

Rethinking capital and wealth taxation

Thomas PIKETTY
Paris School of Economics

Emmanuel SAEZ
University of California at Berkeley

Gabriel ZUCMAN
London School of Economics

September 17 2013*

Abstract

This paper reviews recent developments in the theory of optimal capital taxation. We emphasize three main rationales for capital taxation. First, the frontier between capital and labor 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. Therefore the proper way to tax billionaires is a progressive wealth tax. Finally, 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 entail 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 tryptic.

*Thomas Piketty: piketty@pse.ens.fr; Emmanuel Saez: saez@econ.berkeley.edu; Gabriel Zucman: zucman@gmail.com. First and incomplete draft.

1 Introduction

This paper reviews a number of recent developments in the theory of optimal capital taxation. We emphasize three main rationales for capital taxation. First, the frontier between capital and labor 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. Therefore the proper way to tax billionaires is a progressive wealth tax. Finally, 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 entail 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, in particular regarding the wealth tax, we argue that observed fiscal systems in modern democracies bear important similarities with this ideal tryptic.

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.¹ Nor do we cover rationales that are based upon redistribution between different age groups in the presence of intertemporal market failures.² More generally, capital market imperfections offer a large variety of motives and implications for capital taxation, which we cover only partially in the present paper.³ 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 of this important issue.

¹I.e. once capital is on the table, it is tempting to tax it, even if it would have been preferable to commit ex ante not to do so. For a recent paper, built along these lines, see e.g. Farhi et al (2012). Note that this is a relatively weak rationale for capital taxation. If this was the main reason why capital is taxed, then the right policy response would be to create an independent tax authority with a zero-capital-tax mandate (or a low-capital-tax mandate, in the same way as the low-inflation mandate of independent central banks).

²With 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 recent model along these lines, see Conesa et al (2009). In principle, this could also be achieved by using age-dependant taxation (which to some extent public pension systems do).

³We 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 e.g. Chamley (2001).

2 The rationale for a comprehensive income tax

In the real world, the frontier between capital and labor income flows is often fuzzy - or at least more difficult to draw than what is generally assumed in theoretical models. Typically, self-employed individuals and business owners can to a large extent decide how much they get paid in wages and how much they receive in dividends. This also applies to a large number of corporate executives, whose compensation packages often involve a complex and diverse set of income flows. Sometime it is not at all obvious to decompose these flows into a pure labor component (payment for labor services) and a pure capital component (compensation for capital ownership). E.g. in case 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. labor frontier is the simplest - and the most compelling - rationale for a comprehensive income tax (i.e. an income tax treating labor and capital income flows alike) - or, at least, for taxing capital and labor income flows at rates that are not too different.

Take the extreme case where the frontier is entirely fuzzy, i.e. each individual can costlessly convert labor 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 labor income and y_{ki} is capital income, but the government can only observe total income y_i (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 labor and capital income flows. However if the two tax schedules differ widely, then it is likely that individual taxpayers will choose to pay 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 more comprehensive the income tax.⁴

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. E.g. consider the benchmark Atkinson-

⁴For a simple model with an income shifting elasticity, see Piketty, Saez and Stantcheva (2013).

Stiglitz-type model where individuals live during two periods $t = 1, 2$ and are born with zero inherited wealth. In period $t = 1$, nobody owns any wealth, so that income is simply equal to labor income, which individuals allocate to consumption and saving: $y_{1i} = y_{1li} = c_{1i} + k_{2i}$. In period $t = 2$, income is equal to the sum of labor and capital income: $y_{2i} = y_{2li} + y_{2ki}$, with $y_{2ki} = R \cdot k_{2i}$ (where $R = 1 + r$ is the exogenous rate of return). Under standard separability assumptions on preferences, a well-known result in this class of model 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. So the efficient tax policy in this setting is to tax solely labor income flows (i.e. $\tau = \tau(y_l)$).⁵

But if the government can only observe total income (or if individuals can easily convert labor into capital income and vice versa, so that the income shifting elasticity is very 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. As is common in optimal tax theory, a lot hinges on the trade-off between different elasticities. If the cross-sectional income shifting elasticity e_s is large as compared to the intertemporal substitution elasticity (as suggested by available empirical estimates), then comprehensive income taxes are desirable and create little intertemporal distortions. Conversely, if the shifting elasticity is small as compared to the intertemporal elasticity, then the intertemporal distortion induced by capital taxation entails 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.⁶

3 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 managed through a holding company, a private foundation or

⁵See Atkinson and Stiglitz (1976). See also Saez (2002).

⁶See Piketty and Saez (2012) for a more detailed discussion.

other bodies, and most of the return is being accumulated within this vehicle. The physical owners then choose to receive an annual personal income flow that is sufficient to pay for their private consumption - which can be a very small fraction of their wealth if they are sufficiently wealthy. Although we do not have systematic data on this issue, there is much anecdotal evidence suggesting that the personal income reported by top Forbes billionaires can indeed be a tiny fraction of their total economic income.⁷

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

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

i.e. $y_{ti} = \Delta k_{ti} + c_{ti}$, with $\Delta k_{ti} = k_{t+1i} - k_{ti}$

The problem is that the consumption flow c_{ti} of top wealth holders might be as difficult to define and estimate as the income flow itself y_{ti} . 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_{ti}, k_{t+1i} , etc., is generally easier to observe than y_{ti} and c_{ti} . For instance, using the global billionaires list compiled by Forbes over the 1987-2013 period, we find that top global wealth holders have risen at a very fast pace over the past three decades. The average, real yearly growth rate $\Delta k_{ti}/k_{ti}$ appears to be of the order of 6–7% over the 1987-2013 period (or even higher at the very top of the billionaires' list).⁸

If we only include standard consumption items such as food or clothes into private consumption, then for most billionaires the consumption flow c_{ti} will surely be quite small as compared to Δk_{ti} . For instance, with net wealth k_{ti} equal to 3 billion \$ (roughly the average wealth in the billionaire list), average Δk_{ti} is of the order of 180-210 millions \$ (6-7% of k_{ti}), so that a consumption flow c_{ti} of (say) 10 millions \$ would correspond to about 5% of Δk_{ti} .

