MACRO PERSPECTIVES ON INCOME INEQUALITY*

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Inequality has emerged as a defining challenge for modern economies and a central focus of economic research over the past two decades. In this article, I highlight some key empirical insights from this literature and analyze them through the lens of economic theory. I focus on two key questions.

First, what is the appropriate notion of income to use when measuring inequality? I begin by highlighting the key differences between common measures of income, particularly in how they account for capital income. I then contrast these with the ideal notion of income from a welfare perspective—one that reflects an individual's ability to consume or save for future consumption.

Second, what are the key factors driving the recent rise in top inequality? A shift-share decomposition reveals that most of the long-term increase is not primarily driven by rising labor income inequality or shrinking labor share—rather, it is largely driven by rising capital income inequality, particularly a surge in top entrepreneurial incomes. I then apply a simple model of capital accumulation to quantify the role of three distinct factors behind this phenomenon: higher returns on capital (technological factors), lower costs of external financing (financial factors), and a lighter tax burden (fiscal factors).

1 Defining income

Research on inequality begins with a deceptively simple question: how exactly should we define income? The choice of an income definition can dramatically influence the results, making the debates surrounding inequality more complex and, at times, more contentious. Take taxable income, for instance (Piketty and Saez, 2003): although it is readily available from tax returns, it excludes components commonly recognized as part of economic income, including employer pension contributions or capital income received in tax-exempt accounts. Another issue with taxable income is that tax reforms can make it look like the distribution of income is changing over time—even when the distribution of economic income remains the same. Recognizing these limitations, the recent efforts by Piketty et al. (2018) and Auten and Splinter (2024) combine tax data with surveys and national accounts to focus on a more comprehensive notion of income—factor income—that aligns with national income as defined by statistical agencies.

While factor income represents an improvement, it is not a definitive solution. In this section, I highlight the conceptual limitations of three commonly used income measures in the

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literature: distributed income, factor income, and Haig-Simons income. I then contrast them with the ideal definition of income from a welfare perspective—Hicksian income. As a preview of these results, Table 1 summarizes the differences between these different income concepts based on their sources (Panel A) and their uses (Panel B).

Income concepts

I first highlight the differences between three commonly used income measures—distributed income, factor income, and Haig-Simons income—with a particular focus in how they account for capital income.

Distributed income Distributed income is the component of economic output that is distributed to individuals. Distributed income is the sum of cash flows received from labor—wages, salaries, etc—and the cash flows received from asset ownership—interest income, dividend payments, and rental income.

The concept of distributed income is simple because it focuses on the actual cash flow received by individuals. This simplicity is also its limitation, however, as current cash flows often fail to capture an individual's true economic income. To illustrate this point, consider the example of Alice, who owns stock in a firm that reinvests all of its profits rather than distributing dividends. Even though Alice receives no current cash flow from the firm, this growth in firm capital means that Alice will be able to consume more in the future, either through higher firm dividends—if she keeps holding the stock—or through higher stock prices—if she sells it.[1] This example demonstrates that distributed income fails to capture true economic income period per period. The income concepts described below will propose different ways to account for non-distributed capital income, each with its own specific adjustments and limitations.

Factor income. Factor income includes all economic output, whether or not it is distributed to individuals. The key difference with distributed income is that it includes all firm earnings, regardless of whether they are distributed or reinvested in the firms (retained earnings). Factor income aggregates to the notion of national income as measured in national accounts (GDP minus capital depreciation plus net income from abroad), and, as such, it is the focus of Piketty et al. (2018) who aim to construct disaggregated national accounts.

One drawback of factor income, however, is that it is sensitive to changes in accounting standards. Consider, for instance, the changes in how national accounts handle firm expenses on intellectual property products—software, research and development, and artistic originals. Historically, these items were categorized as intermediate expenditures, and thus excluded from calculations of net output. However, in a series of revisions to the national income and product accounts in 1999, 2013, and 2018, the US Bureau of Economic Analysis reclassified these expenses as investments. These revisions mechanically increased the amount of retained corporate earnings, and, therefore, capital income. For instance, Koh et al. (2020) argues that this reclassification is "responsible" for the rise in the aggregate capital share measured in national accounts. Because business ownership is heavily concentrated at the top of the

[1] The latter case also highlights that, even in present value terms, distributed income does not accurately capture an individual's ability to spend in the presence of trading. I will return to this point below.

income distribution, one can expect these accounting changes to affect empirical measures of income inequality as well.[2]

This sensitivity to accounting conventions highlights a more fundamental issue in using factor income to capture economic income. Consider Bob and Carol, two firm owners. Bob's firm initially generates $100 in profits and reinvests 50 percent annually; this sustained investment allows Bob's firm to maintain a 5 percent annual growth in profits. Carol's firm, meanwhile, starts with $50 in profits and, despite distributing all earnings to shareholders, also achieves 5 percent annual growth because of increasing demand for its goods. Under the notion of factor income, Bob's income is $100 while Carol's income is only $50. Yet, from a financial perspective, Bob and Carol own assets that generate identical cash flows.

The general lesson is that factor income can treat assets with identical cash flows differently. It assigns higher capital income to assets whose cash flows grow through traditional investment, as recognized by national accounts, compared to those whose cash flows grow through more intangible investments (for example, brand-building) or without investment at all (for example, owning land in a rapidly developing area). Yet all these sources of cash flow growth are fundamentally equivalent from a financial perspective. This limitation with factor income motivates another well-known measure of income, Haig-Simons income.

Haig-Simons income. Haig-Simons income is defined as distributed income *plus* capital gains (whether or not they are realized)—that is, changes in the price of assets owned by individuals. Put differently, Haig-Simons's notion of capital income is equal to the return on wealth times initial wealth.[3] By supplementing distributed income with the (market-based) notion of capital gains rather than the (accounting-based) notion of retained earnings, Haig-Simons income treats all sources of asset value increases equally, whether they come from tangible investment, intangible investment, or rising productivity.

One drawback of Haig-Simons income, however, is that not all changes in asset values reflect changes in future cash flows. In fact, a large fraction of changes in asset prices reflects variations in the interest rate at which future cash payments are discounted rather than variations in future cash flows.[4] Consider, following Cochrane (2020), a business owner Bob who consumes his firm's dividends each year. If interest rates suddenly fall, the market value of Bob's business rises, even though his future dividends—and therefore his future consumption—remain unchanged. From an economic perspective, this capital gain does not meaningfully constitute income, as it does not increase Bob's ability to consume—in effect, it is is purely a "paper gain". In sum, while factor income tends to count "too little" capital income by ignoring some sources of cash flow growth, Haig-Simons income tends to count "too much" in times of declining interest rates.

[2]Note, however, that this reclassification has a more muted effect on capital income net of capital depreciation because of the increased capital depreciation associated with this new intangible capital (Rognlie, 2015).

[3]For additional discussion of the origins of the Haig-Simons income concept, see the discussion by Clarke and Kopczuk in this symposium.

[4]For additional discussion of this point, Online Appendix A clarifies the difference between these two sources of capital gains.

Table 1: Comparing different income measures

Income measure	Definition
Panel A: Income sources	
Distributed income	= Wages + Rents + Interest received + Dividends
Factor income	= Distributed income + Retained earnings
Haig-Simons income	= Distributed income + Capital gains
Hicksian income	= Distributed income + PV$\big[\Delta$Distributed income + ΔTrading profits$\big]$
Panel B: Income uses	
Distributed income	= Consumption + Asset purchases
Factor income	= Consumption + Asset purchases + Corporate investment
Haig-Simons income	= Consumption + ΔNetworth
Hicksian income	= Consumption + PV[Δ Consumption]

Notes. This table compares commonly used income measures based on their sources (Panel A) and uses (Panel B). All income concepts satisfy the fundamental individual budget constraint: total income sources must equal total income uses. However, in a dynamic setting, each income concept differs in what qualifies as undistributed income—the portion of income that is earned but not distributed—and, consequently, what qualifies as savings—the portion of income that is earned but not consumed. See Online Appendix B for mathematical definitions and further results on these income measures.

