WORKING paper

BANQUE DE FRANCE
EUROSYSTÈME

From Income to Wealth Inequality Trickle-Down vs. Capital Gains

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November 2026, WP #1068

ABSTRACT

Higher permanent labor income (PLI) inequality raises saving, since high-PLI households save more; asset prices must adjust. We ask how this feeds back on wealth inequality. If the saving finances capital, interest rates fall and wages rise, trickling down to the poor. If it bids up asset prices, capital gains accrue to the rich. In a heterogeneous-agent model with non-homothetic wealth preferences and imperfect competition, markups weaken the first channel and let the second dominate along the transition. In our U.S. calibration, these price effects raised the average wealth of the top 0.1% by 9% over 1970-2020, and average wealth by 0.2%.

Keywords: Wealth Inequality, Permanent Income, Markups, Capital Gains, Tobin's Q

JEL classification: D31, E21, E25, E44

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This work would not have been possible without the helpful supervision and guidance of Axelle Ferrière, Tobias Broer, Karl Harmenberg, David Jinkins, and Birthe Larsen. We are also grateful to Alaïs Martin-Baillon, Edouard Challe, Jeppe Druedahl, Pauline Gandré, Katja Mann, Julien Matheron, Jean-Baptiste Michau, John Kramer, Per Krusell, Søren Hove Ravn, Morten Olsen, Léonard Bocquet, Gilles Saint-Paul, Xavier Ragot, Pontus Rendahl, and Pablo Winant, along with the multiple seminar participants for their useful comments. Center for Economic Behavior and Inequality (CEBI) is a center of excellence at the University of Copenhagen, founded in September 2017, financed by a grant from the Danish National Research Foundation (Grant DNRF134). All remaining errors are our own.

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NON-TECHNICAL SUMMARY

The question. Since the 1970s, the gap between high and low earners in the United States has grown sharply. This is true of yearly pay, and also of what people can expect to earn over their whole careers. People with high lifetime earnings save a larger share of their income. So when earnings become more unequal, aggregate savings rises. That extra saving has to go somewhere, and where it goes changes wages, interest rates and asset prices. We ask how these price changes in turn affect who owns the wealth.

Two possible outcomes. One possibility is that the extra saving pays for new factories, machines and offices. Capital becomes more plentiful, so interest rates fall and wages rise. Workers gain, savers earn less on their wealth, and wealth gaps narrow. We call this the trickle-down channel. The name describes the direction of the effect, not a policy.

The other possibility is that the extra saving bids up the price of assets that already exist, such as company shares. Wages then barely move, and the resulting capital gains accrue mainly to those who already own such assets, who are mostly the wealthiest households. We call this the capital-gains channel, and it widens wealth gaps.

What decides between them: market power. Firms with market power charge prices above their costs and earn profits beyond what their buildings and machines alone would earn. Their shares are therefore worth more than their physical capital. When interest rates fall, those future profits become more valuable straight away. Part of the extra saving then raises share prices instead of building new capital.

Timing matters too. In the very long run, trickle-down wins: lower interest rates and higher wages slowly narrow wealth gaps. But share prices jump as soon as investors expect lower rates. That one-off gain goes to existing owners and gives the top a head start that lasts for decades. Comparing the economy only before and after the change, as most studies do, misses this gain entirely.

What we find. We build a model of the U.S. economy in 1970 with households that differ in earnings and wealth. We then feed it the rise in earnings inequality observed from 1970 to 2019, revealed year by year as it happened. Firms have market power, at the low end of estimates for that period. Under these assumptions:

- By 2020, the price changes alone raise the average wealth of the top 0.1% by 25%, the top 1% by 18%, and all households by 8%.
- With no market power, the same price changes would have lowered wealth for everyone: by 4–5% for households above the median and by 9% for the bottom half.
- The price changes explain about a quarter of the observed rise in the top 1%'s share of wealth.
- Overall, rising earnings inequality accounts for two fifths of the rise in household wealth relative to national income. It also accounts for a quarter of the rise in stock-market values relative to the capital firms own.

Why it matters. Our results suggest that rising income inequality and rising wealth inequality feed each other through asset prices: when the rich save more, what they already own becomes worth

more. Whether extra saving at the top trickles down to workers depends on how much market power firms have. In our model of the U.S. since 1970, the capital-gains channel has won for five decades.

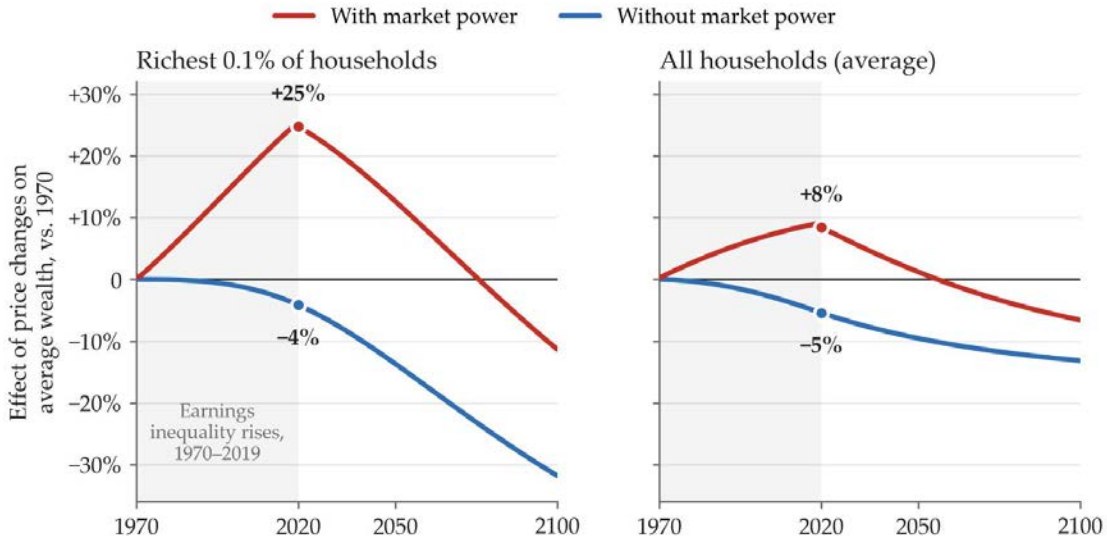


Figure. How price changes affect wealth. Change in average wealth caused only by the shifts in wages, interest rates and asset prices that follow the rise in U.S. earnings inequality, compared with 1970 and after removing normal economic growth. Earnings inequality rises from 1970 to 2019 (grey band) and stays at its 2019 level afterwards. With market power, the richest gain from rising share prices for half a century. Without it, the same price changes lower wealth for everyone.

Des inégalités de revenu aux inégalités de patrimoine : ruissellement vs plus-values

RÉSUMÉ

La hausse des inégalités de revenu permanent du travail accroît l'épargne, car les ménages dont le revenu permanent est plus élevé en épargnent une plus grande part. Pour que les marchés d'actifs s'équilibrent, les prix doivent s'ajuster : quel en est l'effet en retour sur les inégalités de patrimoine ? Si cette épargne finance du capital, les taux d'intérêt baissent, les salaires augmentent et les ménages les plus modestes y gagnent. Si elle fait plutôt monter le prix des actifs, les plus-values reviennent aux plus riches. Dans un modèle à agents hétérogènes avec des préférences non homothétiques pour la richesse et une concurrence imparfaite, les marges (markups) affaiblissent le premier canal et laissent le second dominer pendant cinq décennies au cours de la transition. Alimenté par la hausse des inégalités observée aux États-Unis depuis 1970, le modèle génère les deux cinquièmes de la hausse du ratio patrimoine/PIB et un quart de la hausse du Q de Tobin. D'ici 2020, ces effets de prix augmentent de 25 % le patrimoine moyen des 0,1 % les plus riches et de 8 % le patrimoine moyen de l'ensemble des ménages. En concurrence parfaite, ces deux grandeurs baissent, de 4 % et de 5 % respectivement.

Mots-clés : inégalités de patrimoine, revenu permanent, marges (markups), plus-values, Q de Tobin

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Introduction

Permanent labor income inequality has risen sharply in the U.S. since the 1970s (DeBacker et al. 2011, Guvenen et al. 2021, 2022, Salgado et al. 2023, Braxton et al. 2025). Because households with higher permanent income save a larger share of it, this rise has increased desired saving (Dynan et al. 2004, Straub 2019, Auclert et al. 2025). For asset markets to clear, the return on saving has to change, and this price adjustment feeds back on the distribution of wealth. This paper asks where the additional saving of the rich goes, and what the resulting price changes do to wealth inequality.

Two channels compete. If the saving finances physical capital, the interest rate falls and wages rise: poorer households gain from higher wages, richer households lose financial income, and wealth inequality falls. We call this the trickle-down channel.[1] If savings increase the price of existing assets instead, wages and long-run returns barely move, and the capital gains accrue to the households that hold the assets. This valuation channel raises wealth inequality.

We show that market power decides the balance between the two. In a heterogeneous-agent model with permanent labor income heterogeneity, a non-homothetic taste for wealth, and Dixit-Stiglitz competition among intermediate producers, the price of a firm includes the capitalized value of monopoly rents. When the interest rate falls, the value of these rents rises faster than the stock of physical capital, so Tobin's Q increases and part of the saving of the rich is absorbed by asset prices rather than by capital accumulation.

Figure 1 illustrates this in a supply-and-demand diagram with the interest rate on the vertical axis. An increase in permanent labor income inequality shifts asset demand to the right. Under perfect competition, asset supply is the capital stock (plus public debt): the shift lowers r, raises K and wages. Under imperfect competition, asset supply also includes capitalized rents and is flatter: the same shift lowers r less, raises K less, and raises the value of assets more. The gap between ΔA and ΔK is the rise in Tobin's Q, a pure valuation gain.

[1] We use the term only for the direction of this price effect; it carries no policy claim.

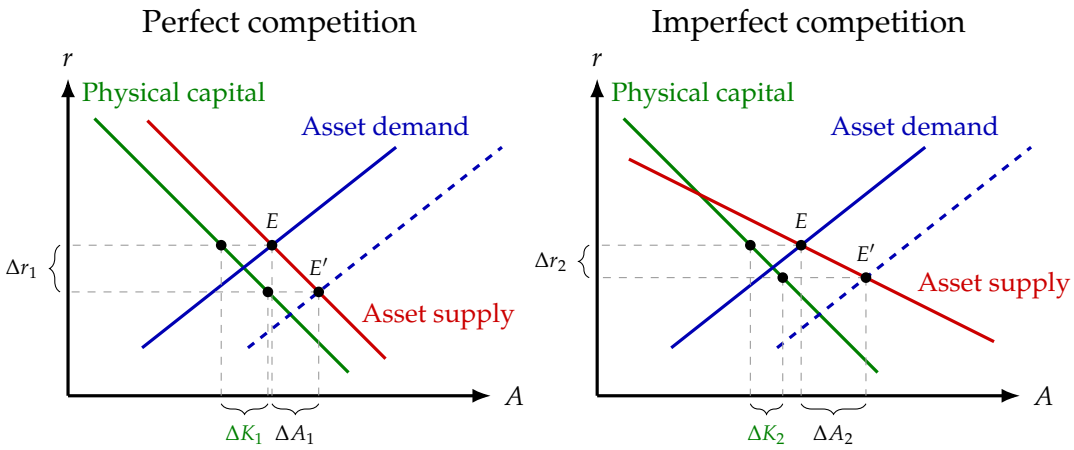


Figure 1: Long-term equilibria on the asset market following a rise in permanent labor income inequality

In an analytical two-agent version of the model, we prove three steady-state results: (i) an increase in permanent labor income inequality lowers the interest rate and raises the wealth-to-output ratio; (ii) this general-equilibrium price change lowers wealth inequality, because the wealth of the rich is more sensitive to r than the wealth of the poor; (iii) markups weaken this trickle-down effect, because a flatter asset supply requires a smaller change in r to clear the market.

Along the transition, the sign reverses. Asset prices are forward-looking, so the permanently lower interest rate is capitalized into firm values at the time of the shock. This capital gain is a one-time transfer to the holders of existing assets: it exists only along the transition, and a steady-state comparison cannot see it. Since equity and business wealth are concentrated at the top of the wealth distribution, and when the rise in inequality comes as a sequence of surprises, the gain raises top wealth for decades before the trickle-down channel takes over. Markups thus dampen the trickle-down channel at the steady state and overturn it along the transition.

We quantify the mechanism in a model calibrated to the U.S. economy in 1970 and fed with the observed 1970–2019 rise in permanent labor income inequality, as a sequence of annual surprises. The general-equilibrium price effects raise the average wealth of the top 1% by 18% and of the top 0.1% by 25% by 2020, and average wealth by 8%; under perfect

competition, the same price effects lower the wealth of every group, by 4 to 5% above the median and by 9% for the bottom half. The welfare effects follow the same pattern: under perfect competition, the price changes hurt the rich and benefit the poor, while with markups the capital gains more than compensate the top for the lower long-run returns.

Compared to the data, the price channel accounts for about a quarter of the observed rise in the top 1% wealth share and a fifth of the rise in the top 0.1% share, and the transition generates two fifths of the rise in the wealth-to-output ratio and a quarter of the rise in Tobin's Q; the rest is left to the other drivers of valuations, corporate taxes, markups and risk premia, which the exercise holds fixed.

Related Literature. Our contribution is twofold. First, we show that a rise in permanent labor income inequality generates capital gains endogenously when firms earn rents, and that the general-equilibrium effect of this rise on top wealth is negative at the steady state but positive along the transition. Second, we quantify this mechanism for the U.S. and decompose it into a direct effect and a general-equilibrium effect.

Rising labor income inequality and the macroeconomy. The closest paper to ours is Straub (2019), who shows that non-homothetic preferences allow the rise in permanent labor income inequality to explain a large part of the increase in wealth inequality and the decline in real interest rates. A large literature links the rise in inequality to the decline in r through the saving of the rich. More Auclert et al. (2025), Michau (2018) and Mian et al. (2021), establish that permanent labor income inequality raises saving and lowers r; we focus instead on the feedback effect of the endogenous change in prices, and show that the answer depends on market power. Michau et al. (2023) study a taste for wealth with identical earnings and no rents: the richest dynasties accumulate without bound as long as r exceeds g, and their accumulation drives r down to g and raises wages. Without rents, the fall in r leaves asset prices unchanged. In our model it is capitalized into firm values, so the same saving pressure raises top wealth along the transition. A large body of work studies the aggregate implications of rising labor income inequality (Heathcote et al. 2010, Favilukis 2013, Kumhof et al. 2015); Kaymak & Poschke (2016) feed the rise in wage dispersion and the changes in taxes and transfers into a standard incomplete-

markets model and attribute the rise in wealth concentration to both, with no role for asset prices. Relative to this literature, we isolate the general-equilibrium feedback on wealth and show analytically that it dampens wealth inequality in the long run.