⁷See e.g. the personal income returns disclosed by Warren Buffet during the 2012 U.S. presidential election.

⁸See Piketty, 2014, chapter 12, table 12.1.

One possibility would then be to neglect the consumption flow and to tax billionaires by applying the regular income tax $\tau(y)$ to their implicit income $\tilde{y}_{ti} = \Delta k_{ti}$ (a lower bound for their economic income, but which in the given example represents 95% of their true economic income), or maybe to $\tilde{y}_{ti} = \max(\Delta k_{ti}, y_{pti})$ (where y_{pti} is their conventionally measured personal income, and is generally much smaller than Δk_{ti}).

However this is relatively arbitrary. Most billionaires seem to derive direct utility from the wealth they own (and the power, prestige and influence conferred by their wealth), at least as much as from their private consumption (probably because of consumption satiation). Also Δk_{ti} can be highly volatile (typically it can strongly negative and then hugely positive), which raises all sorts of difficulties.

Finally, and most importantly, there is no general presumption that the relevant behavioral elasticities for billionaires are the same as those applying to the rest of the population. So in general it is more efficient to have a specific billionaire tax, i.e. a wealth tax $\tau(k)$.

Of course the specific form of the tax $\tau(k)$ (which in general could also depend on the wealth sequence k_{ti}, k_{t+1i} , etc., and not only on current wealth) should vary with the exact shape of the wealth generating process. To take a simple example, assume that the population includes a fixed fraction $1 - \lambda$ of workers with fixed labor income $y_{lti} = y_l$ (who do not save), and a fixed fraction λ of billionaires with the following stochastic wealth process:

$$k_{t+1i} = \tilde{R}(e) \cdot k_{ti}$$

Where $\tilde{R}(e)$ is a stochastic rate of return, which in general might depend on individual effort decision $e = e_{ti}$.

Unsurprisingly, the optimal tax $\tau(k)$ on billionaire wealth will depend upon the elasticity e_R of the stochastic rate of return $\tilde{R}(e)$ with respect to the tax rate and billionaire effort. For instance, assume that we are looking for the linear wealth tax $\tau(k) = \tau \cdot k$ maximizing workers' welfare (i.e. maximizing wealth tax revenue). The one can easily show that $\tau = \tau(e_R)$ is a declining function of the elasticity e_R . If the elasticity is small, i.e. if there is not much billionaires can do in response to taxes in order to affect their rate of return, then the optimal wealth tax rate can be very large. On the contrary, if the elasticity is very large, then the optimal wealth tax rate goes to zero.⁹ Under standard assumptions, the optimal non-linear

⁹Take a simple example. Assume that billionaires choose effort e_{ti} so as to maximize $U = (1 - \tau) \cdot k_{t+1i} -$

wealth tax $\tau(k)$ will be progressive, and the top rate will naturally be a declining function of the elasticity e_R .¹⁰

In principle, one could estimate such elasticities by looking at how growth rates of large fortunes vary over time and across countries (in particular, one could try to measure how much they respond to changes in the tax system). Forbes lists seem to indicate that such growth rates are strongly determined by initial portfolio size (above a certain level, very high fortunes tend to grow very fast, whether they are inherited or self-made, and whether entrepreneurs are retired or not), which might suggest low or moderate elasticities with respect to effort decisions.

Wealth rankings published by magazines constitute however a highly imperfect data source, from which it is very difficult to infer precise elasticity estimates. Gathering systematic data sources that would allow scholars to study global wealth dynamics and to estimate relevant economic elasticities is an important challenge for future research. This is an area where rigorous academic research is seriously lagging behind, which probably explains why magazines and "global wealth reports" published by financial institutions are trying to fill the gap.¹¹

4 The rationale for a progressive inheritance tax

Inherited wealth is usually perceived - and taxed - differently than 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 less heavily earned income or self-made wealth (for which individuals can be held responsible, at least in part) than inherited

$V(e_{it}) \cdot k_{ti}$ (effort costs are assumed to be proportional to portfolio size), and the random return can take only two values: $k_{t+1i} = R_1 \cdot (1 - \tau) \cdot k_{ti} + (1 - \tau) \cdot k_m$ with probability e , and $k_{t+1i} = R_0 \cdot (1 - \tau) \cdot k_{ti} + (1 - \tau) \cdot k_m$ with probability $1 - e$ (where $\Delta R = R_1 - R_0 > 0$ measures the extent to which the return is responsive to billionaire effort, and k_m measures some guaranteed minimum capital stock for billionaires (safe asset)). With $V(e) = e^2/2a$, we get $e = (1 - \tau) \cdot a \cdot \Delta R$. The transition equation for average billionaire wealth looks as follows: $k_{t+1} = (R_0 - \tau + e \cdot \Delta R) \cdot k_t + (1 - \tau) \cdot k_m$. One can see immediately that the elasticity of long run average billionaire wealth k^* with respect to $1 - \tau$ is an increasing function of ΔR , and that the tax rate τ^* maximizing long-run tax revenues $\tau \cdot k^*$ is a decreasing function of ΔR .