Quantitative differences

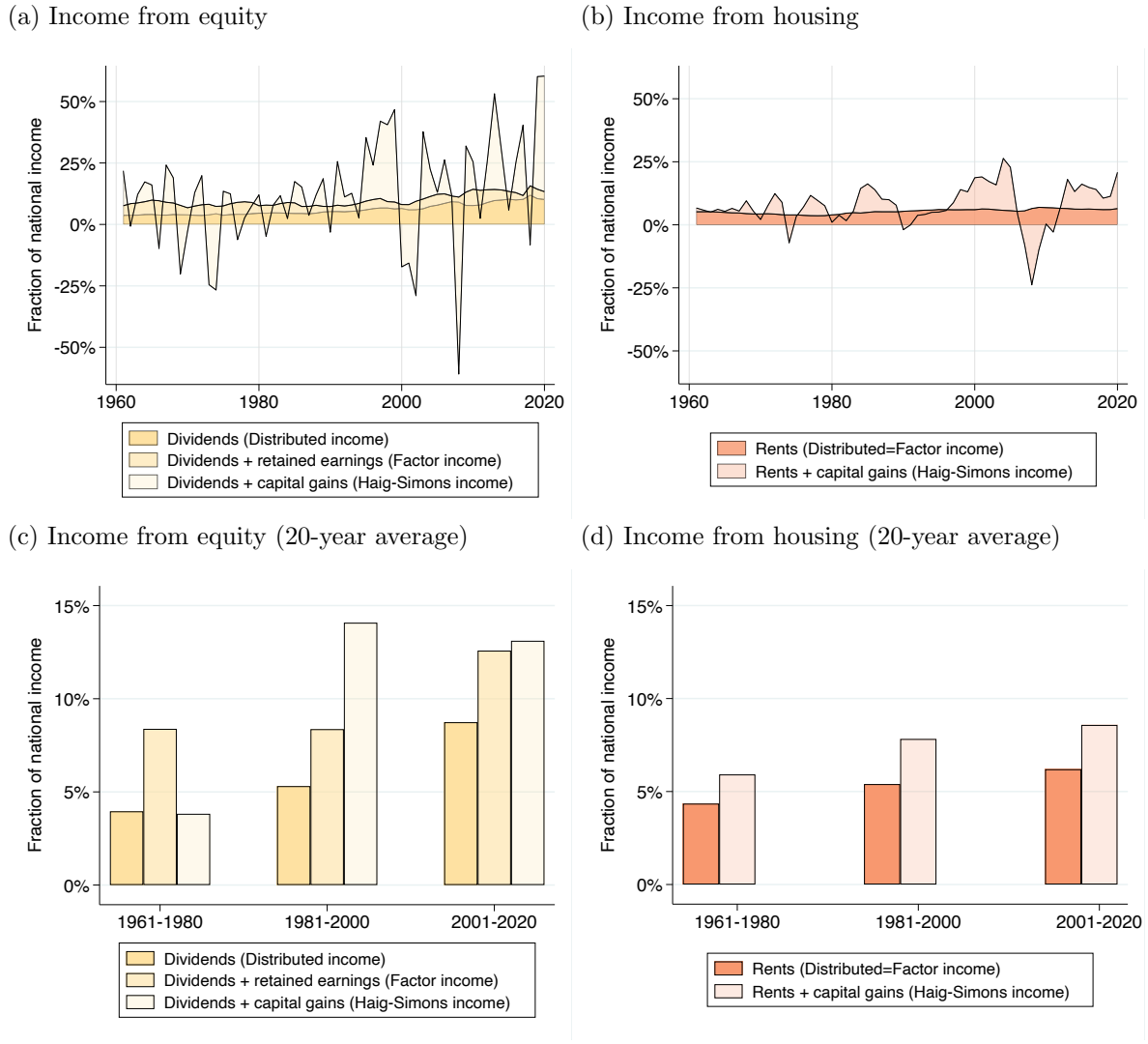
Beyond these conceptual differences, how much do distributed income, factor income, and Haig-Simons incomes differ in practice? To answer this question, I report these three income measures for the two largest asset classes owned by households, US corporate equity and housing, using data from the Integrated Macro Economic Accounts (Bureau of Economic Activity, 2023). For corporate equity, I construct distributed income as corporate dividends, factor income as dividends *plus* the retained earnings of corporations, and Haig-Simons income as dividends *plus* the real change in the market value of corporate equity. For housing, I construct distributed income as rental income (including the imputed rent that homeowners would have paid to themselves if they were renting their residence). I then compute Haig-Simons income as rents *plus* the real change in the market value of housing owned by households.

The results are reported in Figure 1. The two upper panels plot the three income measures every year for the two asset classes. The Haig-Simons measures of income exhibits substantially higher year-to-year volatility, reflecting the fact that the market value of financial assets (equity or housing) fluctuates a lot over time. To focus on the low frequency trends, the two lower panels plot the average of each income measure over 20 year periods. The gap between Haig-Simons and factor income is systematically positive for housing, For corporate equity, the gap is initially negative before turning positive post 1980.[5]

What explains this positive gap between Haig-Simons and factor income for corporate equity and housing? As discussed above, a positive gap means that investors (who price

[5]See Armour et al. (2013), Robbins (2018), and Larrimore et al. (2021) for recent efforts in measuring the distribution of Haig-Simons income. Consistently with the findings in Figure 1, these studies typically find that top Haig-Simons income shares are more volatile than top factor income shares.

Figure 1: Comparing different income concepts for equity and housing



Notes. This figure plots different notions of capital income associated with corporate equity (left panels) and housing (right panels) as a proportion of national income. For equity, I report three income concepts: distributed income (dividends), factor income (dividends plus retained earnings of corporations), and Haig-Simons income (dividends plus capital gains). For housing, I only report two income concepts: distributed income (rents) and Haig-Simons income (rent plus capital gains), as distributed income and factor income coincide. Data from Bureau of Economic Activity (2023) and U.S. Bureau of Labor Statistics (2023).

assets) either expect an increase in distributed income beyond what is recorded as investment in national accounts, or anticipate lower interest rates going forward. Both mechanisms likely play a role in the data. The first mechanism — expectations of higher future distributed income — is clearly relevant for housing. Since land is fundamentally scarce, economic theory suggests that rents should grow with the economy even in the absence of investment (as in the example of Carol above).[6] A similar mechanism also seems to be at play for corporate equity since, over the past forty years, the capital income distributed by the corporate sector has grown faster than its capital stock — an empirical pattern I will return to in the last section of the paper. Still, the secular decline in interest rates suggests that at least some of these "excess" capital gains" stem from falling discount rates too, which may not all be welfare-relevant.

Hicksian income

Economists have long recognized the conceptual flaws in common income measures. It was precisely this type of concerns that led Kaldor (1955) to advocate for consumption-based taxation instead. Rather than revisiting that debate, I now outline the ideal notion of income from a normative perspective.

A natural starting point is Hicks (1939), who defined income as "the maximum amount a man can spend and still be as well off at the end of the week as at the beginning". In formal terms, Hicksian income equals consumption plus the money-metric change in an individual's welfare. If someone only values consumption, this reduces to consumption plus the present value of future changes in consumption (Auerbach, 1985, Sefton and Weale, 2006).

Note that the concept of Hicksian income still fits with Simons (1938)'s broad definition of income as "the sum of consumption and accumulation during a given period", where the notion of accumulation is defined as the increase in the present value of future consumption. From a welfare standpoint, this is arguably the right way to think about saving, rather than the conventional approach of measuring it as the purchase of financial assets (distributed income), the purchase of financial assets and investment (factor income), or the change in financial net worth (Haig-Simons income).

As shown in Table 1, like all other notions of income, Hicksian income can also be defined in terms of its sources: it equals distributed income *plus* the present value of anticipated changes in distributed income at each horizon *plus* the present value of anticipated changes in the price of assets the individual expects to sell.[7] Like distributed income, Hicksian income emphasizes the importance of cash flows relative to other concepts such as retained earnings or capital gains. Unlike distributed income that only counts current cash flows, however, it recognizes that receiving one dollar today is equivalent to receiving $1 + r$ more dollars tomorrow, where r is the interest rate.[8] The difference between all income concepts in terms of their sources is summarized in Table 1 (Panel b).

To be concrete, Hicksian income differs from factor and Haig-Simons income in two essential ways. First, it only counts capital gains to the extent that they affect anticipated distributed income or the price of anticipated transactions. This is the main insight of Fagereng et al.

[6] The model in the Online Appendix B.2 illustrate this point.

[7] For an algebraic presentation of this point, see Proposition 1 in the Online Appendix.

[8] This equivalence assumes the individual's discount rate equals the interest rate. In the presence borrowing constraints, Hicksian income should instead use household-specific discount factors, see Fagereng et al., 2024.

(2024), who stress that, in the absence of cash-flow growth, capital gains simply benefit future sellers and harm future buyers. Returning to the earlier example of Bob: if Bob never plans to sell, none of the capital gain constitutes Hicksian income; if Bob intends to sell his business tomorrow, the entire capital gain constitutes Hicksian income; if Bob plans to sell his business in ten years, what matters is how today's capital gain affects the expected sale price at that future date.[9]

Second, unlike factor income and Haig-Simons income, Hicksian income treats anticipated increases in dividends and wages symmetrically. To understand the rationale, compare Bob, the owner of a firm distributing \$50 in dividends today and is expected to grow 5 percent annually through reinvested earnings, and Dan, a worker earning a \$50 salary expected to grow 5 percent annually. With a 10% interest rate for discounting future cash-flows, factor and Haig-Simons measures would assign \$100 in income to Bob but only \$50 to Dan. Yet Bob and Dan receive identical cash flow streams: Hicksian income recognizes this equivalence by assigning \$100 in income to each.[10]

One might object to treating expected growth in wages and dividends symmetrically: after all, while labor income requires work, capital income does not. While I am sympathetic to this argument, such a view would contradict the very notion of income, which is based on adding up wages, dividends, and indeed income from all sources. While there is value in considering the cash flows earned from labor and those earned from asset ownership separately, the relevant question here is how to best combine these flows into a concept that accurately captures the resources available to an individual. Additionally, note that the labor-capital distinction becomes particularly blurry for active business owners, a point to which I will return in the next section.

To better understand this symmetric treatment of labor and capital income, consider the following perspective. Starting from distributed income (current cash flows), both factor and Haig-Simons income add a forward-looking component for capital—either retained earnings or capital gains. While this addition captures important information about future capital income, it creates an imbalance: capital income is effectively counted twice in a present value term, while labor income is counted only once. Hicksian income resolves this by incorporating a forward-looking component for labor income as well. This point is related to Barro (2021), who argues that the concept of national income effectively double counts capital income relative to labor income.[11]

[9] See also Dávila and Korinek (2018), Moll (2020), Glover et al. (2020), and Del Canto et al. (2023) for similar results.

