MACRO PERSPECTIVES ON 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 their pioneering study, Piketty and Saez (2003) used individual tax returns to construct the distribution of U.S. taxable income. More recently, Piketty et al. (2018) and Auten and Splinter (2024) have extended this work to construct the distribution of a more comprehensive measure of income—factor income—that fully aligns with the concept of national income as defined by statistical agencies.

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: What is the appropriate notion of income from a welfare perspective? And what are the key economic forces driving the recent rise in top inequality?

Measuring inequality starts with a deceptively challenging task: defining income. I highlight key conceptual issues in commonly used income measures, particularly in their treatment of capital income. I then develop a notion of welfare-relevant income—focusing on what captures an individual's capacity to consume or save for future consumption—and show how it differs from conventional measures.

Most empirical studies point to a significant rise in top income inequality over the past four decades. From this extensive empirical literature, I highlight three key patterns. First, top earners almost entirely derive their income from business ownership. Second, the rise in inequality is driven not by a decline in the share of aggregate income going to labor relative to capital, but rather by a joint increase in inequality *within* workers and *within* capitalists. Third, top wealth shares have increased at the same rate as top capital income shares, suggesting that changes in asset valuations are not a major factor in recent inequality trends.

Finally, I analyze the economic forces behind these trends, particularly the surge in top entrepreneurial incomes. I emphasize three key factors behind the rising capital accumulation among entrepreneurs: increased returns on capital (technology), reduced costs of external financing (financial markets), and lighter tax burdens for business owners (fiscal policy).

1 Defining income

Research on inequality begins with one deceptively simple question: how exactly should we define income? This question takes on a particular importance in the literature because the choice of an income definition can substantially 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 significant components commonly recognized as part of economic income, such as

employer pension contributions and dividends received in tax-exempt accounts.[1] 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 the concept of national income defined by statistical agencies.

In this section, I examine what the appropriate notion of income is from a welfare perspective. I first discuss the conceptual limitations of three income measures commonly used in the economic literature, focusing on their different treatments of capital income: *distributed* income, which solely counts the cash flows distributed to asset holders; *factor* income, which also includes corporate retained earnings; and *Haig-Simons* income, which also includes capital gains. I then propose *welfare-relevant* (or *Hicksian*) income as an alternative, which accurately captures what can be used for current consumption or saved for future consumption. For simplicity, I abstract from government taxes and transfers, which would introduce an additional (and orthogonal) dimension of complexity.

Distributed income

The notion of distributed income corresponds to the component of economic output that is distributed to individuals. For this discussion, I define distributed income as the sum of all labor compensation—wages, salaries, benefits, etc—and all cash flows received from asset ownership—interest income, dividend payments, and rental income.[2]

The concept of distributed income is attractive because it focuses on the actual cash that individuals receive every period. However, this simplicity is also its limitation, as current cash flows often fail to capture an individual's true economic income. To illustrate this point, consider Alice, who owns stock in a firm that reinvests 100% of its profits without distributing dividends. Even though Alice receives no 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 in the future—if she keeps holding the stock—or through higher stock prices—if she sells it.[3] This example demonstrates that to fully capture capital income, any measure of income must complement the cash distributed to asset owners with some additional term. Each concept of income described below proposes a different way to account for non-distributed capital income, each with its own specific adjustment and limitations.

Factor income

I now turn to the notion of factor income, which corresponds to distributed income *plus* the retained earnings of corporations. Retained earnings refers to the portion of corporate profits not distributed to shareholders but used instead for capital investment or asset purchases. By including corporate profits that are earned but not immediately distributed to shareholders, factor income provides a more comprehensive picture of economic resources accruing to in-

[1] Another issue is that, because of tax reforms or differences in tax policies, the concept of taxable income makes it hard to compare inequality across time and across countries.

[2] Here and in the rest of the paper, rental income includes the imputed rent that homeowners would have received if they were renting their residence.

[3] This 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.

dividuals: in the example of Alice above, factor income would assign her a positive capital income equal to her share of the firm's reinvested profits.

Factor income is the notion of income picked by Piketty et al. (2018) and Auten and Splinter (2024) to measure income inequality. Its advantage is that it aggregates to the notion of national income as measured in national accounts.[4] Still, it has an important drawback as a measure of economic income, as it is sensitive to changes in accounting standards and classifications, particularly regarding the treatment of business expenses. One notable example is the handling of intellectual property products (i.e., software, research and development, and artistic originals). Historically, these items were categorized as intermediate expenditures in national accounts and thus excluded from calculations of net output. However, in a series of revisions to the National Income and Product Accounts (NIPA) in 1999, 2013, and 2018, the U.S. Bureau of Economic Analysis (BEA) reclassified these expenses as investments. While these revisions do not affect distributed income, they mechanically increase economic output (GDP) as well as the amount of corporate earnings—Koh et al. (2020) argues that this reclassification is "responsible" for the rise in the aggregate capital share as measured by statistical agencies.[5,6] What I want to highlight is that these accounting changes have direct implications for measures of income inequality that align with national accounts: because business ownership is heavily concentrated at the top of the income distribution, any change in accounting standard that increase corporate earnings will mechanically increase income inequality, as measured using the notion of factor income.

This sensitivity to accounting conventions highlights a more fundamental issue in using factor income to capture economic income (i.e., an individual's ability to consume or to save for future consumption). Consider Bob and Carol, two firm owners with different situations. Bob's firm initially generates $100 in profits and reinvests 50% annually; this sustained investment allows Bob's firm to maintain a 5% yearly growth in profits. Carol's firm, meanwhile, starts with $50 in profits and, despite distributing all earnings to shareholders, also achieves 5% annual growth simply through increasing demand for its goods. From a financial perspective, Bob and Carol own assets that generate identical cash flows. Yet, under the notion of factor income, Bob's income is $100 while Carol's income is only $50.

In sum, factor income assigns higher capital income to assets whose cash flows grow through traditional investment, as recognized by national accounts, compared to assets whose cash flows grow through more intangible forms of investment (e.g., investment in customer capital) or no investment at all (e.g., land). Yet all these sources of cash flow growth are fundamentally equivalent for individual spending power: whether future consumption possibilities arise from investment or other forces like productivity gains makes no economic difference. This limitation with factor income motivates our next measure, Haig-Simons income.

[4] National income is defined as GDP minus capital depreciation plus net income from abroad.

[5] While this reclassification unambiguously increases GDP, it has a more muted effect on national income because of the increased depreciation associated with this new, "intangible", capital.

[6] Given these measurement challenges, Atkeson (2020) advocates focusing on distributed income rather than factor income when measuring the labor share, thus avoiding sensitivity to accounting standards.

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.[7] By supplementing distributed income with the (market-based) notion of capital gains rather than the (accounting-based) notion of retained earnings, this measure addresses the key limitation of factor income discussed above: Haig-Simons income treats all sources of asset value increases equally, whether they come from tangible investment, intangible investment, or rising productivity. Returning to our previous example, Bob and Carol's Haig-Simons incomes would be equal, despite their different factor incomes, reflecting their assets' identical cash flow prospects.[8]

The drawback of Haig-Simons income, however, is that not all changes in asset values reflect changes in future cash flows. Indeed, some asset price changes reflect variations in asset discount rates (i.e., changes in the market's required return to hold the asset), which may not be welfare-relevant.[9] 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.[10] From an economic perspective, this capital gain does not meaningfully constitute income, as it does not increase Bob's ability to consume—in effect, this is is purely a "paper gain". Thus, while factor income tends to count "too little" capital income by ignoring some sources of cash flow growth, Haig-Simons income may count "too much" in times of declining discount rates.

The differences between these income measures are not just conceptual, they are quantitatively important. Figure 1 illustrates this by comparing distributed income, factor income, and Haig-Simons income for corporate equity and housing.[11] Haig-Simons income exhibits substantially higher year-to-year volatility, reflecting the greater volatility of capital gains relative to corporate investment. Consistently with the idea that lands appreciate in value without investment, housing Haig-Simons income tends to exceed housing factor income on average: over 1962-2020, housing factor income averaged 3.7% of property value, while Haig-Simons income reached 5.5%, For corporate equity, the average gap is negative during 1962-1980 before turning positive. As detailed in Online Appendix A.2, this difference may partly reflects that investment, as measured in national accounts, fails to fully capture changes in expected cash-flows. It may also reflect the global secular decline in interest rates, which mechanically increases Haig-Simons income relative to factor income.[12]

[7] Put differently, Haig-Simons's notion of capital income corresponds to wealth times the return on wealth.

[8] Given an interest r, the present value of a stream of cash flows with starts at C_t and grows at rate g is $\int_0^\infty e^{-rh}e^{gh}C_t\,\mathrm{d}t = C_t/(r-g)$ (Gordon-growth formula). In particular, the change in the value of the asset per unit of time (its capital gain) is $gC_t/(r-g)$. Assuming that the interest rate is $r = 10\%$, this implies that Bob's (and Carol's)Haig-Simon income is $\$50 + 5\% \times \$50/(10\% - 5\%) = \$100$ ($50 in distributed income and $50 in capital gain).

[9] Online Appendix A.1 clarifies the difference between these two sources of capital gains.