¹⁰E.g. if the policy objective includes diminishing marginal social welfare weights then it is welfare improving to tax higher fortunes at higher rates.

¹¹Unfortunately, the concepts and methods used by magazines and financial institutions in their wealth reports are far from clear. E.g. Forbes rankings provide qualitative information on inherited wealth ("some inheritance", "large inheritance") but no number whatsoever. Also there are strong reasons to believe that these rankings tend to structurally under-estimate the relative importance of inherited wealth (in particular because diversified portfolios are harder to spot than company founders).

wealth (for which individuals can hardly be held responsible).¹² This merit-based argument implies that the ideal fiscal system should also entail 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 centers around the equity vs. efficiency trade-off. In the economic debate, there is a disparate set of models and results on optimal inheritance taxation. Those 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. That is, even individuals who received zero bequest might prefer not to tax inheritance too heavily, because they themselves value a lot the possibility of leaving a bequest to their own children. At the same time, if the tax burden falls entirely on labor income, and inheritance is not taxed at all, then it might be more difficult for zero bequest receivers to accumulate wealth out of their labor income. The key challenge is to be able to take into account these different effects in a tractable manner.

In a recent paper, we have made progress on this issue by showing that optimal inheritance tax formulas can be expressed in terms of estimable “sufficient statistics” including behavioral elasticities, distributional parameters, and social preferences for redistribution.¹³ 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 labor taste shocks) and in terms of inherited wealth (e.g. due to their ancestors’ productivity shocks and bequest taste shocks).

The “sufficient statistics” approach has been fruitfully used in the analysis of optimal labor income taxation. One can follow a similar route and show that the equity-efficiency trade-off logic also applies to inheritance taxation. Our approach successfully brings together many of the existing scattered results from the literature.

One of the most intuitive optimal tax formula that we obtain is the following:

¹²For instance, according to the compensation principle, 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 labor income (Fleurbaey, 2008).

¹³See Piketty and Saez (2013).

$$\tau_B = \frac{1 - \frac{\nu}{R/G} \frac{\bar{b}^{left}}{\bar{y}_L}}{1 + e_B}$$

The optimal linear bequest tax rate τ_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 is available - receives negligible bequests.¹⁴ Hence, this "Meritocratic Rawlsian" optimum has relatively broad appeal.¹⁵

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 $e_B \simeq 0.1 - 0.2$). However this is really an empirical issue, and one certainly cannot exclude the possibility of higher elasticities. Unsurprisingly, the optimal bequest tax rate $\tau_B \rightarrow 0$ as $e_B \rightarrow +\infty$ (irrespective of other parameters).¹⁶ This is the iron law of optimal taxation: one should never try to tax an infinitely elastic tax base. As long as elasticities are moderate, however, the effects are moderate.

The parameter ν measures the fraction of wealth accumulation by zero-receivers that is driven by a bequest motive. According to available estimates, there is wide variety of motives for wealth accumulation in the population: some accumulate wealth primarily due to bequest motive, others accumulation for precautionary reasons, or for the prestige, power or social status that sometime goes with wealth. In principle, one can estimate ν using wealth surveys (an average value around $\nu = 0.5$ might be realistic).¹⁷ Unsurprisingly, the welfare-maximizing bequest tax rate τ_B declines when the strength of the bequest motive ν goes up.

Conversely, in the case $\nu = 0$, then the formula boils down to the standard inverse-elasticity formula: $\tau_B = \frac{1}{1+e_B}$. That is, if zero-bequest receivers do not care at all about leaving a bequest,

¹⁴The bottom 50% of the distribution of received bequests typically receives less than 5% of the aggregate inheritance flow, while the top 10% generally receives at least 60-70%.

¹⁵For more general formulas applying to the case with any level of received bequest (and with positive elasticities of labor supply, which are implicitly assumed to be zero in the formula presented here), see Piketty and Saez (2013). In the paper we also provide simulations of optimal inheritance tax rates using wealth survey data from France and the U.S., and find that optimal rates for the bottom 60-70% of the distribution of received bequests are almost identical to the zero-receivers optimum.

¹⁶Hence our formula covers as a special case the zero-capital-tax result obtained by Chamley-Judd in infinite-horizon, dynastic models with perfect capital markets and no shocks (in effect the long-run elasticity of capital supply is assumed to be infinite in this class of model, hence the result).

¹⁷See e.g. Kopczuk and Luton (2007).

then the only force limiting the taxation of bequests (from their viewpoint) is the elasticity effect. In case $e_B = 0$, then they want to tax bequests at confiscatory rates: $\tau_B = 100\%$.

Now, assume $e_B = 0$ (no elasticity effect) and $\nu = 1$ (wealth accumulation is entirely due to a bequest motive). The optimal tax formula further simplifies to:

$$\tau_B = 1 - \frac{G}{R} \cdot \frac{\bar{b}^{left}}{\bar{y}_L}$$

It is worth noting that even though there is no elasticity effect (i.e. no incentive reason limiting the taxation of bequests), the optimal tax rate - from the viewpoint of zero receivers - is less than 100%. This is because zero receivers want to leave bequests, so that they face a complex trade-off between raising inheritance tax revenue (in order to reduce labor income taxes) and not taxing their own children.