Market power, Tobin's Q, and inequality. Brun & Gonzalez (2017), Gonzalez & Trivin (2019) and Eggertsson et al. (2021) also capitalize monopoly rents into firm values, but shock the supply side of the asset market. In an incomplete-markets model with monopoly power, Brun & Gonzalez (2017) attribute the secular rise of Tobin's Q, the gap between equity wealth and physical capital, and the fall in investment to lower capital taxes and higher markups, and trace their distributional consequences. Gonzalez & Trivin (2019) show that higher valuations, driven by capital taxes, capitalized rents, and corporate-governance frictions, crowd out capital and lower the labor share. Eggertsson et al. (2021) take higher markups and a lower natural rate as given and show, in a representative-agent model, that capitalized pure profits account for the rise in the wealth-to-output ratio and in Tobin's Q, the fall in the labor share, and weak investment. In the first two papers, Q and the interest rate rise together and capital accumulation falls; in the third, the fall in r is exogenous. In ours, the shock is to asset demand: the saving pressure of the rich lowers the discount rate and raises the value of a given stream of rents, so that Q rises while r falls. Asset prices therefore rise because income inequality rises, and the capital gains change the distribution of wealth in turn. Solving the transition also shows which households receive these gains, which a comparison of steady states cannot. Farhi & Gourio (2018) document the macro-finance trends that this loop speaks to, and Greenwald et al. (2025) find that the reallocation of rewards from labor to shareholders is the largest source of the rise in U.S. equity values since 1989; Impullitti & Rendahl (2025) study how barriers to entry raise markups and firm valuations and widen $r - g$; Liu et al. (2022) show that low interest rates can raise concentration; Moll et al. (2022) study how automation raises returns to wealth. We share with these papers the focus on returns to wealth, but the source of the return differential here is the interaction of non-homothetic saving with capitalized rents.

Capital gains and the dynamics of wealth inequality. Gabaix et al. (2016) show that standard

heterogeneous-agent models generate slow increases in wealth inequality, and Benhabib et al. (2019) find that skewed earnings, differential saving rates and return heterogeneity are all needed to match the U.S. wealth distribution. Capital gains and return heterogeneity are the leading candidates to speed them up: richer households accumulate wealth mostly through capital gains (Fagereng et al. 2019) and earn higher returns (Fagereng et al. 2020, Bach et al. 2020, Garbinti et al. 2021); Kuhn et al. (2020) show in long-run SCF data that portfolios differ systematically along the wealth distribution, housing in the middle and business equity at the top, so that asset prices move the wealth distribution; Hubmer et al. (2021) match the dynamics of wealth inequality with exogenous excess returns; Cioffi (2025) and Gomez (2025) show how portfolio heterogeneity turns asset-price movements into persistent changes in top wealth shares. In our model, the aggregate capital gain is derived from equilibrium firm pricing, and an exogenous wealth-dependent portfolio rule, estimated on the Survey of Consumer Finances, allocates it across households; the model does not generate excess returns on a given asset. The contribution is to derive the capital gain from the inequality shock itself.

Outline. Section 1 documents the stylized facts. Section 2 presents the model and Section 3 the analytical results. Section 4 describes the calibration. Section 5 isolates the price effect in two stylized experiments: a comparison of steady states, which puts numbers on the analytical results and shows that markups dampen the trickle-down channel, and a one-time shock, in which the capital gain reverses the sign of the effect for eight decades. Section 6 feeds the model the observed 1970–2019 rise in permanent labor income inequality and quantifies the price effect. Section 7 concludes.

1 Stylized facts

This section documents the main stylized facts about the U.S. that motivate this paper. At the aggregate level, we report (i) the increase in labor income and wealth inequality since the 1970s, (ii) the role of capital gains in the accumulation of wealth. At the cross-sectional level, we use the Survey of Consumer Finances (SCF) to document that richer households

(i) have a higher saving rate and (ii) invest a higher share of their wealth into risky assets.

Figure 2 reports the estimates of labor income and wealth inequality used in this paper, from the distributional national accounts of Piketty et al. (2018) (PSZ), which combine tax, survey, and national accounts data and match the aggregates of the national accounts. The SCF gives similar, slightly lower, values.[2] Both document a large increase in the top 10% and top 1% wealth and labor income shares since the 1970s.

The distribution of wealth has a fatter right tail than the distribution of labor income, and the tail has thickened faster: according to PSZ, the top 1% labor income share rose by about 5 p.p. between 1980 and 2019, against 12 p.p. for the top 1% wealth share. Household wealth also grew faster than national income, and this growth came from prices rather than saving: decomposing the wealth-to-output ratio into a saving and a capital-gain component, the left panel of Figure 3 shows that without capital gains the ratio would have fallen.[3] Over 1971–2019, capital gains account for about three quarters of the change in real household wealth (Online Appendix Table C.3). The revaluation is visible in the value of firms: the right panel shows that the aggregate Tobin's Q, the ratio of the market to the book value of U.S. corporations, went from below 1 before the 1980s to above 1 today. Rising labor income inequality is one force among several behind this revaluation: the decline in dividend and corporate taxes and the rise in markups also played a role (Piketty & Zucman 2014, Brun & Gonzalez 2017), and Greenwald et al. (2025) attribute 40% of the growth of U.S. equity values between 1989 and 2017 to a reallocation of rewards from labor to shareholders. The paper quantifies the share due to inequality alone.

Figure 4 highlights two key stylized facts at the cross-sectional level: (i) the saving rate

[2]The SCF is converted to the equal-split adult unit of PSZ: for married households, dollar amounts are divided by two and weights doubled (Online Appendix B.5). The measurement debate on top shares (Auten & Splinter 2024) concerns the allocation of untaxed capital income rather than labor income, which is observed in tax data; PSZ build on the capitalized-income estimates of Saez & Zucman (2016); the revised estimates of Smith et al. (2023) differ from PSZ in level but confirm the rise.

[3]That is, $\frac{W_t}{GNP_t} = \frac{W_{t-1}+S_{t-1}+KG_{t-1}}{GNP_t}$, where W_t is total real household wealth, S_t total saving and KG_t capital gains. The decomposition is an accounting identity, not a counterfactual: without capital gains, households might have saved more. It is consistent with Fagereng et al. (2019), who find that the higher saving rates of richer households come mostly from capital gains.

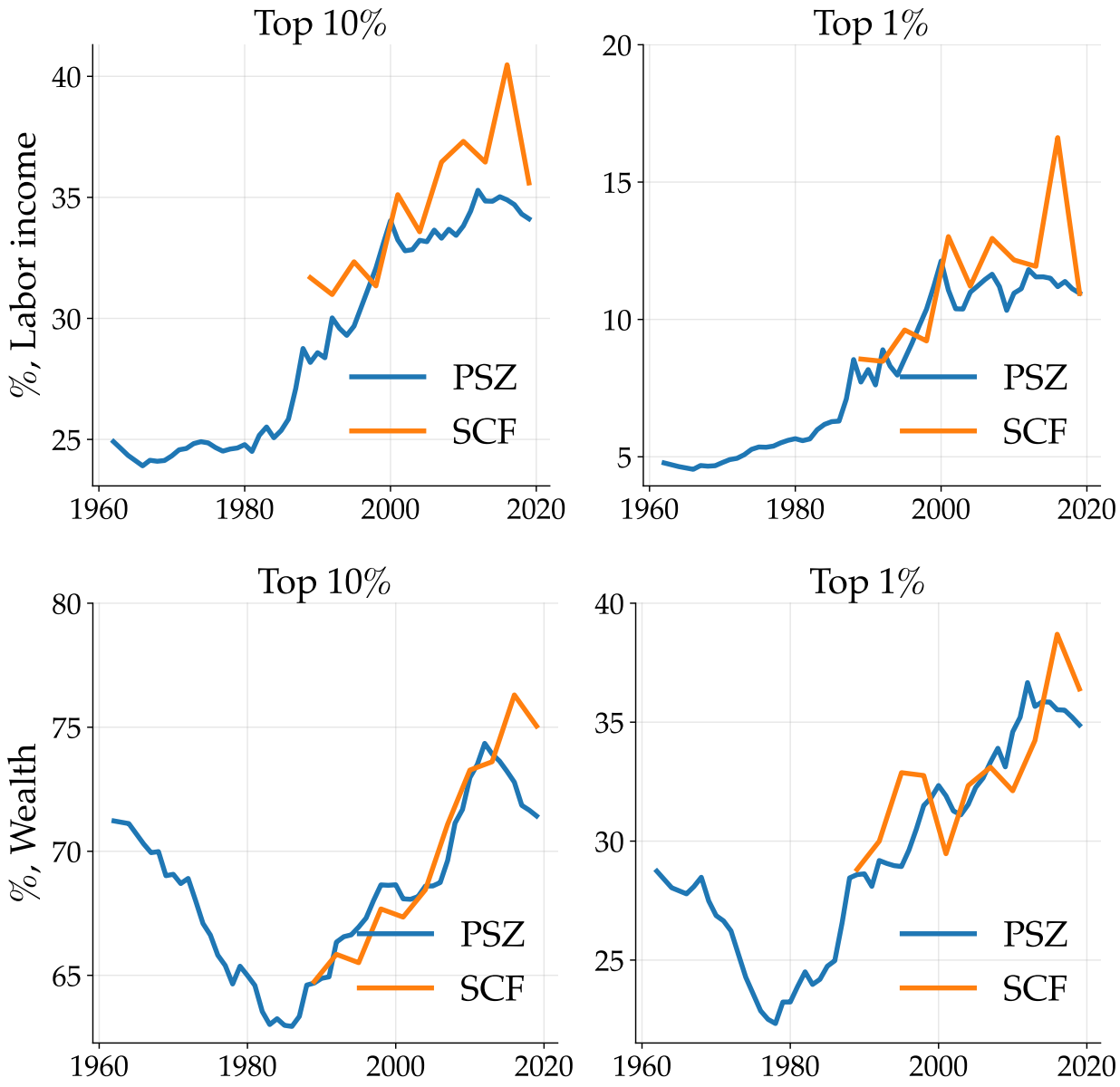


Figure 2: Top labor income shares (top row) and top wealth shares (bottom row)

Note: Top 1% and top 10% pre-tax labor income shares (top row) and wealth shares (bottom row) from the Distributional National Accounts in Piketty et al. (2018) (PSZ, blue line) and in the Survey of Consumer Finances (SCF, orange line, authors' calculations).

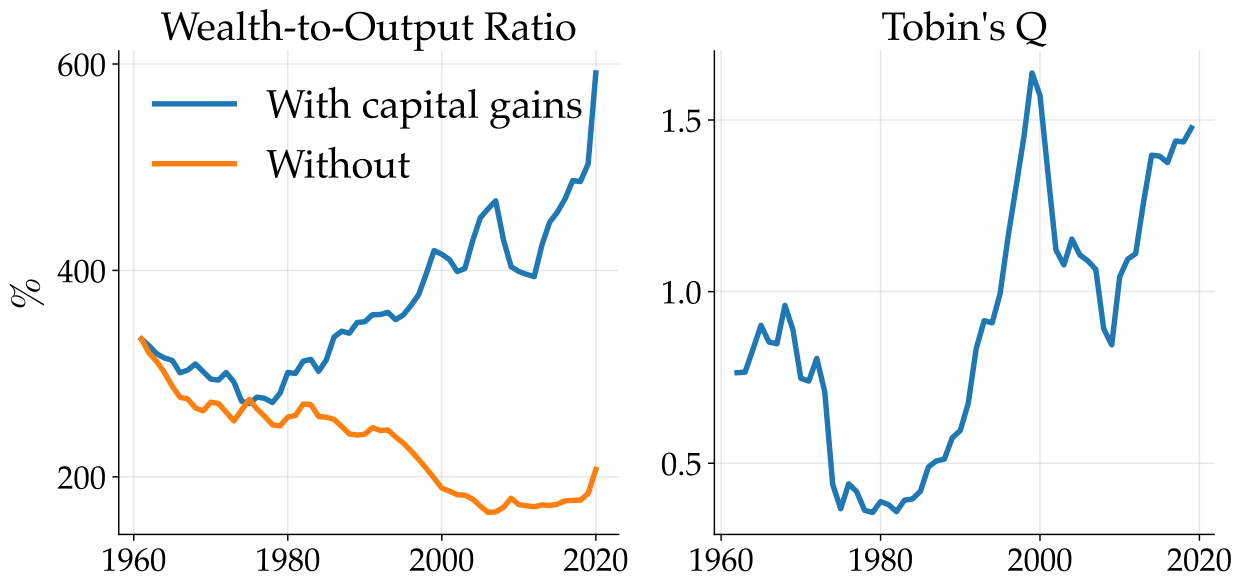


Figure 3: Wealth-to-output ratio and Tobin's Q

Note: The left panel shows the evolution of the household wealth-to-national-output ratio. The decomposition follows Piketty & Zucman (2014) by computing aggregate wealth removing any valuation effect, using the law of motion $W_{t+1} = W_t + S_t + KG_t$ where W_t is the household aggregate wealth, S_t is aggregate savings from households and KG_t are capital gains. The right panel shows the aggregate Tobin's Q reported in Piketty et al. (2018).

is an increasing function of permanent income, and (ii) richer households invest a higher share of their wealth into risky assets.

The two facts are the ingredients of the mechanism: the saving-rate gradient means that a rise in labor income inequality raises desired aggregate saving, which moves the valuation of firms, and the portfolio gradient means that the resulting capital gains accrue mostly to the rich. The saving-rate gradient is documented with other data and methods by Dynan et al. (2004), Straub (2019), Mian et al. (2020) and Bauluz et al. (2022), and Kuhn et al. (2020) document the portfolio gradient in the historical SCF waves back to 1949; Fagereng et al. (2019) show that, net of capital gains, saving rates are nearly flat in wealth, so that the gradient in gross saving rates reflects capital gains, the margin our model operates on. We show the 1989 wave, for which Kumhof et al. (2015) compute saving rates by permanent income; the portfolio profile is stable across waves, and the calibration pools the waves from 1989 to 2019 (Online Appendix B.6).