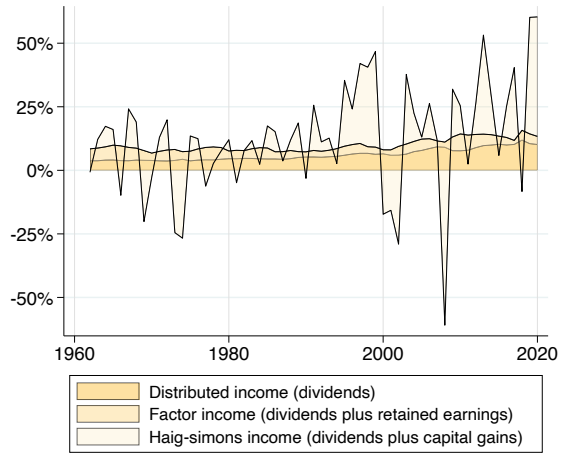
[10] As discussed in the previous footnote, the market value of Bob's business is equal to $C_t/(r-g)$ where C_t denotes the current dividend, g denotes the expected growth rate of dividends, and r denotes the interest rate. For example, with an interest rate $r = 10\%$, the initial market value of the business is $\$50/(10\% - 5\%) = \$1000$. If the interest rate decreases to $r = 7.5\%$, its market value jumps to $\$50/(7\% - 5\%) = \$2000$, a two-fold increase.

[11] While I focus on aggregate differences (i.e., at the level of an asset class) in the main text, Online Appendix A.3 shows that these discrepancies are even more pronounced at the firm level.

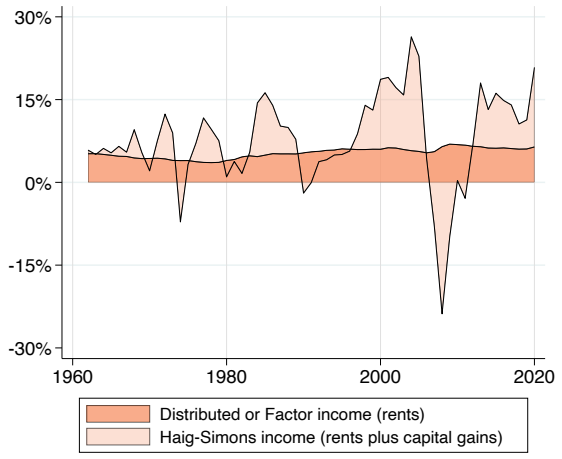
[12] Recent work by Armour et al. (2013), Robbins (2018), and Larrimore et al. (2021) has taken up the task of

Figure 1: Comparing different income concepts for equity and housing

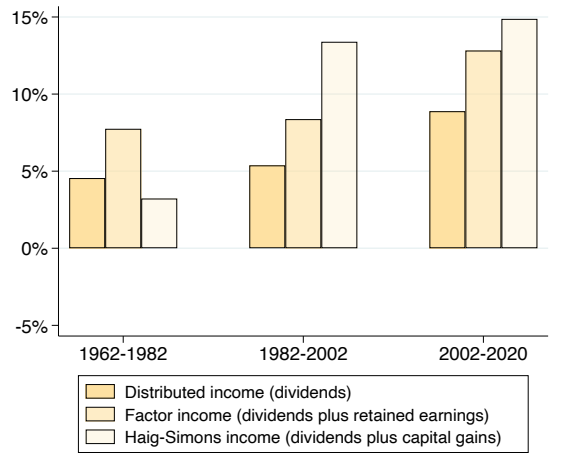
(a) Equity income



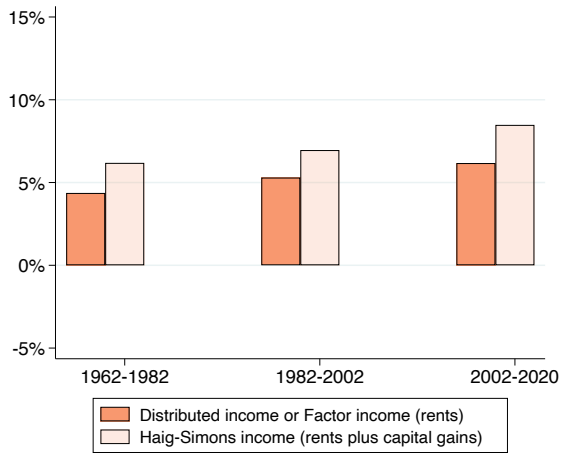
(b) Housing income



(c) Equity income (average over time)



(d) Housing income (average over time)



Notes. Data from the Integrated Macroeconomic Accounts of the United States. Data on equity corresponds to the equity issued by nonfinancial and financial corporate businesses. Retained earnings are net of corporate taxes. Data on housing reflects housing owned by households and nonprofits. All capital gains are deflated by CPI inflation. Y-axis is percent of national income.

Welfare-relevant income

These conceptual challenges with the common income measures are well-known in the economic literature—it was precisely these issues that led Kaldor (1955) to conclude that formulating a coherent notion of income for taxation was impossible, advocating instead for consumption-based taxation.

Instead, I take a more constructive route and outline what the ideal notion of income would be from a normative perspective, building on Hicks (1939)'s definition of 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." As shown by Sefton and Weale (2006), this notion of welfare-relevant (or Hicksian) income can be formalized as the sum of current consumption and expected changes in future consumption.

To clarify this concept and its relationship to the income measures discussed above, it is helpful to examine it through the lens of Simons (1938)'s general framework of income "as the sum of consumption and accumulation during a given period." As summarized in Table 1, each income concept we have discussed represents a different implementation of this framework, each with a different notion of accumulation (i.e., savings): distributed income defines savings as net asset purchases; factor income extends this to include firms' retained earnings; Haig-Simons defines savings as changes in net worth; Hicksian income, by contrast, defines savings as increases in expected future consumption, the welfare-relevant notion of savings (Auerbach, 1985).

What does the notion of Hicksian income look like, in terms of income sources? As shown in the Online Appendix (Proposition 1), this welfare-relevant notion of income 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. 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, however, it recognizes that receiving one dollar today is equivalent to receiving $1 + r$ more dollars tomorrow, where r is the interest rate.[13]

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 value of anticipated transactions. This insight is similar to Fagereng et al. (2024), who show that the welfare impact of asset price changes, holding cash flows constant, depends on an individual's future trading plans, not their current holdings: price increases benefit future sellers and harm future buyers.[14] Returning to Bob's example: if Bob never plans to sell, none of the capital gain constitutes Hicksian income; if Bob intends to sell his

using these data on capital gains to estimate the distribution in Haig-Simons income. Their findings show that top Haig-Simons income shares are more volatile than top factor income shares, consistent with our reduced-form results (Figure 1). Additionally, Robbins (2018) finds a larger rise in Haig-Simons income inequality compared to factor income inequality in the past forty years, reflecting how capital gains on equity and housing have outpaced book measures of investment (Figure 1), and that these gains accrue disproportionately to top incomes.

[13] 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 (as in Fagereng et al., 2024).

[14] See Moll (2020), Fagereng et al. (2019), Dávila and Korinek (2018), and Glover et al. (2020) for similar insights.

Table 1: Different income measures, same budget constraint

Income measure	Definition
Panel A: Income sources	
Distributed income	= Wages + Interest paid + Dividends + Rents
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 contrasts commonly used income measures by their sources (Panel A) and their uses (Panel B). Each income measure corresponds to a different way of writing the same individual budget constraint. See Appendix B for a more formal definition of these income measures.

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.[15]

Second, unlike factor income and Haig-Simons income, Hicksian income treats anticipated increases in dividends and wages symmetrically. To illustrate this point, consider Bob, a business owner whose firm distributes \$50 in dividends today and is expected to grow 5% annually through reinvested earnings, and Dan, a worker earning a \$50 salary expected to grow 5% annually. With a 10% interest rate, factor and Haig-Simons measures would assign \$100 in income to Bob but only \$50 to Dan.[16] Yet Bob and Dan receive identical cash flow streams and thus have the same spending power. Hicksian income recognizes this equivalence, assigning \$100 in income to each.