The parameter $G = e^{gH} \geq 1$ is the generational growth rate (with g = annual growth rate of the economy and H = generation length, typically 30 years). The parameter $R = e^{rH} \geq 1$ is the generational rate of return to wealth (with r = annual rate of return and H = generation length). Further assume $G = R = 1$ ($g = r = 0$), i.e. zero growth and zero rate of return (capital is a pure storage technology). The formula boils down to: $\tau_B = 1 - \frac{\bar{b}^{left}}{\bar{y}_L}$, where \bar{b}^{left} and \bar{y}_L are pure distributional parameters.

Namely, \bar{b}^{left} is the relative position of zero-bequest receivers in the distributions of bequests left, while \bar{y}_L is their relative position in the distribution of labor income.

For instance, if $\bar{b}^{left}/\bar{y}_L = 0.5$, e.g. if zero-bequest receivers expect to leave bequests that are only half of average bequests (i.e. $\bar{b}^{left} = 0.5$) and to earn the same average labor income as the rest of the population (i.e. $\bar{y}_L = 1$), then it is in their interest to tax bequests at rate $\tau_B = 50\%$.

The intuition for this result is straightforward. With a 50% bequest tax rate, the distortion on the “bequest left” margin is so large that the utility value of one additional dollar devoted to bequests is twice larger than one additional dollar devoted to consumption.¹⁸

For the same reasons, if $\bar{b}^{left}/\bar{y}_L = 1$, but $R/G = 2$, then $\tau_B = 50\%$. That is, if the return to capital doubles the value of bequests left at each generation (relative to growth), then it is in the interest of zero receivers to tax bequests at a 50% rate, even if they plan to leave as much bequests as the average. The case $\bar{b}^{left}/\bar{y}_L = 1$ is interesting from a theoretical viewpoint

¹⁸The formula follows directly from a simple first-order condition. See Piketty and Saez (2013).

(though not very realistic empirically), since it implies that the optimal tax formula boils down to: $\tau_B = 1 - \frac{G}{R}$. This can be viewed as a "fiscal Golden rule". That is, from the viewpoint of zero receivers, the goal of optimal bequest taxation is simply to reduce the rate of return to the level of the growth rate. Note that this is much less costly to implement than the standard Golden rule $R = G$, which in low growth societies would require huge quantities of capital accumulation (i.e. very little consumption during many generations, which does not make much sense).¹⁹

In case \bar{b}^{eft}/\bar{y}_L is very small, i.e. if zero bequest receivers expect to leave much less bequests than average, then their most preferred bequest tax rate can naturally be quite high. Conversely, in case zero bequest receivers expect to leave very large bequests, then unsurprisingly they do not like bequest taxes too much. If they expect to leave more than average, they might even 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.²⁰

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 labor income flows.

¹⁹For instance, with a Cobb-Douglas production function $F(K, L) = K^\alpha L^{1-\alpha}$, one needs to attain a capital output ratio $\beta = \alpha/g$ for the marginal product of capital $r = F_K$ to be equal to the long run productivity (and maybe demographic) growth rate. E.g. in case $\alpha = 30\%$ and $g = 1\%$, one needs to accumulate the equivalent of $\beta = 30$ years of output in capital stock. This is far more than the levels observed in the most capital-intensive societies in history (characterized by β around 6–7), and would require huge saving rates during many generations. For a more detailed discussion, see Piketty and Saez (2013) and Piketty (2014, Chapter 16).

²⁰Given the wealth mobility that we observe in the data, optimal bequest tax rates appear to be as large as 50%-60% (or even larger for top bequests), both in France and in the U.S. See Piketty and Saez (2013, Figures 1-2). But in case some zero receivers expect to leave more than what they actually leave on average, they might obviously think differently.

5 Comparing existing tax systems with the ideal tryptic

Our analysis so far suggests that the ideal fiscal system should entail a comprehensive income tax, together with an annual 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 tryptic.

5.1 The comprehensive-income-tax-cum-inheritance-tax consensus (1910-1980)

We start with the comprehensive income tax. When the modern income tax was created, in the late 19th and early 20th centuries, all developed countries decided to institute a comprehensive income tax. I.e. in every country, the progressive tax schedule - and in particular the top marginal rate (see Figure 1) - applied to the sum of labor and capital income. The tax base was defined in very comprehensive manner, particularly for capital income (for instance imputed rent was usually part of the tax base).

It is unclear how much this was due to a concern about income shifting. In the standard Haig-Simon writing 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).²¹ There was probably some concern about income shifting, but the main concern seems to have been about equity and inequality. Given the huge concentration of wealth prevailing at the time (the highest incomes were mostly made of capital incomes), it was obvious to everybody that the income tax should tax capital income at least as much as labor income.