[10] The present-value of a stream of cash flows that starts at C_t and grows at rate g is given by the Gordon growth formula: $C_t/(r-g)$, where r is the interest rate. Hence, Bob's Haig-Simons income—defined as the current cash-flow plus the change in the value of the asset—is $C_t + gC_t/(r-g) = rC_t/(r-g)$. With $g = 5\%$, $r = 10\%$, and $C_t = \$50$, this yields an income of \$100. Bob's Hicksian income—defined as current cash flow plus the present-value of changes in future cash-flows—coincides with Bob's Haig-Simons income in this setup (see Online Appendix B for details).

[11] More generally, this discussion relates to an older literature examining the extent to which national income, as recorded in national accounts, accurately captures welfare-relevant income for the representative agent (see, for instance Weitzman, 1976; Sefton and Weale, 2006; Hulten and Schreyer, 2010; Barro, 2021). A key message of these papers is that the two notions converge with constant technology but diverge in the presence of technological growth. As an illustration, Online Appendix B.2 contrasts the representative agent's distributed income, factor income, Haig-Simons income, and Hicksian income in a standard neoclassical growth model with

Although Hicksian income is the ideal measure of income in a normative sense, it is difficult to quantify in practice. While factor income can be measured from observable accounting statements, and Haig-Simons income can be measured from changes in market valuations, Hicksian income requires to form expectations on future asset cash flows and asset sales—an inherently subjective exercise. Still, we can make some informed guesses about the distribution of Hicksian income relative to the distribution of factor or Haig-Simons income (see Gomez and Guoin-Bonenfant, 2025 for a more detailed study). First, because Hicksian income counts only some capital gains as income (mainly those reflecting changes in future cash flows), we can expect Hicksian capital income to fall between factor and Haig-Simons measures in periods of declining interest rates (like in the past thirty years). Second, because Hicksian income incorporates expected wage growth, we can expect Hicksian labor income to exceed both factor and Haig-Simons measures. Because labor income is disproportionately earned by the bottom 99 percent of the distribution, this adjustment would reduce measured income inequality, to better capture the actual differences in spending power across the population. This adjustment, however, is unlikely to affect the trend in rising inequality, as wage growth rates remain relatively stable over time.

Further discussion

In this section, I have explored the ideal measure of income from a welfare perspective—specifically, what best reflects an individual's ability to consume now or save for the future. As a caveat, I would like to stress that it is not the same thing as the ideal measure of income for taxation. Tax policy has to grapple with a whole other set of concerns, like how easily people can shift income to avoid taxes or how taxation distorts real economic behavior. Another important distinction is that, from an optimal taxation perspective, an ideal measure of income should approximate lifetime consumption in present-value terms—since that's ultimately what matters for lifetime redistribution. In contrast, the income measures discussed above aim to measure all income earned within a given period—both consumption and savings—which implies that taxing such measures would effectively tax saved resources twice (Kaldor, 1955).

Finally, while this discussion has focused on defining income, the same conceptual challenges also emerge when defining wealth: What is the right measure—book value or market value (Bhandari and McGrattan, 2021; Smith et al., 2023; Guvenen et al., 2023)? Should we treat wealth increases from declining discount rates equivalently to those from rising cash flows (Fagereng et al., 2024; Greenwald et al., 2024)? Should we include the capitalized value of future labor income (Catherine et al., 2020; Greenwald et al., 2024)? At the core of these questions lies the same fundamental challenge discussed above: the extent to which a given change in wealth should be counted as economic income.

2 Observations on rising income inequality

Regardless of the specific income concept used—be it taxable income, distributed income, factor income, or Haig-Simons income—the evidence shows rising top income inequality over the past 60 years, although researchers still disagree on the exact magnitude. For example, Piketty et al. (2018) find that the top 1 percent share of pre-tax factor income increased

capital, land, and labor with growing productivity.

by 6 percentage points since 1960. In contrast, Auten and Splinter (2024), with different methodological choices, find a more modest increase of about 3.5 percentage points in the top 1 percent pre-tax income share, and argue that there is little change in post-tax income shares after accounting for taxes and transfers.

The trend of rising inequality is most evident at the very top: even Auten and Splinter (2024) find that post-tax income shares have grown for the top 0.1 percent. External sources such as rankings of the super-rich like the Forbes 400 reinforce this picture, as they show a sharp rise in both the number of billionaires and the share of aggregate wealth that they own.

Composition of top incomes

The empirical literature does not just tell us how much top income shares have grown—it also sheds light on where that income comes from. Figure 2a decomposes US national income (that is, aggregate factor income) into its four main components over time: labor compensation (68 percent of total since 1962), business income (22 percent), interest income (2 percent), and rental income from housing (8 percent). Two trends are apparent. First, the share of national income that takes the form of labor compensation (wages and employer pension contributions) has remained relatively stable over the sample period, rising slightly from 1960 to 1980 before declining modestly through 2020. This stability stands in contrast to well-documented decline in the "gross" labor since 1960 (Karabarbounis, 2024). The difference between the "gross" labor share——labor income as a fraction of GDP— and the "net" labor share—labor income as a fraction of national income—arises from a rise in the depreciation rate of capital, reflecting a shift toward higher-depreciation assets such as software and computers (Rognlie, 2015).[12]

Second, the composition of business income has shifted significantly. Following the 1986 Tax Reform Act, which raised corporate rates while lowering personal rates, businesses increasingly moved from C-corporations, where owners are taxed separately from the business, to pass-through entities, such as S-corporations, partnerships, and sole proprietorships, whose income flows directly to households for tax purposes. C-corporations tend to be large firms with a diffuse ownership, while pass-through businesses tend to be small or mid-market firms with concentrated, active owners.

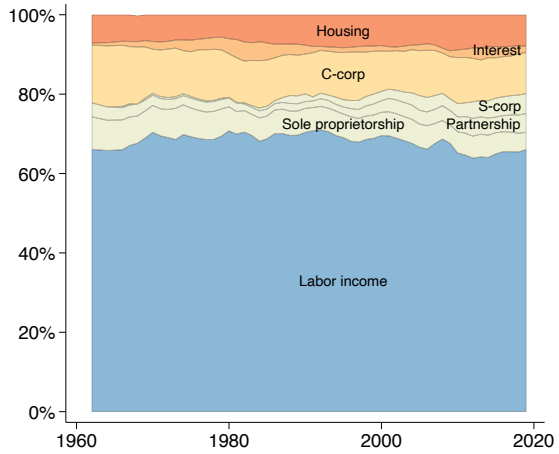
Figures 2b and 2c plots the composition of income accruing to the top 1 percent and top 0.01 percent (data from Piketty et al., 2022). Unlike the relatively stable composition of national income, the sources of top income have shifted markedly, with a rising share of labor compensation as well as income from pass-through businesses. In 1960, the top 1 percent's income was primarily derived from C-corporations; by 2019, it was evenly split between labor income, pass-through business income, and other forms of capital income.

The rising importance of pass-through businesses poses significant measurement challenges. A substantial portion of factor income from these businesses is untaxed due to generous depreciation provisions in the tax code, and, as a result, does not appear on individual tax returns. How to properly allocate this untaxed income to individual earners remain a key issue due to the lack of microdata linking businesses to their owners. In fact, current debates over the level

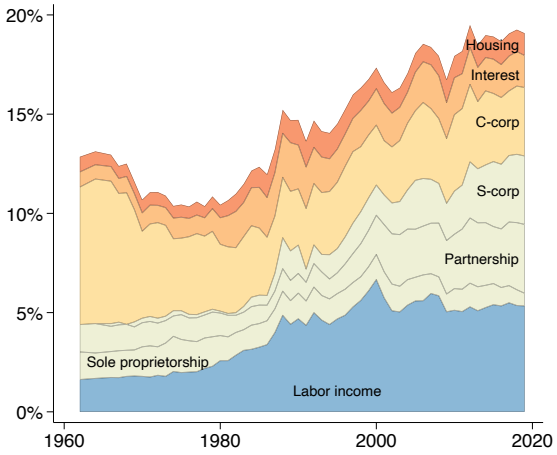
[12]Technically, both labor share measures should also include the fraction of income from non-corporate businesses (partnerships and sole proprietorships) that accrues to labor. In practice, this adjustment has minimal impact since analyses typically assume the labor-capital split in the non-corporate sector mirrors that of the corporate sector.