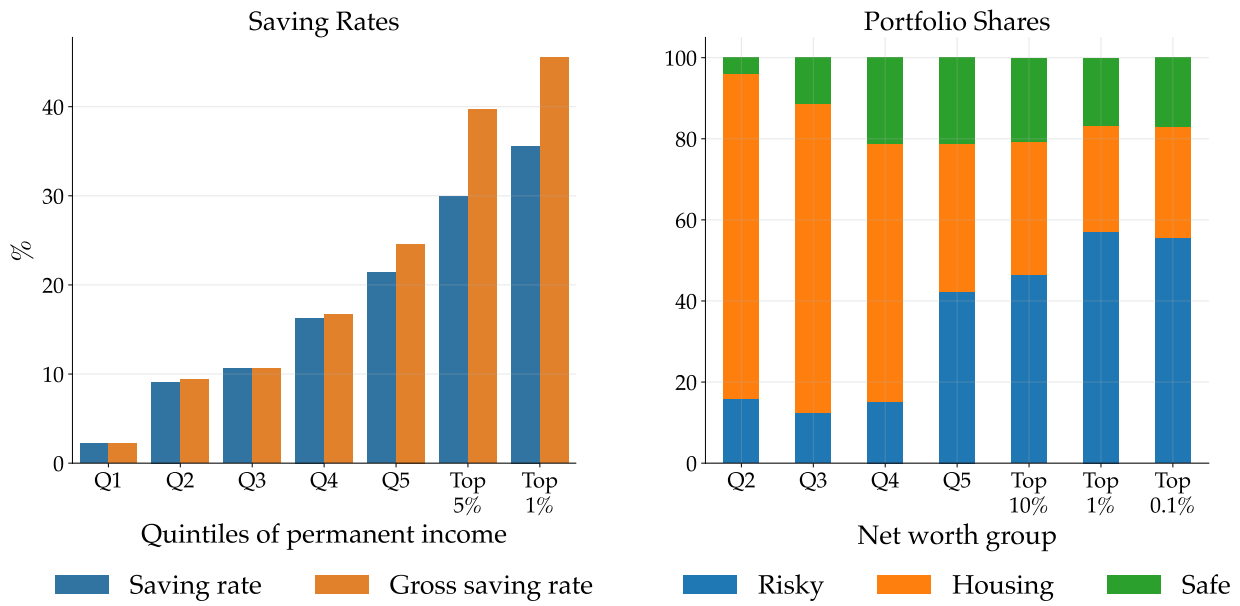


Figure 4: Saving rates by permanent income and portfolio shares by wealth in the SCF, 1989

Note: The left panel reproduces average saving rates by quintile of permanent income (and for the top 5% and top 1%) in the SCF in 1989, as computed by Kumhof et al. (2015). Gross saving rates account for unrealized capital gains. The right panel shows portfolio composition by net worth group in the SCF in 1989 (authors' calculations; the first quintile, with negative net worth, is omitted). Risky assets are claims on firms: equity held directly and through funds, retirement accounts and trusts, private business equity, and other nonfinancial assets; housing is the net value of residential and other real estate; safe assets are the remaining financial assets net of non-mortgage debt. Online Appendix B.6 gives the SCF definitions.

2 Model

The economy is populated by a continuum of households, a continuum of intermediate goods producing firms, a representative final good producer, a mutual fund, and a government. Time is discrete, at the annual frequency, and denoted t. Labor-augmenting productivity grows at an exogenous rate g, and the economy is on its balanced growth path: we detrend all quantities by $(1+g)^t$ and present the stationary detrended system throughout.[4] There is no aggregate risk, and changes to the distribution of permanent labor income are modeled as MIT shocks.[5]

2.1 Households

Households save in a mutual fund, subject to a zero borrowing constraint, and gain labor income at wage w_t, subject to a progressive tax à la Feldstein (1969), Bénabou (2002), and Heathcote et al. (2017), with progressivity parameter λ and level τ_ℓ. They differ in their level of permanent income z_i, and are subject to uninsurable idiosyncratic productivity shocks e_t. They discount the future at a rate β, face a constant death probability ξ, and derive utility from consumption c_t and from their total wealth holdings a_t. Dying households are replaced by newborn households of the same permanent productivity type, to ensure a constant mass of households; newborns start life with an endowment financed by accidental bequests, defined below. Their maximization problem is

$$V_t(a_{t-1}, e_t, z_i) = \max_{a_t} \left\{ u(c_t) + v(a_t) + (1-\xi)\tilde{\beta}\, \mathbb{E}_e\left[V_{t+1}(a_t, e_{t+1}, z_i)\right] \right\}, \tag{1}$$

$$\text{s.t. } c_t + a_t = \underbrace{\frac{1+r_t}{1+g} a_{t-1}}_{\text{financial income}} + \underbrace{\frac{s(a_{t-1}, A_{t-1}) cap_t}{1+g}}_{\text{capital gains}} + \underbrace{(1-\tau_\ell)\, w_t \frac{(z_i e_t)^{1-\lambda}}{\mathbb{E}\left[(ze)^{1-\lambda}\right]}}_{\text{post-tax labor income}}, \quad a_t \geq 0, \tag{2}$$

[4] Growth matters for two objects. Wealth relative to the economy drifts at $(1+r)/(1+g)$ rather than $(1+r)$, which governs the Pareto tail of wealth (Section 4); and dividends grow at g, so equity capitalizes them at $r-g$ rather than r, which raises the sensitivity of the equity price to the interest rate.

[5] An MIT shock is a one-time unexpected shock on some parameter. From the model point of view, this shock is a zero-probability event, and the following transition towards the steady state is completely deterministic. Thus households do not have rational expectations with respect to the variable that is shocked, in this case, the distribution of permanent income.

where $\tilde{\beta} \equiv \beta(1+g)^{1-\sigma}$ is the detrended discount factor, the $1/(1+g)$ terms convert assets chosen at $t-1$ into date-t detrended units, and a newborn of type i at date t enters with its financial income replaced by an endowment $b_t(z_i)$. The taste for wealth is over wealth relative to trend productivity: in levels, the period utility is $u(\hat{c}_t) + (1+g)^{t(1-\sigma)} v(\hat{a}_t/(1+g)^t)$, so that both terms scale with the trend at the same rate, preferences are consistent with balanced growth, and $v(\cdot)$ takes detrended wealth as its argument, as in Michau et al. (2023). In Equation (2), r_t is the interest rate, cap_t denotes the capital gains (to be defined below), A_{t-1} the total wealth in the economy, and $s(a_{t-1}, A_{t-1})$ is the household's exposure to equity, which is assumed to follow an exogenous, wealth-dependent rule:

$$s(a_{t-1}, A_{t-1}) = \min\left\{ \frac{\psi_0}{1+\exp\big(-\psi_1(\log(a_{t-1}/A_{t-1}) - \psi_2)\big)}, 1 \right\} a_{t-1}. \tag{3}$$

This reduced-form rule captures the well-documented heterogeneity in portfolio composition along the wealth distribution without requiring a full portfolio choice problem.[6] The rule allocates the aggregate capital gain across households; it does not generate excess returns. Return heterogeneity in the model therefore comes from portfolio composition, not from household-specific returns on a given asset.

All households supply exogenously a single unit of labor, with productivity $e_t z_i$, where the idiosyncratic productivity e_t follows a log-AR(1) process:

$$\log e_t = \rho \log e_{t-1} + \varepsilon_t^e, \qquad \varepsilon_t^e \sim \mathcal{N}\big(0, (\sigma^e)^2\big), \tag{4}$$

which is discretized using the Rouwenhorst method. The total endowment of labor productivity $\int z_i e_t d\Phi_t$ is normalized to 1, where Φ_t denotes the joint distribution over wealth, idiosyncratic productivity, and permanent productivity. Through the lens of our model, an increase in permanent labor income inequality is a mean-preserving spread in the distribution of z_i such that $\int_i z_i d\Phi_t = 1$.

[6] See Online Appendix B.6 for the calibration of (ψ_0, ψ_1, ψ_2) to the Survey of Consumer Finances, following Auclert & Rognlie (2018). The cap at one rules out leveraged equity positions.

η_t is the total amount of accidental bequests in the economy left by dying households,

$$\eta_t = \frac{\xi}{1+g}\Big((1+r_t)A_{t-1} + cap_t \int s(a_{t-1}, A_{t-1})d\Phi_t\Big). \tag{5}$$

A share τ_b of this pool is taxed by the government; the remainder is given to the newborn households of date t as an initial endowment proportional to their permanent productivity, $b_t(z_i) = (1-\tau_b)\,\eta_t\, z_i/\xi$, so that the endowments add up to $(1-\tau_b)\eta_t$.[7]

Period utility functions are given by

$$u(c_t) = \frac{c_t^{1-\sigma}}{1-\sigma}, \qquad v(a_t) = \gamma\frac{(a_t+\zeta)^{1-\sigma_a}}{1-\sigma_a},$$

where σ is the coefficient of relative risk aversion, γ the intensity of the taste for wealth, ζ a Stone-Geary shifter, and σ_a the curvature of wealth in utility. We assume $\sigma_a < \sigma$, so that the marginal utility out of wealth decreases at a slower rate than the marginal utility out of consumption. Thus, wealth acts as a luxury good in our model, as in the capitalist-spirit preferences of Carroll (1998) and the luxury bequest motive of De Nardi (2004).

2.2 Government

The budget constraint of the government, in detrended units, is

$$B_t = \frac{1+r_t}{1+g}B_{t-1} + G_t - T_t$$

where G_t denotes government spending, T_t total tax receipts, and B_t real government bonds. The government imposes a progressive tax on labor income with level τ_ℓ and progressivity λ, a capital income tax at rate τ_k on distributions d_t, and a bequest tax at

[7] An alternative is to pay the net pool as a flow to all living households in proportion to z_i. We use the newborn endowment because a flow rebate scales with the valuation gains of the rich and would attribute part of the general-equilibrium effect on the bottom of the distribution to redistributed bequests.

rate τ_b:[8]

$$T_t = \tau_k \, d_t + \tau_\ell \, w_t L_t + \tau_b \eta_t,$$

where d_t denotes aggregate dividends, defined in the next subsection. We assume a balanced-budget rule that keeps public debt constant at $B_t = B$, with government spending absorbing the variation in receipts and in debt service, so that the budget constraint simplifies to:

$$G_t = T_t - \frac{r_t - g}{1+g} B.$$

2.3 Firms

The supply side features monopolistic competition in the intermediate-goods sector and perfect competition in the final-goods sector.[9]

Final-good producer. A competitive firm produces the final good (the numéraire) by combining labor L_t and a CES bundle of intermediate varieties $j \in [0,1]$:

$$Y_t = Z \, L_t^{1-\alpha} \, X_t^{\alpha}, \qquad X_t \equiv \left(\int_0^1 x_{j,t}^{\frac{1}{\mu}} \, dj \right)^{\mu},$$

where Z is total factor productivity, α the capital share, and $\mu \geq 1$ is the markup, which parameterizes the substitutability across varieties.[10] The final-good producer chooses labor and intermediate inputs to maximize profits:

$$\max_{L_t, \{x_{j,t}\}} \; Y_t - w_t L_t - \int_0^1 p_{j,t} \, x_{j,t} \, dj.$$

[8]The progressive schedule applies to relative productivity $z_i e_t$ and is indexed to the wage, so that post-tax labor income adds up to $(1-\tau_\ell) w_t L_t$ for any λ and the tax system is consistent with balanced growth; λ only redistributes within labor income. The capital income tax stands in for corporate and personal taxation of distributed profits together: with full expensing of investment, a corporate tax at rate τ_c enters the model exactly like a dividend tax at rate τ_d, so only the composite $(1-\tau_c)(1-\tau_d) = 1-\tau_k$ is identified, and it falls on distributable profits, including monopoly rents; see Brun & Gonzalez (2017) and Brun et al. (2023).

[9]Two remarks on this structure. First, markups apply to intermediate (capital) goods only, so monopoly rents equal $(1-1/\mu)\alpha Y$ rather than $(1-1/\mu)Y$ under economy-wide markups: for a given μ, the valuation channel studied below is conservative. Second, labor enters only the final-good sector, so the structure shuts down any effect of markups on the labor share and the associated wage channel. At a fixed capital stock, Equation (8) implies that a higher markup lowers r; in general equilibrium the smaller capital stock raises Y/K, and the net effect is discussed in Section 3.

[10]The elasticity of substitution across varieties is $\varepsilon = \mu/(\mu-1)$, so that μ is the equilibrium markup of each intermediate producer.

The first-order conditions are

$$w_t = (1-\alpha)\frac{Y_t}{L_t},$$
$$p_{j,t} = \alpha\,\frac{Y_t}{X_t}\left(\frac{X_t}{x_{j,t}}\right)^{\frac{\mu-1}{\mu}}.$$

Defining $P_t^X \equiv \alpha\, Y_t / X_t$ as the price of the intermediate aggregate, the second condition can be inverted to obtain the demand for variety j:

$$x_{j,t} = X_t\left(\frac{p_{j,t}}{P_t^X}\right)^{-\frac{\mu}{\mu-1}}. \tag{6}$$

Intermediate producer. Each intermediate firm j owns its capital stock $k_{j,t-1}$ and operates the linear technology $x_{j,t} = k_{j,t-1}$. Taking the demand curve from Equation (6) as given, firm j chooses its price $p_{j,t}$ and investment $i_{j,t} = k_{j,t} - (1-\delta)k_{j,t-1}/(1+g)$ to maximize the cum-dividend value of the firm $d_{j,t} + q_{j,t}$, where dividends are profits net of investment,

$$d_{j,t} = p_{j,t}\,x_{j,t}(p_{j,t}) - i_{j,t},$$

with δ the depreciation rate of capital, and the end-of-period equity value $q_{j,t}$ satisfies the no-arbitrage condition

$$(1+r_t)\,q_{j,t-1} = (1+g)\left[(1-\tau_k)\,d_{j,t} + q_{j,t}\right]. \tag{7}$$

The $(1+g)$ term converts next-period detrended payoffs into current units: in levels, dividends grow at g, so in a steady state the equity price capitalizes them at $r-g$, $q = (1+g)(1-\tau_k)d/(r-g)$. Under perfect competition ($\mu = 1$), $q_t = (1-\tau_k)K_t$ along any path, so equity is worth its capital net of the tax wedge and there are no capital gains.[11]

[11]The capital income tax scales the dividend cost and the dividend return of investment equally, so it scales the equity price without entering the investment rule below, as the tax on distributions does in McGrattan & Prescott (2005); for the corporate part this relies on full expensing. We do not model the accrual taxation of capital gains: its effective rate is low (Section 4), and in this model it would tax the trend appreciation of equity, which moves the pole of the equity price from $r = g$ to $r = (1-\tau_g)g$ and breaks the proportionality of q to K under perfect competition.

