

# Rethinking capital and wealth taxation

Thomas Piketty,\* Emmanuel Saez,\*\* and Gabriel Zucman\*\*\*

\* Paris School of Economics, France, e-mail: [piketty@pse.ens.fr](mailto:piketty@pse.ens.fr)

\*\* University of California at Berkeley, USA, e-mail: [saez@econ.berkeley.edu](mailto:saez@econ.berkeley.edu)

\*\*\* University of California at Berkeley, USA, e-mail: [zucman@berkeley.edu](mailto:zucman@berkeley.edu)

We thank Robin Boadway, Joel Slemrod, one anonymous referee, and conference participants for helpful comments and discussions.

## Abstract

This paper reviews recent developments in the theory and practice of optimal capital taxation. We emphasize three main rationales for capital taxation. First, the frontier between capital and labour income flows is often fuzzy, thereby lending support to a broad-based, comprehensive income tax. Next, the very notions of income and consumption flows are difficult to define and measure for top wealth holders where capital gains due to asset price effects dwarf ordinary income and consumption flows. Therefore the proper way to tax billionaires is a progressive wealth tax. Finally, as individuals cannot choose their parents, there are strong meritocratic reasons why we should tax inherited wealth more than earned income or self-made wealth for which individuals can be held responsible, at least in part. This implies that the ideal fiscal system should also include a progressive inheritance tax, in addition to progressive income and wealth taxes. We then confront our prescriptions with historical experience. Although there are significant differences, we argue that observed fiscal systems in modern democracies bear important similarities with this ideal triptych.

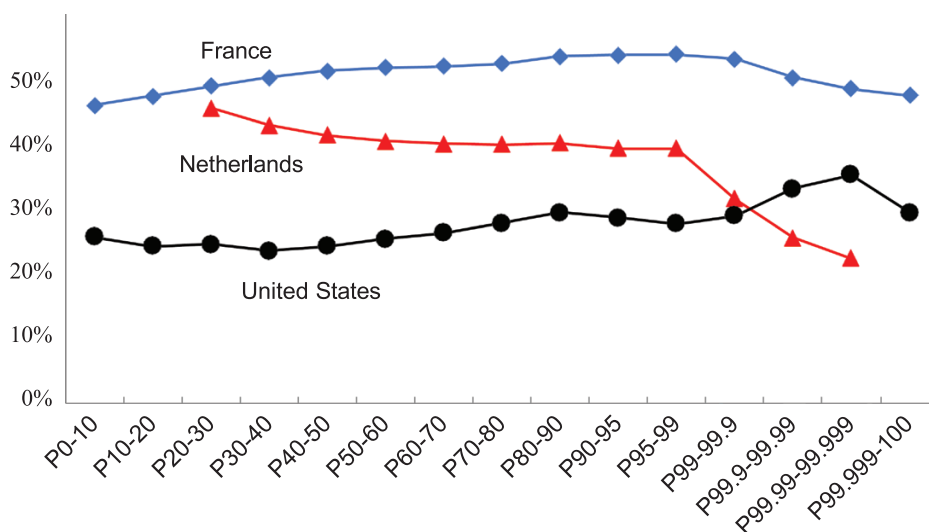
**Keywords:** optimal capital taxation, wealth taxation, inheritance taxation

**JEL classification:** H21

## I. Introduction

This paper reviews a number of recent developments in the theory of optimal capital taxation and confronts them with tax practice. The equity–efficiency trade-off is at the heart of optimal tax theory. For capital taxation, this trade-off is especially marked as capital ownership is much more concentrated than labour income. While the top 1 per cent labour income share is generally below 10 per cent, the top 1 per cent wealth share is typically several times higher, ranging from 25 to 40 per cent in advanced modern economies. While the top 10 per cent labour income share generally ranges from 25 to 50 per cent, the top 10 per cent wealth share is usually around 60–80 per cent. Even more strikingly, while the bottom 50 per cent labour income ranges around 20–25 per cent in some of the most advanced countries in the world, the bottom 50 per cent wealth share is below 5 per cent in pretty much every country on the planet (see [Chancel \*et al.\* \(2022\)](#) for a recent presentation of such statistics across the world).

There are a variety of taxes on capital that can be assessed either directly on assets or income flows generated by assets: property and wealth taxes assessed on asset stocks, individual income taxes on many forms of capital income received by individuals, corporate income taxes on corporate profits, and inheritance (or estate) taxes on transfers at death. It is useful at the outset to show what tax progressivity looks like when including all taxes collected at all levels of government, using the recently developed Distributional National Accounts methodology which is being applied to a growing number of countries (e.g. [Piketty \*et al.\* \(2018\)](#), [Blanchet \*et al.\* \(2021\)](#)). [Figure 1](#) depicts the average tax rate by income groups in the United States, France, and the Netherlands. Income is defined to match total national income as recorded in the national accounts, following internationally agreed standards and methods, and thus maximizing comparability across countries. National income includes all forms of labour



**Figure 1:** Average tax rates by income group: US, France, Netherlands.

*Notes:* This figure depicts the average tax rate (as a percent of pre-tax income) in 2018 by decile (P0–10 is the bottom decile, etc.) with smaller breakdown within the top decile. It includes all taxes at all levels of government. Pre-tax income aggregates to national income (a comprehensive definition of income including both labour and capital income). Series for all countries follow the same distributional national account methodology (Blanchet *et al.*, 2022). The last dot for the Netherlands is for the P99.99–100 group.

*Source:* Piketty *et al.* (2018) for the United States (September 2020 update); Bozio *et al.* (2020) for France; Bruil *et al.* (2022) for the Netherlands.

income (salary and benefits) and capital income (including profits retained in corporations).<sup>1</sup> Labour taxes are assigned to corresponding workers, capital taxes to owners, and consumption taxes to consumers. In all countries, tax progressivity, if it exists at all, is modest: all income groups, including those at the bottom of the distribution, pay about the same fraction of their income in taxes. At the very top, the tax system becomes regressive, particularly so in the Netherlands where the data are of highest quality for the very top (see below). Existing taxes on capital income—income which is highly concentrated at the top of the distribution—are not sufficient in practice to maintain progressivity at the upper end of the scale. This pattern of regressivity at the top seems to be true no matter whether countries have large governments (like France), medium-size governments (like the Netherlands), or relatively small governments (like the United States).<sup>2</sup>

Naturally, progressivity touches only upon the (vertical) equity aspect of the optimal tax problem. Figure 1 is silent on the efficiency effects of taxation. From a purely logical perspective, it is conceivable that lower tax rates on the rich (due to a more favourable treatment of capital income than labour income) is actually beneficial for the economy and in the interest of people with lower incomes. The literature on optimal capital taxation has developed models to capture the efficiency costs of capital taxation and the ultimate incidence of the tax to analyse this trade-off.

From this rich literature, we emphasize three main rationales for capital taxation that strike us as most important and hence most relevant in practice. First, the frontier between capital and labour income flows is often fuzzy, thereby lending support to a broad-based, comprehensive income tax to reduce tax avoidance opportunities. Next, the very notions of income and consumption flows are difficult to define and measure for top wealth holders. For the ultra-wealthy, capital gains due to asset price effects dwarf ordinary income and consumption flows. Furthermore, wealth at the very top is primarily in the form of business ownership, which is by definition divisible in shares and hence can be easily taxed: a 1 per cent wealth tax implies that business owners should simply give the government 1 per cent of their shares. Therefore the proper way to tax billionaires is a progressive wealth tax. Finally, because individuals do not choose their parents, there are strong meritocratic reasons why we should tax inherited wealth more than earned income or self-made wealth, for which individuals are at least in part responsible for.<sup>3</sup>

<sup>1</sup> Capital gains due to changes in prices of assets are not included in national income whether they are realized or not. Hence, the national income definition is less comprehensive than the Haig–Simons definition that also includes all capital gains.

<sup>2</sup> Of course, taxes fund transfers and transfers are progressive, so that the net effect of the tax-and-transfer system is almost always progressive (see Chancel *et al.*, 2022).

<sup>3</sup> To be sure, earning ability is also partly inherited due to enhanced educational opportunities provided by parental resources.

This implies that the ideal fiscal system should also include a progressive inheritance tax, in addition to progressive income and wealth taxes.

We confront our prescriptions with historical experience. Although there are significant differences, in particular regarding the wealth tax, we argue that observed fiscal systems in modern democracies bear important similarities with this ideal triptych. There is still a long way to go towards a socially optimal system, however. We argue that this triptych should be reinforced and made more systematic and consistent, both at the domestic and global level. This would require much more intensive international coordination than what has been achieved until now, as well as a more active role by major international organizations and a modernization of existing fiscal doctrine—a task to which the present paper attempts to contribute. In the longer run, the wealth tax and inheritance tax components could and should be extended substantially if we want to reach a more equal distribution of wealth and economic power. In particular, progressive wealth and inheritance taxes could be used to finance a minimum inheritance to all—arguably one of the most promising avenues to equalize wealth and opportunities. This will certainly take time, but we feel that it is important and useful to take a long-run perspective on these important issues and to set broad targets for the future.

We should make clear from the outset that we do not attempt in the present paper to cover all possible rationales for capital taxation. In particular, we do not cover time-inconsistency arguments.<sup>4</sup> Nor do we cover rationales that are based upon redistribution between different age groups in the presence of inter-temporal market failures.<sup>5</sup> More generally, capital market imperfections offer a large variety of motives and implications for capital taxation and wealth redistribution, which we cover only partially in the present paper.<sup>6</sup> At a more modest level, our objective in this paper is to show that the theory of optimal capital taxation has made some progress, in the sense that we now have a number of simple, tractable economic models that allow us to think about the pros and cons of existing systems of capital taxation. Needless to say, more research is needed in order to reach a more complete understanding.

We are not the first ones to review the recent literature on optimal capital taxation and confront it with practice. [Boadway \(2012\)](#) is a comprehensive survey connecting optimal taxation to practice. [Diamond and Saez \(2011\)](#) is a shorter take on the same issue. [Scheuer and Slemrod \(2020\)](#) provide a recent survey on the literature on taxing the rich, covering both theory and empirics. [Kaplow \(2022\)](#) provides a theoretically oriented survey on optimal income taxation with a significant focus on the rich and issues of market power. [Stantcheva \(2020\)](#) presents a survey on optimal dynamic taxation from a theoretical angle. [Saez and Zucman \(2019a\)](#) discuss prospects for progressive wealth taxation mostly from a practical angle. [Scheuer and Slemrod \(2021\)](#) provide a recent overview on wealth taxation. Our paper provides a very selective review, focusing on the theoretical aspects that we think are the most relevant in practice, some of which have not yet been modelled and analysed fully.