Figure 2: The composition of income across the distribution

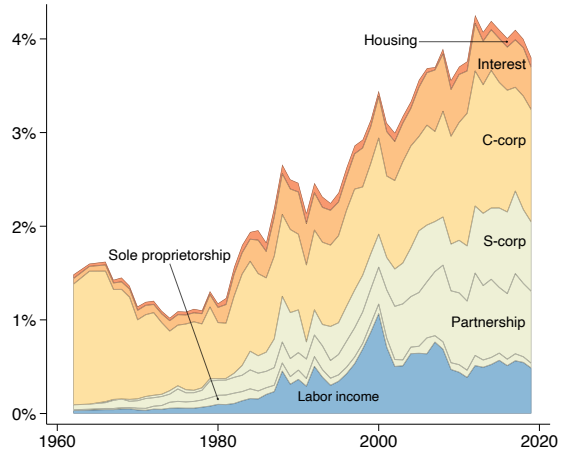
(a) Top 100%



(b) Top 1%



(c) Top 0.01%



Notes. This figure plots the composition of the pre-tax factor income earned by top percentiles, broken down in different categories, using data from Piketty et al. (2022) with two modifications: I allocate 60% of pension capital income to C-corp income and the rest to interest income instead of treating it as a separate source of capital income, and I offset mortgage payments against interest income rather than housing income.

of inequality largely come down to disagreements over how to properly allocate the portion of national income and wealth earned through pass-through businesses (Auten and Splinter, 2024; Smith et al., 2019, 2023; Piketty et al., 2024)

Shift-share decomposition

To analyze the rise in top income shares, I now use a shift-share approach that separates the impact of three forces: rising labor income inequality, rising capital income inequality, and a shrinking labor share. For any given top percentile p, the share of total income going to that group can be expressed as a weighted average of their share of total labor income and their share of total capital income:

$$\text{Income share}(p) = \text{LS} \times \text{Labor income share}(p) + (1 - \text{LS}) \times \text{Capital income share}(p),$$

where LS denotes the economy's overall labor share. Taking the difference of this equation over time gives a simple way to decompose the rise in top income shares:[13]

$$\begin{aligned}\Delta\text{Income share}(p) = {} & \text{LS} \times \Delta\text{Labor income share}(p) \\ & + (1 - \text{LS}) \times \Delta\text{Capital income share}(p) \\ & + \big(\text{Labor income share}(p) - \text{Capital income share}(p)\big) \times \Delta\text{LS}.\end{aligned}$$

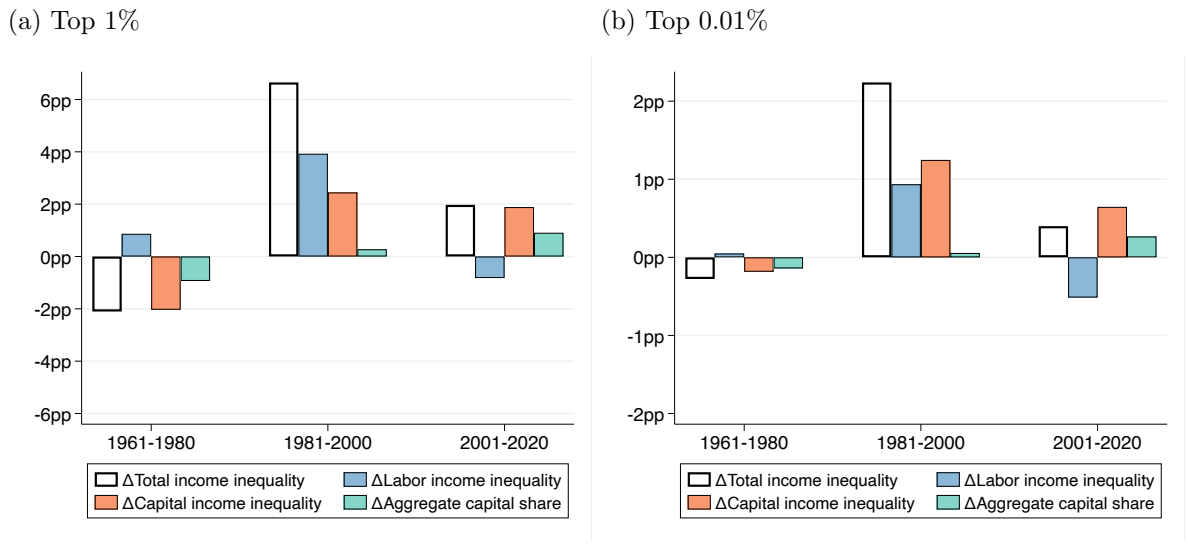
Each term has a clear interpretation. The first term captures how changes in labor income inequality impacts top income shares. The second captures how changes in capital income inequality impacts top income shares. The third term captures the impact of changes in the economy's overall labor share, since capital income is more unequally distributed than labor income. See Meade (2013), Moll et al. (2022), and Irie (2024) for related decompositions.

Classifying income from pass-through businesses as either labor or capital is challenging. Part of the challenge is empirical: non-corporate businesses do not separate owner wages from profits on tax returns. Even S-corporation owners, who are required make this distinction, have tax incentives to classify labor income as profits (Smith et al., 2022). The difficulty is also conceptual—defining labor and capital income in these cases is not straightforward. Consider profits from organizational capital (e.g., know-how or customer bases). These profits are not purely labor income, as they compensate for effort exerted in the past rather than current work. Yet, they are not purely capital income either, because this kind of capital is effectively embodied in the owners themselves (Jones and Kim, 2018, Smith et al., 2019, Bhandari and McGrattan, 2021, Eisfeldt et al., 2023, and Crouzet et al., 2022). Following Saez and Zucman (2020), I use a 75/25 labor/capital split for small pass-through businesses and a 25/75 split for the largest ones. However, the specific allocation has little impact on the decomposition—the results remain largely unchanged when using the classification from Smith et al. (2019), which tends to use a higher labor/capital split.

Figure 3 presents the results of the accounting framework for the top 1 percent and top 0.01 percent. To visualize the findings, I aggregate the results of the annual decomposition over three 20-year periods: 1960-1980, 1980-2000, and 2000-2020. The first key takeaway is that the decline in the aggregate labor share had minimal impact on top income shares. In

[13] The Δ notation denotes the difference between the two periods. See Online Appendix A for a formal derivation.

Figure 3: A shift-share decomposition of the rise in top income inequality



Notes. This figure reports the results of using a shift-share approach to decompose the overall change in top factor (pre-tax) income shares into three components: rising labor income inequality, rising capital income inequality, and declining labor share. I implement this decomposition yearly and aggregate the results over three periods: 1962-1982, 1982-2002, and 2002-2020. See Online Appendix A for additional details and results. Data from Piketty et al. (2022).

other words, rising inequality is almost entirely driven by growing disparities within labor and capital income—not by a shift from labor to capital.

Second, most fluctuations in top income shares are driven by fluctuations in capital income inequality rather than fluctuations in labor income inequality. The main exception is the period between 1981 and 2000 period, when a significant portion of the rise in top income shares was driven by a rise in labor income inequality. This pattern aligns with research documenting the surge in executives pays and, more broadly, the growing returns to talent during that time (see, among many others, Levy and Murnane, 1992, Jones and Kim, 2013, and Edmans et al., 2017).

3 Drivers of rising income inequality

I now study the proximate causes behind the rise in top inequality. A frequently used method in the literature is to adopt a *forward-looking* approach: start with top earners at the beginning of the period and follow their income trajectories over time. However, this approach is fundamentally flawed because the composition of individuals in the top percentiles is constantly changing—yesterday's highest earners are not necessarily today's. For instance, using IRS public use panel data from 1979 to 1990, Gomez (2023) finds that the average income growth of existing individuals in the top percentiles was zero; instead, the entire increase in top income shares was driven by composition changes—individuals with high income growth entering the top percentiles and displacing previous top earners. This pattern persists even when income is smoothed using a three-year moving average to reduce year-to-year fluctuations.

Given this constant turnover, a more informative approach is to adopt a *backward-looking*

perspective—examining how the lifetime trajectories of today's top earners compare with those of their predecessors (Gomez and Gouin-Bonenfant, 2024; Ozkan et al., 2023; Gomez, 2024a). Pragmatically, this means asking: How does the lifetime income trajectory of today's top earners compare to that of previous generations? What has changed in the way income is accumulated?

A simple model of capital accumulation

Given its central role in the trend of rising top income shares (Figure 3), I focus on analyzing the rise in capital income inequality, and, more specifically, the rise in the income accruing to top business owners.

I use a simple model of capital accumulation. Each period, business owners (i.e., entrepreneurs) can borrow external funds at an interest rate r. They operate a project that produces a profit rok_i per dollar invested in the project. The profits from the projects are then used to pay interest expenses and taxes, to consume, or to invest in new capital. This simple model leads to the following accounting equation for entrepreneurs' capital accumulation:

$$\text{rate of capital accumulation}_i = (1-\tau)\left(r + \lambda(rok_i - r)\right) - \text{consumption rate}_i,$$

where λ denotes the entrepreneur's leverage—the amount of capital operated by the entrepreneur divided by the amount of capital they own—and where τ denotes the effective tax rate faced by the entrepreneur. Note that the return on capital, rok_i, is conceptually different from the cost of capital, r: the return on capital, rok_i, represents the entrepreneur's net profit per unit invested in the firm— it is a physical return, largely determined by the entrepreneur's production technology— while the cost of capital, r, represents how much it costs for the entrepreneur to borrow external funds—it is a financial rate of return, determined by the supply and demand for funds in financial markets. In the neoclassical model with linear return to scale, entrepreneurs borrow capital until the marginal product of capital equals the interest rate; and so $rok_i = r$. In practice, however, the two objects typically differ at the individual level because of market power, decreasing return to scale, or adjustment costs in installing capital (e.g., Hayashi, 1982).

This capital accumulation equation highlights three key determinants of capital income inequality identified in the literature: the return on capital, rok_i (Moll et al., 2022), the cost of capital, r (Gomez and Gouin-Bonenfant, 2024, İmrohoroğlu and Zhao, 2022), and the average tax rate, τ (Hubmer et al., 2021, Lee et al., 2021). I now discuss the long-term trends in each of these factors.