This is exemplified by the fact that a number of countries applied tax surcharges for capital income flows. During the interwar period, capital income flows were taxed more heavily than labor income flows pretty much everywhere. In the U.S. and in the U.K., the top rate applying to so-called "earned income" - i.e. labor 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 1 were those applying to capital income (the rates applying to

²¹See e.g. Seligman (1911), Haig (1921), Simon (1938).

earned income were often about 10 points lower).²²

This is also confirmed by the rise of comprehensive income tax during the 20th century came together with the development of steeply progressive inheritance taxes, particularly in the U.S. and in the U.K. (see Figure 2). 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 clearly to limit the perpetuation of large wealth disparities across generations. In his famous 1919 presidential address to the American Economic Association, Irving Fisher expresses 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 calls for steeply progressive taxes on inheritance and capital incomes as the proper way to restore equality of opportunities.²³

5.2 The decline of tax progressivity and the vanishing capital tax base (1980-2010)

Starting around 1980, one can observe in nearly every developed country a sharp decline in tax progressivity. Top tax rates on large income flows and high bequests were substantially reduced, especially in Anglo-Saxon countries (see Figures 1-2). Also, in many countries, a growing fraction of capital income was gradually left out of the income tax base, so that the progressive income tax has almost become a progressive labor income tax (sometime with an explicit dual income tax system).

One can think of several explanations for this evolution. 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 postwar period a decline in inherited wealth, a relative rise of life-cycle wealth, and a compression of wealth inequality. In the extreme case with zero inherited wealth and pure life-cycle accumulation, then under preference separability and perfect capital markets assumptions it can indeed be optimal not to tax all capital income flows.

This can be only a partial explanation, however. While it is true that inheritance flows were historically very low in the 1950s-1960s (at the time Modigliani formulated the pure lifecycle

²²See Piketty and Saez (2012, Figure 3).

²³Fisher recommends to apply the Rignano principle, according to which the entire bequest should be taxed if it has been transmitted for at least three generations. See Fisher (1919).

model), this was largely a transitory state due to war shocks, and inheritance flows are now back to much larger levels. Also, it is important to realize that the historical decline in wealth concentration has been less spectacular than what some observers tend to imagine. The top 10% wealth shares used to be as much as 80-90% of aggregate wealth in developed countries at the beginning of the 20th century; in the late 20th and early 21st centuries, it is about 60-70%.²⁴ The bottom line is that wealth is so concentrated that from a social welfare viewpoint distributional effects are very much likely to dominate intertemporal distortions effect - unless one is ready to assume very high intertemporal elasticities.²⁵

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 U.S. until the 1970s-1980s were close to optimal from the viewpoint of the bottom 60-70% of the population, while those observed in the 2000s-2010s are closer to the optimum from the viewpoint of the top 10-20% 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 attractint growing attention.²⁶

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 power). With free capital flows and little reporting of cross-country positions, each country is in effect facing a highly elastic capital tax base. This is particularly true for small European countries, e.g. in 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 the 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 tough every country would attain higher social welfare from tax coordination and positive capital taxation.²⁷

²⁴See Piketty (2011, 2014).

²⁵Lucas (1990) views the zero-capital-tax result obtained in the zero-shock, infinite-horizon model 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 model.

²⁶See e.g. Bonica et al (2013).

²⁷From this viewpoint, it is particularly striking to compare the conclusions of the Mirrlees (2011) report (which takes for the most part a single-country, U.K. perspective on the optimal tax system, and therefore recommends to pursue 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. See in particular Kaldor (1955) and Meade (1978),

5.3 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. There seems to be growing concern in developed countries that a number of large multinational firms manage to escape profit taxation almost entirely, and that more tax coordination - e.g. in the form of a common international tax base for profits - would be desirable. There is also growing awareness of the fact that a rising fraction of household wealth is located in tax havens, and that automatic international transmission of bank information on cross-border financial assets is the way to go.²⁸ Proposals in favour of a coordinated international registry on equity stakes are 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 to materialize such a registry. Given the fast growth rates observed at the very top of international wealth rankings, a coordinated wealth tax would also be a logical response (see above). This is particularly evident on Europe, where aggregate wealth-income ratios have been rising steeply over the past decades, so that the wealth tax base is quite attractive as compared to the income tax base (see Figure 3).

More generally, it should be noted that annual wealth taxes have been much more present historically in Europe than in the U.S. (or in the U.K.). Annual progressive wealth taxes have been applied since the early 20th century in countries like Germany, Switzerland or Sweden, and were introduced in the last third of the century in countries like France or Spain. The top rate was as large as 4% 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 Anglo-saxon countries). It should be noted however that annual wealth taxes experimented in Continental Europe during the 20th century have often been characterized by an ill-defined tax base. Very high rates often applied to fiscal values well below market values, which does not make much sense and led to the repeal of the wealth tax in Germany and Sweden during the 2000s.²⁹ An annual wealth tax is still in place in Switzerland, France and Spain. There was also a recent attempt to introduce a wealth tax in Italy in 2012 (it finally took the form of a dual wealth tax

who take a much more progressive perspective. Note that the steeply progressive consumption tax advocated by Kaldor has never been implemented in any country (in part because the proper measurement of individual consumption levels requires the measurement of both income and wealth, i.e. a progressive consumption tax requires the existence of a progressive income tax and a progressive wealth tax).

²⁸See Zucman (2013).

²⁹On the history of the Swedish wealth tax, see e.g. Hotchguertel and Ohlsson (2012).

system, which higher rates on non-movable real estate assets and lower rates on financial assets), which given the very high wealth-income ratios (and the large public debt) prevailing in Italy is not too surprising. Thanks to better fiscal technology - automatic transmission of cross-border bank information and pre-filled wealth declarations -, a progressive wealth tax could be part of the fiscal package of the future.