The constant-elasticity demand implies the standard markup pricing rule $p_{j,t} = \mu\, mc_{j,t}$, where the marginal cost $mc_{j,t}$ equals the user cost of capital $r_t + \delta$, obtained from the first-order condition for investment.[12] Hence $p_{j,t} = \mu\,(r_t + \delta)$.

Symmetric equilibrium. Since all intermediate firms face identical costs and demand conditions, the equilibrium is symmetric: $x_{j,t} = x_t$ and $p_{j,t} = p_t$ for all j. The CES aggregator then gives

$$X_t = \left(\int_0^1 x_t^{\frac{1}{\mu}}\, dj \right)^{\mu} = x_t,$$

so that $X_t = K_{t-1}/(1+g)$.[13] Combining with the markup pricing rule $p_t = \mu\,(r_t + \delta)$ yields

$$r_t = \frac{\alpha}{\mu}(1+g)\frac{Y_t}{K_{t-1}} - \delta. \tag{8}$$

Imposing equilibrium on the labor market $L_t = L = 1$, detrended output is $Y_t = Z\,K_{t-1}^{\alpha}$, where the constant $(1+g)^{-\alpha}$ is absorbed into Z. Aggregate dividends are

$$d_t = \alpha Y_t - K_t + \frac{1-\delta}{1+g}K_{t-1}.$$

In a steady state, the value of the firm is its physical capital plus the capitalized value of monopoly rents, net of the capital income tax:

$$q = (1-\tau_k)\Big[K + \underbrace{\alpha\frac{\mu-1}{\mu}\frac{1+g}{r-g}Y}_{\text{capitalized value of rents}}\Big]. \tag{9}$$

[12] The first-order condition for $k_{j,t}$ equates the marginal cost of investment (one unit of the final good) to the discounted marginal return: $1 = (p_{j,t+1} + 1 - \delta)/(1 + r_{t+1})$ in levels, yielding $p_{j,t} = r_t + \delta$. Investment is fully expensed, so the capital income tax scales the dividend cost and return of investment equally, and the firm discounts at the pre-tax rate: taxes do not enter.

[13] In symmetric equilibrium $p_t = P_t^X = \alpha\, Y_t/X_t$. Since the final good is the numéraire, P_t^X is an endogenous price that does not require a separate normalization; it is eliminated by combining the final-good and intermediate FOCs.

2.4 Mutual fund

A mutual fund receives all savings from households a_t and invests them in firm equity q_t and government bonds B. We assume that firm equity q_t is in unit net supply. The no-arbitrage condition (7) ensures that the return on equity equals r_t. Combined with asset market clearing and zero profits in the fund market, this implies that the return on households' assets also equals r_t.

However, in the first period after an unexpected shock, the no-arbitrage condition (7) does not hold, since the jump in q_0 and d_0 is unanticipated and was not priced into $q_{-1} = q_{ss}$. The unexpected excess return is paid to households according to the portfolio rule from Equation (3), and capital gains in period 0 are equal to

$$cap_0 = (1+g)\,\frac{(q_0 - q_{ss}) + (1-\tau_k)(d_0 - d_{ss})}{\int s(a_{ss}, A_{ss})d\Phi_{ss}},$$

the revaluation of equity relative to the price at which it was bought, in date-0 detrended units. For tractability, we also define a return including capital gains

$$r_t^{full} = r_t + cap_t \frac{\int s(a_{t-1}, A_{t-1})d\Phi_{t-1}}{A_{t-1}},$$

the unexpected gain expressed as a return on total household assets.

2.5 Market Clearing and Equilibrium

Definition 1 (Equilibrium)**.** *Let $\mathcal{A}$ be the space for assets, $\mathcal{E}$ the space for productivity, and $\mathcal{Z}$ the space for permanent type.*

An equilibrium in this economy is defined as paths, for $t \geq 0$, of household and firm decisions $\{a_t, c_t, K_t, d_t\}$, prices $\{r_t, q_t, w_t\}$, bequests $\{\eta_t\}$, capital gains cap_0, the tax policy $(\tau_\ell, \lambda, \tau_k, \tau_b)$, and distributions $\{\Phi_t\}$, such that, for all t: (1) households and firms solve their objective functions, (2) the sequence of distributions satisfies aggregate consistency conditions, (3) the government budget holds, and (4) all markets clear at all times:

1. *The asset market clears:* $\int_{\mathcal{A}\times\mathcal{E}\times\mathcal{Z}} a_t \, d\Phi_t = B + q_t$.

2. *The labor market clears:* $L_t = 1$.

3. *The goods market clears:* $Y_t = C_t + K_t - \dfrac{(1-\delta)K_{t-1}}{1+g} + G_t$.

3 Analytical Results

This paper examines the general-equilibrium effects of rising permanent labor income inequality. To build intuition, we begin with a simplified two-agent version of the model presented in Section 2.[14] We analyze a mean-preserving spread in which the rich agent's labor income z_1 increases while the poor agent's income $z_2 = 1 - z_1$ decreases by an equivalent amount. We also impose the following simplifications: the taste-for-wealth coefficient is normalized to $\gamma = 1$, a zero Stone-Geary constant ($\zeta = 0$), no idiosyncratic risk, death, or bequests, no growth ($g = 0$), and no government sector (zero labor, capital, and bequest taxes, public debt, and spending).[15] We assume a steady state exists and compare steady states before and after the increase in permanent labor income inequality.[16]

We establish three results. First, an increase in permanent labor income inequality lowers the interest rate and raises the wealth-to-output ratio. Second, the general-equilibrium response dampens the resulting increase in wealth inequality. Third, this trickle-down effect weakens with markups.

3.1 General-Equilibrium Effect of a Rise in Permanent Labor Income Inequality

Throughout this section, we focus on the case where wealth is a luxury good: $\sigma > \sigma_a$. We further maintain the following assumption.

[14] Each agent has unit mass, so that aggregate wealth is $A = a_1 + a_2$ and aggregate labor is $z_1 + z_2 = 1$.
[15] The $\zeta = 0$ assumption ensures that the borrowing constraint will never be binding for any agent.
[16] Additional details are provided in Online Appendix A.1.

Assumption 1. *The share of capital income in consumption of each agent satisfies* $ra_i/c_i < \sigma_a/\sigma$, $i = 1, 2$.

The household steady-state equation has at most two roots, and Assumption 1 holds at a root if and only if it is saddle-path stable (Online Appendix A.2). It binds for the rich agent, who holds more wealth per unit of permanent income. The condition is specific to the two-agent economy of this section, where each household must converge to a finite steady state. It does not carry over to the quantitative model of Section 2, in which the wealth of the top types grows without bound and stationarity of the distribution is restored by the presence of both idiosyncratic and mortality risk rather than by individual convergence.

Proposition 1. *Under Assumption 1, an increase in permanent labor income inequality increases desired savings in partial equilibrium:*

$$\partial \log A \equiv \sum_i \frac{\partial \log(a_i)}{\partial z_i} dz_i > 0. \tag{10}$$

Furthermore, the semi-elasticities of asset demand and supply, $\varepsilon^A \equiv d\log A/dr$ *and* $\varepsilon^q \equiv -d\log q/dr$*, taken at a fixed distribution of* z *and letting* w *and* K *adjust to* r*, are strictly positive, so that, for a given* $\partial \log A$*:*

1. *The equilibrium interest rate decreases*

$$dr = -\frac{\partial \log A}{\varepsilon^A + \varepsilon^q} < 0, \tag{11}$$

2. *The equilibrium wage increases*

$$d\log w = -\alpha \varepsilon^K dr > 0, \tag{12}$$

3. *The equilibrium wealth-to-output ratio increases*

$$d\log \frac{q}{Y} = \frac{\varepsilon^q - \alpha\varepsilon^K}{\varepsilon^A + \varepsilon^q} \partial \log A > 0. \tag{13}$$

where $\varepsilon^K \equiv -d\log(K)/dr$ *is the semi-elasticity of the capital stock with respect to the interest rate.*

Proof. See Online Appendix A.3. □

Equations (11) and (13) in Proposition 1 are the counterparts of the decomposition in Auclert et al. (2025) in our setting. The impact of higher permanent labor income inequality on the interest rate follows a standard supply-and-demand logic: when asset demand rises, prices must adjust to clear markets. This can be seen in Figure 1: the increase in permanent labor income inequality shifts the asset-demand curve to the right, raising the desired aggregate savings A at a given interest rate r. The equilibrium is determined by the intersection of the asset-supply (the price of the firm q) and desired savings A. The equilibrium change dr depends on the semi-elasticities of asset supply and demand, ε^q and ε^A.

The intuition behind Proposition 1 is as follows. When $\sigma_a < \sigma$, the taste for wealth is non-homothetic: wealth acts as a luxury good. Households with higher permanent labor income hold proportionally more wealth for the social status it confers, making savings an increasing and convex function of permanent income, as we documented in Section 1. A mean-preserving spread in permanent labor income therefore raises desired aggregate savings, $\partial \log A > 0$. Since both semi-elasticities are positive, $dr < 0$. The decline in the interest rate raises the value of firms and, in turn, the wealth-to-output ratio.

In the absence of a non-homothetic taste for wealth (either because $\gamma = 0$ or because $\sigma_a = \sigma$), savings would be linear in permanent labor income and the increase in permanent labor income inequality would not raise desired savings, so $\partial \log A = 0$. In this case, there would be no change in the interest rate, and the wealth-to-output ratio would remain unchanged. This highlights the critical role of non-homothetic wealth preferences in both matching the observed relationship between savings and permanent income, and generating the general-equilibrium effects described in Proposition 1.

3.2 The Trickle-Down Effect

We established that a rise in permanent labor income inequality lowers the interest rate. The resulting decline in r raises the price of the firm q and the capital stock K, altering the endogenous prices that govern household wealth accumulation: the return on assets r and wages w. These price adjustments, in turn, affect the distribution of wealth, which is the central object of interest in this paper. The magnitude of these price responses, and thus their implications for wealth inequality, depends critically on the degree of imperfect competition in the economy, summarized by the markup parameter μ.

Proposition 2. *Define $\varepsilon^{a_i} \equiv d\log(a_i)/dr$ for $i = 1, 2$ the semi-elasticity of the wealth of agent i. Under Assumption 1, the non-homothetic taste for wealth implies that the semi-elasticity of wealth is higher for the rich than for the poor, $\varepsilon^{a_1} > \varepsilon^{a_2}$, so that:*

$$\varepsilon^{a_1} - \varepsilon^{A} > 0, \tag{14}$$

and the general equilibrium effect ($dr < 0$) dampens the increase in wealth inequality following an increase in permanent labor income inequality:

$$(\varepsilon^{a_1} - \varepsilon^{A})\, dr < 0. \tag{15}$$

Proof. See Online Appendix A.4. □

The key insight of Proposition 2 is that non-homothetic wealth preferences imply $\varepsilon^{a_1} > \varepsilon^{a_2}$: the wealth of the rich is more sensitive to the interest rate than the wealth of the poor.[17] The aggregate semi-elasticity ε^{A} is a wealth-weighted average of ε^{a_1} and ε^{a_2}, so it lies below ε^{a_1}, and the percentage decline in the wealth of the rich exceeds the percentage decline in average wealth: the general-equilibrium price effect always dampens wealth inequality. The two-agent model has no bequests; in the quantitative model of Section 5, the bequest flow is large relative to the wealth of the bottom half, so the price adjustment

[17] Note that this also accounts for the wage channel: since $a = a(z, w(r), r)$, the total derivative is $da/dr = \partial a/\partial r + (\partial a/\partial w) \cdot (dw/dr)$. The wage channel can make ε^{a_2} negative: a lower r raises w, and the poor agent, whose income is mostly labor income, saves more.

lowers their wealth in levels far less than the wealth of the top groups, and raises their wealth share.

The trickle-down effect has direct welfare implications. The interest rate decline reduces capital income (in proportion to a_i) while raising wages. Because financial income represents a higher share of the income of the rich, and labor income a higher income share of the poor, this disproportionately benefits poorer households. Proposition 3 formalizes this under a stark $\beta = 0$ assumption: the general-equilibrium price adjustment reduces welfare inequality, and under perfect competition, it increases the welfare of the poor and decreases the welfare of the rich. Our quantitative model will show that this still holds in a more realistic setting.

Proposition 3. *Under Assumption 1, with $\beta = 0$, $\sigma > 1$, and $\sigma_a < 1$, the general-equilibrium price change $dr < 0$ increases the welfare of the poor more than the welfare of the rich. Moreover, at $\mu = 1$, the price effect is fully redistributive: $\Delta U_1 < 0 < \Delta U_2$.*

Proof. See Online Appendix A.5. □

3.3 Imperfect Competition vs Trickle Down

We now examine how markups affect the trickle-down effect, proceeding in two steps. First, we show that higher markups dampen the equilibrium price response, reducing $|dr|$. Second, we show that this in turn weakens $|(\varepsilon^{a_1} - \varepsilon^{A})dr|$, the overall trickle-down effect on wealth inequality.

A rise in markups operates through three channels: (i) it increases the value of firms and its sensitivity to r by raising monopoly rents; (ii) it reduces the capital stock, as the firm restricts output to protect its rents, which also lowers w; and (iii) it raises the equilibrium interest rate. The first channel is the one that matters: the firm value at the steady state can be written as

$$q = K + \underbrace{\alpha \frac{\mu - 1}{\mu} \frac{Y}{r}}_{\text{capitalized value of rents}}. \tag{16}$$

When r falls, this valuation channel increases q even if K responds only modestly, raising q/K, the average Tobin's Q, a mechanism absent under perfect competition. ε^q therefore increases with μ at a given r: the asset-supply curve of Figure 1 is flatter, a smaller change in r clears the asset market for a given $d\log A$, and the change in K, and hence in output and wages, is smaller than the change in q. Channels (ii) and (iii) require total differentiation of the equilibrium conditions; to obtain analytical results we set $\beta = 0$ and consider a local increase in markups around perfect competition, $\mu = 1$.