## II. The rationale for a comprehensive income tax

In the real world, the frontier between capital and labour income flows is often fuzzy—or at least more difficult to draw than what is generally assumed in theoretical models. Owners of businesses often also work in their businesses, and hence their profits arise from both labour and capital. In practice, self-employed individuals and business owners can (at least partly) decide how much they get paid in wages vs dividends. This also applies to corporate executives, whose compensation packages often involve a complex and diverse set of income flows. Sometimes it is not at all obvious to decompose these flows into a pure labour component (payment for labour services) and a pure capital component (compensation for capital ownership). For example, if individual wage bargaining power is influenced by one's equity position, or if there is collusion between employees and owners so as to minimize tax burden, the frontier might be fuzzy.

In our view, the fuzziness of the capital vs labour frontier is the simplest—and the most compelling—rationale for a comprehensive income tax (i.e. an income tax treating labour and capital income flows alike) or, at least, for taxing capital and labour income flows at rates that are not too different.<sup>7</sup>

<sup>4</sup> Once capital is created, it is tempting to tax it, even if it would have been preferable to commit *ex ante* not to do so (see, for example, [Farhi et al. \(2012\)](#) for a model along these lines). The right policy response would be to create an independent tax authority with a zero-capital-tax mandate (or a low-capital-tax mandate), similar to the low-inflation mandate of independent central banks. In practice, one-time taxes on existing capital are rare and most forms of capital taxation are recurrent annual taxes suggesting that the time-inconsistency argument has little empirical relevance.

<sup>5</sup> With uninsurable income risk and borrowing constraints, taxing capital income can be a way to shift the tax burden onto older cohorts and to alleviate the liquidity constraints faced by younger cohorts. For a model along these lines, see [Conesa et al. \(2009\)](#).

<sup>6</sup> We refer below to a particular form of capital market imperfection, namely uninsurable idiosyncratic shocks to rates of return. Other imperfections, e.g. borrowing constraints, also matter a great deal for optimal capital taxation and redistribution. See, for example, [Chamley \(2001\)](#).

<sup>7</sup> This point has been made numerous times before. See [Diamond and Saez \(2011\)](#) and [Piketty and Saez \(2013b\)](#) for surveys that formalize this point and provide more complete references.

Take the extreme case where the frontier is entirely fuzzy, i.e. each individual can costlessly convert labour income into capital income and vice versa. That is, each individual  $i$  receives total income  $y_i = y_{li} + y_{ki}$ , where  $y_{li}$  is labour income and  $y_{ki}$  is capital income, but the government can only observe total income  $y_i$  as the division between the two components can be manipulated at no cost. Then the only possible tax policy is a comprehensive income tax, i.e. a tax  $\tau(y)$  on total income.

Consider now the case where it is costly to shift income flows between tax bases. The government can now try to impose a dual income tax system, with different tax schedules  $\tau_l(y_l)$  and  $\tau_k(y_k)$  applying to labour and capital income flows. However if the tax rates differ widely, then individual taxpayers may choose to incur the cost and shift their income to the most favourable tax base. If we note  $e_s$  the relevant income-shifting elasticity, one can easily show that the optimal tax differential  $\tau_l - \tau_k$  is a declining function of  $e_s$ . That is, the higher the income-shifting elasticity, the closer the tax rates on labour and capital should be.<sup>8</sup> Empirically, a large body of work has shown that tax avoidance responses can be large when there are tax avoidance opportunities. These avoidance responses often dwarf real responses (see *Saez et al. (2012)* for a survey), as posited by the influential hierarchical model of behavioural responses to taxation of *Slemrod (1990, 1995)*.

It is worth stressing that the fuzziness rationale also applies in economic environments where there is otherwise no reason at all to tax capital income. Consider the benchmark *Atkinson and Stiglitz (1976)* model where individuals live during two periods  $t = 1, 2$  and are born with zero inherited wealth. In period  $t = 1$ , income is simply equal to labour income, which individual  $i$  allocates to consumption and saving:  $y_{1i} = y_{1li} = c_{1i} + k_{2i}$ . In period  $t = 2$ , income is equal to the sum of labour and capital income:  $y_{2i} = y_{2li} + y_{2ki}$ , with  $y_{2ki} = r \cdot k_{2i}$  where  $r$  is the exogenous rate of return on savings. Under standard separability assumptions on preferences for consumption vs leisure, a well-known result in this class of models is that taxing capital income is useless: it creates a pure intertemporal distortion between periods 1 and 2 consumption decisions (just like differential commodity taxation) and brings no welfare gain. The efficient tax policy in this setting is to tax solely labour income flows (i.e.  $\tau = \tau(y_l)$ ).<sup>9</sup> But if the government can only observe total income (or if individuals can easily convert labour into capital income and vice versa, so that the income-shifting elasticity is large), then there is no choice but using a comprehensive income tax ( $\tau = \tau(y)$ , with  $y = y_l + y_k$ ), or a dual income tax with limited tax differentials between income categories.

Conservatives often advocate for a consumption tax on the grounds that it is equivalent to a labour income tax and hence exempts the return on capital from taxation. This is true in the basic two-period model just described, but the progressive tax on consumption would have to be defined on the present discounted value of life-time consumption  $c_{1i} + c_{2i}/(1+r)$ . Even assuming that  $c_{1i}$  and  $c_{2i}$  are measurable, this would require measuring  $r$  which again leaves the door open for manipulation, i.e. claiming that labour income is small and capital income is large, so that  $r$  is larger and  $c_{1i} + c_{2i}/(1+r)$  is smaller. The most common form of progressive consumption tax proposed in practice is a progressive tax on annual consumption which cannot replicate the optimal labour income tax in the standard Atkinson–Stiglitz model.

As is common in optimal tax theory, a lot hinges on the relative magnitude of different elasticities. If the cross-sectional income-shifting elasticity  $e_s$  is large compared to the intertemporal substitution elasticity, then comprehensive income taxes are desirable and create little intertemporal distortions. Conversely, if the shifting elasticity is small compared to the intertemporal elasticity, then the intertemporal distortion induced by capital taxation generates significant welfare costs, so that it is better to have a dual system with low tax rates on capital income. In economic environments where there are other reasons to tax capital (e.g. the existence of inheritance, as discussed below), then other parameters play a role. In any case, the income-shifting elasticity  $e_s$  plays an important role for the determination of the optimal tax system.

At the upper end of the distribution, the most important area where income-shifting considerations are relevant involves shifting between the individual vs corporate income tax bases. The logic of comprehensive income taxation laid out here implies that corporate profits should be included in the individual income tax base, just like the profits of unincorporated businesses. The US experience since the Tax Reform Act of 1986 shows that taxing profits at the individual level is possible even for large and complex businesses. Currently, S-corporations and partnerships (many of which are large and some of which are even publicly traded) are taxed directly and solely on the individual tax returns of their owners. Applying this regime to all corporations would be a key step towards a comprehensive income tax system. The corporate income tax would become a withholding tax at source that could be credited back to owners for individual tax purposes, just like the taxes withheld on wage earnings are.

<sup>8</sup> See *Piketty et al. (2014)* for a formal modelling for the top rate and *Piketty and Saez (2013b)* for a simpler linear tax rate analysis.

<sup>9</sup> See *Atkinson and Stiglitz (1976)*. See also *Saez (2002)*.

This comprehensive income tax would make it impossible for business owners to avoid taxation by shifting income from the individual to the corporate base and retaining profits in corporations; see [Saez and Zucman \(2019b\)](#) and our discussion below.

### III. The rationale for a progressive wealth tax

One important limitation of income taxes is that income flows are often difficult to define and measure for top wealth holders. In particular, owners of very large fortunes typically receive personal, taxable income flows that are much smaller than their full economic income. Their wealth portfolio is generally a large stake in a business and/or managed through a holding company, a private foundation, or other bodies, and most of the return is being accumulated within this vehicle. The individual owners then choose to receive an annual personal income flow that is sufficient to cover their private consumption costs—which can be a very small fraction of their wealth if they are very wealthy. Although we do not have systematic data on this issue, there is much anecdotal evidence suggesting that the personal income reported by top billionaires can indeed be a tiny fraction of their true economic income.<sup>10</sup>

In other words, income flows themselves—and not only their division into capital and labour income components—are often non-observable for top wealth holders. Assume for simplicity that there is tiny group of billionaires—making a fixed fraction  $\lambda$  of the population—for whom the government can only observe the evolution of their net wealth  $k_{it}, k_{i,t+1}$ , etc. In principle, one could try to recover the full economic income  $y_{it}$  (in the Haig–Simons sense) by using the following accounting equation:

$$k_{i,t+1} = k_{it} + y_{it} - c_{it}$$

i.e.

$$y_{it} = \Delta k_{it} + c_{it}, \text{ with } \Delta k_{it} = k_{i,t+1} - k_{it}$$

The problem is that the consumption flow  $c_{it}$  of top wealth holders might be as difficult to define and estimate as the income flow itself  $y_{it}$ . Should we include the private jet used by Bill Gates or his collaborators as part of his private consumption, or as part of the income flow that is being re-invested by his foundation in order to promote new projects? It can be quite difficult—and cumbersome—to decide.

The net wealth sequence  $k_{it}, k_{i,t+1}$ , etc. is generally easier to observe than  $y_{it}$  and  $c_{it}$ . Generally, billionaires' wealth is tied to large business stakes (e.g. Tesla stock for Elon Musk, the richest person in the world in 2022). If businesses are publicly traded, wealth is easy to measure. In the United States, for example, large equity stakes in publicly traded businesses have to be reported to the Security Exchange Commission. These data form the backbone of the rich lists compiled by *Forbes* and *Bloomberg* (see [Saez and Zucman, 2022b](#)). If wealth is held in private businesses, the value is harder to measure, but because businesses are owned in the form of shares, it is straightforward to assess a proportional wealth tax: a 1 per cent wealth tax means that the owner has to give to the government 1 per cent of her shares in each business she owns.<sup>11</sup>

The global billionaires list compiled by *Forbes* since 1987 shows that the wealth of the top global wealth holders has risen at a very fast pace. The average, real yearly growth rate  $\Delta k_{it}/k_{it}$  appears to be of the order of 6–7 per cent over the 1987–2013 period (or even higher at the very top of the billionaires' list).<sup>12</sup> These high wealth growth rates primarily reflect asset price effects rather than ordinary capital income earned by the asset (such as profits in the case of corporate stock). Indeed, corporate stock values surge when a business is expected to become eventually profitable well before actual profits materialize (e.g. Amazon or Google). Therefore, for billionaires, wealth is the most relevant economic variable, not income flows derived from wealth.