Return on capital

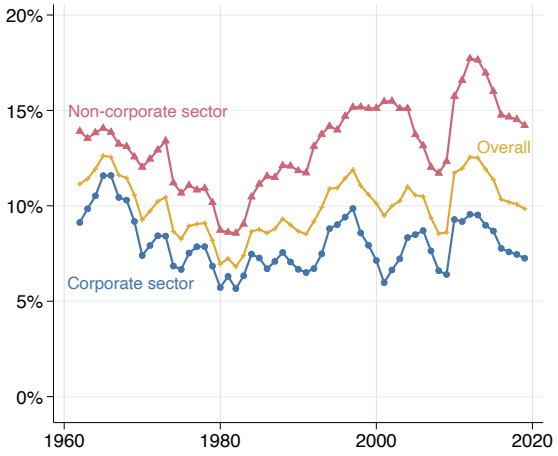
I first discuss the evolution of the aggregate return on capital. I construct the return on capital in the US corporate and non-corporate sector by dividing net operating surplus by the book value of capital using data from Bureau of Economic Activity (2023). The results, plotted in Figure 4a, indicate that the return on capital exhibits a U-shape pattern, declining between 1960 and 1980 and rising thereafter. This pattern closely aligns with the dynamics of top income shares over the same period (see Figure **??**).

I also present separate estimates of the return on capital for the corporate and non-corporate sectors. I find that the recent increase in the return on capital is largely driven by firms in the

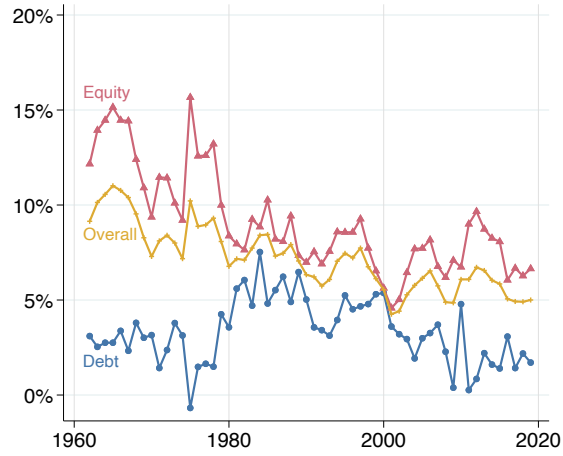
non-corporate sector—partnership and sole proprietorships—whose ownership is concentrated at the top. While intriguing, this difference is difficult to interpret due to significant composition changes over time—for example, a firm that previously filed as an S-corp may now file as a partnership.

Figure 4: Economic determinants of entrepreneurs' growth rates

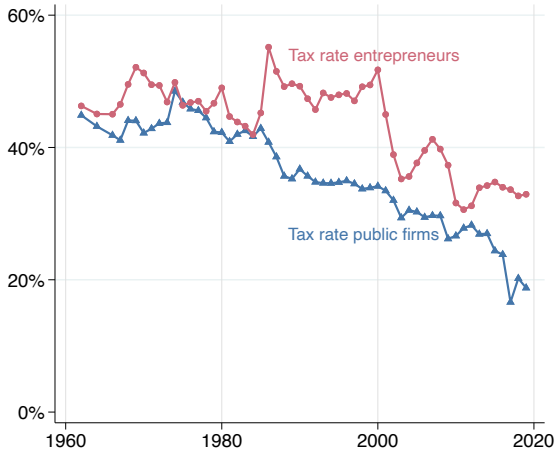
(a) Aggregate return on capital *rok*



(b) Aggregate cost of capital r



(c) Aggregate tax rate τ



Notes. This figure plots the evolution of key economic objects that affect the entrepreneurs' rate of capital accumulations. Figure 4a plots the return on capital, computed as the ratio of a sector's net operating surplus to its capital (data Bureau of Economic Activity, 2023). Figure 4b plots the cost of capital of the corporate sector, calculated as the ratio of net operating surplus minus net investment to the market value of liabilities, plus net investment (see Gomez and Gouin-Bonenfant, 2024 for additional details). The cost of debt is calculated as the weighted average of the yield of AAA bonds and of the bank prime loan rate, adjusted for inflation (data from Moody's, 2023, Board of Governors of the Federal Reserve System , US, and U.S. Bureau of Labor Statistics, 2023). The cost of equity is calculated using the Modigliani-Miller formula $r_D + \lambda(r_A - r_D)$ where λ denotes the leverage of the corporate sector, r_A the overall cost of capital, and r_D the cost of debt. Finally, Figure 4c computes corporate taxes paid, as a percentage of net income, for firms in Compustat as well as total taxes paid, as a percentage of pre-tax factor income, for entrepreneurs in the DINA microdata (data from SP Global Market Intelligence, 2025 and Piketty et al., 2022).

While this empirical evidence focuses on changes in the *average* return on capital, the more relevant measure in our context would be the changes in the return on capital for the right tail of entrepreneurs; that is, those who make it to top percentiles. This is more difficult to measure due to the lack of microdata linking individuals to private firms as well as difficulties in measuring capital (tangible and intangible) for individual firms. Still, there is some evidence that the increase in the return on productive assets is concentrated in a small number of fast-growing firms (e.g., Andrews et al., 2016; Autor et al., 2020), which are typically owned by top entrepreneurs.

What explains the rise in the return to capital? One possible explanation is higher productivity, thanks in part to technological advances like computers and automation (e.g., Moll et al., 2022). Another explanation is that firms are gaining more market power—both in the product and labor markets (e.g., De Loecker et al., 2020; Boar and Midrigan, 2024).

Cost of capital

I now examine the evolution of the entrepreneurs' cost of capital. As shown in the capital accumulation equation, entrepreneurs benefit from a decrease in the interest rate, r, provided they are net borrowers (i.e., the leverage $\lambda > 1$). Figure 4b plots the average cost of capital for the US corporate sector, measured as the payout yield of the corporate sector plus the growth in capital. The figure illustrate a steady decline in the average cost of funding since 1960.

Entrepreneurs raise external financing through both debt and equity. To differentiate between the two, Figure 4b present separate estimates of the cost of capital for debt and equity financing. The cost of debt is computed as a weighted average of the bank prime loan rate and the yield on AAA bonds adjusted for inflation while the cost of equity is calculated by combining the cost of capital with the cost of debt using the usual Modigliani-Miller formula (as explained in the notes under Figure 4). The figure shows that the cost of debt is initially low, spikes in the 80s, and then declines. In contrast, the cost of equity steeply declines over time. Hence, lower cost of capital benefited both debt and equity issuers.

What explains the decline in the cost of capital over time? The literature does not provide a definitive answer, but proposed explanations include the slowdown in average productivity growth, increased foreign demand for US assets (the "global savings glut"), population aging (Auclert et al., 2020), and, possibly, rising inequality itself (Mian et al., 2021; Gomez, 2024b).

Tax rate

I now examine the evolution of the average tax rate paid by entrepreneurs. I start by computing the effective tax rate for public firms, which I define as corporate taxes paid divided by net income (net operating surplus minus interest payments). As shown in Figure 4c, this effective rate has declined from 40 percent to 20 percent since 1962. This is consistent with the overall decline in the statutory corporate tax rate during the period, which decreased from 53 percent in 1962 to 21 percent under the Tax Cuts and Jobs Act in 2017.

The decline in the effective corporate tax rate may not fully capture the effective tax rate of entrepreneurs, since a substantial fraction of them own pass-through businesses, which are not subject to the corporate tax. Therefore, I also estimate the average tax rate of entrepreneurs using microdata from the Distributional National Accounts (Piketty et al., 2018). I define an individual as an entrepreneur if factor income from businesses (corporate and non-corporate)

accounts for more than half of their total revenue—this group represents roughly 15 percent of the population. Figure 4c reports that the average tax rate of entrepreneurs under this computation follows a similar downward trend, from 50 percent to 30 percent between 1962 and 2019. This decline in the effective tax rate reflects both lower marginal tax rates and and greater opportunities for entrepreneurs to reduce their taxable income, for instance, through generous depreciation allowances.

Quantification

I now perform a back-of-the-envelope calculation to quantify the mechanical effect of these long-term trends on top income inequality. Figure 4 reports that, since 1980, the average return on capital has increased by 2pp, the cost of capital has decreased by 3pp, and the average tax rate has declined by 10pp. Plugging these numbers into the capital accumulation equation above, these trends suggest that entrepreneurs' rate of capital accumulation has increased by 7.5pp (3pp due to changes in rok, 1.5pp due to changes in r, and 3pp due to changes in τ) — for this computation, I calibrate an average leverage $\lambda = 1.5$ and an average rate of capital accumulation of 30pp, consistently with Gomez and Gouin-Bonenfant (2024). Assuming that the average entrepreneur in the top percentiles has been operating a firm for around 20 years, this translates into a 1.5 log point increase in their capital holdings relative to their counterparts in 1980. Figure 1 shows that the income share of the top 0.01 percent has quadrupled since 1980— a 1.4 log point increase—which is of a similar order of magnitude. Thus, this calculation suggests that the combined effects of changes in returns to capital, interest rates, and taxes can quantitatively account for the rise in top income shares. Naturally, this is a simplified exercise, and I discuss some caveats in Online Appendix D.

In this exercise, I have taken the changes in the return on capital, the interest rate, and the tax rate as given. From an economic perspective, however, the observed divergence between these three objects raises a puzzle: when the after-tax return on capital is high relative to the interest rate, as it is now, it should incentivize more people to start businesses and encourage existing entrepreneurs to invest more. In turn, this surge in entrepreneurial investment should push down the return on capital and, ultimately, decrease inequality.