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 and dividends to begin with. While there is value in considering separately the cash flows earned from effort (labor) and those earned from passive asset ownership (capital), the relevant question here is how to best combine these flows into a concept that accurately captures the resources available to an individual.[17]

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

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

[16] See Footnote 8 for the computation of Bob's Haig-Simons income

[17] Additionally, note that this labor-capital distinction becomes particularly blurry for active business owners, a point I will return to in the next section.

capital gains. While this addition captures important information about future capital income, it creates an imbalance: capital income is effectively counted twice (present and future), while labor income is counted only once (present). Hicksian income resolves this by incorporating future growth for both sources. Barro (2021) identifies a similar issue in national accounts, arguing that national income double-counts capital income relative to labor income when compared to actual consumption possibilities.[18]

The main drawback of Hicksian income lies in its measurement: while factor income (resp. Haig-Simons income) can be computed from observable accounting statements (resp. market valuations), Hicksian income requires forecasting future asset cash flows and asset sales—an inherently subjective exercise. Still, based on the preceding discussion, we can make some informed guesses about the distribution of Hicksian income relative to the distribution of factor and Haig-Simons income. First, since Hicksian income counts only some capital gains as income (mainly those reflecting changes in future cash flows), its measure of capital income is likely to fall between factor and Haig-Simons measures, at least in periods of declining interest rates. Second, because Hicksian income incorporates expected wage growth, Hicksian labor income should exceed both factor and Haig-Simons measures. Because labor income is disproportionately earned by the bottom 99% of the distribution, this adjustment would reduce measured income inequality under Hicksian income, relative to factor or Haig-Simons measures, better reflecting actual differences in spending power across the population.[19]

Further discussion

While Hicksian income best captures welfare—measuring the individual's ability to consume today or save for future consumption—this does not necessarily make it the ideal basis for taxation. From an optimal tax perspective, the appropriate concept must consider additional factors: the distortive effects of taxation—through both income shifting and real economic responses—and lifetime distributional considerations—as emphasized by Kaldor (1955), since all income concepts discussed here capture both current consumption ability and potential consumption growth, taxing such measures effectively double-taxes saved resources. In this context, Aguiar et al. (2024) suggest that taxing distributed income *plus* realized capital gains may offer a practical compromise between these competing considerations.[20]

Given the conceptual issues with commonly used income measures and the difficulty in measuring Hicksian income, one might conclude that inequality researchers should abandon the income concept entirely and focus on wealth measurement instead. However, the same conceptual challenges that plague income definition also emerge when defining wealth: Should

[18] More generally, this discussion builds on a macroeconomic 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 capital, land, and labor with growing productivity.

[19] Note, however, that this adjustment is unlikely to affect the trend in rising inequality, as wage growth rates remain relatively stable over time.

[20] This would require a more systematic treatment of capital gains than current taxable income, including eliminating the step-up basis loophole.

we use book or market values (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 sixty years. What researchers still disagree on are the exact magnitudes and the extent to which government taxes and transfers offset this increase. Piketty et al. (2018) find that the top 1% share of pre-tax factor income increased from 13% to 19%, while the top 0.01% share tripled from 1.3% to 4%.[21] In contrast, Auten and Splinter (2024), using different methodological choices, find more modest increases—about half those documented by Piketty et al. (2018).[22] In this section, I sidestep this debate to emphasize other key insights from the literature.

Composition of top incomes

The first fact concerns the composition of income across the distribution. Using national accounts data, Figure 2a decomposes U.S. national income (i.e., aggregate factor income) into its four main components: labor compensation (68% of total since 1962), business income (22%), interest income (2%), and rental income from housing (8%). While these shares have remained broadly stable, two well-documented trends are apparent. First, the share of national income that takes the form of labor compensation (wages and employer pension contributions) follows an inverted U-shape: rising from 1960 to 1980 before declining through 2020. This pattern in the "net" labor share (labor income as fraction of national income) contrasts with the well-known secular decline in the "gross" labor share (labor income as fraction of GDP). The difference stems from rising capital depreciation in the U.S., following the shift toward higher-depreciation assets such as software and computers (Rognlie, 2015).[23]

Second, the composition of business income has changed markedly. Following the 1986 tax reform, which raised corporate rates and decreased personal rates, businesses have increasingly moved from C-corporations to pass-through structures (S-corporations, partnerships, and sole proprietorships): while C-corporations pay corporate tax, pass-through entities' income flows directly to households for tax purposes.

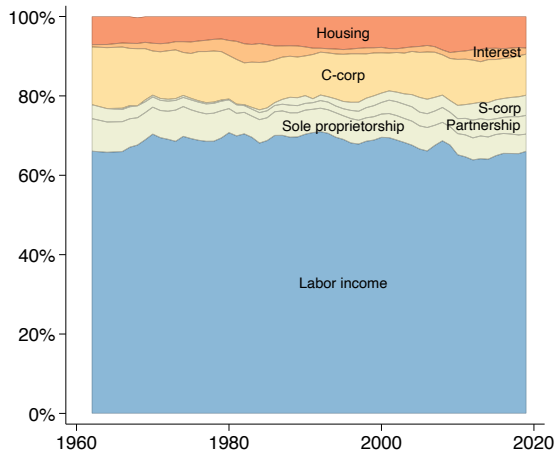
[21] Here, and in the rest of the paper, I use the updated version of these results downloaded from Gabriel Zucman's website (2022 vintage).

[22] More precisely, they report an increase of 3.5 percentage points for the top 1% and 1.9 percentage points for the top 0.1% between 1962 and 2019 (they do not report data for the top 0.01%).

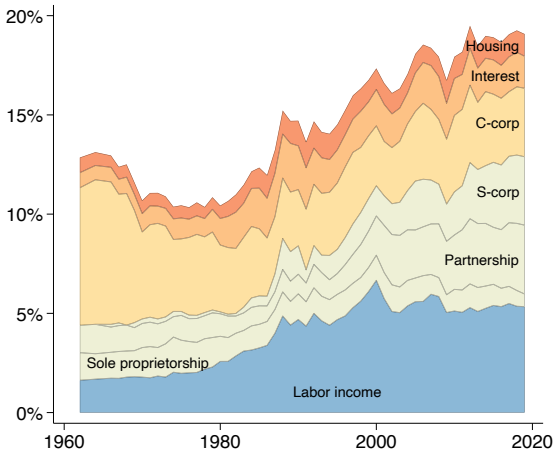
[23] Technically, both labor share measures should also include the fraction of income from non-corporate businesses (partnerships and sole proprietorships) that accrues to labor. In practice, this adjustment has minimal impact since analyses typically assume the labor-capital split in the non-corporate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

Figure 2: The composition of income across the distribution

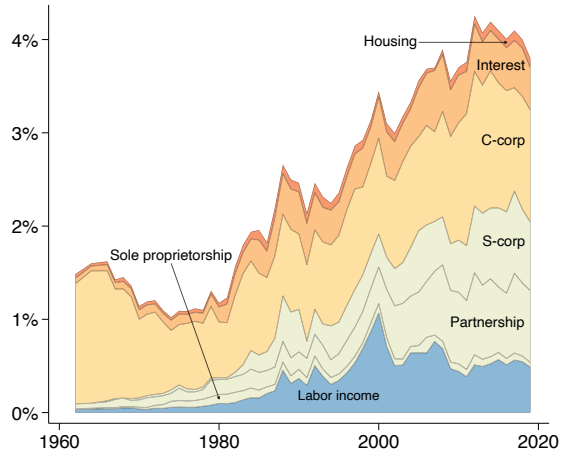
(a) Top 100%



(b) Top 1%



(c) Top 0.01%



Notes. This figure plots the factor income (pre-tax) earned by top percentiles, broken down in different categories, using data from Piketty et al. (2018). More precisely, I use the spreadsheet compopeincdet in the Excel file PSZ2022AppendixTablesII(Distrib) from Gabriel Zucman's website (2022 vintage) 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.

I now examine the composition of top incomes. Figures 2b and 2c show how income composition has evolved for the top 1% and top 0.01% (data from Piketty et al., 2018). Unlike national income's stable composition, top incomes have shifted markedly, with a growing importance in labor compensation and income from pass-through businesses. By 2019, the top 1%'s income was evenly split between labor income, pass-through businesses, and other forms of capital income.

Beyond its economic implications, the rising importance of pass-through businesses poses significant measurement challenges. To understand why, note that a substantial portion of factor income from these businesses must be imputed from individual tax returns: specifically, the total amount reported in national accounts is distributed proportionally to reported tax return income. This proportional allocation method can create growing biases in top income shares if top earners own different types of businesses than others (e.g., different depreciation allowances). Indeed, current debates about the level of inequality largely come down to disagreements over how to properly allocate the portion of national income and wealth flowing through these pass-through businesses (Auten and Splinter, 2024; Smith et al., 2019, 2023; Piketty et al., 2024)

Shift-share analysis

I now leverage these results to do a shift-share analysis on rising inequality. This analysis decomposes the rise in top income shares into three terms: a term due to rising labor income inequality, a term due to rising capital income inequality, and a term due to declining aggregate labor share—the last term reflecting the fact that capital income is more unequally distributed than labor income.

To do so formally, I start by writing the share of aggregate income going to a top percentile p as a weighted average of the share of aggregate labor income going to the top p and of the share of aggregate capital income going to the top p:

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

where LS denotes the aggregate labor share in the economy. Differentiating this equation between two periods yields the following decomposition for the change in top income shares:[24]

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

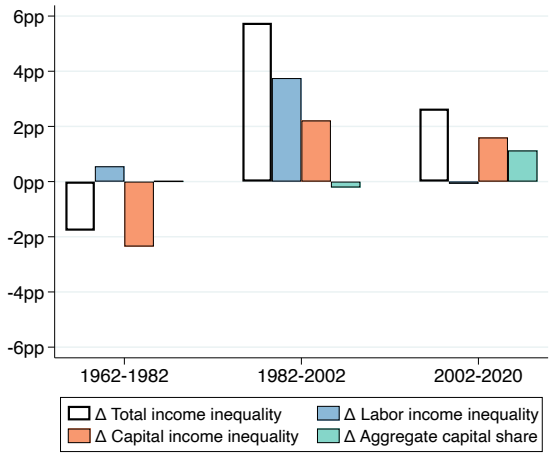
This equation gives a simple way to decompose a given change in top income shares into the three components mentioned above: the first term captures the mechanical effect of changes in top labor income shares, the second term captures the effect of changes in top capital income shares, while the last term captures the effect of changes in the aggregate labor share.