Proposition 4. *Set $\beta = 0$ and consider a local increase in the markup at $\mu = 1$. For a given partial-equilibrium increase in savings $\partial \log A$, a higher markup μ:*

1. *Under sufficient conditions stated in Online Appendix A.6, which hold at the calibrated parameter values, raises $\varepsilon^A + \varepsilon^q$ and thus decreases the equilibrium fall in the interest rate $|dr|$;*

2. *Decreases $|(\varepsilon^{a_1} - \varepsilon^A)dr|$, the magnitude of the trickle-down effect, keeping $\varepsilon^{a_1} - \varepsilon^A$ constant;*

3. *Decreases $\varepsilon^{a_1}/\varepsilon^A$ whenever the effect of the markup on this ratio through the equilibrium rise in r dominates its direct effect at a given r, which holds at the calibrated parameter values, further weakening the trickle-down effect.*

Proof. See Online Appendix A.6 and A.7. □

4 Calibration

We calibrate the model to the U.S. economy in 1970, at the annual frequency. Table 1 summarizes the calibration.

Table 1: Calibration of the model

Parameter	Description	Value	Source
Households			
$\tilde{\beta}$	Discount factor (detrended)	0.98	Annual r of 3%.
σ	CRRA on consumption	2.00	Standard.
σ_a	CRRA on wealth	0.89	Cons./wealth Pareto tails θ^c/θ^a.
γ	Strength of taste for wealth	0.65	Top 1% wealth share, 1970.
ζ	Stone-Geary shifter	25.11	Wealth to permanent labor income elasticity, 1.6.
ξ	Death probability	0.02	Wealth Pareto tail, given r and g.
ρ, σ^e	Persistence and s.d. of shocks (annual)	(0.9, 0.5)	Storesletten et al. (2004).
$\{\psi_0, \psi_1, \psi_2\}$	Portfolio shares	(1.0, 0.35, 2.62)	SCF 1989–2019, pooled.
Firms			
α	Cobb-Douglas	0.33	Standard.
δ	Depreciation	0.047	Annual W/Y of 3.7.
Z	TFP	0.65	$Y = 1$
μ	Markup	1.20	Below De Loecker et al. (2020).
g	Productivity growth	1.50%	Growth per capita, 1970–2019.
Government			
B_{ss}	Public debt	0.19	FRED.
G_{ss}	Government spending	0.28	Budget residual.
τ_ℓ	Labor tax	0.30	Standard.
λ	Tax progressivity	0.11	Ferrière and Navarro (2018).
τ_k	Capital income tax	0.53	McGrattan and Prescott (2005).
τ_b	Bequest tax	0.38	Bequest flow 4.5% of Y.

4.1 Calibration Strategy

Growth and preferences. We set the real interest rate r to 3%, growth per capita g to 1.5% and the coefficient of relative risk aversion σ to 2. The curvature of the taste for wealth σ_a and the death probability ξ follow from the Pareto tails of wealth and consumption. Following Gaillard et al. (2023), the tail exponents in the model are approximately[18]

$$\theta^a = -\frac{\log(1-\xi)}{\log\left(\frac{1+r}{1+g}\right)}, \qquad \theta^c = \theta^a \frac{\sigma}{\sigma_a},$$

and their long-run U.S. estimates, $\theta^a = 1.35$ and $\theta^c/\theta^a = 2.24$, give $\xi = 0.02$, implying an average working lifetime of 50 years, and $\sigma_a = 0.89$. The level of the taste for wealth γ and the Stone-Geary shifter ζ are set jointly: γ matches the top 1% wealth share of 26.9% in 1970 in Piketty et al. (2018), and ζ matches a cross-sectional elasticity of wealth to permanent labor income of 1.6, giving $\gamma = 0.65$ and $\zeta = 25.1$. The detrended discount

[18]See Online Appendix B.1 for the derivation.

factor $\tilde{\beta} = 0.98$ clears the asset market at $r = 3\%$. The resulting marginal propensity to save out of a permanent rise in labor income rises steeply with permanent income (Online Appendix Table B.3), the gradient that Section 3 identified as the source of the price effect.

Online Appendix Table B.1 reports the wealth shares in the model against the data. The model reproduces the top 1% and top 0.1% wealth shares but understates the share of the next 9% of the distribution, 33.5% against 42.2% in the data, a version of the "missing middle" of one-asset models discussed by Kaplan & Violante (2022).

Labor income. The persistence of idiosyncratic shocks ρ is 0.9 and the standard deviation of their innovations σ^e is 0.5, in the range of the annual estimates of Storesletten et al. (2004); the process is discretized with the Rouwenhorst method. The five permanent productivity levels z_i stand for the bottom 50%, next 40%, next 9%, next 0.9%, and top 0.1% of the distribution of pre-tax labor income, and match the labor income shares of these groups in Piketty et al. (2018).

Portfolio shares. The portfolio rule of Equation (3), which allocates the capital gains of period $t = 0$ after a shock, is fitted to the share of net worth held in claims on firms (equity held directly and through funds, private business equity, and other nonfinancial assets, the risky assets of Figure 4) along the wealth distribution, pooling the Survey of Consumer Finances waves from 1989 to 2019 (Online Appendix B.6). Section 6.2 reports the results under alternative rules.

Bequests. The death probability implies a gross flow of accidental bequests of 7.3% of output, in the range of the annual inheritance flows measured by Alvaredo et al. (2017). We set the tax on inheritances $\tau_b = 0.38$ to match the net inheritance flow reported in Straub (2019). We call τ_b a bequest tax, but it stands for everything that separates the wealth of the dying from the endowment of the next generation, estate taxes, charitable bequests and consumption late in life.

Government and taxes. Public debt is 19% of GDP, the federal debt held by domestic private investors in 1970. Labor income is taxed at an average rate $\tau_\ell = 30\%$ with progressivity $\lambda = 0.11$, close to the 1970–2010 average of the federal income tax progressivity series of

Ferrière & Navarro (2018). Distributed profits are taxed at $\tau_k = 0.53$, the composite $1 - (1 - \tau_c)(1 - \tau_d)$ of the effective corporate income tax, $\tau_c = 0.35$, and the effective marginal tax on distributions, $\tau_d = 0.275$. McGrattan & Prescott (2005) estimate a corporate income tax of 43% in the 1960s and 35% in the 1990s, and a tax on distributions of 41% and 17%; the tax is held fixed over the transition, so we set both rates at or between their 1960s and 1990s values. We do not tax accrued capital gains: gains are taxed on realization, deferral roughly halves the effective burden, so the accrual-equivalent rate is far below the statutory 25–35% (Bailey 1969, Protopapadakis 1983). Government spending is the residual of the budget constraint and public debt is held fixed along the transition.

Firms. We set the markup μ to 1.2, standard in the literature and at the lower end of the 1960s and 1970s values of De Loecker et al. (2020) (Online Appendix B.7). Section 6.2 reports the results for markups between 1 and 1.3. The elasticity of output with respect to capital α is $1/3$, and Z and δ match an output level of one and a wealth-to-output ratio $(q + B)/Y$ of 3.7, the average ratio of household net worth to GDP over 1950–1970. Given the tax wedge, this delivers a capital-output ratio of 3.6, a depreciation rate of 4.7%, and a Tobin's Q of 0.95, above its measured 1970 values of 0.75 for the household sector in Piketty et al. (2018) and 0.44 for nonfinancial corporations in Brun & Gonzalez (2017). The level of Tobin's Q in 1970 does not drive the results below: what matters is the response of firm value to the interest rate, $-dr/(r - g)$ per unit of rents, which is the same whatever the initial level.[19]

[19]For the perfect-competition benchmark, we re-calibrate Z and δ so that r, w, and the wealth-to-output ratio hit the same targets. The household side, and therefore the 1970 wealth distribution, is then identical to the baseline; only the asset-supply side differs.

5 The General-Equilibrium Effect of Rising Permanent Labor Income Inequality: Steady State and Impact Dynamics

We now use the full quantitative model to answer two questions: how large is the trickle-down effect, and what are the dynamics of wealth inequality after the shock? At the steady state, markups only dampen the trickle-down effect; along the transition, they overturn it, because the rise in inequality creates capital gains that accrue to the wealthy.

5.1 Steady state

We compare steady states with the 1970 and the 2019 distributions of permanent labor income, in the baseline economy ($\mu = 1.2$) and under perfect competition ($\mu = 1$).

Table 2 reports the relevant elasticities and the implied change in r in the two economies. Consistent with the mechanism highlighted in Section 3, the asset-supply elasticities are higher in economies with higher markups, which also reduces the adjustment in r required to clear the asset market when inequality increases. Thus, in the perfect competition economy, the interest rate decreases by 76 b.p., against 56 b.p. in our baseline economy ($\mu = 1.2$). For comparison, Auclert et al. (2025) attribute a fall of 92 basis points over 1950–2024 to rising inequality in a steady-state decomposition of the decline in r; our comparison of steady states covers the 1970–2019 rise in labor income inequality only. The wealth-to-output ratio, however, increases by 117 p.p. in our baseline model, against 68 p.p. in the perfect competition economy. The two economies start from the same 1970 wealth distribution and the same wealth-to-output ratio, since Z and δ are re-calibrated at each markup. Thus, the difference comes from the asset-supply side alone. Even a low level of imperfect competition thus dampens the adjustment in r that clears the asset market after a rise in asset demand.

These price changes dampen the increase in wealth inequality provoked by the rise in

Table 2: Elasticities at the steady state

Model	$\partial \log A$	ε^q	ε^A	dr	$d \log Y$	d(A/Y)
$\mu = 1.0$	0.7	31.1	43.2	-76.4	9.6	68.2
$\mu = 1.2$	0.7	44.2	47.9	-55.7	3.8	117.0

Note: Interest rate change *dr* reported in basis points (1 p.p. = 100 basis points). Note that the reported change *dr* does not fully match our baseline formula because of non-linearities in the model, and the large size of the shock.

permanent labor income inequality. To quantify this channel, Table 3 decomposes the general-equilibrium contribution of r, w, and η to changes in average wealth levels within each quantile, holding permanent labor income constant and varying only equilibrium prices. Because permanent labor income is more equally distributed than capital income, and capital income represents a larger share of total income at the top of the wealth distribution, the decline in r reduces income disproportionately at the top, while the rise in w benefits households more evenly. The total general-equilibrium effect decreases the wealth levels of the top 1% (0.1%) by 38% (57%) under perfect competition, compared with 35% (52%) in our baseline economy. Most of the decrease in top wealth levels comes from the decline in the real interest rate. Table C.2 in the Online Appendix shows that the results for the top 1% and the top 0.1% carry over to wealth shares.

Table 3: General equilibrium effect on wealth levels at the steady state

Variable	Model	Bottom 50%	Next 40%	Top 10%	Top 1%	Top 0.1%	Top 0.01%	Average
r	$\mu = 1.0$	-31	-26	-40	-50	-65	-83	-35
	$\mu = 1.2$	-24	-20	-33	-42	-57	-76	-28
w	$\mu = 1.0$	9	16	25	25	26	29	21
	$\mu = 1.2$	3	6	9	10	10	11	8
η	$\mu = 1.0$	19	15	6	5	4	4	10
	$\mu = 1.2$	24	18	8	6	5	5	12
Total	$\mu = 1.0$	-11	-3	-24	-38	-57	-79	-16
	$\mu = 1.2$	-3	0	-23	-35	-52	-73	-14

Note: This table displays the percent change in the average wealth levels (divided by average income) for each quantile due to the general equilibrium effect. Note that due to non-linearities in the policy functions, the sum of the partial effects does not add up to the total general equilibrium effect.

5.2 One-Time Permanent Transitions

We now turn to the transition that follows a one-time increase in permanent labor income inequality. Figure 5 plots the value of firms and the capital stock, average Tobin's Q, the return on wealth and the wage along the transition, in the two economies.

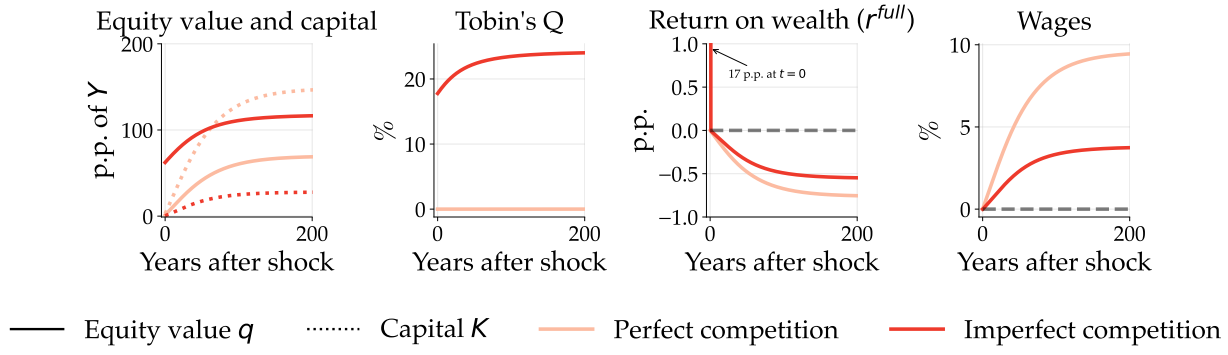


Figure 5: Equity value, capital, Tobin's Q, return on wealth and wages following a one-time increase in permanent labor income inequality

Note: Changes from the 1970 steady state. Equity value q and capital K in percentage points of output; Tobin's Q in percent; the return on wealth is $r^{full} = r + cap_0 \times \int s(a)\, d\Phi/A$, which includes the unexpected capital gain of the first period, off the scale of the panel and reported by the arrow; wages in percent. Under perfect competition $q = (1 - \tau_k)K$, so the equity value rises by 0.47 times the rise in capital.

Under perfect competition, the rise in aggregate savings induced by higher permanent

labor income inequality is absorbed entirely through an expansion of the physical capital stock. Asset prices follow the stock of capital one-for-one, so average Tobin's Q is constant, and the adjustment operates entirely through quantities. The interest rate declines smoothly as capital accumulates, and the value of firms rises only as fast as the capital stock. Because wealth accumulation reflects slow movements in physical assets rather than valuation effects, its dynamics are slow and progressive.

When firms operate under imperfect competition, the long-run decline in the real interest rate translates primarily into higher firm valuations rather than a commensurate increase in the capital stock. Since equity prices are forward looking, the higher long-run value of firms induces an immediate jump in their price at the time of the shock. This generates a jump in Tobin's Q and in the value of firms on impact, while the capital stock barely moves, together with a one-time rise in the realized return due to unexpected capital gains. This pattern, an increase in the wealth-to-output ratio driven mostly by valuation effects, matches the dynamics observed in the U.S. data that we documented previously.