For most billionaires the consumption flow  $c_{it}$  is likely quite small compared to  $\Delta k_{it}$ . For instance, with net wealth  $k_{it}$  equal to \$3 billion (roughly the average wealth of billionaires), average  $\Delta k_{it}$  is of the order of \$180–210 millions (6–7 per cent of  $k_{it}$ ), so that a consumption flow  $c_{it}$  of (say) \$10 million would correspond to about 5 per cent of  $\Delta k_{it}$  only.

One possibility would then be to ignore the consumption flow and to tax billionaires by applying the regular income tax  $\tau$  ( $y$ ) to their implicit income  $\tilde{y}_{it} = \Delta k_{it}$  (a lower bound for their Haig–Simons income), or maybe to  $\tilde{y}_{it} = \max(\Delta k_{it}, y_{pit})$ , where  $y_{pit}$  is their conventionally measured personal income, generally much smaller than  $\Delta k_{it}$ . Indeed, some economists have advocated for the taxation of unrealized capital gains in addition to regular

<sup>10</sup> See [Saez and Zucman \(2019b\)](#), [Leiserson and Yagan \(2021\)](#), and the billionaire tax data leaked to ProPublica ([Eisinger et al., 2021](#)) for evidence in the case of the United States.

<sup>11</sup> A graduated wealth tax makes practical implementation more complex. [Saez and Zucman \(2019\)](#) discuss in detail how this could be implemented in practice. [Saez and Zucman \(2022c\)](#) propose a straight flat rate tax on the stock of (large) corporations that does not require valuation.

<sup>12</sup> See [Piketty, 2014](#), ch. 12, table 12.1.

income (see [Saez et al. \(2021\)](#) for a recent discussion in the US context). For the ultra-rich, this corresponds approximately to taxing wealth gains  $\Delta k_{it}$ . Such proposals have gained traction in the US tax policy debate in recent years and the Biden administration proposed a version of this idea in its 2023 budget, in the form of a minimum tax on unrealized gains for taxpayers with wealth in excess of \$100 million ([US Office of Management and Budget, 2022](#)). So far, however, this remains a proposal and no country in the world has yet implemented a systematic tax on unrealized gains of the wealthy.

Taxing increments in wealth is relatively arbitrary, however. Most billionaires seem to derive direct utility from the wealth they own (and the power, prestige, and influence conferred by their wealth or by the control of a large business), at least as much as from their private consumption (probably because of consumption satiation).<sup>13</sup> Indeed, popular rich lists such as the *Forbes* billionaires list focus on wealth rather than wealth gains.<sup>14</sup> Moreover,  $\Delta k_{it}$  can be highly volatile (strongly negative in stock market downturns, and strongly positive in booms), which raises practical implementation difficulties.<sup>15</sup>

Standard optimal capital tax theory—such as the one coming out of the [Atkinson and Stiglitz \(1976\)](#) life-cycle model or the [Chamley \(1986\)](#) and [Judd \(1985\)](#) infinite horizon model—abstracts from price effects on wealth and falls short for understanding the policy value of wealth taxes, particularly at the very top of the distribution. To take a simple illustration, consider an annual tax on wealth  $\tau(k)$  and assume that the population includes a fixed fraction  $1 - \lambda$  of workers with fixed labour income  $y_{it} = y_l$  (who do not save), and a fixed fraction  $\lambda$  of billionaires with the following stochastic wealth process:

$$k_{t+1i} = \tilde{R}(e_{it}) \cdot (k_{it} - \tau(k_{it})), \quad (1)$$

where  $\tilde{R}(e_{it})$  is a stochastic rate of return (reflecting both price effects on assets and income earned on assets), which in general might depend on individual effort decision  $e_{it}$  such as entrepreneurial effort.

It is important to note that a tax on capital income cannot replicate the wealth tax for two reasons. First and theoretically, suppose that income is defined according to Haig–Simons as the full return on wealth including price effects, i.e.  $(y_{it} = \tilde{R}(e_{it}) - 1) \cdot k_{it}$ . With a tax on Haig–Simons income at rate  $\tau_y$ , the transition equation is  $k_{t+1i} = \tilde{R}(e_{it}) k_{it} - \tau_y (\tilde{R}(e_{it}) - 1) \cdot k_{it}$  which is no longer equivalent to (1) if returns are heterogeneous across individuals. The Haig–Simons income tax hits harder those with particularly high returns than the wealth tax. Hence, the wealth tax favours the wealthy with high returns (typically new self-made billionaires) and disfavours the wealthy with low returns (typically older or inheriting billionaires). [Allais \(1977\)](#) famously advocated for a wealth tax on such efficiency grounds and [Güvener et al. \(2019, 2021\)](#) provide a modern modelling. Second and practically, no income tax system to date has been able to tax the full return on wealth which includes unrealized capital gains. Actual income tax systems have a much narrower base limited to income produced by the asset (such as rent, interest, or dividends) and sometimes realized capital gains (i.e. gains measured solely when the assets are sold). Hence, annual wealth taxation has been so far the only—and still quite imperfect—tool to go after unrealized returns on a continuous basis (see our discussion in section V).

Coming back to our model, the long-run ergodic distribution of top wealth will depend on the wealth tax schedule  $\tau(k)$  both through mechanical effects—the fact that the wealth tax directly reduces next period wealth in [equation \(1\)](#)—and through behavioural effects—the fact that the wealth tax may reduce the incentives to put effort  $e_{it}$  towards building or maintaining wealth. Take a simple example with a linear wealth tax at rate  $\tau$ . Assume that billionaires choose effort  $e_{it}$  so as to maximize  $U = Ek_{t+1i} - V(e_{it}) \cdot k_{it} = (1 - \tau) E \cdot \tilde{R}(e_{it}) \cdot k_{it} - V(e_{it}) \cdot k_{it}$  (effort costs are assumed to be proportional to portfolio size). This produces a first order condition for effort  $(1 - \tau) E \cdot \tilde{R}'(e_{it}) = V'(e_{it})$  so that effort will increase with the net-of-tax rate  $1 - \tau$  under standard assumptions of concavity of  $\tilde{R}(e)$  and convexity of  $V(e)$ . As a result, the long-run wealth distribution depends on the net-of-tax rate  $1 - \tau$  through this behavioural effort channel. [Saez and Zucman \(2019a\)](#) consider a simple model of billionaires' wealth that includes only mechanical effects and no behavioural responses. Mechanical effects still produce a long-term elasticity of top wealth with respect to the net-of-tax wealth tax rate that can be large. To see this, if consumption is negligible for billionaires, after  $T$  years of taxation at average rate  $\tau$  each year, the wealth of a billionaire is mechanically reduced by a factor  $(1 - \tau)^T$ . The elasticity created by pure mechanical effects is equal to the average number of years billionaires remain billionaires and hence are subject to the billionaire wealth tax. The wealth tax has less impact on top wealth when there is a lot of mobility among billionaires and when new fortunes are created and destroyed quickly. Conversely, in a dynastic environment with little wealth mobility, a progressive wealth tax will have much larger long-run effects as it hits fortunes for a long

<sup>13</sup> Saez and [Stantcheva \(2018\)](#) show that introducing wealth in the utility function in the standard dynamic model overturns the classic result by [Chamley \(1986\)](#) and [Judd \(1985\)](#) that capital taxes should be zero in the long run.

<sup>14</sup> To be sure, these lists do mention sometimes the largest gains or the largest losses in wealth but the primary focus is on wealth itself.

<sup>15</sup> The recent US proposal to tax the unrealized gains of the ultra-wealthy ([US Office of Management and Budget, 2022](#)) is akin to a pre-paid minimum tax on the stock of unrealized gains that builds up over time, rather than an attempt to tax annual unrealized gains in full year after year, precisely to smooth volatility. [Chen and Slemrod \(2023\)](#) lay out a new proposal in this direction.

time, possibly several generations. Using a simple calibration based on the *Forbes* 400 rich list for the United States since 1982, [Saez and Zucman \(2019a\)](#) find that billionaires have been on the list for 15 years on average, implying a long-run elasticity of around 15. The corresponding average wealth tax rate that maximizes wealth tax revenue is then given by the standard inverse elasticity rule  $\tau^* = 1/(1 + e) = 1/(1 + 15) = 6.25$  per cent.

[Blanchet \(2022\)](#) considers a much more general model of the wealth distribution using a continuous time stochastic model calibrated using US wealth distribution data, allowing one to assess the short- and long-run effects of wealth taxation. The model can incorporate both mechanical effects and behavioural effects. He derives simple formulas for how the tax base reacts to the net-of-tax rate on wealth in the long run, which nests insights from several existing models, and can be calibrated using estimable elasticities. In his benchmark calibration, the revenue-maximizing wealth tax rate at the top is high (slightly above 10 per cent), but the revenue collected from the tax is lower than in the static case as the wealth tax has a large long-run impact on top wealth.<sup>16</sup>

These recent contributions depart from the standard micro-founded model of optimal intertemporal consumption smoothing and focus instead on understanding the forces shaping the wealth distribution and the fiscal consequences of wealth taxation, which are significant, given the high and rising wealth-to-income ratios and concentration of wealth (see, for example, [Saez and Zucman \(2016, 2020\)](#) in the case of the United States, and [Zucman \(2019\)](#) for a review of the global evidence). In advanced economies, wealth to national income ratios have reached levels about five or more today (up from 2–3 in mid-twentieth century). If the top 1 per cent owns 30 per cent of wealth, a 1 per cent average wealth tax on the top 1 per cent raises about  $5 \cdot 0.3 \cdot 1\% = 1.5\%$  of national income, which is quite large.<sup>17</sup>

To capture the relevant trade-offs involved in taxing top-end wealth, this new approach is in our view more relevant and robust, because it seems unlikely that consumption smoothing considerations—the heart of standard dynamic models—play a large role in the creation and destruction of great fortunes.

#### IV. The rationale for a progressive inheritance tax

Inherited wealth is usually perceived—and taxed—differently from earned income or self-made wealth. Most normative theories of distributive justice put a strong emphasis on individual responsibility and merit, and share the view that life opportunities should be equalized as much as possible (in particular between individuals with different levels of inherited wealth). From an equal-opportunity viewpoint, it seems to make sense to tax earned income or self-made wealth—for which individuals can be held responsible, at least in part—less heavily than inherited wealth, for which individuals can hardly be held responsible.<sup>18</sup> This merit-based argument suggests that the ideal fiscal system should also include a progressive inheritance tax, in addition to progressive income and wealth taxes.