Figure 3 illustrates the results of the accounting framework for the top 1% and top 0.01%. The key takeaway is that the decline in the aggregate labor share only had a minimal impact on top income shares: almost all of the rise in income inequality is due to growing disparities within income types—labor and capital—rather than a redistribution from workers to capitalists.

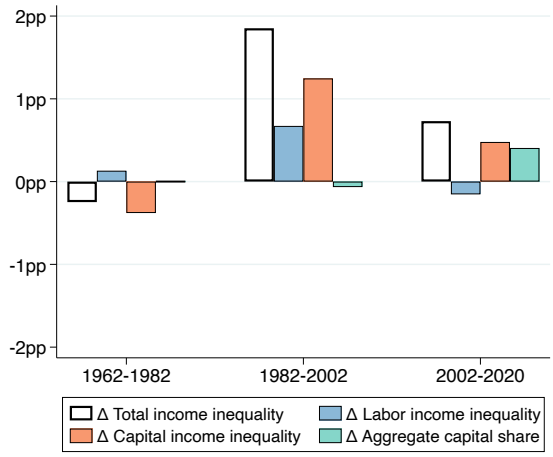
[24] Δ denotes the difference between the two periods. See Online Appendix C.1 for a formal derivation.

Figure 3: Decomposing changes in income inequality into changes in labor and capital inequality

(a) Top 1%



(b) Top 0.01%



Notes. This figure reports the results of using the accounting framework (1) 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 — $\big($Labor income share(p) $-$ Capital income share(p)$\big)$ $\times$ ΔLS. Data is from the spreadsheet TA2 in the Excel file PSZ2022AppendixTablesII(Distrib) from Gabriel Zucman's website (2022 vintage). See Online Appendix C.1 for additional details.

While the rise in labor income inequality plays an important role for the rise in the top 1% during the 1982-2002 period, changes in capital income inequality dominate in other times, and always dominates for the top 0.01% (see Online Appendix Figure A1 for an extended version of the figure with a longer time series and additional percentiles.)

Income versus wealth

The final fact I wish to highlight is the parallel movements between top wealth inequality and top capital income inequality (Irie, 2024). To illustrate this point, Online Appendix Figure A2 shows that top capital income shares and top wealth shares, constructed from Piketty et al. (2018), have moved in remarkable tandem since 1962.

At first glance, the parallel rise in top wealth inequality and top capital income inequality might seem puzzling. Given that equity valuations have risen relative to housing, and that top individuals hold a disproportionate share of equity compared to housing, should not we expect top wealth shares to have grown faster than top capital income shares (Kuhn et al., 2020; Greenwald et al., 2024)?[25]

There are two reasons why this pattern does not appear in the data. First, the mechanical impact of rising asset valuations is actually quite modest relative to the overall rise in inequality. To see why, consider the following back-of-the-envelope calculation: the representative agent holds approximately 40% of their wealth in equity while the top 0.01% holds 90% (Gomez, 2024b). Since equity valuations have roughly doubled since 1960 (see Online Appendix Figure A3), one can expect these differences in equity exposures to have mechanically increased the top 0.01% wealth share by $(90\% - 40\%) \times 100\% = 50\%$ (in relative terms). This increase is quite modest compared to the actual tripling of the top 0.01% wealth share over this period. Online Appendix Figure A4 validates this calculation by comparing observed top wealth shares with counterfactual series derived solely from changes in asset valuations (equity and housing). While these counterfactual series track short-term fluctuations in top wealth shares well, they fail to capture the long-term trends. These results align with Gomez (2024b), who shows through a more structural approach that realized equity returns alone cannot explain the rising trend in top wealth shares.[26]

A second, more nuanced explanation for why capital income and wealth inequality have not diverged stems from Piketty et al. (2018)'s methodology for measuring non-corporate business wealth (i.e., partnership and sole proprietorships). Following U.S. financial accounts conventions, they value these businesses at book value—the replacement cost of their capital—rather than at market value—the price they would command if sold.[27] This means that changes in corporate equity valuations do not mechanically affect an increasing portion of the wealth held by top individuals.

[25] Here, and throughout the paper, I use the term "valuation" to refer to the ratio of an asset's market value to the cash-flow it generates for its holders.

[26] They also align with Gomez (2023) and Atkeson and Irie (2022), who emphasize the role of increasing dispersion in equity returns, rather than increasing average equity returns, in explaining low-frequency fluctuations in top wealth shares.

[27] See Smith et al. (2023) for a recent effort to estimate top wealth shares using market-value assessments of equity in non-corporate businesses.

3 Causes of rising income inequality

I now examine potential economic explanations for the rise in inequality, and, in particular, for the rise in top entrepreneurial income and wealth.[28]

Determinants of entrepreneurs' capital accumulation

A simple, but naive approach to understanding a given rise in inequality is start from yesterday's top earners and track the evolution of their income over time. However, this forward-looking approach is fundamentally misguided, as the composition of top income groups constantly changes: so yesterday's highest earners are not the same individuals as today's. For example, using IRS public use panel data from 1979 to 1990, Gomez (2023) finds that top earners' average income growth was zero; instead, the growth in top income shares entirely came from new entrants in top percentiles.[29]

Given this constant churn at the top, it is often more illuminating to adopt a *backward-looking* perspective; that is, start with today's top earners and examine what exactly in their trajectory made it so that they now capture so much more of total income than their counterparts did in the past (Gomez and Gouin-Bonenfant, 2024; Ozkan et al., 2023; Gomez, 2024a). Let us be more concrete. Figure 1 shows that the average capital income of a typical entrepreneur in the top 0.01% quadrupled between 1980 and 2019. Assuming, realistically, that typical entrepreneurs at this level have operated their forms for approximately 25 years, this increase corresponds to a 6 percentage points ($= \log(4)/25$) increase in their lifetime average growth rate compared to their 1980 counterparts. Hence, explaining rising top shares reduces to identifying the economic factors that enabled today's most successful entrepreneurs to achieve growth rates 6 percentage points higher than their predecessors.[30]

To answer this question, I focus on the following simple model of capital accumulation for entrepreneurs. Each period, an entrepreneur combines the capital they own with some capital borrowed from external investors to generate some output; this output is then be used to pay interest expenses and taxes, consume, or reinvest in capital. This results in the following equation for the growth of the capital owned by an entrepreneur between two time periods:[31]

$$\text{growth in capital}_i = (1 - \text{tax rate}_i) \times (r + \lambda(rok_i - r)) - \text{consumption rate}_i \tag{2}$$

where rok_i denotes the entrepreneur's return on capital (i.e, profits per unit of capital, net of any capital deprecation), r denotes the cost of capital (i.e., the rate at which the entrepreneur

[28] In particular, I do not discuss changes in labor income inequality, which remains important to understand the rise in the top 1% during the 1982-2002 period (Figure 3). See Levy and Murnane (1992), Jones and Kim (2013), and Edmans et al. (2017) for some discussions stressing the importance of higher returns to talents in the labor market.

[29] This is true even when considering a notion of "permanent" income, which smooth out year-to-year variations.

[30] This focus on the change in growth rates is directly related to analyses of changes in the distribution's tail index (e.g. Jones and Kim, 2018).

[31] Such a budget constraint for entrepreneurs is common in the literature—see, for instance, De Nardi (2004) or Moll (2014). For the sake of parsimony, I assume that entrepreneurs only raises external funds via one-period debt and that the price of capital goods, relative to consumption goods, is fixed over time — I will discuss the effect of relaxing these assumptions below.

can borrow), and λ denotes the entrepreneur's leverage (i.e., the amount of capital operated by the entrepreneur divided by the amount of capital they own).

The distinction between the return on capital (rok_i) and the cost of capital (r) is important. The former represents the profit per unit of capital generated by the entrepreneur (a physical rate of return, determined, in part, by technology), while the latter represents how much it costs for the entrepreneur to borrow external funds (it is a financial rate of return, determined by supply and demand of funds in financial markets). In the neoclassical growth model with linear returns to scale, the representative firm rents capital until the marginal product of capital equals the interest rate; and so these two quantities are equal: $rok = r$.[32] In practice, however, the two objects can differ substantially, both at the individual and at the aggregate level, because of the presence of market power, decreasing return to scale, or adjustment costs in installing capital (e.g., Hayashi, 1982). As shown in (2), entrepreneurs benefit from an increase in the return to capital (rok_i) and from a *decrease* in the cost of capital (r), provided they are net borrowers (i.e., $\lambda > 1$).

In the equation for capital accumulation (2), I have specified consumption as a fraction of capital. This contrasts with another common specification in the inequality literature, where consumption is expressed as a fraction of capital income (see, for instance, Solow, 1999 or Saez and Zucman, 2016); this latter specification mechanically implying that higher returns to capital increase consumption. Economically, however, the effect of a higher expected returns on consumption is ambiguous, as they induce both income and substitution effects. While there is some disagreement on the literature, my reading is that the two forces tend to compensate at the top (e.g., Vissing-Jørgensen, 2002 and Holm et al., 2024), and so specifying consumption as a fraction of capital, rather than as a fraction of capital income, is likely a more realistic assumption for individuals at the top of the distribution.[33]

In sum, this equation emphasizes that entrepreneurs' capital accumulation rates increase with their returns on capital (rok_i) but decrease with the cost of capital (r) and tax rates.[34] I now turn to examining the secular trends in each of these determinants.