A key question is why this equilibrium effect has not yet occurred (or, in the terminology of Barkai, 2020, what explains the rise in "pure profits"). One explanation is that entrants now face increased barriers to competition with established firms due to changes in knowledge diffusion (Akcigit and Ates, 2023), regulatory capture (Gutiérrez and Philippon, 2019), or demographics (Karahan et al., 2024). Another possibility is that the aggregate supply of entrepreneurial talent is less elastic than commonly assumed (Gomez and Gouin-Bonenfant, 2025).

In the absence of such equilibrium effects, government policies could act as an additional stabilizing force on inequality. In practice, however, this stabilizing role of government policies has remained limited in the United States, possibly because of prevailing beliefs that high inequality reflects a meritocratic process (Mijs, 2021), the challenge of enacting non-distortionary taxes on the wealthy (Bastani and Waldenström, 2020), or the influence of entrenched elites on policymaking (Glaeser et al., 2003).

Data availability statement

The data and code necessary to replicate this paper is available at http://doi.org/10.3886/E222942V1.

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Online Appendix for "Macro Perspectives on Income Inequality"

A Anatomy of capital gains

To better understand the difference between these income concepts, I now discuss how capital gains arise. It is useful to start from the fact that the price of an asset can be thought of as the present value of its future cash flows. Formally, denoting P_t the price of an asset, we have:

$$P_t = \sum_{h=1}^{\infty} R_{t\to t+h}^{-1} \mathbb{E}_t[D_{t+h}],$$

where $R_{t\to t+h}$ denotes the discount rate between t and $t+h$ and $\mathbb{E}_t[D_{t+h}]$ denotes the expected dividend at time $t+h$. While I assume that this discount rate is deterministic, a similar equality would hold if it was stochastic or asset-specific (Campbell and Shiller, 1988). The only important assumption to obtain such a formula is to rule out bubbles, that is, a situation where the path of asset prices increases much faster than dividends, which is unlikely for most assets held by households. The asset in question could be a stock, a fixed-income security (in which case the dividend should be understood as the coupon payments plus the principal), or a house (in which case the dividend corresponds to the rent associated with the ownership of a house).

We can differentiate this equality over time to obtain a decomposition of capital gains. Denoting by Δ the difference of a variable between $t+1$ and t, we have:

$$\Delta P_t = \sum_{k=1}^{\infty} R_{t\to t+h}^{-1} \times \Delta \mathbb{E}_t[D_{t+h}] + \sum_{h=1}^{\infty} \left(\Delta R_{t\to t+h}^{-1}\right) \times \mathbb{E}_{t+1}[D_{t+h+1}].$$

This equality decomposes the capital gain into two terms. The first term corresponds to the present value of the change in dividends at each horizon h, $\Delta \mathbb{E}_t[D_{t+h}]$; the second term corresponds to changes in the way these dividends are discounted, as captured by $\Delta R_{t\to t+h}^{-1}$. Put differently, this equation says that capital gains can arise due to two distinct forces: either because the present value of future dividends increases or because the rate used to discount the future decreases.

Note that, irrespective of the source of the capital gain, capital gains can be expected or unexpected. Typically, most expected capital gains reflect expected changes in cash flows, as discount rates are seldom expected to change. For instance, if the economy is expected to grow on average at a rate of 3%, rents are expected to grow at a rate of 3%, and, therefore, house prices are also expected to grow at a rate of 3%.

Year-to-year, *realized* capital gains can be higher or lower than their expected values. At the level of an asset class (e.g., S&P 500 or national housing index), unexpected capital gains are, on average, equally driven by unexpected changes in future cash flows or unexpected changes in future discount rates (Campbell, 1991). In contrast, at the level of an individual asset (that is, a typical firm or a typical house), news about future cash flows typically dominates (Vuolteenaho, 2002). Between 1980 and 2020, there has been a series of unexpected negative shocks on interest rates. This suggests that a substantial component of the higher-than-average

capital gains observed for equity and housing during that period (Figure 1 in the main text) may have been driven by a decline in discount rates rather than a rise in expected cash flows.

B Formalizing income measures

This section formalizes the difference between the four different notions of income discussed in the main text: distributed income, factor income, Haig-Simons income, and Hicksian income. Proposition 1, which is the key new result of this note, is obtained by combining the definition of Hicksian income from Sefton and Weale (2006) with the results of Fagereng et al. (2024) on the welfare-effect of small deviations in future income and asset prices. As a preview of the results, Table A1 contrasts the mathematical expression of each income concept.

B.1 General environment

To simplify the exposition, I first consider an endowment economy, where dividends and labor income "fall from the sky". When discussing the concept of factor income, I will move to a production economy as, otherwise, the concept does not make sense.

Time is continuous. There is a financial asset that returns a flow of dividends $(D_t)_{t\geq 0}$. Denote P_t the price of the asset at time t. Note that we can define the return of the asset as $r_t \equiv (D_t + \dot{P}_t)/P_t$. Consider an individual that earns labor income $Y_{L,t}$ and that can trade the financial assets. Denoting N_t number of shares held at time t. The individual budget constraint is

$$C_t + P_t \dot{N}_t = Y_{L,t} + N_t D_t. \tag{1}$$

Simons (1938) defines income as "the sum of consumption and accumulation during a given period." Each income concept below will correspond to a different notion of accumulation (or savings).

Distributed income. Distributed income is defined as consumption *plus* net asset purchases.

$$\text{Distributed income} \equiv C_t + P_t \dot{N}_t = Y_{L,t} + N_t D_t,$$

where the second equality follows from the individual budget constraint 1. This equation says that distributed income includes labor income and the dividend income received by households.

Haig-Simons income. Haig-Simons income is defined as consumption *plus* change in net-worth

$$\text{Haig-Simons income} \equiv C_t + \frac{\mathrm{d}}{\mathrm{d}t}(P_t N_t) = Y_{L,t} + N_t(D_t + \dot{P}_t), \tag{2}$$

where the second equality follows from the individual budget constraint 1. Intuitively, Haig-Simons income corresponds to the maximum amount one can spend and still be as wealthy at the end of the period as at the beginning. This equation says that Haig-Simons income includes labor income, the dividend income received by households, and the change in asset value. The last two terms aggregate to the total return of the asset.

Hicksian income. Hicksian income is defined as as consumption *plus* the money-metric change in welfare. Consider an infinitely-lived individual with subjective discount rate ρ and utility function U:

$$\text{Hicksian income} \equiv C_t + \frac{1}{U'(C_t)} \frac{\mathrm{d}}{\mathrm{d}t} \left(\int_0^\infty e^{-\rho h} U(C_{t+h}) \, \mathrm{d}h \right). \tag{3}$$

Exchanging the derivative and the integral sign gives

$$\begin{aligned} \text{Hicksian income} &= C_t + \int_0^\infty e^{-\rho h} \frac{U'(C_{t+h})}{U'(C_t)} \dot{C}_{t+h} \, \mathrm{d}h \\ &= C_t + \int_0^\infty e^{-\int_t^{t+h} r_s \, \mathrm{d}s} \dot{C}_{t+h} \, \mathrm{d}h, \end{aligned}$$

where the second line uses the Euler equation. This expression is obtained in Sefton and Weale, 2006. The next proposition combines this expression with the individual budget constraint (1) to express Hicksian income in terms of income sources.

Proposition 1. *Hicksian income can be written as current cash flows* plus *changes in anticipated cash flows* plus *changes in anticipated trading profits:*

$$\text{Hicksian income} = Y_{L,t} + N_t D_t + \int_0^\infty e^{-\int_t^{t+h} r_s \, \mathrm{d}s} \left(\dot{Y}_{L,t+h} + N_{t+h} \dot{D}_{t+h} - \dot{N}_{t+h} \dot{P}_{t+h} \right) \mathrm{d}h. \tag{4}$$

This proposition says that Hicksian income corresponds to labor income, dividend income, and the present value of changes in future labor income, dividend income, and trading profits. The intuition for this equation is as follows. From the individual's point of view, between t an $t+dt$, two things happen: first, the individual receives some payout. Second, the set of income that will be received at each horizon changes, and so there is a money metric term for this: as seen in Fagereng et al. (2024), the cash-equivalent of a small change in labor income, dividend income, and prices at all horizons is given by the integral term in (4).