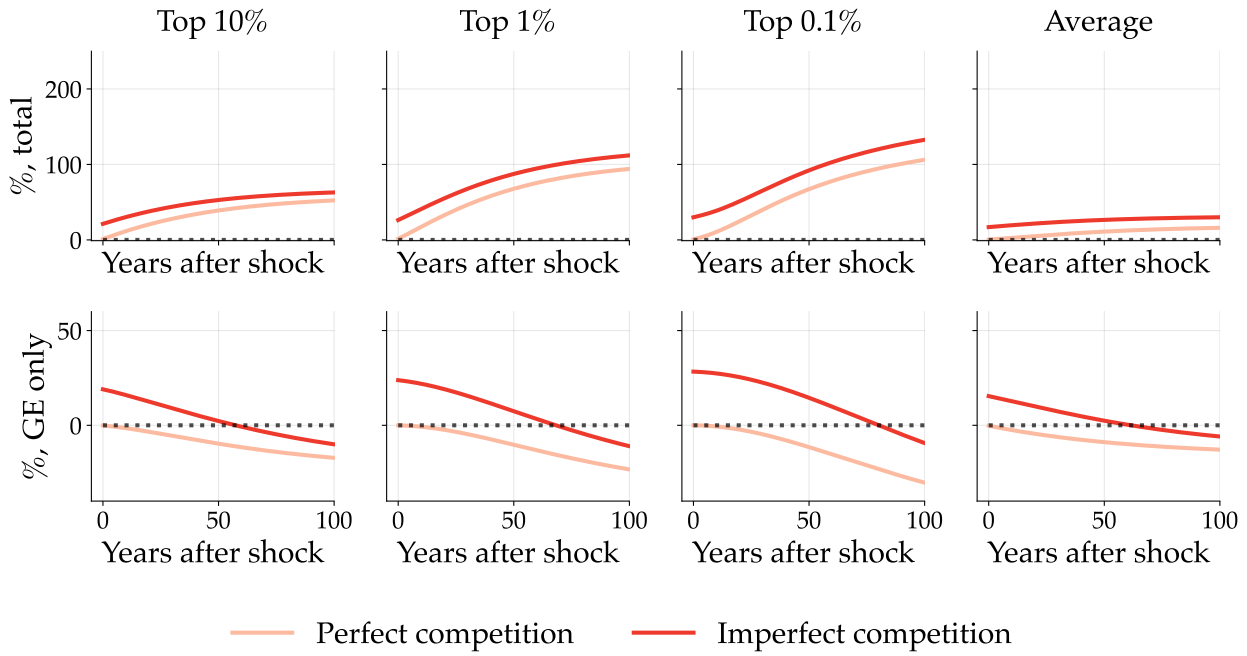


Figure 6: Change in wealth levels by wealth group following a one-time increase in permanent labor income inequality

Note: The top row shows the percent change in the average wealth level of each wealth group following a permanent labor income inequality shock. The second row shows the price (general-equilibrium) effect alone, in percent of the 1970 level. The bottom 50%, the next 40% and the top 0.01% are reported in the tables only.

Figure 6 reports the total change in the top wealth levels (first row) and the general-equilibrium effect (second row). Throughout the quantitative analysis, we measure the general-equilibrium (or price) effect as the change in the average wealth of a group, relative to its 1970 steady-state level, induced by the realized paths of r, w, capital gains, and bequests when the distribution of permanent labor income is held at its 1970 level. Under perfect competition, the general equilibrium strictly reduces wealth inequality: the decline in interest rates reduces financial income at the top, while labor income is less unequally distributed than capital income, and represents a larger share of total income at the bottom.

With imperfect competition, however, the valuation channel dominates in the short and medium run. The price jump at the time of the shock generates sizable capital gains for asset-rich households, producing an immediate increase in top wealth levels and accelerating the convergence toward the high-inequality steady state. In this case, the general-equilibrium effect is positive on impact and quantitatively large in the early phases of the transition. The general-equilibrium effect increases the average wealth of the top 1% (0.1%) by 24% (28%) on impact, against 7% for the bottom 50% and 11% for the next 40%, and the effect on the top 0.1% remains positive for eight decades.

Figure 7 decomposes this sign reversal for the top 0.1%, channel by channel. Each of the first four columns is a partial-equilibrium experiment: the distribution of permanent labor income stays at its 1970 value, and households face the realized path of a single price. The top row reports the wealth of the top 0.1%, and the bottom row repeats the same experiments for average wealth, on the same scale. Under imperfect competition, the capital gains increase the wealth level of the top 0.1% by 29%. Although capital gains are paid only on impact, their effect persists, and the total general equilibrium effect remains positive for 81 years. Under perfect competition, the only forces are the slow decline in r, which alone lowers the wealth of the top 0.1% by 65% in the long run, and the smaller offsetting rise in w and in bequests (Table 3). In the absence of revaluation, the price effect is negative at every horizon.

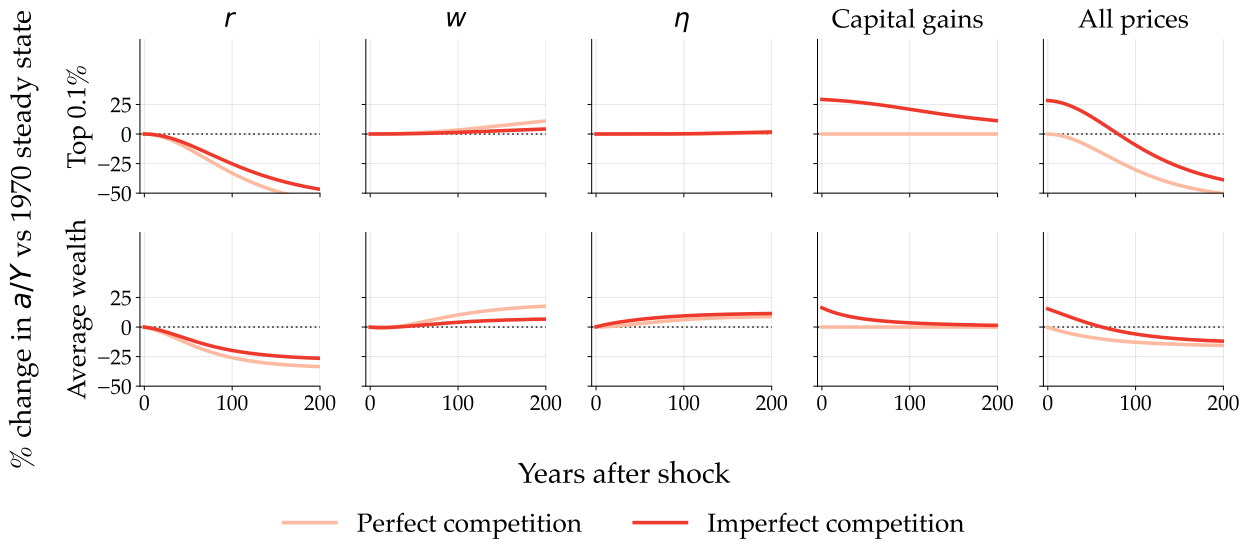


Figure 7: Anatomy of the price channels after a one-time rise in permanent labor income inequality: wealth of the top 0.1%

Note: Percentage change of wealth per capita relative to output (a/Y) with respect to the 1970 steady state, along the transition that follows a one-time, permanent and unanticipated rise in permanent labor income inequality. The top row reports the average wealth of the top 0.1%, the bottom row average wealth in the economy. Each column is a partial-equilibrium experiment: the labor income process stays at its 1970 value and households face the realized path of one price only, the interest rate r, the wage w, the inheritance flow η, or the capital gains on equity, which arise only at $t = 0$ since the shock is unanticipated. 'All prices' feeds the four price paths jointly, and is the price (trickle-down plus valuation) channel of the paper. r and w are predetermined at $t = 0$, so their impact effects are zero by construction, and capital gains vanish in the long run. Because the channels interact, the four single-price columns do not add up exactly to the last one.

6 The U.S. Transition, 1970–2019

Section 5.2 considered a stylized experiment in which permanent labor income inequality jumps immediately from its 1970 level to its 2019 level. In the data, inequality rose gradually over five decades, so we now feed the model the observed 1970–2019 path of permanent labor income inequality, one year at a time: in each period, the economy is hit by a one-time, unanticipated MIT shock, and households understand its implications for current and future prices but do not foresee future shocks.

6.1 Quantitative Results

Figure 8 plots the price paths against the data. The exercise is not a fit, but aims at estimating the share of the trends that can be explained by our mechanism. The model is fed with the rise in permanent labor income inequality only, and the other drivers of valuations, such as rising markups, risk premia and corporate taxes, are held fixed (Brun & Gonzalez 2017, Gonzalez & Trivin 2019, Farhi & Gourio 2018). This one force generates two fifths of the observed rise in the wealth-to-output ratio and a quarter of the rise in Tobin's Q, and it reproduces the composition of the accumulation: capital gains account for about three quarters of the change in wealth in the model as in the data. Both require imperfect competition: without markups, the model generates a tenth of the observed rise in the wealth-to-output ratio, and none of it through valuations.

With markups, the wealth-to-output ratio rises by 23% by 2020, almost entirely through firm values: the capital stock barely moves, and Tobin's Q rises from 0.95 to 1.15. Each surprise raises firm values on impact, and these capital gains lift the realized return on wealth above the interest rate, even as the interest rate itself falls, by 20 basis points by 2020. Under perfect competition, the same saving pressure is absorbed by investment, a slow-moving variable: Tobin's Q is constant, the wealth-to-output ratio rises a quarter as much, and the return on wealth falls steadily, with no capital gains to offset it.

Figure 9 reports the average wealth of each group relative to its 1970 level, along the full transition (top row) and along the price-only transition (bottom row). The full transition raises the average wealth of the top 1% and of the top 0.1% by about 60% by 2020, relative to trend, roughly half of the observed rise for the top 1% and a third for the top 0.1%.[20] The price effect alone accounts for 18 and 25 points of these gains, and the gain rises along the wealth distribution, from 4% for the bottom half to 8% on average. Under perfect competition, the full transition still raises top wealth, but, importantly, the price effect lowers the wealth of every group, by 4% at the top and by 9% for the bottom half: with no revaluation, the price effect is the trickle-down channel alone, and by 2020 the

[20] Real average wealth per adult of the group from Piketty et al. (2018), 1970 to 2019, detrended at the model's 1.5% growth rate.

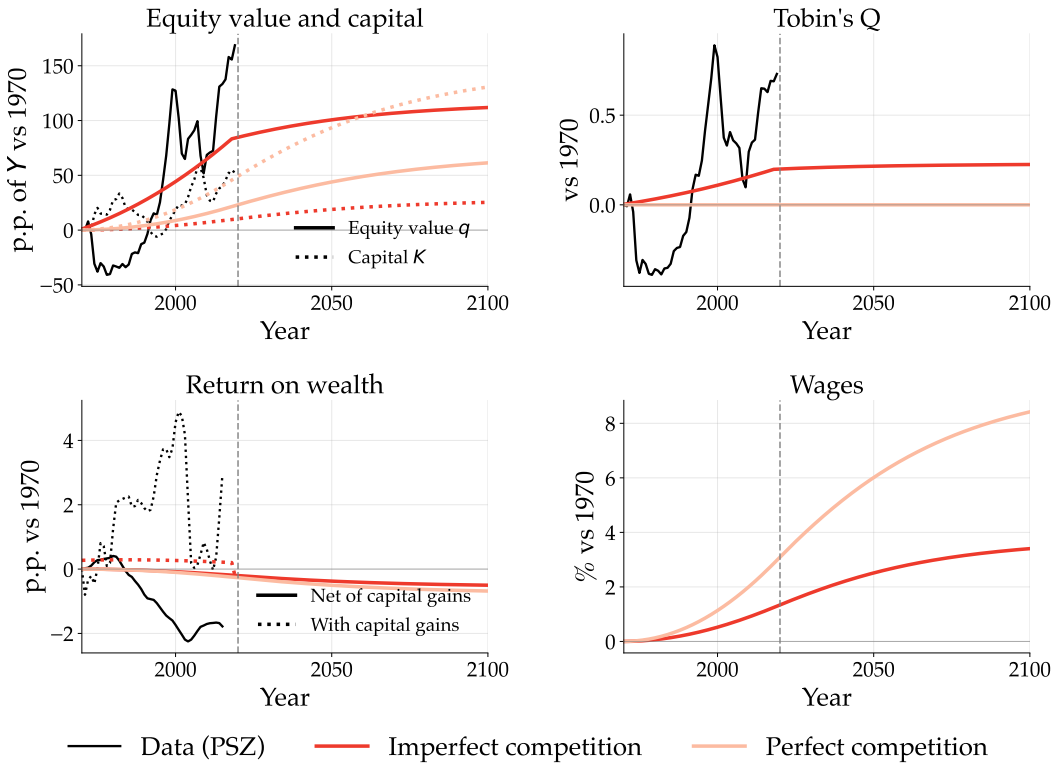


Figure 8: Prices along the gradual increase in permanent labor income inequality, model and data

Note: All series as changes since 1970; black lines are data from Piketty et al. (2018) to 2019, colored lines the model along the gradual transition with annual surprises to 2100; the vertical line marks 2020. Equity value and capital in percentage points of output (data: corporate equity at market value and corporate capital at replacement cost, the two ingredients of Tobin's Q, in percent of GDP; model: q and K). Return on wealth in percentage points (data: capital income over household wealth, and the total real return on household wealth including capital gains, both as ten-year centered moving averages; model: r, and r^{full}, which adds the unexpected capital gains at each revelation date divided by aggregate wealth). Wages in percent of their 1970 level, relative to trend; the data have no counterpart at this level of abstraction.