[32] In this case, the entrepreneur's growth rate simplifies to the more familiar $(1 - \text{tax rate}) \times r - \text{consumption rate}_i$ (e.g., Piketty and Zucman, 2015)

[33] In a micro-founded model, the sensitivity of consumption to the expected return on capital is equal to one minus the elasticity of intertemporal substitution (EIS). My assumption consumption is a constant fraction of capital is equivalent to assuming EIS is equal to one (e.g., log utility). Instead, the assumption that consumption is a constant fraction of capital income is equivalent to assuming EIS = saving rate (i.e., saving as a fraction of income).

[34] There are two additional things to note. First, I abstract from changes in the consumption rate of entrepreneurs due to the lack of data (see also the previous footnote). Second, while I have focused on the fact that higher returns on capital rok_i or lower costs of capital r increase capital's accumulation by entrepreneurs, they also increase the level of income earned for a given amount of capital, amplifying their effects on top income shares. Formally, consider an entrepreneur that funded a firm n periods ago with some initial amount of capital K_0. From today's perspective, given (2), the entrepreneur now owns a quantity of capital $K = (1 + (1 - \text{tax rate}_i) \times (r + \lambda(rok_i - r)) - \text{consumption rate}_i)^n K_0$, and earns an income $(r + \lambda(rok_i - r))\, K$; that is, r and rok_i appear both in the amount of capital owned today (through their effects on the entrepreneur's past returns) and in the quantity of income earned per unit of capital (through their effects on today's return).

Return on capital

I start by discussing the evolution of the average return on capital since 1962. I first construct the return on capital in the U.S. corporate and non-corporate sector by dividing net operating surplus by the value of capital using data from the Integrated Macroeconomic Accounts.[35] As shown in Figure 4a, the return on capital roughly follows a U-shape: it declines between 1960 and 1980 and increases afterward. This pattern is noteworthy because it roughly matches the dynamics of top income shares during the period. Figure 4a also plots separately the return on capital for the corporate and non-corporate sector: most of the recent increase in the return on capital is driven by the non-corporate sector. While interesting, I find this division hard to interpret due to the significant composition changes between the corporate and non-corporate sector during the period (e.g., a firm that used to file as an S-corp may now file as a partnership).

While this empirical evidence focuses on changes in the *average* return on capital across entrepreneurs, the relevant object in our context would be the changes in the returns on capital for entrepreneurs that make it to the top. This is harder to measure due to the lack of micro-data on private firms and, more generally, the difficulty in measuring capital for firms that rely intensively on intangibles. Still, there is some evidence that the increase in the return on productive assets is concentrated in a few fast-growing firms (e.g., Andrews et al., 2016; Autor et al., 2020), which tend to be the type of firms owned by top entrepreneurs.

As stressed in the business dynamic literature, the normative implications of this shift in the return on capital are ambiguous. On the positive side, it could reflect an increase in productivity, partly due to the development of new technology such as computers and automation (e.g., Moll et al., 2022). On the negative side, it could also reflect the increased capacity of some firms to exert market power in the product and in the labor market (e.g., Boar and Midrigan, 2024).[36] Finally, note that I remain agnostic on how much of higher returns on capital reflects luck, talent, or entrepreneur's effort (Smith et al., 2019, Bhandari and McGrattan, 2021). While this distinction is important to understand why some entrepreneurs have high returns on capital, the effect of tax reforms, or how much of high returns on capital are capitalized in firm value, it does not matter for the simple accounting framework presented here.

Cost of capital

I now turn to the evolution of the cost of capital (r) since 1962. Figure 4b plots the average cost of capital for the U.S. corporate sector measuring using data from the Integrated Macroeconomic Accounts. We can observe a steady decline in the average cost of funds since 1960. This rising wedge between the return on capital and the cost of capital is directly linked to the rise in "pure profits" (or "factor-less income"), $(rok - r)K$, where K denotes aggregate capital (Barkai, 2020).[37] This rise in the pure profits share is also linked to the rise in the

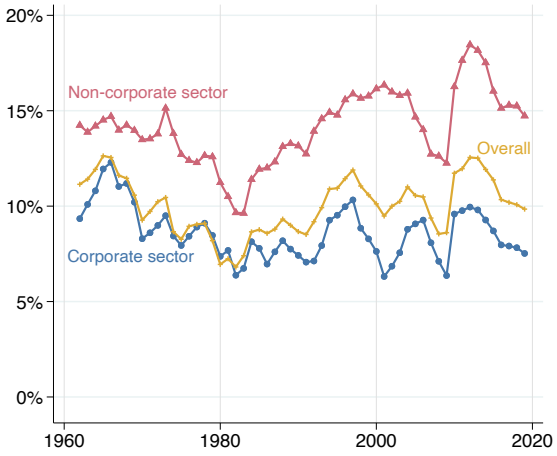
[35] Net operating surplus corresponds to the gross value added of the sector, net of capital depreciation, production taxes, and compensation of employees. Equivalently, it corresponds to what can be used to pay corporate taxes, pay investors (debt or equity holders), invest, or purchase assets.

[36] In turn, this rise in market power could be the result of a decline in anti-trust policies (e.g., Philippon, 2019) or of the development of new technologies themselves (e.g., Autor et al., 2020; Gouin-Bonenfant, 2022).

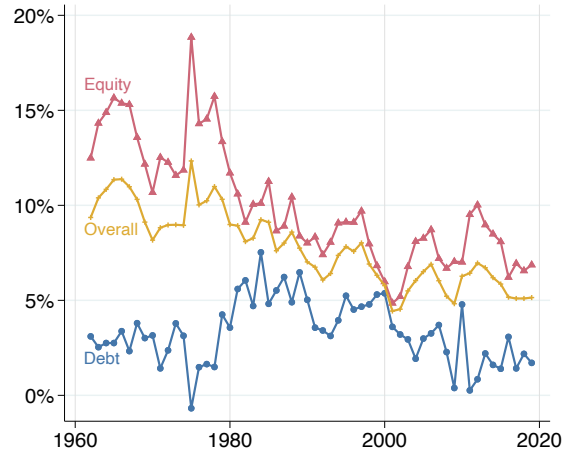
[37] More precisely, if the price of investment goods fluctuates relative to the price of consumption goods, there would be an additional adjustment equal to the growth of the relative price of investment goods.

Figure 4: Economic determinants of entrepreneurs' growth rates

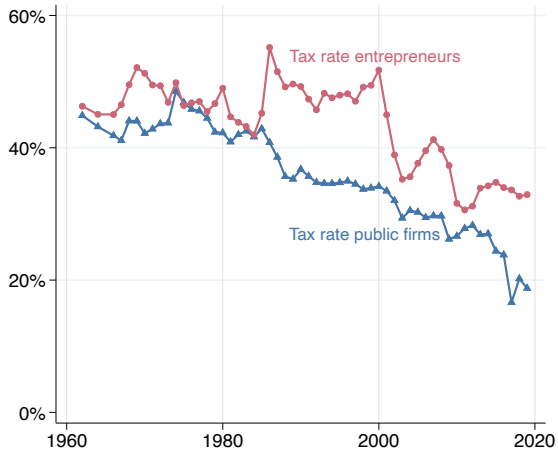
(a) Sectoral return on capital *rok*



(b) Cost of capital r



(c) Taxes paid as a percentage of income



Notes. This figure plots the evolution of key economic objects that affect the entrepreneurs' rate of capital accumulations (2). Figure 4a plots the return on capital, computed as the ratio of a sector's net operating surplus to its capital (data from the U.S. Integrated Macroeconomic Accounts). 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. 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 micro-data.

market value of the corporate sector relative to the replacement cost of the capital it owns, Tobin's Q, as $(Q-1)K$ can be rewritten as the present value of future pure profits. I discuss in more details potential explanations for this rise in pure profits in Online Appendix A.2.

Entrepreneurs raise external financing through both debt and equity. To differentiate between the two, Figure 4b also plots the cost of debt and equity financing over time separately. 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.[38] 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.

After combining these secular trends with micro-data on the debt and equity issuance of top entrepreneurs, Gomez and Gouin-Bonenfant (2024) argue that the secular decrease in the cost of capital, holding the return on capital constant, can explain a 2-percentage-point increase in the annual growth rate of entrepreneurs. İmrohoroğlu and Zhao (2022) also argue that the decline in interest rates have played an important role in the rise in income inequality. This estimate constitutes a lower bound for the role of financial factors on inequality: beyond the pure price effect of decreased financing costs, one might also consider the fact that improvement in financial markets—such as reduced frictions in issuing equity through venture capital funding—may also have improved capital allocation to the most productive entrepreneurs.[39]

Taxes

Finally, I discuss the evolution of the average tax rate paid by entrepreneurs. I start by computing the effective tax rate of public firms, defined as corporate taxes paid divided by net income (net operating surplus minus interest rate payment). As shown in Figure 4c, this effective rate declines from 40% to 20% over the period (1962-2019). This is consistent with the overall decline of the statutory corporate tax rate during the period, which decreased from 53% in 1962 to 21% in 2017 with the Tax Cuts and Jobs Act.