There is substantial controversy, however, about the proper level of taxation of inherited wealth. The public debate centres around the equity vs efficiency trade-off. In the economic debate, there is a disparate set of models and results on optimal inheritance taxation. These models differ primarily in terms of preferences for savings/bequests and the structure of economic shocks. One central conceptual difficulty is that each individual is at the same time—at least potentially—a bequest receiver and a bequest leaver. Even individuals who received zero bequest might prefer not to tax inheritance too heavily, because they themselves value the possibility of leaving a bequest to their own children. At the same time, if the tax burden falls entirely on labour income and inheritance is not taxed at all, then it might be more difficult for zero bequest receivers to accumulate wealth out of their labour income. The challenge is to be able to take into account these different effects in a tractable manner.

[Piketty and Saez \(2013a\)](#) consider such a model and show that optimal inheritance tax formulas can be expressed in terms of estimable ‘sufficient statistics’ including behavioural elasticities, distributional parameters, and social preferences for redistribution.<sup>19</sup> Those formulas are robust to the underlying primitives of the model and capture the key equity–efficiency trade-off in a transparent way. They apply to a large class of models where inequality is two-dimensional: individuals differ both in terms of earnings (e.g. due to productivity shocks and labour taste shocks) and in terms of inherited wealth (e.g. due to their ancestors’ productivity shocks and bequest taste shocks).<sup>20</sup>

<sup>16</sup> [Jakobsen et al. \(2020\)](#) estimate wealth tax elasticities leveraging the high-quality administrative wealth data of Denmark and also find the wealth tax has significant effects on long-run wealth levels at the top.

<sup>17</sup> A 1 per cent marginal wealth tax above the top 1 per cent wealth threshold raises 1 per cent (instead of 1.5 per cent) as it exempts wealth below the threshold which is 1/3 of the base (as average wealth above a given threshold is approximately 3 times the threshold).

<sup>18</sup> For instance, according to the compensation principle of fair taxation, individuals should be compensated for inequality they are not responsible for—such as bequests received—but not for inequality they are responsible for—such as labour income ([Fleurbay, 2008](#); [Fleurbay and Maniquet, 2018](#)).

<sup>19</sup> [Decerf and Maniquet \(2021\)](#) use a similar model but based on fairness principles instead of standard social welfare maximization. They consider more general inheritance taxation and obtain qualitatively similar results.

<sup>20</sup> The bi-dimensionality of inequality—labour and inheritance—is the key element that breaks the classical [Atkinson and Stiglitz \(1976\)](#) result of zero capital taxation (which is obtained in a life-cycle model with only labour income inequality).

Consider a simplified version of the [Piketty and Saez \(2013a\)](#) model with a measure one of individuals indexed by  $i$ , who are both bequests receivers and bequest leavers. A linear tax on bequests at rate  $\tau_B$  funds a lumpsum grant  $E$ .<sup>21</sup> The life-time budget constraint of individual  $i$  is

$$c_i + b_i = R \cdot (1 - \tau_B) \cdot b_i^r + y_{Li} + E$$

where  $c_i$  is consumption,  $b_i$  is bequest left,  $y_{Li}$  is inelastic labour income,  $b_i^r$  is pre-tax bequest received with  $R = 1 + r$  the generational rate of return on bequests received.

Individual  $i$  has utility  $V^i(c, b)$  with  $b = R(1 - \tau_B)b$  net-of-tax bequests left and solves

$$\max_{b_i} V^i(y_{Li} + E + R(1 - \tau_B)b_i^r - b_i, Rb_i(1 - \tau_B)) \Rightarrow V_c^i = R(1 - \tau_B)V_b^i.$$

The government budget constraint is  $E = \tau_B \bar{b}$  with  $\bar{b}$  aggregate (=average) bequests. The government chooses  $\tau_B$  to maximizes a social welfare function of the form:

$$SW F = \int_i \omega_i V^i(y_{Li} + \tau_B \bar{b} + R(1 - \tau_B)b_i^r - b_i, Rb_i(1 - \tau_B))$$

with  $\omega_i \geq 0$  Pareto weights.

Let us consider a meritocratic Rawlsian criterion where the government maximizes welfare of those receiving no inheritances with uniform social marginal welfare weight  $\omega_i V^i$  among zero-receivers. In this case the optimum bequest tax rate takes the simple form:

$$\tau_B = \frac{1 - b}{1 + e_B}, \quad (2)$$

with

$$e_B = \frac{1 - \tau_B}{b} \frac{db}{d(1 - \tau_B)}$$

the elasticity of aggregate bequests with respect to the net-of-tax rate  $1 - \tau_B$  and

$$\bar{b} = \frac{E[b_i | b_i^r = 0]}{b}$$

the average bequest left by zero-receivers relative to the population average  $b$ .

The proof is easy to understand intuitively. Suppose the government increases  $\tau_B$  by  $d\tau_B$ . This mechanically raises  $b d\tau_B$  extra in taxes but it loses  $\tau_B db = -\tau_B e_B b d\tau_B / (1 - \tau_B)$  through behavioural responses so that net government new revenue funding the lumpsum grant is  $dE = b d\tau_B [1 - e_B \tau_B / (1 - \tau_B)]$ . There are two welfare effects on zero receivers utility  $V^i(y_{Li} + E - b, Rb_i(1 - \tau_B))$ . First, there is the mechanical effect of  $dE$  equal to  $V_c^i dE$ . Second, there is the effect of  $d\tau_B$  as the change in  $\tau_B$  hurts those who leave bequests by  $-V^i b R b d\tau_B = -b d\tau_B V_c^i / (1 - \tau_B)$  (using the envelope theorem as  $b_i$  maximizes utility). Therefore, the net effect on social utility is  $\omega_i V_c^i b d\tau_B \cdot [1 - e_B \tau_B / (1 - \tau_B) - (b/b)/(1 - \tau_B)]$ . Summing across all zero receivers (using the fact that the welfare weights  $\omega_i V_c^i$  are assumed to be uniform in this group) and setting this equal to zero at the optimum leads to  $1 - e_B \tau_B / (1 - \tau_B) - \bar{b} / (1 - \tau_B) = 0$  which can be rewritten as formula (2).

The optimal linear bequest tax rate  $\tau_B$  in this formula refers to what we label the ‘zero-bequest receivers’ optimum, or ‘Meritocratic Rawlsian’ optimum. This is the tax rate maximizing the welfare of individuals who received zero bequests. Note that about half the population in France or the US—or in any country for which data are available—receives negligible bequests.<sup>22</sup> Hence, this ‘Meritocratic Rawlsian’ optimum has relatively broad appeal.

Importantly, if the normative objective puts weight on bequest receivers, then lower or even negative bequest tax rates can be optimal. Negative tax rates can be optimal because bequest taxes hurt both the receivers and the donors, and hence creates a double welfare cost. This point was made by [Kaplow \(2001\)](#) and formalized in [Farhi and Werning \(2010\)](#).<sup>23</sup>

<sup>21</sup> We consider the linear tax case here for simplicity. However, the derivation can be easily extended to a progressive tax with a single marginal tax rate that applies above a given threshold (see [Piketty and Saez, 2013a](#)).

<sup>22</sup> The bottom 50 per cent of the distribution of received bequests typically receives less than 5 per cent of the aggregate inheritance flow, while the top 10 per cent generally receives at least 60–70 per cent (see [Piketty \(2011\)](#) for a comprehensive study for France).

<sup>23</sup> [Piketty and Saez \(2013a\)](#) provide more general formulas with general social welfare objectives and with positive elasticities of labour supply, which are assumed to be zero in the formula presented here. They also provide simulations of optimal inheritance tax rates using wealth survey data from France and the United States.



The elasticity  $e_B$  in the formula is the long-run elasticity of the aggregate bequest flow with respect to the net-of-tax rate  $1 - \tau_B$ . This parameter reflects how much individuals respond to bequest taxation by accumulating less wealth. Available estimates using tax changes suggest that the elasticity  $e_B$  is moderately positive (say  $e_B \simeq 0.1 - 0.2$ , see Kopczuk and Slemrod (2001)). However this is really an empirical issue, and one certainly cannot exclude the possibility of higher elasticities.<sup>24</sup>

Note that if  $\bar{b} = 0$ , i.e. zero bequest receivers also leave themselves negligible bequests (relative to average), then the formula boils down to the classic inverse elasticity  $\tau_B = 1/(1+e_B)$  that maximizes bequest tax revenue. Conversely, if zero bequest receivers expect to leave very large bequests, say above average with  $\bar{b} > 1$ , they would favour bequest subsidies (i.e.  $\tau_B < 0$ ). One can see the crucial role of wealth mobility—and beliefs about wealth mobility—for the determination of optimal inheritance tax rates.

Empirically in France or the United States,  $\bar{b} \simeq 0.5$ , i.e. zero receivers leave themselves bequests that are around half of the average. In such a case, it is in their interest to tax bequests at a rate of ‘only’  $\tau_B \simeq 50$  per cent even if the elasticity of bequests is zero. This is because zero receivers want to leave bequests, so that they face a true trade-off between raising inheritance tax revenue to receive a larger lumpsum grant vs not taxing their own children.

The model just presented assumes that wealth accumulation is motivated solely by bequest motives. However, according to available estimates, there is a wide variety of motives for wealth accumulation in the population: some accumulate wealth primarily due to bequest motives, others accumulate for precautionary reasons, or for the prestige, power, or social status that comes with wealth. If only a fraction  $\nu$  of bequests are due to bequest motives, then  $\bar{b}$  should simply be replaced by  $\nu \cdot \bar{b}$  in formula (2). In principle, one can estimate  $\nu$  using wealth surveys. An average value around  $\nu = 0.5$  might be realistic (see, for example, Kopczuk and Lupton (2007)). Unsurprisingly, the optimal bequest tax rate  $\tau_B$  decreases sharply with  $\nu$ . In the extreme case  $\nu = 0$ , then the formula boils down to the standard inverse-elasticity formula  $\tau_B = 1/(1 + e_B)$ . That is, if zero-bequest receivers do not care at all about leaving a bequest, then the only force limiting the taxation of bequests (from their viewpoint) is the elasticity effect. Consistent with this discussion, many countries, such as France or Germany, have lower inheritance taxes for bequests to children than for less related or unrelated heirs, presumably because bequest motives are stronger when bequests are left to children rather than less related individuals.