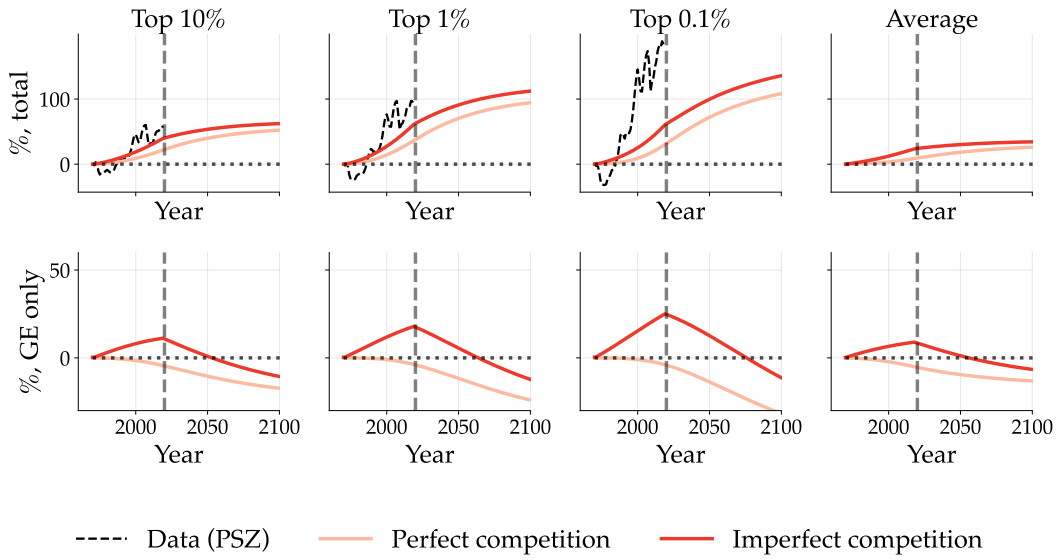


Figure 9: Change in wealth levels by wealth group following a gradual increase in permanent labor income inequality

Note: Average wealth of the top groups and of all households in percent of its 1970 level, relative to trend. Top row: full transition, with the PSZ data (real average wealth per adult of the group, detrended at 1.5%) as the dashed line. Bottom row: price-only transition, which holds permanent labor income at its 1970 distribution and feeds households the realized paths of r, w, capital gains and bequests.

lower interest rate has cost the bottom half more than the higher wage has brought them. The price effect accounts for most of the gap in top wealth between the two economies.

The gains at the top are persistent: even in the absence of further shocks, the price effect remains positive until the 2060s for the top 1% and the 2070s for the top 0.1%, before converging in the long run to the steady-state losses of Section 5.1, -35% for the top 1% and -52% for the top 0.1%. The trickle-down channel identified there is still present with markups, but it takes a century to dominate: as long as the rise in inequality comes as a sequence of surprises, the revaluation of firms keeps top wealth above its path at constant prices.

These price changes have direct welfare implications, which we measure by an equivalent variation in wealth: for a household with permanent income z and assets a in the 1970 steady state, the transfer $\tau(z,a)$ solves $V^{ss}(z,a+\tau) = V_0(z,a)$, where V_0 is the realized discounted utility along the myopic path and V^{ss} the value of remaining in the initial steady state, so that a positive τ means that the household gains from the price

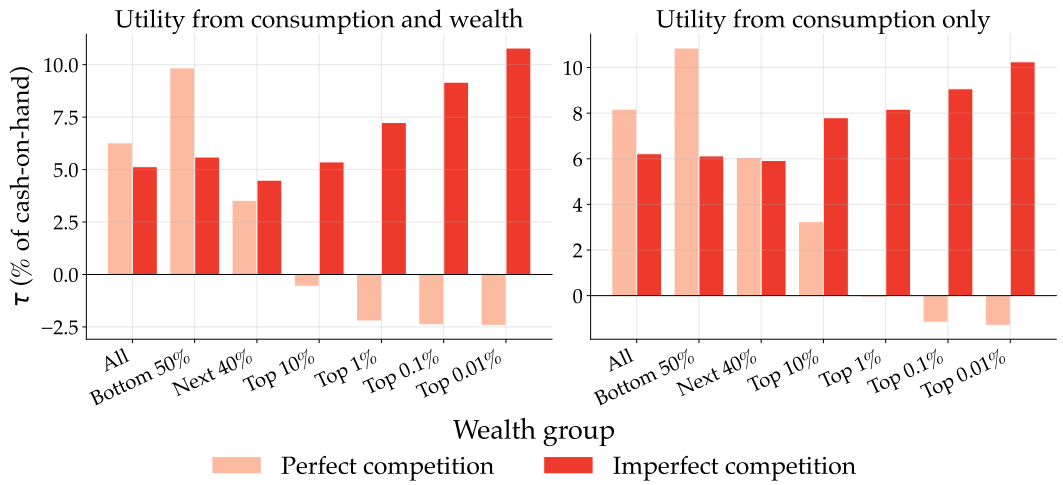


Figure 10: Transfer-equivalent welfare effect of the general-equilibrium price changes, following a gradual increase in permanent labor income inequality

Note: $\tau(z,a)$ solves $V^{ss}(z,a+\tau) = V_0(z,a)$; left panel: utility from consumption and wealth, right panel: utility from consumption only. Group averages of τ as a share of beginning-of-period resources $(1+r)a/(1+g)+y$. Value functions are computed along the realized myopic path.

changes. Figure 10 reports group averages of τ, as a share of beginning-of-period resources $(1+r)a/(1+g)+y$, under the full period utility $u(c)+v(a)$ and under the utility from consumption alone.

Under perfect competition, the price changes benefit the bottom 90% of households and hurt the top 10%, 1% and 0.1% (left panel; with utility from consumption alone, the losses are confined to the top 0.1%). Under imperfect competition, the pattern reverses: the top benefits more than the bottom. At the top the reason is timing: the front-loaded capital gains outweigh the lower long-run returns, which are heavily discounted at $t = 0$. In short, along the U.S. transition the revaluation of firms dominates the trickle-down channel for five decades: with markups the price effect raises top wealth and top welfare, without them it lowers both.

6.2 Robustness

The headline number rests on four choices: the level of the markup, which sets whether saving pressure becomes capital gains rather than capital; the portfolio rule, which allo-

cates these gains across households; the expectations process, which sets how much of the revaluation is unanticipated; and trend growth, which sets the rate at which rents are capitalized. Table 4 varies each in turn, together with the bequest rule and the progressivity of the labor income tax, reporting the price effect on group average wealth in 2020, as in Figure 9. The result is qualitatively robust: with any market power, the price effect raises top wealth levels in 2020, and the alternative assumptions change only its magnitude.

Expectations matter least: the effect on the top 0.1% falls from 25% with annual surprises to 22% when households learn ten years of the path at once, and to 15% under perfect foresight, where the single revaluation of 1970 is followed by five decades of lower returns. The portfolio rule matters more: a flat exposure profile, either a constant portfolio share or the broad definition of risky assets that adds housing, spreads the same aggregate gain evenly, 12% for the top 0.1% against 8% on average, so what concentrates the effect at the top is the slope of the exposure profile in Figure 4. Growth matters most: rents are capitalized at $r - g$, so without growth the same fall in r moves firm values half as much and the effect on the top 0.1% falls to 1%. The level of the markup is immaterial once it is positive, 22% to 25% at markups between 1.1 and 1.3, because a lower markup means fewer rents but a larger fall in r; under perfect competition the effect is -4%. Equal bequests trim it to 21%, and a flat labor income tax raises it to 33%, since progressivity compresses the post-tax rise in inequality that drives every price.

Table 4: Price channel effect on average wealth levels in 2020 across model variants

	Top 10%	Top 1%	Top 0.1%	Top 0.01%	Average
Markup					
$\mu = 1.0$	-4.6	-4.0	-4.1	-4.3	-5.4
$\mu = 1.1$	8.7	15.0	21.9	27.1	6.3
$\mu = 1.2$ (baseline)	10.8	17.6	24.8	30.3	8.4
$\mu = 1.3$	11.3	17.9	24.8	30.1	8.9
Portfolio rule ($\mu = 1.2$)					
Broad incl. housing	8.4	10.9	12.7	13.2	7.8
Constant share	8.3	10.7	12.4	12.9	7.8
Expectations ($\mu = 1.2$)					
5-year window	10.0	16.4	23.4	28.8	7.9
10-year window	9.1	15.2	21.9	26.9	7.4
Perfect foresight	5.6	9.6	14.5	18.2	5.3
Growth, bequests, taxes ($\mu = 1.2$)					
No growth ($g = 0$)	-1.4	0.1	1.1	1.9	-2.3
Equal bequest redistribution	8.4	14.9	21.2	26.1	6.4
Flat labor tax ($\lambda = 0$)	15.0	23.3	32.9	40.3	12.4

Note: Price (general equilibrium) channel effect on the average wealth level of each group in 2020, in percent of its 1970 level, holding the income distribution at its 1970 value. Online Appendix C.2 describes each variant.

7 Conclusion

Because rich households save a larger share of their permanent income, a rise in permanent labor income inequality raises desired saving, and prices must adjust for asset markets to clear. This paper studied the effect of this price adjustment on the distribution of wealth, and showed that it depends on imperfect competition. At the steady state, imperfect competition dampens the trickle-down effect: capitalized rents flatten asset supply, so the interest rate falls less and wages rise less. Along a transition, it creates capital gains: the lower rates are capitalized into firm values at the time of the shock, and accrue to the holders of existing assets. In the quantitative model fed with the observed 1970–2019 rise in U.S. permanent labor income inequality, the price effects raise the average wealth of the top 0.1% by 25% by 2020, against a 4% loss under perfect competition. The size of the valuation channel depends on the gap between the interest rate and the growth rate, at which rents are capitalized: at the U.S. value of 1.5%, a small markup overturns the trickle-down channel for a century.

References

Alvaredo, F., Garbinti, B. & Piketty, T. (2017), 'On the share of inheritance in aggregate wealth: Europe and the USA, 1900–2010', *Economica* **84**(334), 239–260.

Auclert, A., Bardóczy, B., Rognlie, M. & Straub, L. (2021), 'Using the sequence-space Jacobian to solve and estimate heterogeneous-agent models', *Econometrica* **89**(5), 2375–2408.

Auclert, A., Malmberg, H., Rognlie, M. & Straub, L. (2025), The race between asset supply and asset demand, Technical report, National Bureau of Economic Research.

Auclert, A. & Rognlie, M. (2018), Inequality and aggregate demand, Working Paper 24280, National Bureau of Economic Research.

Auten, G. & Splinter, D. (2024), 'Income inequality in the United States: Using tax data to measure long-term trends', *Journal of Political Economy* **132**(7), 2179–2227.

Bach, L., Calvet, L. E. & Sodini, P. (2020), 'Rich pickings? Risk, return, and skill in household wealth', *American Economic Review* **110**(9), 2703–2747.

Bailey, M. J. (1969), Capital gains and income taxation, *in* A. C. Harberger & M. J. Bailey, eds, 'The Taxation of Income from Capital', Brookings Institution, Washington, DC.

Bauluz, L., Novokmet, F. & Schularick, M. (2022), The anatomy of the global saving glut, Discussion Paper 17215, CEPR.

Beare, B. K. & Toda, A. A. (2022), 'Determination of Pareto exponents in economic models driven by Markov multiplicative processes', *Econometrica* **90**(4), 1811–1833.

Bénabou, R. (2002), 'Tax and education policy in a heterogeneous-agent economy: What levels of redistribution maximize growth and efficiency?', *Econometrica* **70**(2), 481–517.

Benhabib, J., Bisin, A. & Luo, M. (2019), 'Wealth distribution and social mobility in the US: A quantitative approach', *American Economic Review* **109**(5), 1623–1647.

Braxton, J. C., Herkenhoff, K., Rothbaum, J. & Schmidt, L. (2025), 'Changing income risk across the US skill distribution: Evidence from a generalized Kalman filter', *American Economic Review* **115**(12), 4438–4475.

Brun, L. & Gonzalez, I. (2017), Tobin's Q and inequality. Available at SSRN 3069980.

Brun, L., Gonzalez, I. & Montecino, J. (2023), Corporate taxation and market power wealth. Available at SSRN 4410717.

Carroll, C. D. (1998), Why do the rich save so much?, Working Paper 6549, National Bureau of Economic Research.

Carroll, C. D. (2006), 'The method of endogenous gridpoints for solving dynamic stochastic optimization problems', *Economics Letters* **91**(3), 312–320.

Cioffi, R. (2025), Heterogeneous risk exposure and the dynamics of wealth inequality. Working Paper, Paris School of Economics.

De Loecker, J., Eeckhout, J. & Unger, G. (2020), 'The rise of market power and the macroeconomic implications', *The Quarterly Journal of Economics* **135**(2), 561–644.

De Nardi, M. (2004), 'Wealth inequality and intergenerational links', *The Review of Economic Studies* **71**(3), 743–768.

DeBacker, J., Heim, B., Panousi, V. & Vidangos, I. (2011), Rising inequality: Transitory or permanent? New evidence from a US panel of household income 1987–2006, Finance and economics discussion series working paper, Board of Governors of the Federal Reserve System.

Dynan, K. E., Skinner, J. & Zeldes, S. P. (2004), 'Do the rich save more?', *Journal of Political Economy* **112**(2), 397–444.

Eggertsson, G. B., Robbins, J. A. & Wold, E. G. (2021), 'Kaldor and Piketty's facts: The rise of monopoly power in the United States', *Journal of Monetary Economics* **124**, S19–S38.

Fagereng, A., Guiso, L., Malacrino, D. & Pistaferri, L. (2020), 'Heterogeneity and persistence in returns to wealth', *Econometrica* **88**(1), 115–170.

Fagereng, A., Holm, M. B., Moll, B. & Natvik, G. (2019), Saving Behavior Across the Wealth Distribution: The Importance of Capital Gains, Technical Report w26588, National Bureau of Economic Research, Cambridge, MA.

Farhi, E. & Gourio, F. (2018), Accounting for macro-finance trends: Market power, intangibles, and risk premia, Technical report, National Bureau of Economic Research.

Favilukis, J. (2013), 'Inequality, stock market participation, and the equity premium', *Journal of Financial Economics* **107**(3), 740–759.

Feldstein, M. S. (1969), 'The effects of taxation on risk taking', *Journal of Political Economy* **77**(5), 755–764.

Ferrière, A. & Navarro, G. (2018), The heterogeneous effects of government spending: It's all about taxes, International Finance Discussion Paper 1237, Board of Governors of the Federal Reserve System.

Gabaix, X., Lasry, J.-M., Lions, P.-L. & Moll, B. (2016), 'The Dynamics of Inequality', *Econometrica* **84**(6), 2071–2111.

Gaillard, A., Wangner, P., Hellwig, C. & Werquin, N. (2023), Consumption, wealth, and income inequality: A tale of tails. Available at SSRN 4636704.

Garbinti, B., Goupille-Lebret, J. & Piketty, T. (2021), 'Accounting for Wealth-Inequality Dynamics: Methods, Estimates, and Simulations for France', *Journal of the European Economic Association* **19**(1), 620–663.

Gomez, M. (2025), 'Wealth inequality and asset prices', *The Review of Economic Studies* **92**(6), 3924–3967.

Gonzalez, I. & Trivin, P. (2019), The global rise of asset prices and the decline of the labor share. Available at SSRN 2964329.

Greenwald, D. L., Lettau, M. & Ludvigson, S. C. (2025), 'How the wealth was won: Factor shares as market fundamentals', *Journal of Political Economy* **133**(4), 1083–1132.