However, this decline in the corporate tax does not capture the overall environment of an entrepreneur since a substantial fraction of business income flows through pass-through businesses, which are not subject to the corporate tax. Hence, I also plot the average tax rate entrepreneurs pay on their pre-tax income, using the micro-data from Distribution National Accounts (Piketty et al., 2018). I define an individual as an entrepreneur if the factor income from businesses (corporate and non-corporate) accounts for more than half of their total revenue—this captures roughly 15% of the population. As reported in Figure 4c, the average tax rate of entrepreneurs follows a similar decline over time, from 50% to 30%. This decline in effective tax rate reflects both a decrease in marginal tax rates and changes in the ability of entrepreneurs to reduce their taxable income through, for instance, generous depreciation allowances.

Compared to the evolution of the return on capital and the interest rate, which have an additive impact on the growth rate of entrepreneurs, changes in tax rates have a *multiplicative* impact on their growth rates, which means that they disproportionately affect the most suc-

[38] See the notes of Figure 4 for additional details.

[39] In a reduced form way, this can be thought of as a rise in λ in (2).

cessful entrepreneurs.[40] To be more concrete, consider an entrepreneur with a lifetime average pre-tax return of 15%. A decline in the average tax rate from 40% to 30% (as reported in Figure 4c) implies an increase in the post-tax return from 9% to 10.5%; that is, an increase in the annual return by 1.5pp (holding fixed the return on capital). For an entrepreneur with a higher lifetime average pre-tax return of 30%, however (as may be typical for entrepreneurs in the top 0.01%), the decline in tax rates would increase the annual return by 3pp. Hence, this back-of-the-envelop calculation suggests that the decrease in entrepreneur taxation can account for a substantial increase in top inequality. Along these lines, Saez and Zucman (2019), Hubmer et al. (2021), and Lee et al. (2021) emphasize the effect of lower taxes on inequality.

Further discussion

In this section, I have emphasized three key drivers behind the rise in top entrepreneurial incomes: increased returns on capital, decreased funding costs, and lower taxes for business owners. While this provides a useful lens to account for the rise in inequality, the observed divergence between these three objects raise an important economic 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 equilibrium, this surge in investment should push down the return on capital, until it equates to the interest rate, which would push pure profits to zero and, ultimately, decrease inequality.[41]

An important question for future research is why this general equilibrium effect has not occurred yet. One possibility is that entrants now face increased barriers to competing 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 more inelastic than commonly assumed.

In the absence of such equilibrium effects, government policies could act as an additional stabilizing force on inequality: one could imagine a backlash against inequality to prompt more redistributive measures. In practice, however, this stabilizing role of government policies has remained largely absent in the U.S., possibly due to the beliefs that a high level of inequality is reflective of 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 advocating for favorable tax cuts and regulations (Glaeser et al., 2003).

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[40] Actually, considering that changes in tax rate are driven mainly by a change in the marginal tax rates, the effect is even more than multiplicative, as emphasized by Hubmer et al. (2021).

[41] In the presence of heterogeneous returns on capital, top entrepreneurs would still earn rents, but less of it.

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Online Appendix

A Details on Haig-Simons income

A.1 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 between $t+1$ and t, we have:[42]

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

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 (i.e., a typical firm or a typical house), news about future cash flows typically dominates

[42] More precisely, $\Delta P_{t+1} \equiv P_{t+1} - P_t$, $\Delta \mathbb{E}_t[D_{t+h}] \equiv \mathbb{E}_{t+1}[D_{t+h+1}] - \mathbb{E}_t[D_{t+h}]$, and $\Delta R_{t\to t+h}^{-1} \equiv R_{t+1\to t+h+1}^{-1} - R_{t\to t+h}^{-1}$.

(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) may have been driven by a decline in discount rates rather than a rise in expected cash flows.

A.2 Factor income versus Haig-Simons income for equity and housing

I now discuss how to interpret the fact that, over the last forty years, Haig-Simons income from housing and equity has outpaced factor income, as reported in Figure 1.

Equity. In the standard neoclassical model (perfect competition, linear returns on scale, and frictionless capital adjustment), the market value of a firm is simply equal to the value of the capital it owns. Under this view, any discrepancy between capital gains and investment (that is, between factor income and Haig-Simons income) must come from measurement errors in the amount of investment recorded in accounting statements.[43] For instance, Hall (2001) used this logic to infer the real amount of investment by the corporate sector from measures of capital gains. This is quite possibly part of the explanation—Corrado (2024) convincingly argues that, despite the recent revision in the BEA classifications discussed above, corporate investment in intangible is still underestimated by statistical agencies. However, researchers typically estimate that this cannot explain the whole story (Crouzet and Eberly, 2023).[44]

Another possibility, however, is that the discrepancy between the market value of the firm and the value of its capital reflects the present value of rents. Such rents could reflect firms' market power in the goods or labor market (pure rents) or decreasing returns in production technology or capital adjustment costs (Ricardian rents), as in Hayashi (1982). In this scenario, an increase in the market value of the corporate sector, relative to book measures of investment, could reflect an increase in expected rents or, alternatively, a decrease in the way they are discounted. Economic data provides suggestive evidence for both of these stories: De Loecker et al. (2020) measures an increase in markups while there is ample evidence that discount rates have declined over time (see, for instance, Gomez and Gouin-Bonenfant, 2024).

Housing. The persistent difference between factor and Haig-Simons income for housing stems from land's fundamental scarcity. When an asset is both economically productive and supply-constrained, its rental rate tends to grow with the broader economy, which implies that, on average, it accrues capital gains equal to the growth rate of the economy.[45] In recent years, however, measures of house prices have increased faster than rents, which suggests, as for the case of equity, that some part of these "excess" capital gains is due to declining discount rates.

[43] More precisely, a discrepancy could also come from changes in the price of investment goods. However, this only worsens what needs to be explained since the price of investment goods has been falling over the period.

[44] There is a one-to-one mapping between this discrepancy and the evolution of Tobin's Q, defined as the ratio between the market value of equity to its book value. Formally, denote V_t, the market value of a firm. and K_t. the amount of capital in the firm; Tobin's Q is defined as $Q_t = V_t/K_t$. Note that the change in the value of a firm relative to the change in capital is $\dot{V}_t - \dot{K}_t = (Q_t - 1)\dot{K}_t + K_t\dot{Q}_t$. When the firm issues both debt and equity, there is an additional wedge between capital gains and the change in the value of the firm, which depends on firm leverage.

[45] See the neoclassical growth model in the Online Appendix B.2 for such an example.

A.3 Factor income versus Haig-Simons income in the cross-section

Figure 1 focuses on the difference between factor income (dividends plus retained earnings) and Haig-Simons income (dividends plus capital gains) for a representative individual holding the corporate sector. In reality, however, individuals, especially at the top, have concentrated ownership in certain firms. I now show that, in the cross-section, there are large differences between factor and Haig-Simons income.

Table A1 reports the regression of the (log) growth in the market value of equity on the (log) growth in the book value of equity for Compustat firms. The former captures capital gains (as a fraction of market equity), while the latter captures retained earnings (as a fraction of book equity).

Table A1: Comparing capital gains to retained earnings across public firms

	Growth in market equity	
	1-year	5-year
Growth in book equity	0.39	0.68
	(0.00)	(0.00)
Constant	-0.01	0.04
	(0.00)	(0.00)
R^2	0.21	0.41
Period	1961-2020	1966-2020
N	290,431	180,859

Notes. I define book equity as stockholders' equity (depending on data availability, seq, ceq + pstkr, ceq + pstl, ceq + pstk, or at-lt) plus deferred taxes (depending on data availability, txditc or txdb + itcb) minus preferred equity (depending on data availability, pstkr, pstkl, or pstk). Finally, I construct the market value of equity as mkvalt or prcc_c×csho, depending on data availability. All variables are winsorized to be between the 1% and 99% levels. Standard errors (clustered at the firm level) in parenthesis. All regressions are with year-fixed effects.

B Formalizing income concepts

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 A2 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

$$C_t + P_t \dot{N}_t = Y_{L,t} + N_t D_t. \tag{3}$$

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 3. 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

$$\text{Haig-Simons income} \equiv C_t + \frac{\mathrm{d}}{\mathrm{d}t}\left(P_t N_t\right). = Y_{L,t} + N_t(D_t + \dot{P}_t), \tag{4}$$

where the second equality follows from the individual budget constraint 3. 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. Sefton and Weale (2006) defines Hicksian income as consumption *plus* expected change in future consumption:[46]

$$\text{Hicksian income} \equiv C_t + \int_0^\infty e^{-\int_t^{t+h} r_s \,\mathrm{d}s} \dot{C}_{t+h} \,\mathrm{d}h. \tag{5}$$

Combining this definition with the individual budget constraint (3) makes it possible 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:*

$$\text{Hicksian income} = Y_{L,t} + N_t D_t + \int_0^\infty e^{-\int_t^{t+h} r_s \,\mathrm{d}s} \left(\dot{Y}_{L,t+h} + N_{t+h}\dot{D}_{t+h} - \dot{N}_{t+h}\dot{P}_{t+h}\right) \mathrm{d}h. \tag{6}$$

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

[46] Alternatively, integrating by parts the expression gives

$$\text{Hicksian income} \equiv \int_0^\infty r_{t+h} e^{-\int_t^{t+h} r_s \,\mathrm{d}s} C_{t+h} \,\mathrm{d}h,$$

that is, Hicksian income is a weighted average of current and future consumption.