Finally, note that these results about optimal inheritance taxation also have implications about lifetime capital taxes. That is, if one introduces capital market imperfections, then it might be optimal to split the inheritance tax burden between a tax paid at the time of inheritance and a tax paid during the inheritor’s lifetime (either in the form of a tax on the flow income from capital or a property or wealth tax levied on the stock). For instance, with uninsurable idiosyncratic risk about the future returns to capital, one does not know at the time of inheritance what the capitalized bequest value will be, so it is more efficient to spread the tax burden. As a consequence, depending on the specific parameters (e.g. the effort elasticity of future rates of return, the share of inheritance in total wealth, etc.), the optimal tax rate on capital income flows might be either higher or smaller than the optimal tax rate on labour income flows (see Piketty and Saez, 2012). Furthermore, in contrast to inheritance taxes, lifetime capital taxes can also equalize parental investment in children across parents by reducing the ability of wealthy parents to spend on their children (see Berg and Hebous (2021) for a recent empirical analysis for Norway).

The recent model of stochastic wealth by Blanchet (2022) shows that, given the substantial mobility in wealth over a lifetime, bequest taxes are much less powerful than annual wealth taxes to reduce wealth concentration. To see this, note that even if bequest taxes were 100 per cent, there would still be substantial wealth inequality due to self-made wealth. For example, a significant fraction of the *Forbes* 400 richest Americans are self-made and hence would still be billionaires even in presence of complete bequest confiscation. In contrast, wealth taxes at sufficiently high rates can quickly compress the distribution of wealth (as discussed and proposed by Piketty (2020)). Given the level of wealth mobility estimated in Blanchet (2022) for the United States, a 100 per cent bequest tax has approximately the same impact as a 3 per cent annual wealth tax on reducing wealth concentration. This point connects with our previous section on the need for wealth taxation even on top of optimal inheritance taxes.

## V. Comparing actual tax systems with the ideal triptych

Our analysis so far suggests that the ideal fiscal system should include a comprehensive income tax, together with an annual progressive wealth tax, and a progressive inheritance tax. We now briefly confront our prescriptions with historical experience. Although there are significant differences, in particular regarding the wealth tax, we argue that observed fiscal systems in modern democracies bear important similarities with this ideal triptych.

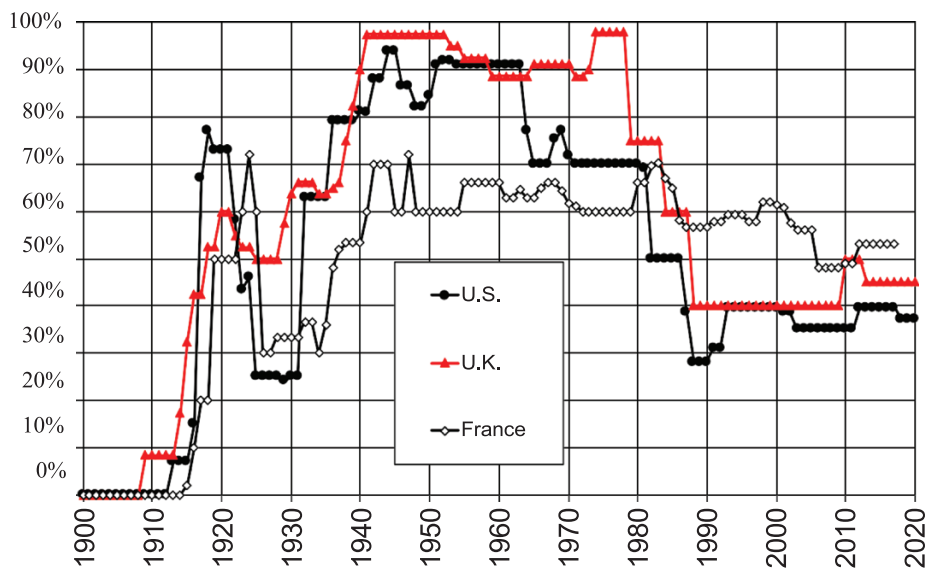
<sup>24</sup> Goupille-Lebret and Infante (2018) propose a particularly well identified study in the case of France where there was an abrupt change in inheritance taxation for a specific savings vehicle (‘Assurance Vie’). They obtain an elasticity of 0.4 but this elasticity includes both avoidance and real effects so that the real elasticity  $e_B$  could be substantially lower.

### (i) The comprehensive income tax cum inheritance tax consensus before 1980

We start with the comprehensive income tax. The modern income tax was created in the United Kingdom in the early nineteenth century (see [Keen and Slemrod \(2021\)](#) for a recent history). By the early twentieth century, almost all rich countries had instituted comprehensive income taxes. In every country, the progressive tax schedule—and in particular the top marginal rate (depicted in [Figure 2](#) for the United States, the United Kingdom, and France)—applied to the sum of labour and capital income. The tax base was defined in a comprehensive manner, particularly for capital income that included all business profits, rents (sometimes even including imputed rent on homeowners), as well as all dividends and interest paid by corporate stocks and fixed-income assets. A separate corporate income tax was often added as a way to tax corporate profits at source. Some countries, such as the United States, effectively imposed a double taxation of corporate profits (with first the corporate income tax, and then the individual income tax on dividends). Most other countries—notably in Western Europe—developed ways to alleviate this double taxation by providing a credit for corporate taxes paid for dividend income reported on individual tax returns, effectively making the corporate tax like a withholding tax at source and respecting the logic of the comprehensive income tax we discussed in section II.

It is unclear the extent to which the choice to opt for comprehensive income taxes was due to concerns about income shifting. In the standard Haig–Simons writings about the comprehensive income tax, one finds for the most part rationales expressed in terms of ability to pay: all forms of income should be treated alike, because they reflect similar ability to pay taxes.<sup>25</sup> There was probably some concern about income shifting, but the main concern seems to have been about horizontal equity (across income sources) and vertical inequality (across income levels). Given the huge concentration of wealth prevailing at the time—the highest incomes were mostly made of capital incomes (see [Atkinson et al., 2011](#)), it was obvious to everybody that the income tax should tax capital income at least as much as labour income. In practice, effective tax rates on capital (taking into account all capital taxes) typically exceeded effective tax rates on labour in developed countries in the 1960s and 1970s ([Bachas et al., 2022](#)).

An illustration of this reality is that a number of countries applied tax surcharges for capital income flows (see [Keen and Slemrod, 2021](#)). During the interwar period, capital income flows were taxed more heavily than labour income flows pretty much everywhere. In the United States and in the United Kingdom, the top rate applying to so-called ‘earned income’—i.e. labour income—was at times somewhat lower than the top rate applying to so-called ‘unearned income’—i.e. capital income. In particular, in the 1960s–1970s, the top rates reported on



**Figure 2:** Top income tax rates 1900–2020.

*Notes:* This figure depicts the top marginal tax rate for the individual income tax in the United States (federal income tax only), the United Kingdom, and France from 1900 to 2020. The tax rate on ordinary income with no preferential treatment is reported.

*Source:* [Piketty \(2014\)](#) and updates.

<sup>25</sup> See, for example, [Seligman \(1911\)](#), [Haig \(1921\)](#), [Simons \(1938\)](#).

Figure 2 were those applying to capital income (the rates applying to earned income were often about 10 points lower).

This is also confirmed by the fact that the rise of comprehensive income tax during the twentieth century came together with the development of steeply progressive inheritance taxes, particularly in the United States and in the United Kingdom (see Figure 3). Inheritance taxes had long been advocated by a number of economists and philosophers as one of the most desirable forms of taxation (at least since Thomas Paine and John Stuart Mill). In the 1910s–1920s, when modern progressive inheritance taxes were created, the chief concern was to limit the perpetuation of large wealth disparities across generations. In his famous 1919 presidential address to the American Economic Association, Irving Fisher expressed strong concerns about the rising concentration of wealth in America (which in his view was becoming as unequal and ‘undemocratic’ as in Old Europe), and called for steeply progressive taxes on inheritance and capital incomes as the proper way to restore equality of opportunities.<sup>26</sup>

The treatment of capital gains generated a conundrum for these progressive tax systems. Countries typically taxed capital gains only upon realization—if at all, and generally at lower rates than ordinary income. For example, when individual tax rates on ordinary income were at or above 90 per cent in the United States in the 1950s, the tax rate on capital gains was only 25 per cent. Realized capital gains are often lumpy, making it challenging to apply the ordinary progressive tax schedule on gains that may represent a lifetime of wealth accumulation (e.g. a founder selling his or her business). The United States recognized this problem as early as 1922 when it first gave preferential treatment to capital gains by introducing an alternative tax rate of 12.5 per cent for gains on assets held at least 2 years. Taxing unrealized capital gains is the Haig–Simons theoretical solution, sometimes proposed (most recently by the Biden administration in 2022 (US Office of Management and Budget, 2022)), but never implemented in practice. Instead, some countries, mostly in continental Europe, adopted annual progressive wealth taxes to indirectly tax unrealized gains.<sup>27</sup>

Other countries, notably the United States, never implemented direct progressive wealth taxes, perhaps because of constitutional constraints.<sup>28</sup> However, the estate tax was seen as a backstop to go after unrealized gains accumulated over a lifetime at the time of bequest. Similarly, the corporate tax was also a backstop to go after business

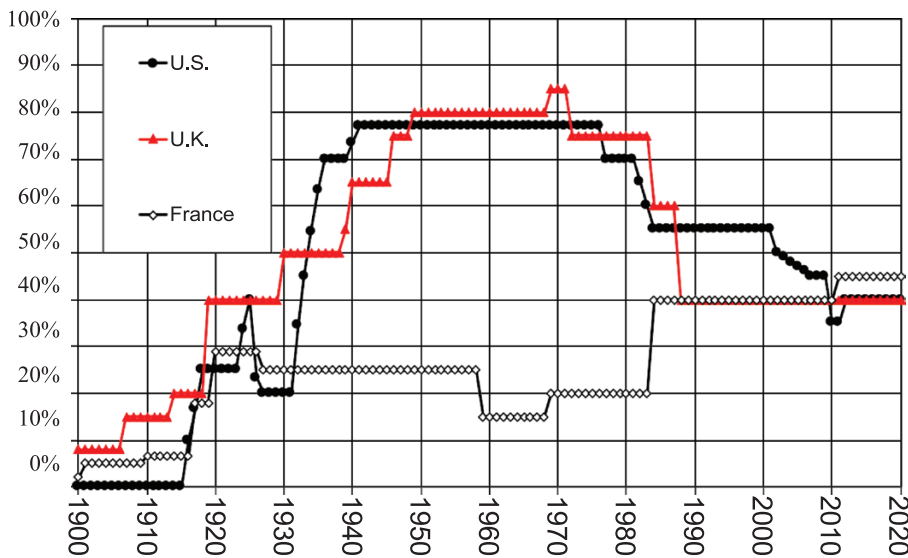


Figure 3: Top inheritance tax rates 1900–2020.

Notes: This figure depicts the top marginal tax rate for the inheritance (or estate) tax in the United States (federal estate tax only), the United Kingdom, and France from 1900 to 2020. The tax rate for bequests to children in direct line is reported when rates for other inheritors are higher in France. Source: Piketty (2014) and updates.