References

Atkinson, Anthony and Joseph E. Stiglitz, "The Design of Tax Structure: Direct Versus Indirect Taxation," *Journal of Public Economics*, 1976, 61(2): 55-75

Bonica, Adam, Nolan McCarty, Keith T. Poole, and Howard Rosenthal, "Why Hasn't Democracy Slowed Rising Inequality?", *Journal of Economic Perspectives*, 2013, 27(3), 103-124

Chamley, Christophe, "Capital Income Taxation, Wealth Distribution and Borrowing Constraints," *Journal of Public Economics*, 2001, 79, 55-69

Conesa, Juan Carlos, Sagiri Kitao, and Dirk Krueger, "Taxing Capital? Not a Bad Idea after All!", *American Economic Review*, 2009, 99(1): 25-48.

Farhi, Emmanuel, Christopher Slit, Ivan Werning and Sevin Yeltekin, "Non-linear Capital Taxation Without Commitment", *Review of Economic Studies*, 2012, 102(1), 1-25

Fisher, Irving. "Economists in Public Service: Annual Address of the President," *American Economic Review*, 1919, 9(1), 5-21.

Fleurbaey, Marc, *Fairness, Responsibility and Welfare*, 2008, Oxford University Press.

Haig, Robert M., "The Concept of Income - Economic and Legal Aspects", in *The Federal Income Tax*, 1921, New York: Columbia University Press. pp. 1-28

Hotchguertel, Henrik, and Henrik Ohlsson, "Who is at the top? Wealth mobility over the life cycle", Uppsala Universitet WP, 2012

Kaldor, Nicholas, *An Expenditure Tax*, 1955, Unwin University Books, 248p.

Kopczuk, Wojciech and Joseph Lupton, "To Leave or Not to Leave: The Distribution of Bequest Motives", *Review of Economic Studies*, 2007, 74(1), 207-235

Kopczuk, Wojciech and Joel Slemrod 2001. "The Impact of the Estate Tax on Wealth Accumulation and Avoidance Behavior", in *Rethinking Estate and Gift Taxation*, W. Gale, J.R. Hines and J. Slemrod eds., Washington DC: Brookings Institution, 299-349

Lucas, Robert. “Supply-Side Economics: An Analytical Review”, *Oxford Economic Papers*, 1990, 42(2), 293–316.

Meade, James, *The Structure and Reform of Direct Taxation*, 1978, Report of a Committee chaired by J.E. Meade, Institute for Fiscal Studies, 551p.

Mirrlees, James A. (ed.). *Tax By Design: The Mirrlees Review*, 2011, Institute for Fiscal Studies, Oxford: Oxford University Press.

Piketty, Thomas, “On the Long-Run Evolution of Inheritance: France 1820-2050,” *Quarterly Journal of Economics*, 2011, vol.126(3), pp.1071-1131.

Piketty, Thomas, *Capital in the 21st Century*, Harvard University Press, 2014

Piketty, Thomas and Emmanuel Saez, “A Theory of Optimal Capital Taxation”, *NBER Working Paper*, 2012

Piketty, Thomas and Emmanuel Saez, “A Theory of Optimal Inheritance Taxation”, *Econometrica*, 2013, forthcoming

Piketty, Thomas, Emmanuel Saez and Stefanie Stantcheva, “Optimal Taxation of Top Labor Incomes: A Tale of Three Elasticities”, *American Economic Journal: Economic Policy*, 2013

Piketty, Thomas and Gabriel Zucman, “Capital is Back: Wealth-Income Ratios in Rich Countries 1700-2010,” 2013, PSE Working Paper.

Saez, Emmanuel, "The Desirability of Commodity Taxation under Nonlinear Income Taxation and Heterogeneous Tastes," *Journal of Public Economics*, 2002, 83, 217-230

Seligman, Edwin R. A, *The Income Tax: A Study of the History, Theory and Practice of Income Taxation at Home and Abroad*, 1911, Macmillan.

Simons, Henry, *Personal Income Taxation: the Definition of Income as a Problem of Fiscal Policy*, 1938, Chicago: University of Chicago Press

Zucman, Gabriel, “The Missing Wealth of Nations: Are Europe and the U.S. Net Debtors or Net Creditors?”, *Quarterly Journal of Economics*, 2013, forthcoming.