$t+dt$, 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 (6).

Proof of Proposition 1. Plugging the individual budget constraint (3) $C_t + P_t = \dot{N}_t Y_{L,t} + N_t D_t$ into the definition of Hicksian income (5) gives:

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

Using integration by parts, we can rewrite the last term as

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

Plugging this expression into the previous equation gives:

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

By definition, $r_{t+h} = (D_{t+h} + \dot{P}_{t+h})/P_{t+h}$, and so the last term is null, which concludes the proof. □

The following proposition characterizes the difference between Hicksian income and Haig-Simons income (see Hulten and Schreyer, 2010 for the result). Hicksian income is equal to the Haig-Simons income *plus* the present value of the change in future Haig-Simons income due to changes in wages or interest rates going forward.

Proposition 2. *We have the following relationship between Hicks and Haig-Simons income:*

$$\text{Hicksian income} = \underbrace{Y_{L,t+h} + r_{t+h} N_{t+h} P_{t+h}}_{\text{Haig-Simons income}} + \int_0^\infty e^{-\int_t^{t+h} r_s \,\mathrm{d}s} \left(\dot{Y}_{L,t+h} + N_{t+h} P_{t+h} \dot{r}_{t+h} \right) \mathrm{d}h$$

Proof of Proposition 2. The proof follows Plugging the individual budget constraint (4) $C_t +$

Table A2: Formalizing different income measures

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

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 is the formalization of Table 1 in the main text.

$\frac{\mathrm{d}}{\mathrm{d}t}(N_tP_t)=Y_{L,t}+r_tN_tP_t$ into the definition of Hicksian income (5) gives:

$$\begin{aligned}
\text{Hicksian income} &= C_t+\int_0^\infty e^{-\int_t^{t+h}r_s\,\mathrm{d}s}\dot{C}_{t+h}\,\mathrm{d}h\\
&= Y_{L,t}+r_tN_tP_t-\frac{\mathrm{d}}{\mathrm{d}t}(N_tP_t)\\
&\quad+\int_0^\infty e^{-\int_t^{t+h}r_s\,\mathrm{d}s}\frac{\mathrm{d}}{\mathrm{d}h}\left(Y_{L,t+h}+r_{t+h}N_{t+h}P_{t+h}-\frac{\mathrm{d}}{\mathrm{d}h}(N_{t+h}P_{t+h})\right)\mathrm{d}h.\\
&= Y_{L,t}+r_tN_tP_t-\frac{\mathrm{d}}{\mathrm{d}t}(N_tP_t)\\
&\quad+\int_0^\infty\left(e^{-\int_t^{t+h}r_s\,\mathrm{d}s}\left(\dot{Y}_{L,t+h}+\dot{r}_{t+h}N_{t+h}P_{t+h}\right)-\frac{\mathrm{d}}{\mathrm{d}h}\left(e^{-\int_t^{t+h}r_s\,\mathrm{d}s}N_{t+h}P_{t+h}\right)\right)\mathrm{d}h.\\
&= Y_{L,t}+r_tN_tP_t+\int_0^\infty e^{-\int_t^{t+h}r_s\,\mathrm{d}s}\left(\dot{Y}_{L,t+h}+\dot{r}_{t+h}N_{t+h}P_{t+h}\right)\mathrm{d}h.
\end{aligned}$$

Note that the first two terms sum up to Haig-Simons income, as defined in (4), which 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 (3). 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 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 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:

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

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:

$$r_K = r + \delta$$
$$r_{H,t} = rP_{H,t} - \dot{P}_{H,t},$$

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 A2, 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 Empirical Appendix

C.1 Details on decomposing the change of top income shares into within-between components

Theory. I now derive formally the accounting framework presented in Equation (1) 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:

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

This corresponds to (1) in the main text.

Implementation. The classification of income as either labor or capital presents particular challenges for owners of non-corporate businesses (partnerships and sole proprietorships), which do not separate owner wages from profits. To address this, I follow Saez and Zucman (2020), who assign an increasing share of income to capital as business size grows.

Additionally, Smith et al. (2019) argue that the distinction between capital and labor income can be problematic even in the corporate sector as S-corporation owners face tax incentives to under-report wage income to minimize liabilities for Medicare and Affordable Care Act taxes. To address this issue, they propose reclassifying a portion of S-corporation profits from capital to labor income. Still, this alternative classification approach would not substantially affect the results of this decomposition.

Results. 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%).

C.2 Trends in capital income versus wealth inequality

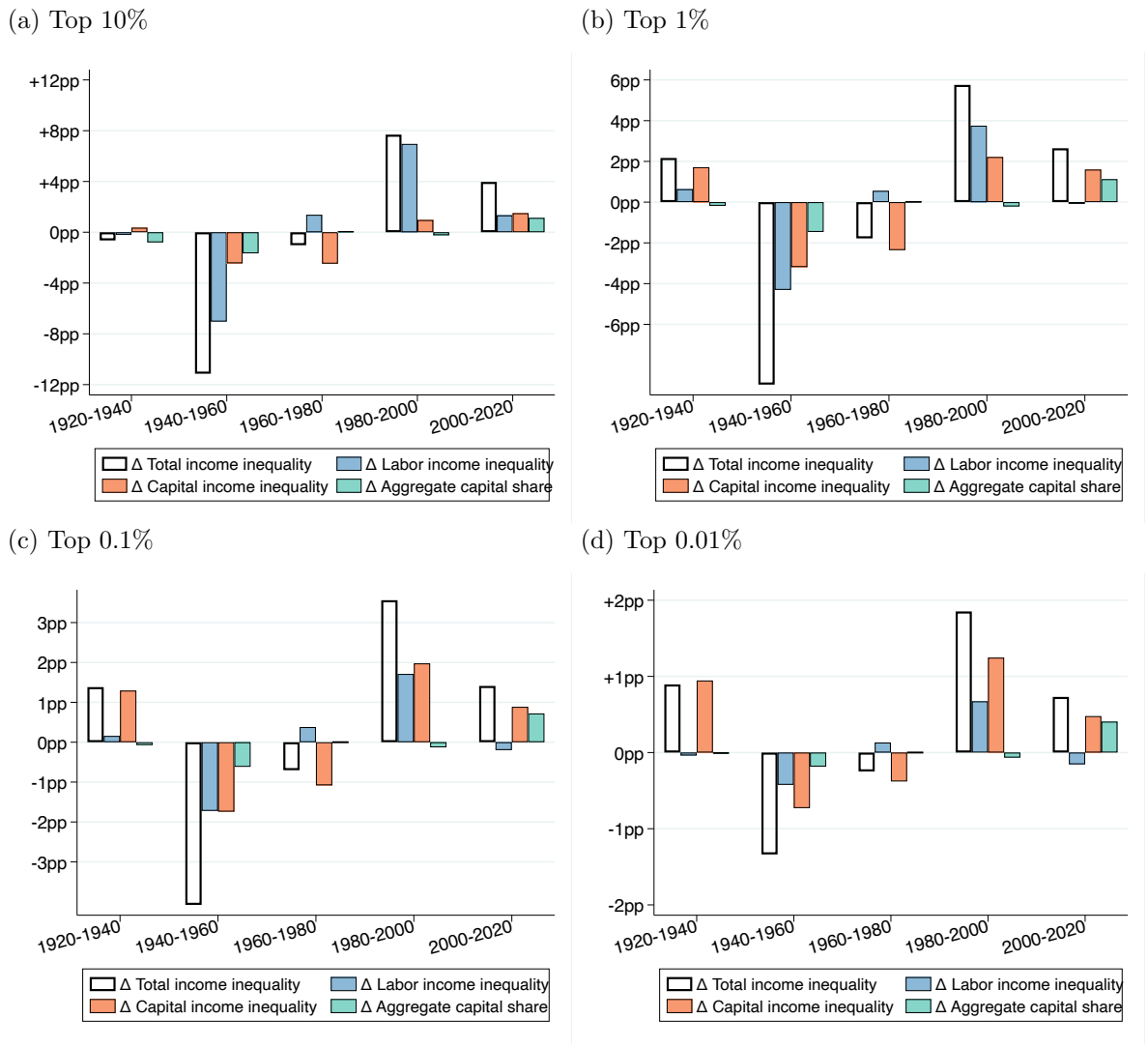
Figure A2 plots top wealth shares, as reported in Piketty et al. (2018), and top capital income shares, which are calculated by ranking observations in the DINA micro-data by capital income and aggregating these by percentile groups. As argued in Irie (2024), both series exhibit parallel trends.