<sup>26</sup> Fisher recommended to apply the Rignano principle, according to which the entire bequest should be taxed away if it has been transmitted for at least three generations. See Fisher (1919).

<sup>27</sup> Limberg and Seelkopf (2022) create a dataset on the introduction of taxes on comprehensive wealth across the world. They argue that such wealth taxes were mainly used as an emergency tax when countries faced major recession shocks.

<sup>28</sup> US states have a long tradition of proportional but comprehensive wealth taxation (on both real estate and financial assets) at economically significant rates ranging from 0.5 per cent to 1.5 per cent on average; see Saez and Zucman (2019b, ch. 2), and Dray et al. (2022). In the twentieth century, these state wealth taxes have become limited to real estate property taxes only.

profits, even if these profits were retained within the corporation and not distributed to shareholders in the form of dividends. Furthermore, regulations were put in place to prevent corporations from excessive retained earnings and from distributing these earnings through share repurchases instead of regular dividends.<sup>29</sup> The estimates by [Saez and Zucman \(2019b\)](#) show that the high effective tax rates on high earners in the post-war decades were achieved thanks to a large (as high as 50 per cent) corporate tax on profits at source.

Obviously, such progressive tax systems combining highly progressive individual income and inheritance taxes along with heavy corporate taxation had to rely on strong enforcement to work as designed. This enforcement encompassed both direct enforcement from tax authorities but also more generally strong social norms against tax avoidance and evasion ([Saez and Zucman, 2019b](#)).

## (ii) The decline of tax progressivity and the vanishing capital tax base since 1980

Starting around 1980, one can observe in most developed countries a sharp decline in tax progressivity, with the United States under Reagan and the United Kingdom under Thatcher leading the way. Top tax rates on large incomes and large bequests were reduced, especially in English-speaking countries (see [Figures 2–3](#)). In many countries, a growing fraction of capital income was gradually left out of the progressive income tax base and either taxed at flatter preferential rates or sometimes fully exempt for some asset classes (such as life insurance in France). As a result, in many OECD countries, the progressive income tax has almost morphed into a progressive labour income tax, sometimes with an explicit dual income tax system as in Scandinavian countries or the Netherlands.

[Saez and Zucman \(2019b\)](#) show that this reduced nominal progressivity translated into real reduced progressivity in the case of the United States. When taking into account all taxes at all levels of government, the US had a very strongly progressive tax system in the decades just after the Second World War with high-income groups paying a much larger fraction of their income in taxes than lower-income groups. Today, by contrast, the US tax system looks much like a flat tax with all income groups paying fairly similar tax rates, and some regressivity at the very top. As seen in [Figure 1](#), recent studies show that this is also the pattern in European countries such as France ([Bozio et al., 2020](#)) and the Netherlands ([Bruil et al., 2022](#)). Regressivity for European countries is more pronounced than in the United States and starts around the 95th percentile while it is confined to the top 0.01 per cent in the United States.<sup>30</sup>

In all countries, regressivity at the top is driven by three main factors. First, the large payroll and consumption taxes that generate a substantial fraction of total tax revenues are regressive at the top, as income at the top does not come primarily from labour (and payroll taxes are often capped above some earnings levels) and is to a large extent saved rather than consumed (so that consumption is a small fraction of income). Second, the individual income tax is regressive at the top-end (in spite of nominally progressive schedules) because a large fraction of the income of the very rich is sheltered from the individual income tax (separate taxation at preferential flat rates for various capital income categories such as capital gains, or retained profits within corporations or shells). Third, the corporate income tax, which is the main tax for the very rich (who derive most of their income from business profits) has shrunk over the last 50 years in most OECD countries. In the United States, the federal corporate tax rate was in excess of 50 per cent in the mid-twentieth century, while it is only 21 per cent today (see [Zucman \(2014\)](#) for a longer discussion).

One can think of several explanations for the demise of progressive taxation. To some extent, this can be viewed as a rational collective response to changes in the nature of wealth. That is, one can observe in the post-war period a decline in inherited wealth, a relative rise of life-cycle wealth, and a compression of wealth inequality ([Piketty, 2014](#)). In the extreme case where there is zero inherited wealth and pure lifecycle accumulation, then under preference separability and perfect capital markets assumptions it can indeed be optimal not to tax capital income flows ([Atkinson and Stiglitz, 1976](#)).

This can be only a partial explanation, however. While it is true that inheritance flows were historically low in the 1950s–1960s (at the time Modigliani formulated the pure lifecycle model), this was largely a transitory state due to war shocks, and inheritance flows are now back to higher levels ([Piketty, 2011](#)). It is also important to note that the historical decline in wealth concentration has been less spectacular than what some observers tend to imagine. The top 10 per cent wealth shares used to be as much as 80–90 per cent of aggregate wealth in developed

<sup>29</sup> For example, in the United States, share repurchases were largely banned through regulation until 1982 when they were almost completely deregulated. Since then, share repurchases have become the major form of distribution of profits to shareholders. In 2022, a new modest 1 per cent excise tax on share repurchases has been introduced in the United States with proposals to increase it further, suggesting that share repurchases may be regulated and discouraged through taxation in coming years.

<sup>30</sup> The study for the Netherlands is the most sophisticated, as it links individual business owners to their businesses and hence can assign business-level taxes to individual owners with great precision (something that cannot be done systematically in the United States, due to the lack of administrative data on the owners of businesses subject to the corporate income tax).

countries at the beginning of the twentieth century; in the late twentieth and early twenty-first centuries, it is about 60–70 per cent (Chancel *et al.*, 2022). The bottom line is that wealth is so concentrated that from a social welfare viewpoint distributional effects are very likely to dominate intertemporal distortion effects—unless one is ready to assume very high intertemporal elasticities.<sup>31</sup>

A more promising line of explanation is a change in the balance of political power. For instance, according to the optimal inheritance tax formulas described above (calibrated with plausible distributional parameters and elasticities), the top inheritance tax rates observed in the United States until the 1970s–1980s were close to optimal from the viewpoint of the bottom two-thirds of the population, while those observed in the 2000s–2010s are closer to the optimum from the viewpoint of the top 10–20 per cent of the distribution. Why and how this change in political power—and also the change in perceptions and beliefs about expected wealth mobility—came about is a complicated and fascinating political science question, and which is indeed attracting growing attention.<sup>32</sup>

Finally, there is little doubt that financial globalization and international tax competition have contributed to the decline in capital taxation (and possibly to the shift in the balance of political power). With free capital flows and little reporting of cross-border assets and income, each country is in effect facing a highly elastic capital tax base. This is particularly true for small European countries, such as Scandinavian countries where dual income tax systems were adopted in the 1990s–2000s and in some cases where the inheritance tax was abolished (in spite of strong egalitarian values, such as in Sweden). From a single-country perspective, it might indeed be optimal with perfect capital mobility to opt for zero capital taxes, even though every country would attain higher social welfare from tax coordination and positive capital taxation. From this viewpoint, it is particularly striking to compare the conclusions of the Mirrlees (2011) report (which takes for the most part a single-country, UK perspective on the optimal tax system, and therefore recommends corporate tax cuts and favours a very moderate approach on tax progressivity and inheritance taxation) and the previous British reports on the ideal tax system (e.g. Kaldor, 1955; Meade, 1978), which take a much more progressive perspective.

As narrated in Saez and Zucman (2019b) in the case of the United States, the demise of progressive taxation took place in two steps. First, there was a weakening of enforcement that led to an explosion of tax avoidance. This rise in tax avoidance (e.g. the boom of tax shelters in the late 1970s and early 1980s) was then used to argue that ‘progressive taxation does not work’ and to advocate for lower statutory taxes on the rich.

### (iii) The return of the wealth tax and the future of tax coordination

It is unclear at this stage whether rising tax competition or increased tax coordination will prevail in the future. According to the estimates of Tørsløv *et al.* (2022), close to 40 per cent of multinational profits—profits booked by corporations outside of the country of their headquarters—are shifted to tax havens each year. In spite of ambitious reforms—such as the Base Erosion and Profit Shifting initiative launched under the auspices of the OECD in 2015, and the US tax reform of 2017—there is no sign that this shifting is abating (Wier and Zucman, 2022; Garcia-Bernardo *et al.*, 2022). In this context, there is growing recognition that more tax coordination—e.g. in the form of a common minimum corporate tax—might be desirable. In 2021, 136 countries and territories agreed to impose a 15 per cent minimum tax on the country-by-country profits of multinational companies. However, as of the end of 2022, no large countries had yet enacted this tax, so it remains to be seen whether this change will happen. The agreement also has a number of limitations. The 15 per cent rate is a low tax rate (relative to typical tax rates on wage income). It applies to a narrow base that allows for significant carveouts for payroll and physical capital deployed abroad. If implemented, this international agreement would undermine artificial profit shifting (moving paper profits to territories with no real economic activity) but would keep tax competition (moving workers and physical capital to low-tax places) very much alive (Barake *et al.*, 2021).

There has also been growing awareness of the fact that a rising fraction of household wealth is located in tax havens (Zucman, 2013, 2015), most of which owned by households at the top of the wealth distribution (Alstadsæter *et al.*, 2018; Johannesen *et al.*, 2020). To address this issue, the United States moved unilaterally in 2010 by passing the Foreign Account Tax Compliance Act (FATCA) that requires all foreign financial institutions to report to US tax authorities balances and income information for all US individual clients they may have. Failure to comply carries heavy tax withholding penalties that the United States can credibly enforce as it is the key player in the financial international system, and leak risks for financial institutions are real. The unilateral move by the United States was later followed by an international agreement, the *Common Reporting Standard* for the Automatic

<sup>31</sup> Lucas (1990) views the zero-capital-tax result obtained in the zero-shock, infinite-horizon model of Chamley (1986) and Judd (1985) as the ‘largest genuinely free lunch’ brought by economic science. However there is little evidence supporting the infinite long-run elasticity of capital supply implicitly assumed in this class of models.

<sup>32</sup> See, for example, Bonica *et al.* (2013).

Exchange of Information on financial accounts between tax authorities, which was developed by the OECD in 2014 and which about 100 countries and territories signed. The list of signatories includes many tax havens such as Switzerland which used to have strict bank secrecy rules that in effect protected foreign tax evaders. Even though implementation has been slow—many tax authorities may not yet have used the reported information aggressively, and important forms of wealth such as real estate are not yet covered by this agreement (Alstadsæter *et al.*, 2022)—it is clear that offshore tax evasion now carries a higher risk (or perceived risk) of detection than before 2010. This change is perhaps the starkest example of how new forms of international cooperation, long deemed utopian, can materialize relatively quickly and change the practicality of taxing capital in a globalized world.