Figure 1: Top Inheritance Tax Rates 1900-2011

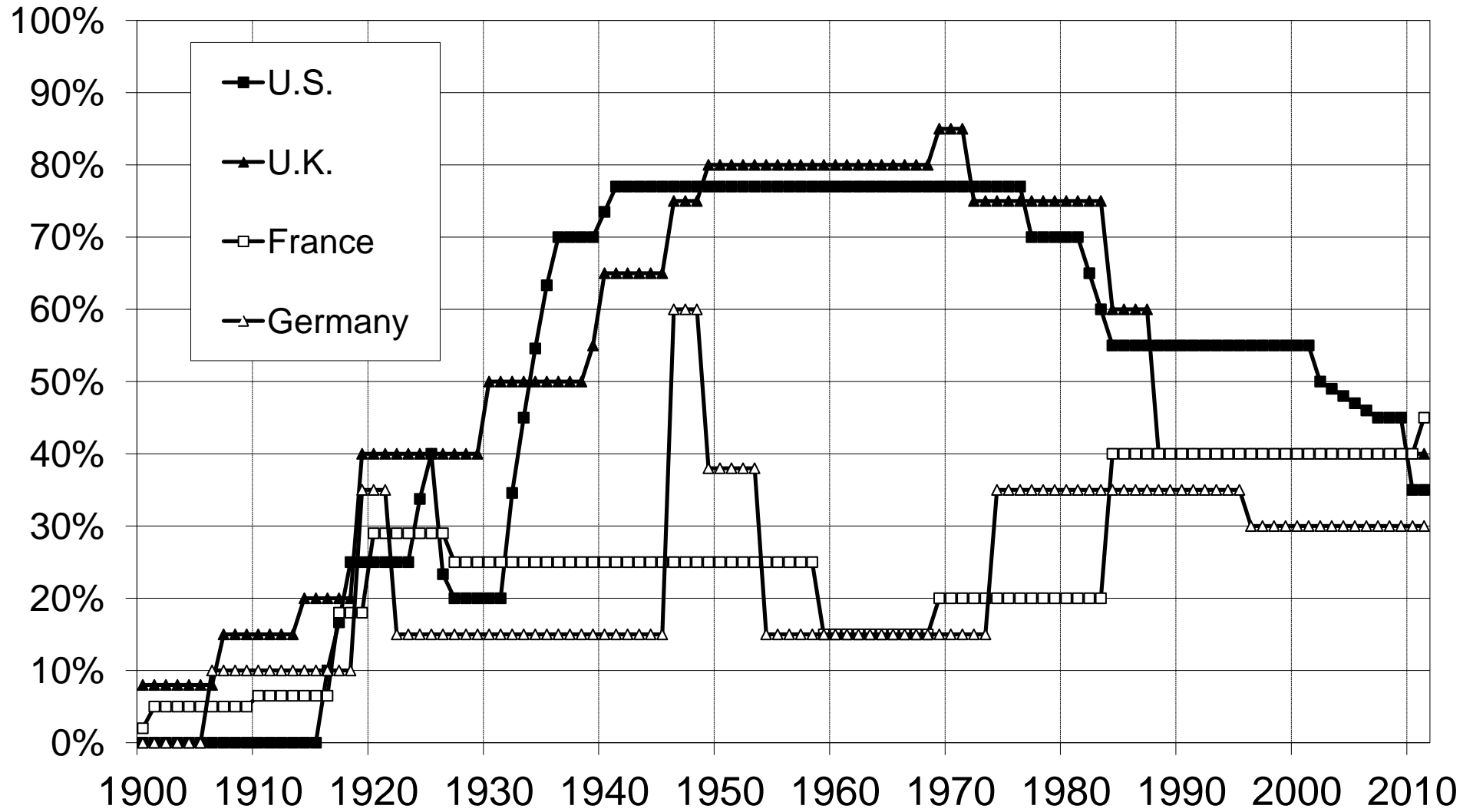


Figure 2: Top Income Tax Rates 1900-2011

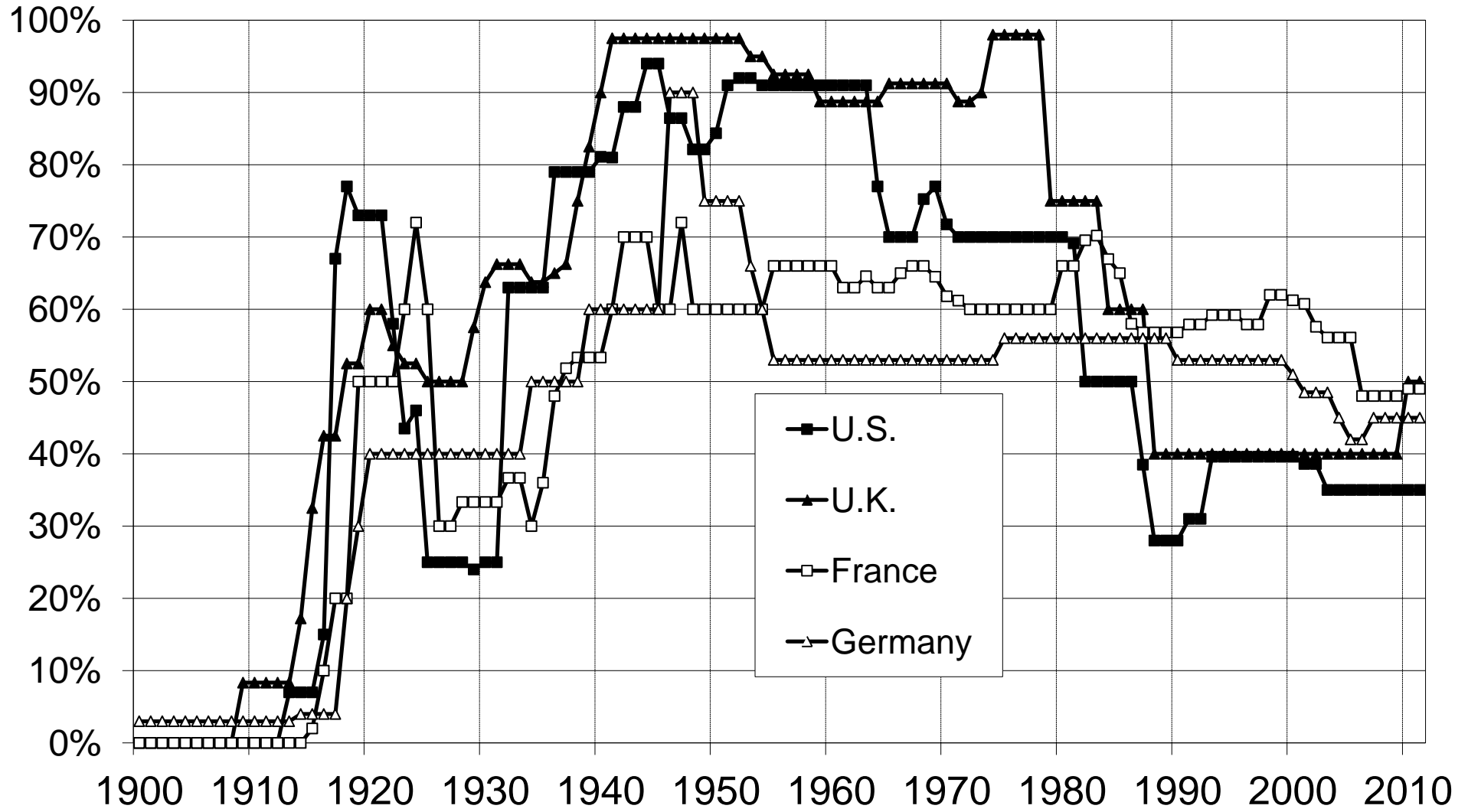
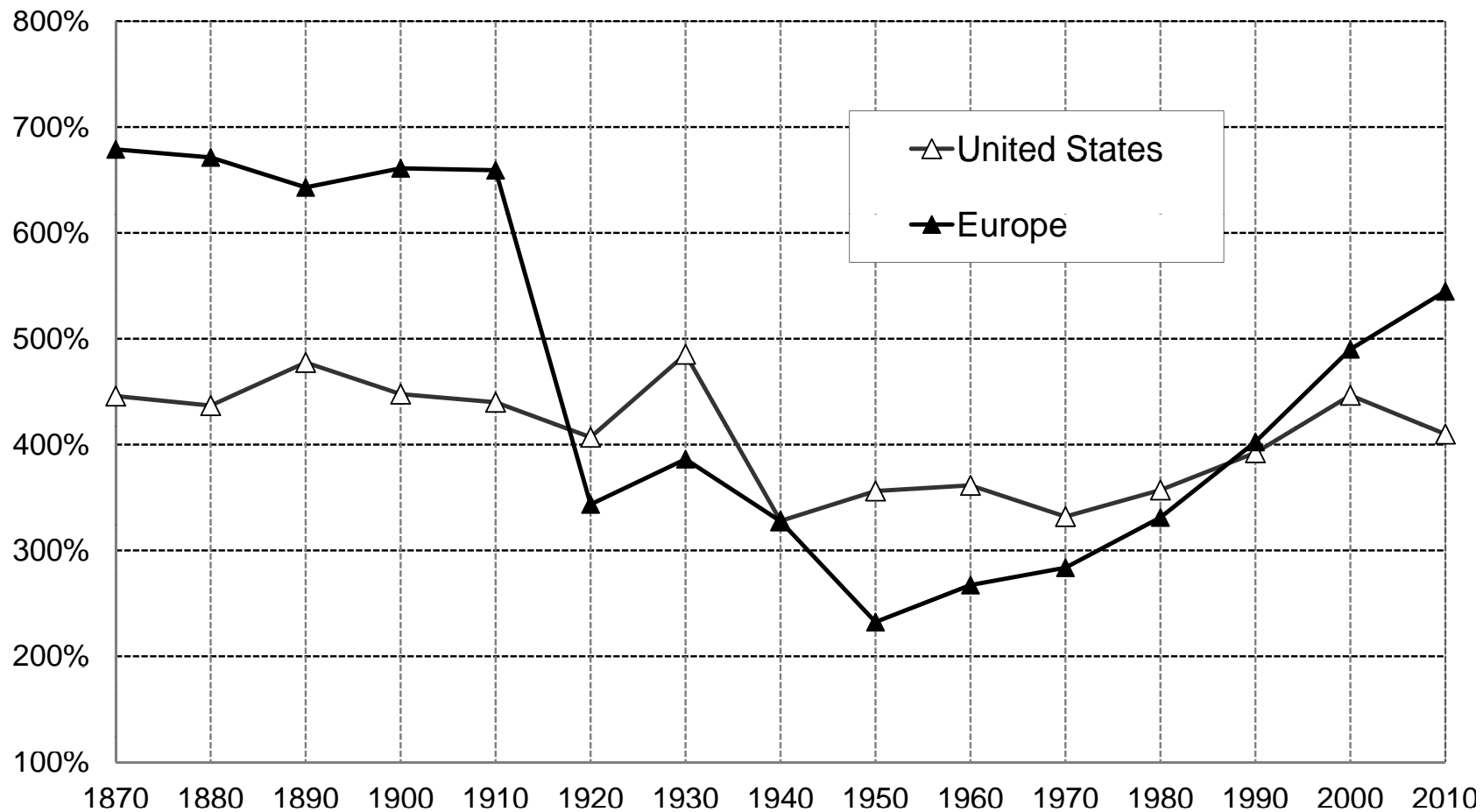


Figure 3. Private wealth/national income ratios 1870-2010



Notes: Source is Piketty and Zucman (2013). Europe is the (unweighted) average of France, Germany, and the United Kingdom. Private wealth is defined as the sum of non-financial assets, financial assets, minus financial liabilities in the household and non-profit sectors.