Figure A3 depicts the growth in valuations for equity and housing since 1962. More specifically, it shows the growth of each asset class's market value relative to a chosen income measure. For robustness, I consider two distinct valuation measures for equity: (i) the corporate sector's market value relative to its dividends and retained earnings (using data from the Integrated Macroeconomic Accounts), and (ii) the price-dividend ratio of the CRSP value-weighted index. Similarly, I also consider two distinct valuation measures for housing: (i) the market value of housing held by households relative to net housing value added (NIPA table 7.4.5, line 13), and (ii) the price-to-rent ratio computed by Jordà et al. (2019), which is based on the house price index constructed by Shiller (2015).

Figure A4 uses these series to compare the actual evolution of top wealth shares with the evolution of counterfactual shares, obtained solely from the changes in asset valuations since 1962. Specifically, each year, I calculate the counterfactual wealth of a top percentile by multiplying its equity and housing holdings in 1962 by the growth in the valuation of equity and housing since 1962. Following the estimates in Gomez (2024b), I assume that the share of wealth invested in equity is 40% for the overall economy, 60% for the top 1%, and 90% for the top 0.01%. This degree of heterogeneity in equity shares is larger than the ones reported in Piketty et al. (2018), which finds that the share of wealth invested in equity (public or private businesses) averages 41% for the top 100%, 46% for the top 1%, and 62% for the top 0.01%. I also use the housing valuation series from Jordà et al. (2019), which shows a more modest increase in housing valuations, thereby reducing the negative effect of rising housing valuation on wealth inequality.

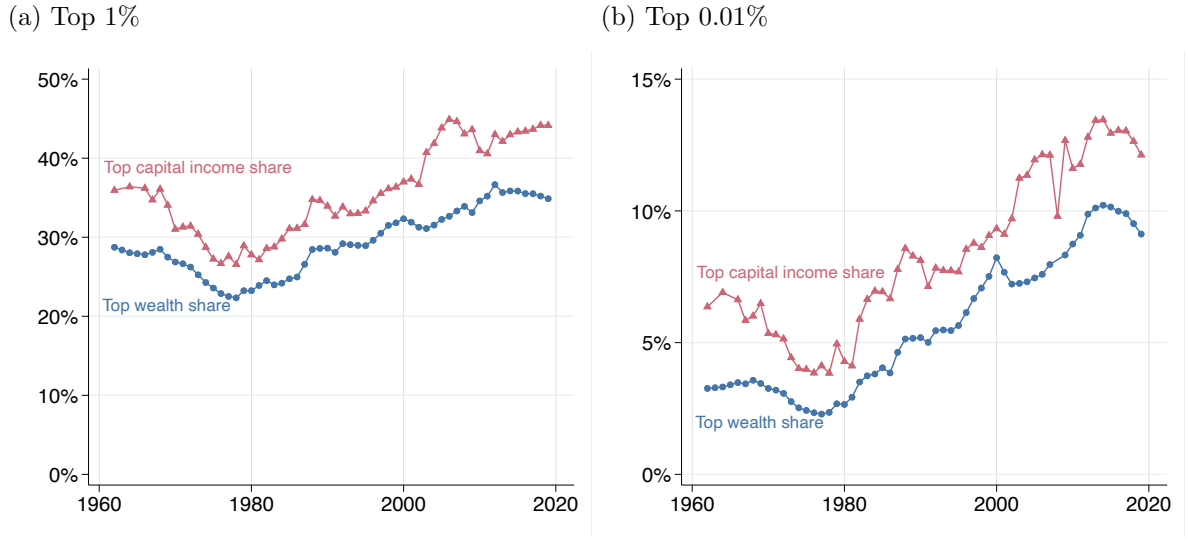
The key takeaway of these figures is that this counterfactual version of top wealth shares does not vary substantially relative to actual top wealth shares, suggesting that the mechanical

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



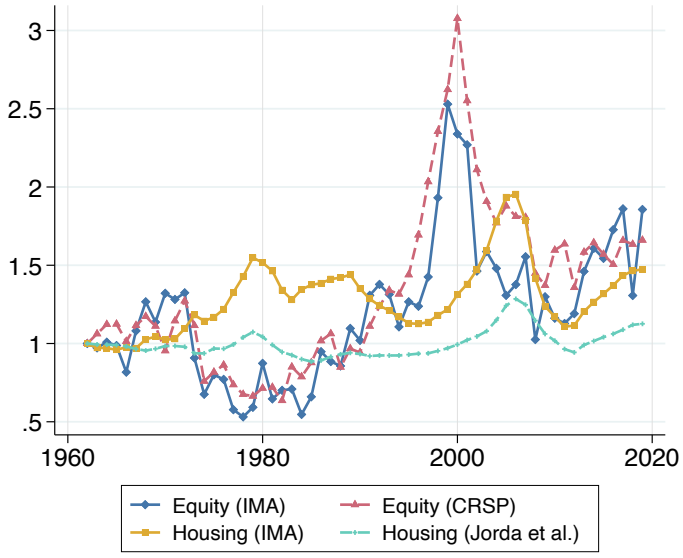
Notes. This figure reports the results of using the accounting framework (1) to decompose the overall change in top factor (pre-tax) income shares over three periods: 1962-1982, 1982-2002, and 2002-2020. The overall change in top income shares is broken down into three terms: a term capturing the change in labor inequality —LS $\times$ ΔLabor income share(p) — a term capturing the change in capital inequality — $(1 - \text{LS}) \times \Delta$Capital income share($p$) — and a term capturing the change in aggregate labor share — $\big($Labor income share(p) $-$ Capital income share(p)$\big) \times \Delta$LS. Data is from the spreadsheet TA2 in the Excel file PSZ2022AppendixTablesII(Distrib) from Gabriel Zucman's website (2022 vintage).

Figure A2: Comparing the evolution of top capital income and top wealth shares



Notes. This figure compares the evolution of top wealth shares and of top capital (factor) income shares using data from Piketty et al. (2018). More precisely, I compare the series of top wealth shares reported in spreadsheet TE2 in the Excel file PSZ2022AppendixTablesII(Distrib) to the series of top capital income shares obtained from the DINA micro-data. Both datasets are downloaded from Gabriel Zucman's website (2022 vintage).

Figure A3: Growth in equity and housing valuations

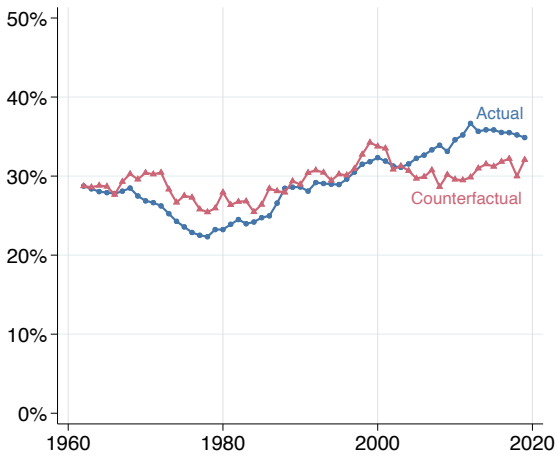


Notes. This figure plots the growth in asset valuations since 1962 for two asset classes: equity and housing. The first series plots the growth of the corporate sector's market value relative to the sum of dividends and retained earnings (data from the U.S. Integrated Macroeconomic Accounts). The second series plots the growth of the price-dividend ratio of public U.S. firms (data from CRSP value-weighted index). The third series plots the growth of the market value of houses held by households relative to net housing value added (data from the U.S. Integrated Macroeconomic Accounts). The last series plots the growth of the U.S. housing price-to-rent ratio, as reported by Jordà et al. (2019).

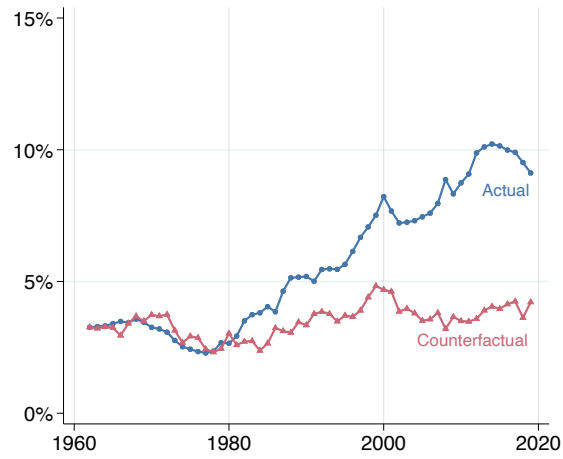
impact of rising asset valuations alone cannot account for the increase in top wealth inequality. This finding is consistent with the fact that top wealth shares and top capital income shares have evolved in parallel over the analyzed period, as shown in Figure A2.

Figure A4: Quantifying the mechanical impact of growing asset valuations on top wealth shares

(a) Wealth share of top 1%



(b) Wealth share of top 0.01%



Notes. This figure compares the actual top wealth shares to counterfactual shares derived solely from changes in asset valuation. More precisely, I construct the counterfactual wealth in a top percentile in a given year by multiplying asset holdings in 1962 with the growth in asset valuations since then. Data on top wealth shares comes from Piketty et al. (2018) (2022 vintage, downloaded from Gabriel Zucman's website) while Data on asset valuations comes from the Integrated Macroeconomic Accounts, Shiller's website, and Jordà et al. (2019).