Proposals in favour of a coordinated international registry on financial securities (e.g. as described in Zucman, 2014, 2015) are also becoming increasingly popular. In this context, some form of annual wealth tax—or registration duty—would be a natural way to establish individual property rights and contribute to such a registry. Given the fast growth rates in wealth observed among billionaires, a coordinated wealth tax would also be a logical response (see above). This is particularly evident in Europe and the United States, where aggregate wealth–income ratios have been rising steeply over the past decades, so that the wealth tax base is quite dynamic as compared to the income tax base (Piketty and Zucman, 2014; Chancel *et al.*, 2022).

More generally, it should be noted that annual wealth taxes have been much more present historically in Europe than in the United States (or United Kingdom). Annual progressive wealth taxes have been applied since the early twentieth century in countries like Germany, Switzerland, or Sweden, and were introduced in the last third of the twentieth century in countries like France or Spain. The top rate was as large as 4 per cent in Sweden in the early 1980s and came in addition to progressive income and inheritance taxes (though these two taxes were less steeply progressive than in English-speaking countries).

The annual wealth taxes implemented in continental Europe during the twentieth century suffered from four main weaknesses, however (see Saez and Zucman (2019a, 2022) for detailed discussions). First, they did not have a comprehensive base, creating tax avoidance opportunities. The biggest issue in most cases was the exemption of the business wealth of owner-managers (broadly defined), making it easy for the ultra-rich to avoid the tax. Some asset classes such as real estate were often not valued at market prices, creating horizontal inequities and inefficiencies. These issues led to the repeal of the wealth tax in Germany and Sweden in the 1990s and 2000s. Second, the wealth taxes were relatively easy to avoid by moving abroad and easy to evade by putting wealth in offshore accounts. Available estimates suggest that in the 2000s, more than 20 per cent of the wealth of the top 0.01 per cent richest Scandinavians was hidden in tax havens (Alstadsæter *et al.*, 2019). Third, the European wealth taxes had relatively low exemption thresholds (typically \$1 million or even less in Switzerland), creating financial hardships for some illiquid millionaires that could be exploited by politicians seeking to repeal the tax. Last, these taxes were generally based on self-reported wealth (as opposed to third-party reporting as in the income tax) and enforcement was often weak. In France, tax authorities stopped requiring a detailed tax return from most taxpayers after 2011; taxpayers could simply report their estimate of their net wealth with no further details, increasing opportunities for tax evasion (Garbinti *et al.*, 2022).

These issues could be remedied by making the tax base more comprehensive (as Switzerland does, for example), taxing citizens leaving to live abroad (if not for life as in the United States, at least for a number of years), using the new common reporting standard to tax offshore wealth, increasing the exemption level so that the wealth tax hits only the very rich where liquidity issues are minimal, and strengthening information reporting requirements and enforcement. The recent wealth tax proposal by presidential candidate Elizabeth Warren in 2019 had these characteristics. Saez and Zucman (2019a) estimate that such a tax, if successfully enforced, would dramatically increase the progressivity of the US tax system at the very top.

#### (iv) The redistribution of inheritance and the redistribution of wealth

Let us conclude by stressing that the taxation of capital and wealth has two main purposes: the first one is the raising of fiscal revenue in the most efficient and fair manner; the second one is the redistribution of wealth. While this paper has largely focused upon the first objective, it is important to stress that the second objective is also very important.

If the objective of wealth taxation is not only to raise revenue but also to have a significant impact on the long-run distribution of wealth, then going beyond revenue maximization can make sense. For instance, the 2019 tax plan made by presidential candidate Elizabeth Warren initially proposed a wealth tax at a rate of 2 per cent above \$50 million and 3 per cent above \$1 billion. While this is enough to raise very significant tax revenue, this might not be sufficient to affect the wealth distribution in a significant manner, first because top billionaire wealth has been rising much faster in recent decades (typically around 6–8 per cent per year), and next because the proposal

did not include a wealth transfer to lower wealth classes. In contrast, Senator Bernie Sanders proposed a more graduated wealth tax with rates of up to 8 per cent for fortunes above \$10 billion. Elizabeth Warren later proposed a higher marginal tax rate of 6 per cent surtax above \$1 billion instead of 3 per cent in her original plan. With top tax rates around 6–8 per cent it becomes possible to reduce top-end wealth concentration, or at least to keep it under control (Saez and Zucman (2019a) provide a simple simulation of impact based on the Forbes 400 richest since 1982). The complicated question from a normative perspective is to decide what the target should be in terms of long-run distribution of wealth: is it desirable to return to the wealth distribution of 1980 or 1950, or do we aim for a more equal distribution of wealth? The models and simulation tools that were recently developed by Blanchet (2022) make it possible to simulate the long-run impact of any progressive wealth tax schedule, an important step toward tackling these complicated questions.

Revenue from progressive capital taxes can be used to finance wealth transfers to those with less wealth. The bottom 50 per cent wealth share is extremely small (less than 5 per cent) in pretty much every country and region of the world: it is currently about 4 per cent in Europe, 2 per cent in the US, and 1 per cent in Latin America (see Chancel *et al.*, 2022). Given that the distribution of wealth among decedents is approximately the same as among the living, the distribution of inherited wealth is similarly skewed: the bottom 50 per cent children typically receive less than 5 per cent of the total, while the top 10 per cent children receive 60–80 per cent. Proposals have been made to use progressive wealth and inheritance taxes to fund a system of minimum universal inheritance equal to 60 per cent of per-adult wealth at age 25. For example, the minimum inheritance would be equal to €120,000 if average per-adult wealth is equal to €200,000 (as is approximately the case in Western Europe currently). The total annual cost would be about 5 per cent of national income and could be paid for by a mixture of progressive wealth tax (raising about 4 per cent of national income) and progressive inheritance tax raising an additional 1 per cent of national income (see Piketty, 2022, Table 2, p. 161).

Needless to say, a fully satisfactory analysis of such redistributive schemes would require substantial progress in terms of theoretical modelling and normative thinking. In particular, the long-run efficiency impact of wealth redistribution requires a proper modelling of credit constraints and capital market imperfections. In principle, having the poorest 50 per cent of children receive around 20–30 per cent of total inheritance (which would be approximately the case with a minimum inheritance equal to 60 per cent of per-adult wealth) could make a big difference in terms of investment opportunities as compared to the current situation where they receive less than 5 per cent of total inheritance. But quantifying such efficiency gains is certainly a very complicated task. However, one would need a minimum inheritance of at least this amount in order to make a substantial difference to the long-run wealth distribution. For example, if the minimum inheritance is only equal to 10 per cent of per-adult wealth, then this is very unlikely to make a big difference regarding the long-run evolution of the bottom 50 per cent wealth share. Finally, the practical implementation of such redistributive schemes would obviously require major shifts in the balance of political power between social groups. The tax revenue required for this transformation to take place (5 per cent of national income) is not enormous compared to the historical rise of public spending in advanced countries (from less than 10 per cent of national income before the First World War to about 30–50 per cent today). In any case, we feel that it is important that scholars working in this area contribute to develop a long-run perspective on these important issues and to set broad targets for the future.

## References

- Allais, M. (1977), *L'impôt sur le Capital et la Réforme Monétaire [capital tax and monetary reform]*, Hermann, Paris.
- Alstadsæter, A., Johannesen, N., and Zucman, G. (2018), 'Who Owns the Wealth in Tax Havens? Macro Evidence and Implications for Global Inequality', *Journal of Public Economics*, 162, 89–100.
- — (2019), 'Tax Evasion and Inequality', *American Economic Review*, 109(6), 2073–103.
- Planterose, B., Zucman, G., and Økland, A. (2022), 'Who Owns Offshore Real Estate? Evidence from Dubai', EU Tax Observatory Working Paper #1.
- Atkinson, A., and Stiglitz, J. E. (1976), 'The Design of Tax Structure: Direct Versus Indirect Taxation', *Journal of Public Economics*, 61(2), 55–75.
- Piketty, T., and Saez, E. (2011), 'Top Incomes in the Long Run of History', *Journal of Economic Literature*, 49(1), 3–71.
- Bachas, P., Fisher-Post, M., Jensen, A., and Zucman, G. (2022), 'Globalization and Factor Income Taxation', NBER Working Paper #29819.
- Barake, M., Chouc, P.-E., Neef, T., and Zucman, G. (2021), 'Minimizing the Minimum Tax? The Critical Effects of Substance Carveouts', *EU Tax Observatory Note #1*.
- Berg, K., and Hebous, S. (2021), 'Does the Wealth Tax Improve Equality of Opportunity? Evidence from Norway', IMF Working Paper 21/85, International Monetary Fund, Washington, DC.