Proof of Proposition 1. Plugging the individual budget constraint (1) into the definition of Hicksian income (3) gives:

$$\begin{aligned} \text{Hicksian income} &= C_t + \int_0^\infty e^{-\int_t^{t+h} r_s \, \mathrm{d}s} \dot{C}_{t+h} \, \mathrm{d}h \\ &= Y_{L,t} + N_t D_t - \dot{N}_t P_t + \int_0^\infty e^{-\int_t^{t+h} r_s \, \mathrm{d}s} \frac{\mathrm{d}}{\mathrm{d}h} \left(Y_{L,t+h} + N_{t+h} D_{t+h} - \dot{N}_{t+h} P_{t+h} \right) \mathrm{d}h \\ &= Y_{L,t} + N_t D_t - \dot{N}_t P_t + \int_0^\infty e^{-\int_t^{t+h} r_s \, \mathrm{d}s} \left(\dot{Y}_{L,t+h} + N_{t+h} \dot{D}_{t+h} - \dot{N}_{t+h} \dot{P}_{t+h} \right) \mathrm{d}h \\ &\quad + \int_0^\infty e^{-\int_t^{t+h} r_s \, \mathrm{d}s} \left(\dot{N}_{t+h} D_{t+h} - \ddot{N}_{t+h} P_{t+h} \right) \mathrm{d}h. \end{aligned}$$

Using integration by parts, we have

$$\begin{aligned} -\int_0^\infty e^{-\int_t^{t+h} r_s \, \mathrm{d}s} \ddot{N}_{t+h} P_{t+h} \, \mathrm{d}h &= P_t \dot{N}_t + \int_0^\infty \frac{\mathrm{d}}{\mathrm{d}h} \left(e^{-\int_t^{t+h} r_s \, \mathrm{d}s} P_{t+h} \right) \dot{N}_{t+h} \, \mathrm{d}h \\ &= P_t \dot{N}_t + \int_0^\infty e^{-\int_t^{t+h} r_s \, \mathrm{d}s} \left(-r_{t+h} P_{t+h} + \dot{P}_{t+h} \right) \dot{N}_{t+h} \, \mathrm{d}h \end{aligned}$$

Plugging this formula into the expression for Hicksian income obtained above gives

$$\text{Hicksian income} = Y_{L,t} + N_t D_t + \int_0^\infty e^{-\int_t^{t+h} r_s \, \mathrm{d}s} \left(\dot{Y}_{L,t+h} + N_{t+h} \dot{D}_{t+h} - \dot{N}_{t+h} \dot{P}_{t+h} \right) \mathrm{d}h$$
$$+ \int_0^\infty e^{-\int_t^{t+h} r_s \, \mathrm{d}s} \left(-r_{t+h} P_{t+h} + \dot{P}_{t+h} + D_{t+h} \right) \dot{N}_{t+h} \, \mathrm{d}h.$$

The last term in this expression equals zero given that, by definition, $r_{t+h} = (D_{t+h} + \dot{P}_{t+h})/P_{t+h}$. This concludes the proof. □

Factor income. I now turn to the concept of factor income. Because this concept of income is defined in terms of the production technology, I now need to specify the supply side of the economy. I assume the stock held by the individual corresponds to the share of a firm, whose number of shares is normalized to one. The firm uses capital K_t to produce output according to the production function F. As in Hayashi (1982), the firm faces adjustment costs in installing capital: to increase capital by I_t, the firm needs to spend $p_{I,t} I_t + C(I_t, K_t)$, where $p_{I,t}$ denotes the price of the investment good relative to the consumption good and C is a smooth convex function. The objective of the firm is to choose a path of capital to maximize its value P_t:

$$P_t = \int_0^\infty e^{-\int_t^{t+h} r_s \, \mathrm{d}s} D_{t+h} \, \mathrm{d}h,$$

where $D_t \equiv F(K_{t+h}) - p_{I,t+h}(\dot{K}_{t+h} + \delta) - C(\dot{K}_{t+h}, K_{t+h})$ corresponds to the distributed profits of the firm at time t.

Factor income is defined as what can be used to consume, purchase assets, or accumulate capital:

$$\text{Factor income} \equiv C_t + P_t \dot{N}_t + p_{It} \dot{K}_t = Y_{L,t} + N_t (D_t + p_{I,t} \dot{K}_t),$$

where the second equality follows from the individual budget constraint (1). This says that factor income corresponds to distributed income *plus* the retained earnings of the corporation.

The difference between Haig-Simons and factor income is equal to the difference between capital gains and retained earnings; that is, $N_t(\dot{P}_t - p_{I,t}\dot{K}_t)$. The difference is zero if $P_t = p_{I,t} K_t$, which would obtain in a neoclassical frictionless model without costs of capital installation; that is, $C = 0$.

B.2 Illustrating these different income concepts in a neoclassical growth model

I now illustrate the difference between these four income concepts in a simple neoclassical model of growth. The presence of technology growth and of a type of capital in fixed supply (here, land) will be enough to generate a wedge between all notions of income.

Set up. Consider an economy where a representative firm combines capital K_t, labor L, and land H to produce some output Y_t:

$$Y_t = A_t K_t^\alpha H^\beta L^{1-\alpha-\beta},$$

where A_t denotes the technology level, and $\alpha > 0, \beta > 0, 1-\alpha-\beta > 0$. I assume that labor and land supply are fixed. Moreover, I assume that capital depreciates with rate δ while housing

Table A1: Formalizing different income measures

Panel A: By income sources	
Distributed income	$=Y_{L,t} + N_t D_t$
Factor income	$= Y_{L,t} + N_t D_t + N_t p_{K,t} \dot{K}_t$
Haig-Simons income	$= Y_{L,t} + N_t D_t + N_t \dot{P}_t$
Hicksian income	$= Y_{L,t} + N_t D_t + \int_0^\infty e^{-\int_t^{t+h} r_s \, \mathrm{d}s} \left(\dot{Y}_{L,t+h} + N_{t+h} \dot{D}_{t+h} - \dot{N}_{t+h} \dot{P}_{t+h} \right) \mathrm{d}h$
Panel B: By income uses	
Distributed income	$= C_t + P_t \dot{N}_t$
Factor income	$= C_t + P_t \dot{N}_t + N_t p_{K,t} \dot{K}_t$
Haig-Simons income	$= C_t + P_t \dot{N}_t + N_t \dot{P}_t$
Hicksian income	$= C_t + \int_0^\infty e^{-\int_t^{t+h} r_s \, \mathrm{d}s} \dot{C}_{t+h} \, \mathrm{d}h$

Notes. This table summarizes the results obtained in Section B by contrasting different income measures by their sources (Panel A) and their uses (Panel B). This table formalizes Table 1 in the main text.

does not depreciate. Finally, technology A_t grows at rate η. There is a representative agent with CRRA preferences with elasticity of intertemporal substitution (EIS) ψ and subjective discount rate ρ.

Balanced growth path. I now assume that the economy follows a balanced growth path. This implies that output and capital must grow at the same rate, which I denote by g. Differentiating the production function gives

$$g = \eta + \alpha g \implies g = \frac{\eta}{1-\alpha}.$$

Denote $R_{K,t}$ the rental rate of capital, $R_{H,t}$ the rental rate of land, and w_t the wage. Profit maximization for the representative firm gives:

$$\begin{aligned} R_{K,t} K_t &= \alpha Y_t \\ R_{H,t} H &= \beta Y_t \\ w_t L &= (1-\alpha-\beta) Y_t. \end{aligned}$$

The equilibrium interest rate, r, is pinned down by the Euler equation $r = \rho + \psi g$. Finally, the return of owning capital or land must equal the interest rate:

$$\begin{aligned} R_{K,t} &= r + \delta \\ R_{H,t} &= r P_{H,t} - \dot{P}_{H,t}, \end{aligned}$$

where $P_{H,t}$ denotes the market price of one unit of land. Since, on a balanced growth path, $\dot{P}_{H,t}$ must also grow at rate g, the second equation implies $P_{H,t} = R_{H,t}/(r-g)$.

Income concepts. I now use the formulas obtained in the previous section to determine what the four income concepts are in this economy for the representative household. Distributed income is defined as the actual cash received by the representative agent, which corresponds to labor income, $w_t L$, income from renting land to the representative firm, $R_{H,t}H$, as well as the part of physical capital income that is distributed to households (as opposed to being retained by the representative firm to invest)

$$\text{Distributed income} = w_t L + (r - g)K_t + R_{H,t}H.$$

Factor income is defined as distributed income *plus* the retained earnings of the representative firm, gK_t:

$$\text{Factor income} = w_t L + rK_t + R_{H,t}H.$$

Haig-Simons income is defined as distributed income *plus* capital gains. Capital gains for physical capital correspond to the retained earnings of the representative firm, while capital gains for housing represent the change in the value of the housing stock $\dot{P}_{H,t}H$:

$$\text{Haig-Simons income} = w_t L + rK_t + \left(R_{H,t} + \dot{P}_{H,t}\right) H.$$

Finally, Hicksian income is defined as distributed income *plus* the present value of the change in future distributed income. On a balanced growth path with constant interest rates, this effectively corresponds to Haig-Simons income, with the addition of the shadow capital gain of human capital, $w_t L \times g/(r-g)$:

$$\text{Hicksian income} = \frac{r}{r-g} w_t L + rK_t + \frac{r}{r-g} R_{H,t}H.$$

One can use the first-order-conditions on firm profit maximization to substitute out the wage, rental price of capital, and rental price of land and obtain the following set of equations for all four income concepts:

$$\begin{aligned}
\text{Distributed income} &= Y_t - \delta K_t - gK_t \\
\text{Factor income} &= Y_t - \delta K_t \\
\text{Haig-Simons income} &= Y_t - \delta K_t + \tfrac{g}{r-g}\beta Y_t \\
\text{Hicksian income} &= Y_t - \delta K_t + \tfrac{g}{r-g}(1-\alpha) Y_t.
\end{aligned}$$

One key observation from these equations is, if $g = 0$, all of these income concepts are equalized. In this particular economy, the key driver of the wedge between these four income concepts is the presence of TFP growth. A similar result is made by Barro (2021), who emphasizes that investment is double-counted in the presence of growth.

It is instructive to rewrite all of these income concepts in terms of consumption, which equals national (factor) income minus investment, $C_t = Y_t - \delta K_t - \dot{K}_t$:

$$\begin{aligned}
\text{Distributed income} &= C_t \\
\text{Factor income} &= C_t + \dot{K}_t \\
\text{Haig-Simons income} &= C_t + \dot{K}_t + H\dot{P}_{H,t} \\
\text{Hicksian income} &= C_t + \tfrac{g}{r-g} C_t = \tfrac{r}{r-g} C_t.
\end{aligned}$$

These equations are consistent with Panel B of Table A1, which distinguishes the different income sources by their uses rather than their sources. Note that, on the balanced growth path, where growth rates and interest rates are constant, the notion of Hicksian income corresponds to the return on total wealth, which is the sum of the market value of capital, land, and human capital (see, for instance, Greenwald et al., 2024).