- Blanchet, T. (2022), 'Uncovering the Dynamics of the Wealth Distribution', WIL Working Paper.
- Chancel, L., Flores, I., Morgan, M., *et al.* (2021), 'Distributional National Accounts Guidelines: Methods and Concepts Used in the World Inequality Database', World Inequality Lab Working Paper.
- Boadway, R. (2012), *From Optimal Tax Theory to Tax Policy: Retrospective and Prospective Views*, 2009 Munich Lectures in Economics, Cambridge, MA, MIT Press.
- Bonica, A., McCarty, N., Poole, K. T., and Rosenthal, H. (2013), 'Why Hasn't Democracy Slowed Rising Inequality?', *Journal of Economic Perspectives*, 27(3), 103–24.
- Bozio, A., Garbinti, B., Goupille-Lebret, J., Guillot, M., and Piketty, T. (2020), 'Predistribution vs Redistribution: Evidence from France and the US', CEPR Discussion Paper 15415.
- Bruil, A., Van Essen, C., Leenders, W., Lejour, A., Mohlmann, J., and Rabaté, S. (2022), 'Inequality and Redistribution in the Netherlands', CPB Discussion Paper.
- Chamley, C. (1986), 'Optimal Taxation of Capital Income in General Equilibrium with Infinite Lives', *Econometrica*, 54(3), 607–22.
- (2001), 'Capital Income Taxation, Wealth Distribution and Borrowing Constraints', *Journal of Public Economics*, 79, 55–69.
- Chancel, L., Piketty, T., Saez, E., and Zucman, G. (2022), *The World Inequality Report 2022*, Cambridge, MA, Harvard University Press.
- Chen, X., and Slemrod, J. (2023), 'Capital Gains: the Achilles Heel of Taxing the Rich', *Oxford Review of Economic Policy*, 39(3), 592–603.
- Conesa, J. C., Kitao, S., and Krueger, D. (2009), 'Taxing Capital? Not a Bad Idea after All!', *American Economic Review*, 99(1), 25–48.
- Decerf, B., and Maniquet, F. (2021), 'Fair Inheritance Taxation', World Bank Policy Research Working Paper.
- Diamond, P., and Saez, E. (2011), 'The Case for a Progressive Tax: From Basic Research to Policy Recommendations', *Journal of Economic Perspectives*, 25(4), 165–90.
- Dray, S., Landais, C., and Stantcheva, S. (2022), 'Wealth and Property Taxation in the United States', NBER Working Paper No. 31080.
- Eisinger, J., Ernsthausen, J., Kiel, P. (2021), 'The Secret IRS Files: Trove of Never-before-seen Records Reveal how the Wealthiest Avoid Income Tax', *ProPublica*, 8 June.
- Farhi, E., and Werning, I. (2010), 'Progressive Estate Taxation', *Quarterly Journal of Economics*, 125(2), 635–73.
- Slit, C., Werning, I., and Yeltekin, S. (2012), 'Non-linear Capital Taxation Without Commitment', *Review of Economic Studies*, 102(1), 1–25.
- Fisher, I. (1919), 'Economists in Public Service: Annual Address of the President', *American Economic Review*, 9(1), 5–21.
- Fleurbaey, M. (2008), *Fairness, Responsibility and Welfare*, Oxford, Oxford University Press.
- Maniquet, F. (2018), 'Optimal Income Taxation Theory and Principles of Fairness', *Journal of Economic Literature*, 56(3), 1029–79.
- Garbinti, B., Goupille-Lebret, J., Munöz, M., Stantcheva, S., and Zucman, G. (2022), 'Tax Design, Information, and Elasticities: Evidence from the French Wealth Tax', available at <https://gabriel-zucman.eu/files/GGMSZ2023.pdf>.
- Garcia-Bernardo, J., Jansky, P., and Zucman, G. (2022), 'Did the Tax Cuts and Jobs Act Reduce Profit Shifting by US Multinational Companies?', NBER Working Paper No. 30086.
- Goupille-Lebret, J., and Infante, J. (2018), 'Behavioral Responses to Inheritance Tax: Evidence from Notches in France', *Journal of Public Economics*, 168, 21–34.
- Güvenen, F., Kambourov, G., Kuruscu, B., and Ocampo, S. (2021), 'Taxing Wealth and Capital Income when Returns are Heterogeneous', Working Paper, available at <https://www.lowe-institute.org/wp-content/uploads/2022/09/Sergio-Ocampo.pdf>.
- Chen, D. (2019), 'Use It or Lose It: Efficiency Gains from Wealth Taxation', NBER Working Paper 26284.
- Haig, R. M. (1921), 'The Concept of Income—Economic and Legal Aspects', in *The Federal Income Tax*, New York, Columbia University Press, 1–28.
- Jakobsen, K., Jakobsen, K., Kleven, H., and Zucman, G. (2020), 'Wealth Taxation and Wealth Accumulation: Theory and Evidence from Denmark', *Quarterly Journal of Economics*, 135(1), 329–88.
- Johannesen, N., Langetieg, P., Reck, D., Risch, M., and Slemrod, J. (2020), 'Taxing Hidden Wealth: The Consequences of US Enforcement Initiatives on Evasive Foreign Accounts', *American Economic Journal: Economic Policy*, 12(3), 312–46.
- Judd, K. (1985), 'Redistributive Taxation in a Simple Perfect Foresight Model', *Journal of Public Economics*, 28(1), 59–83.
- Kaldor, N. (1955), *An Expenditure Tax*, Unwin University Books.
- Kaplow, L. (2001), 'A Framework for Assessing Estate and Gift Taxation', in W. Gale, J. R. Hines, and J. Slemrod (eds), *Rethinking Estate and Gift Taxation*, Washington, DC, Brookings Institution.
- (2022), 'Optimal Income Taxation', NBER Working Paper No. 30199, in preparation for *Journal of Economic Literature*.
- Keen, M., and Slemrod, J. (2021), *Rebellion, Rascals, and Revenue: Tax Follies and Wisdom through the Ages*, Princeton, NJ, Princeton University Press.
- Kopczuk, W., and Lupton, J. (2007), 'To Leave or Not to Leave: The Distribution of Bequest Motives', *Review of Economic Studies*, 74(1), 207–35.
- Slemrod, J. (2001), 'The Impact of the Estate Tax on Wealth Accumulation and Avoidance Behavior', in W. Gale, J. R. Hines, and J. Slemrod (eds), *Rethinking Estate and Gift Taxation*, Washington, DC, Brookings Institution, 299–349.
- Leiserson, G., and Yagan, D. (2021), 'What Is the Average Federal Individual Income Tax Rate on the Wealthiest Americans?', US Council of Economic Advisors, Washington, DC, White House.



- Limberg, J., and Seelkopf, L. (2022), 'The Historical Origins of Wealth Taxation', *Journal of European Public Policy*, 29(5), 670–88.
- Lucas, R. (1990), 'Supply-side Economics: An Analytical Review', *Oxford Economic Papers*, 42(2), 293–316.
- Meade, J. (1978), *The Structure and Reform of Direct Taxation*, Report of a Committee chaired by J. E. Meade, London, Institute for Fiscal Studies.
- Mirrlees, J. A. (ed.) (2011), *Tax By Design: The Mirrlees Review*, Institute for Fiscal Studies, Oxford, Oxford University Press.
- Piketty, T. (2011), 'On the Long-Run Evolution of Inheritance: France 1820–2050', *Quarterly Journal of Economics*, 126(3), 1071–131.
- (2014), *Capital in the 21st Century*, Cambridge, MA, Harvard University Press.
- (2020), *Capital and Ideology*, Cambridge, MA, Harvard University Press.
- (2022), *A Brief History of Equality*, Cambridge, MA, Harvard University Press.
- Piketty, T., and Saez, E. (2012), 'A Theory of Optimal Capital Taxation', NBER Working Paper No. 17989.
- Saez, E. (2013a), 'A Theory of Optimal Inheritance Taxation', *Econometrica*, 81(5), 1851–86.
- (2013b), 'Optimal Labor Income Taxation', ch. 7 in A. Auerbach, R. Chetty, M. Feldstein, and E. Saez (eds), *Handbook of Public Economics*, vol. 5, Amsterdam, Elsevier-North Holland, 391–474.
- Zucman, G. (2014), 'Capital is Back: Wealth–Income Ratios in Rich Countries 1700–2010', *Quarterly Journal of Economics*, 129(3), 1255–310.
- Saez E., and Stantcheva, S. (2014), 'Optimal Taxation of Top Labor Incomes: A Tale of Three Elasticities', *American Economic Journal: Economic Policy*, 6(1), 230–71.
- Zucman, G. (2018), 'Distributional National Accounts: Methods and Estimates for the United States', *Quarterly Journal of Economics*, 133(2), 553–609.
- Saez, E. (2002), 'The Desirability of Commodity Taxation under Nonlinear Income Taxation and Heterogeneous Tastes', *Journal of Public Economics*, 83, 217–30.
- Stantcheva, S. (2018), 'A Simpler Theory of Optimal Capital Taxation', *Journal of Public Economics*, 162, 120–42.
- Zucman, G. (2016), 'Wealth Inequality in the United States since 1913: Evidence from Capitalized Income Tax Data', *Quarterly Journal of Economics*, 131(2), 519–78.
- (2019a), 'Progressive Wealth Taxation', *Brookings Papers on Economic Activity Fall*, 437–511.
- (2019b), *The Triumph of Injustice: How the Rich Dodge Taxes and How to Make Them Pay*, Norton, New York City.
- (2020), 'The Rise of Income and Wealth Inequality in America: Evidence from Distributional Macroeconomic Accounts', *Journal of Economic Perspectives*, 34(4), 3–26.
- (2022), 'Wealth Taxation: Lessons from History and Recent Developments', *American Economic Association, Papers and Proceedings*, 112, 58–62.
- (2022b), 'Top Wealth in America: A Reexamination', NBER Working Paper No. 30396.
- (2022c), 'A Wealth Tax on Corporations' Stock', *Economic Policy*, 37(110), 213–27.
- Slemrod, J., and Giertz, S. (2012), 'The Elasticity of Taxable Income with Respect to Marginal Tax Rates: A Critical Review', *Journal of Economic Literature*, 50(1), 3–50.
- Yagan, D., and Zucman, G. (2021), 'Capital Gains Withholding', unpublished working paper, available at <https://gabriel-zucman.eu/files/SYZ2021.pdf>.
- Scheuer, F., and Slemrod, J. (2020), 'Taxation and the Superrich', *Annual Review of Economics*, 12, 189–211.
- (2021), 'Taxing Our Wealth', *Journal of Economic Perspectives*, 35, 207–30.
- Seligman, E. R. A. (1911), *The Income Tax: A Study of the History, Theory and Practice of Income Taxation at Home and Abroad*, Macmillan.
- Simons, H. (1938), *Personal Income Taxation: The Definition of Income as a Problem of Fiscal Policy*, Chicago, IL, University of Chicago Press.
- Slemrod, J. (1990), 'The Economic Impact of the Tax Reform Act of 1986', in J. Slemrod (ed.), *Do Taxes Matter? The Impact of the Tax Reform Act of 1986*, Cambridge, MA, and London, MIT Press, 1–12.
- (1995), 'Income Creation or Income Shifting? Behavioral Responses to the Tax Reform Act of 1986', *American Economic Review*, 85(2), 175–80.
- Stantcheva, S. (2020), 'Dynamic Taxation', *Annual Review of Economics*, 12, 801–31.
- Tørsløv, T., Wier, L., and Zucman, G. (2022), 'The Missing Profits of Nations', *Review of Economic Studies*, forthcoming.
- US Office of Management and Budget. (2022), *Budget of the US Government, Fiscal Year 2023*, US Government Publishing Office.
- Wier, L., and Zucman, G. (2022), 'Global Profit Shifting, 1975–2019', UNU-WIDER Working Paper 2022/121 and NBER Working Paper #30673.
- Zucman, G. (2013), 'The Missing Wealth of Nations: Are Europe and the US Net Debtors or Net Creditors?', *Quarterly Journal of Economics*, 128(3), 1321–64.
- (2014), 'Taxing across Borders: Tracking Personal Wealth and Corporate Profits', *Journal of Economic Perspectives*, 28(4), 121–48.
- (2015), *The Hidden Wealth of Nations: The Scourge of Tax Havens*, Chicago, IL, University of Chicago Press.
- (2019), 'Global Wealth Inequality', *Annual Review of Economics*, 11, 109–38.