C Details on the shift-share decomposition of rising top income shares

I now derive formally the shift-share decomposition of the rise in top income shares presented in the main text. Denote $Y_{L,t}(p)$ and $Y_{K,t}(p)$ the labor and capital income in a given top percentile $p \in (0, 1]$. The share of total income earned by top percentile p, denoted $S_t(p)$, is given by:

$$\begin{aligned} S_t(p) &= \frac{Y_t(p)}{Y_t(100\%)} = \frac{Y_{L,t}(p) + Y_{K,t}(p)}{Y_{L,t}(100\%) + Y_{K,t}(100\%)} \\ &= \frac{Y_{L,t}(100\%)}{Y_t(100\%)} \times \frac{Y_{L,t}(p)}{Y_{L,t}(100\%)} + \frac{Y_{K,t}(100\%)}{Y_t(100\%)} \times \frac{Y_{K,t}(p)}{Y_{K,t}(100\%)} \\ &= \mathrm{LS}_t \times S_{L,t}(p) + (1 - \mathrm{LS}_t) \times S_{K,t}(p), \end{aligned}$$

where $\mathrm{LS}_t \equiv Y_{L,t}(100\%)/Y_t(100\%)$ denotes aggregate labor share, $S_{L,t}(p) \equiv Y_{L,t}(p)/Y_{L,t}(100\%)$ denotes share of labor income earned by top p and $S_{K,t}(p) \equiv Y_{K,t}(p)/Y_{K,t}(100\%)$ denotes share of capital income earned by top p. Hence, this last equation says that the income share of top p is a weighted average of the income share of top p across income sources, where the weights correspond to the relative importance of this income source in the aggregate. Classically, the change in a weighted average across two periods of time can be rewritten as the sum of two components: the weighted average of the change and a change in weights times pre-existing difference in values:

$$\begin{aligned} \Delta S_t(p) &= \Delta\Big(\mathrm{LS}_t \times S_{L,t}(p) + (1 - \mathrm{LS}_t) \times S_{K,t}(p)\Big) \\ &= \frac{\mathrm{LS}_t + \mathrm{LS}_{t-1}}{2} \times \Delta S_{L,t}(p) + \left(1 - \frac{\mathrm{LS}_t + \mathrm{LS}_{t-1}}{2}\right) \times \Delta S_{K,t}(p) \\ &+ \left(\frac{S_{L,t}(p) + S_{L,t+1}(p)}{2} - \frac{S_{K,t}(p) + S_{K,t+1}(p)}{2}\right) \times \Delta LS_t. \end{aligned}$$

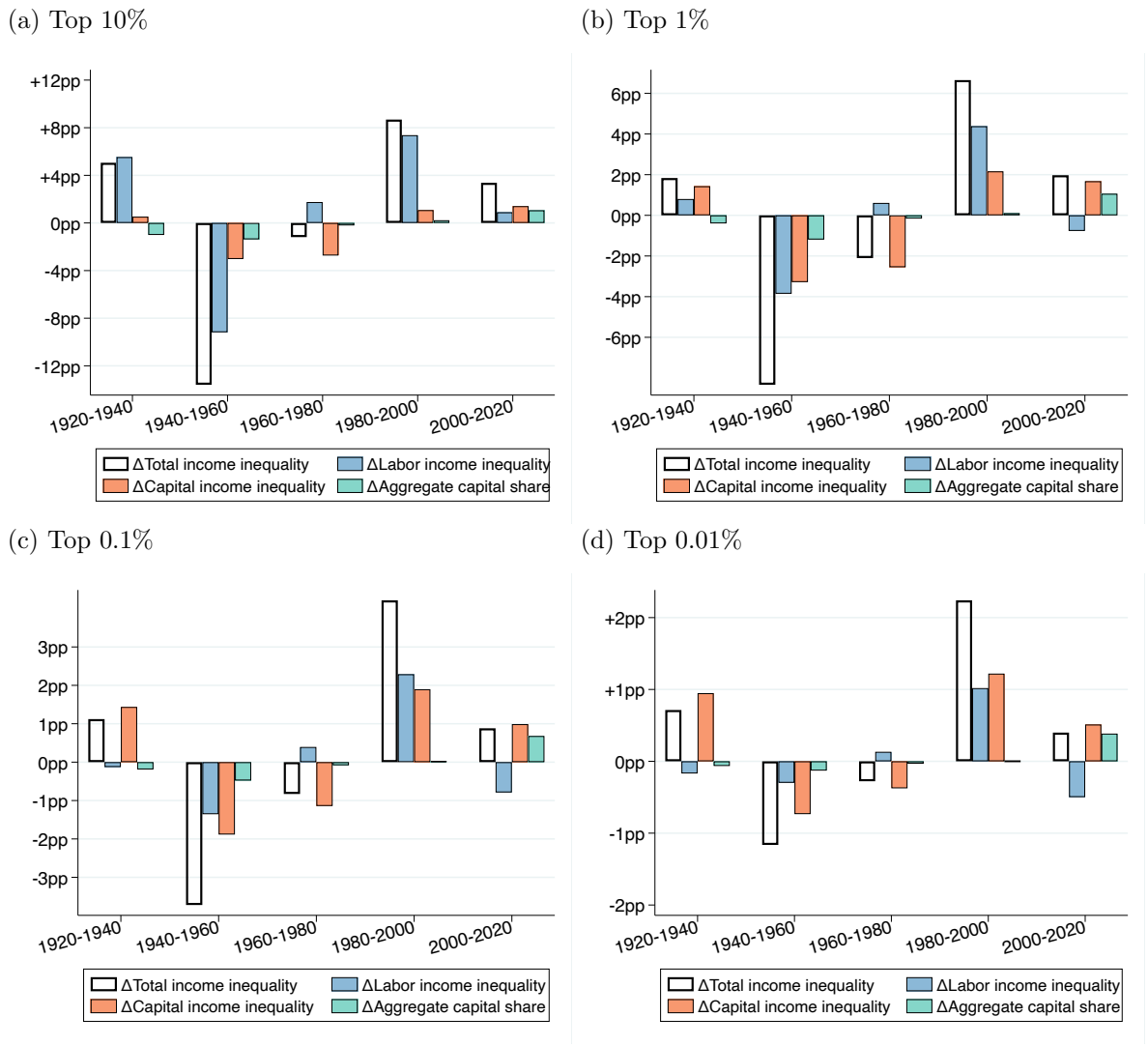
This corresponds to the accounting decomposition presented in the main text.

Figure A1 plots the results of the decomposition. Relative to Figure 3 in the main text, it expands the analysis to compute the result of the decomposition over larger periods, five decades from 1920 to 2020, and for a wider range of top percentiles (top 10%, top 1%, top 0.1%, and top 0.01%).

D Details on the quantification exercise

In the main text, I conduct a rough quantification of the effect of changes in the return to capital, the cost of capital, and tax rates for top income shares. While this back-of-the-envelope computation is useful for obtaining the correct order of magnitude, I now discuss some caveats.

Figure A1: Decomposing the change in top income shares over the 20th century



Notes. This figure reports the results of using a shift-share approach to decompose the overall change in top factor (pre-tax) income shares over three periods: 1962-1982, 1982-2002, and 2002-2020. The overall change in top income shares is broken down into three terms: a term capturing the change in labor inequality—LS $\times$ ΔLabor income share(p)— a term capturing the change in capital inequality—(1 $-$ LS) $\times$ ΔCapital income share(p)—and a term capturing the change in aggregate labor share—(Labor income share(p) $-$ Capital income share(p)) $\times$ ΔLS. Data is from Piketty et al. (2022).

Top versus average. The main text provides a quantification of the change in the log income of top entrepreneurs. When converting this estimate for the change in top income *shares*, the quantification implicitly assumes that the average level of income in the economy has not been impacted by these changes. In other words, the assumption is that changes in the return to capital, interest rates, and taxes have not affected the average income. One could improve these estimates by better modelling these effects.

Growth versus level effects. In the main text, I focus on the fact that higher return on capital rok_i (or a lower cost of capital r) increase the rate of entrepreneurs' capital accumulation and so their level of capital holdings after a number of years. One additional effect, however, is that a higher return of capital also increases the level of income they earn today for a given amount of capital.

Consumption. In the capital accumulation equation, I specified consumption as a fraction of the capital owned by entrepreneurs. A common alternative in the literature is to model consumption as a fraction of capital income instead (Solow, 1999, Saez and Zucman, 2016). The latter assumption implies that consumption increases with higher returns to capital. However, economic theory tells us that higher expected returns on consumption induce both income and substitution effect and the empirical literature suggests that these two forces tend to compensate at the top (e.g., Vissing-Jørgensen, 2002 and Holm et al., 2024). Hence, specifying consumption as a fixed fraction of capital, rather than as a fixed fraction of capital income, is likely to be a more realistic assumption for individuals at the top of the distribution.

In a consumption-savings model with isoelastic utility functions, the sensitivity of consumption to the expected return on capital is equal to one minus the elasticity of intertemporal substitution (EIS). My assumption that consumption is a fixed fraction of capital is equivalent to assuming an EIS equal to one (i.e., log utility). The alternative assumption in the literature—assuming that consumption is a fixed fraction of capital income instead— is equivalent to assuming an EIS equal to the saving rate instead.

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