Guvenen, F., Kaplan, G., Song, J. & Weidner, J. (2022), 'Lifetime earnings in the United States over six decades', *American Economic Journal: Applied Economics* **14**(4), 446–479.

Guvenen, F., Karahan, F., Ozkan, S. & Song, J. (2021), 'What Do Data on Millions of U.S. Workers Reveal About Lifecycle Earnings Dynamics?', *Econometrica* **89**(5), 2303–2339.

Heathcote, J., Storesletten, K. & Violante, G. L. (2010), 'The macroeconomic implications of rising wage inequality in the United States', *Journal of Political Economy* **118**(4), 681–722.

Heathcote, J., Storesletten, K. & Violante, G. L. (2017), 'Optimal tax progressivity: An analytical framework', *Quarterly Journal of Economics* **132**(4), 1693–1754.

Hubmer, J., Krusell, P. & Smith, A. A. (2021), 'Sources of US Wealth Inequality: Past, Present, and Future', *NBER Macroeconomics Annual* **35**, 391–455.

Impullitti, G. & Rendahl, P. (2025), Market power, growth, and wealth inequality, Technical Report Working Paper 020, Centre for Inclusive Trade Policy.

Kaplan, G. & Violante, G. L. (2022), 'The marginal propensity to consume in heterogeneous agent models', *Annual Review of Economics* **14**, 747–775.

Kaymak, B. & Poschke, M. (2016), 'The evolution of wealth inequality over half a century: The role of taxes, transfers and technology', *Journal of Monetary Economics* **77**, 1–25.

Kuhn, M., Schularick, M. & Steins, U. I. (2020), 'Income and wealth inequality in America, 1949–2016', *Journal of Political Economy* **128**(9), 3469–3519.

Kumhof, M., Rancière, R. & Winant, P. (2015), 'Inequality, leverage, and crises', *American Economic Review* **105**(3), 1217–1245.

Liu, E., Mian, A. & Sufi, A. (2022), 'Low interest rates, market power, and productivity growth', *Econometrica* **90**(1), 193–221.

McGrattan, E. R. & Prescott, E. C. (2005), 'Taxes, regulations, and the value of U.S. and U.K. corporations', *Review of Economic Studies* **72**(3), 767–796.

Mian, A., Straub, L. & Sufi, A. (2020), The saving glut of the rich, NBER Working Paper 26941, National Bureau of Economic Research.

Mian, A., Straub, L. & Sufi, A. (2021), 'Indebted Demand', *The Quarterly Journal of Economics* **136**(4), 2243–2307.

Michau, J.-B. (2018), 'Secular stagnation: Theory and remedies', *Journal of Economic Theory* **176**, 552–618.

Michau, J.-B., Ono, Y. & Schlegl, M. (2023), The preference for wealth and inequality: Towards a Piketty theory of wealth inequality. ISER Discussion Paper 1223, Osaka University.

Moll, B., Rachel, L. & Restrepo, P. (2022), 'Uneven growth: Automation's impact on income and wealth inequality', *Econometrica* **90**(6), 2645–2683.

Piketty, T., Saez, E. & Zucman, G. (2018), 'Distributional national accounts: Methods and estimates for the United States', *The Quarterly Journal of Economics* **133**(2), 553–609.

Piketty, T. & Zucman, G. (2014), 'Capital is Back: Wealth-Income Ratios in Rich Countries 1700–2010', *The Quarterly Journal of Economics* **129**(3), 1255–1310.

Protopapadakis, A. (1983), 'Some indirect evidence on effective capital gains tax rates', *Journal of Business* **56**(2), 127–138.

Saez, E. & Zucman, G. (2016), 'Wealth inequality in the United States since 1913: Evidence from capitalized income tax data', *The Quarterly Journal of Economics* **131**(2), 519–578.

Salgado, S., Bloom, N., Guvenen, F., Pistaferri, L. & Sabelhaus, J. (2023), Evaluating the great micro moderation. Available at SSRN 4585714.

Smith, M., Zidar, O. & Zwick, E. (2023), 'Top wealth in America: New estimates under heterogeneous returns', *Quarterly Journal of Economics* **138**(1), 515–573.

Storesletten, K., Telmer, C. I. & Yaron, A. (2004), 'Cyclical dynamics in idiosyncratic labor market risk', *Journal of Political Economy* **112**(3), 695–717.

Straub, L. (2019), Consumption, savings, and the distribution of permanent income. Working paper, Harvard University.

A Proofs of the Analytical Results

A.1 Additional details on the analytical model

The economy is composed of two agents who differ in their level of permanent income z_i. We index agents as 1 and 2 (1 being the rich, 2 the poor, so that $z_1 > z_2$). We also impose that $z_1 + z_2 = 1$, so that an increase in inequality is a mean-preserving spread. They have preferences towards consumption and wealth. Their maximization problem writes

$$\max_{c_t, a_t} V(a_{t-1}) = \frac{c_t^{1-\sigma}}{1-\sigma} + \frac{a_t^{1-\sigma_a}}{1-\sigma_a} + \beta V(a_t)$$

subject to $a_t + c_t = a_{t-1}(1 + r_t^a) + z_i w_t$. The first-order condition with respect to a_t is

$$c_t^{-\sigma} = a_t^{-\sigma_a} + \beta V'(a_t).$$

The envelope condition gives $V'(a_{t-1}) = (1 + r_t^a)c_t^{-\sigma}$, so that $V'(a_t) = (1 + r_{t+1}^a)c_{t+1}^{-\sigma}$ and, the Euler equation is

$$c_t^{-\sigma} = a_t^{-\sigma_a} + \beta(1 + r_{t+1}^a)c_{t+1}^{-\sigma}.$$

At the steady-state, $a_t = a_{t-1}$ so that $c = ar + wz$ and

$$1 - \beta(1 + r) = \frac{a^{-\sigma_a}}{c^{-\sigma}}.$$

A.2 Assumption 1 and the stability of the household steady state

Substituting the budget constraint into the Euler equation eliminates consumption and reduces the household problem to a single second-order difference equation in wealth,

$$\Psi(a_{t-1}, a_t, a_{t+1}) \equiv \left[Ra_{t-1} + wz - a_t\right]^{-\sigma} - a_t^{-\sigma_a} - \beta R\left[Ra_t + wz - a_{t+1}\right]^{-\sigma} = 0,$$

where $R \equiv 1 + r$ and $k \equiv 1 - \beta R > 0$. Setting $a_{t-1} = a_t = a_{t+1} = a$ recovers the steady-state Euler equation,

$$\Psi(a, a, a) = kc^{-\sigma} - a^{-\sigma_a} = -c^{-\sigma} F(a), \qquad F(a, z, w, r) \equiv (ar + wz)^{\sigma} a^{-\sigma_a} + \beta(1 + r) - 1,$$

with $c = ra + wz$. Differentiating F gives $F_a = -a^{-\sigma_a - 1} c^{\sigma - 1} D$, where

$$D \equiv \sigma_a wz - (\sigma - \sigma_a) ar,$$

so that $F_a < 0$ if and only if $D > 0$, which is Assumption 1. Let $\Psi_{-1}, \Psi_0, \Psi_{+1}$ denote the partial derivatives of Ψ with respect to its three arguments, evaluated at a steady state a:

$$\Psi_{-1} = -\sigma R c^{-\sigma - 1} < 0, \qquad \Psi_{+1} = -\beta R \sigma c^{-\sigma - 1} < 0,$$
$$\Psi_0 = \sigma c^{-\sigma - 1} \left(1 + \beta R^2\right) + \sigma_a a^{-\sigma_a - 1} > 0.$$

Linearising gives $\Psi_{+1} \hat{a}_{t+1} + \Psi_0 \hat{a}_t + \Psi_{-1} \hat{a}_{t-1} = 0$, with normalised characteristic polynomial $P(\lambda) = \lambda^2 + (\Psi_0 / \Psi_{+1})\lambda + \Psi_{-1} / \Psi_{+1}$. Two properties pin down the local dynamics.

(i) Reciprocity. For $\beta > 0$ the product of the roots is

$$\lambda_1 \lambda_2 = \frac{\Psi_{-1}}{\Psi_{+1}} = \frac{R}{\beta R} = \frac{1}{\beta} > 1,$$

so $\lambda_2 = 1/(\beta \lambda_1)$: the roots come in reciprocal pairs, the usual structure of a discounted variational problem. In particular they can never both lie inside the unit circle, so the steady state is either saddle-path stable or a source.

(ii) The test at $\lambda = 1$. Evaluating the polynomial at $\lambda = 1$ sums the three partial derivatives, which is the derivative of Ψ when its arguments move together — that is, along the locus of steady states. Since $\Psi(a, a, a) = -c^{-\sigma} F(a)$ and $F = 0$ at a steady state,

$$\Psi_{-1} + \Psi_0 + \Psi_{+1} = \frac{d}{da} \Psi(a, a, a) = -c^{-\sigma} F_a.$$

Dividing by $\Psi_{+1} < 0$ and using $c^{\sigma} a^{-\sigma_a} = k$,

$$(1-\lambda_1)(1-\lambda_2) = P(1) = \frac{c}{\beta R \sigma} F_a = -\frac{k}{\beta R \sigma a} D. \tag{A.1}$$

If $D > 0$, then $P(1) < 0$: exactly one root lies inside the unit circle and the steady state is saddle-path stable (the roots are then necessarily real, since complex conjugates would give $P(1) = |1-\lambda_1|^2 > 0$). If $D < 0$, then $P(1) > 0$ and, by (i), both roots lie outside the unit circle: the steady state is a source and no path converges to it. Assumption 1 therefore selects the stable steady state. The equivalence in (A.1) is not a coincidence: $\lambda = 1$ describes a permanent constant deviation, that is, a move to a neighbouring steady state, which the steady-state equation admits only where it is degenerate, $F_a = 0$. The same condition governs stability and the applicability of the implicit function theorem.

Two remarks follow. First, since $\Psi(a,a,a) = -c^{-\sigma} F(a)$ and $\sigma > \sigma_a$, F has at most two zeros in a: generically either two — satisfying $D > 0$ and $D < 0$ respectively — or none. They collide when $ra/c = \sigma_a/\sigma$, beyond which the household has no finite steady-state wealth. Second, when $\beta = 0$, as in Propositions 3 and 4, the system reduces to the first-order map $a_t = g(a_{t-1})$ with $g'(a) = \sigma R a/(\sigma a + \sigma_a c)$, and $g'(a) < 1$ is again equivalent to $D > 0$.

A.3 Proof of Proposition 1

Let us start from the asset-market clearing condition $A = a_1 + a_2 = q$. $A(z, w(r), r)$ is a function of z, r and $w(r)$, while the value of the firm is a function of the interest rate $q(r)$. Taking the log on both sides and totally differentiating the asset market equation yields

$$dr = -\frac{\partial \log A}{\varepsilon^A + \varepsilon^q}$$
$$d\log(q/Y) = \frac{\varepsilon^q - \varepsilon^Y}{\varepsilon^A + \varepsilon^q} \cdot \partial \log A,$$

To show that $dr < 0$, we show that (i) $\partial \log A$ is positive, (ii) ε^q is positive, (iii) that ε^A is

positive. To show that the wealth to output increases, we finally show that $\varepsilon^q > \varepsilon^Y$.

1. Positivity of $\partial \log A$

Now, let us prove that $\partial \log A > 0$. Recall from Online Appendix A.2 the steady-state Euler equation

$$F(a, z, w, r) \equiv (ar + wz)^{\sigma} a^{-\sigma_a} + \beta(1 + r) - 1 = 0.$$

By the Implicit Function Theorem, provided $F_a \neq 0$, we have

$$\frac{\partial a}{\partial z} = -\frac{F_z}{F_a}.$$

Taking the derivative, we obtain

$$\begin{aligned} F_a &= a^{-\sigma_a - 1} c^{\sigma - 1} \left[(\sigma - \sigma_a) ar - \sigma_a wz \right] \\ F_z &= \sigma w \, a^{-\sigma_a} c^{\sigma - 1}. \end{aligned}$$

With $D \equiv \sigma_a wz - (\sigma - \sigma_a) ar$ as in Online Appendix A.2, we then have

$$\frac{\partial a}{\partial z} = \frac{\sigma w \cdot a}{D},$$

which is positive if $D > 0$. The second derivative can be written as

$$\frac{\partial^2 a}{\partial z^2} = \sigma w \left(\frac{\partial a}{\partial z} D^{-1} - a D^{-2} \frac{\partial D}{\partial z} \right)$$

with $\partial D / \partial z = \sigma_a w - (\sigma - \sigma_a) r \partial a / \partial z$. Thus,

$$\begin{aligned} \frac{\partial^2 a}{\partial z^2} &= \sigma w \left(\frac{\partial a}{\partial z} D^{-1} - a D^{-2} \left(\sigma_a w - (\sigma - \sigma_a) r \frac{\partial a}{\partial z} \right) \right) \\ &= \frac{\sigma w}{D} \left(\frac{\partial a}{\partial z} \left(1 + \frac{ar(\sigma - \sigma_a)}{D} \right) - \frac{a \sigma_a w}{D} \right) \\ &= \frac{\sigma w a}{D^2} \left(\sigma w \left(1 + \frac{ar(\sigma - \sigma_a)}{D} \right) - \sigma_a w \right) \\ &= \frac{\sigma w^2 a (\sigma - \sigma_a)}{D^2} \left(1 + \frac{\sigma ar}{D} \right) > 0. \end{aligned}$$

So $a(z; r, w)$ is increasing and convex in z. Since $A = a(z_1) + a(z_2)$ and $z_1 + z_2 = 1$, convexity implies that a mean-preserving spread ($dz_1 = -dz_2 > 0$) increases aggregate savings: $\partial \log A > 0$.

2. Positivity of ε^q

For convenience, define

$$\varepsilon^K \equiv -\frac{\partial \log K}{\partial r} = \frac{1}{(1-\alpha)(r+\delta)}.$$

Recall that $q = K + V$ where $V \equiv \Pi/r$ with $\Pi \equiv \alpha \frac{\mu-1}{\mu} Y$ denoting gross monopoly rents. Since $\varepsilon^Y \equiv -\partial \log Y / \partial r = \alpha \varepsilon^K$, differentiating gives

$$-\frac{\partial q}{\partial r} = K\varepsilon^K + \frac{\Pi \varepsilon^Y + V}{r}.$$

Using $\Pi = rV$, we rewrite the second term as

$$\frac{\Pi \varepsilon^Y + V}{r} = V\left(\varepsilon^Y + \frac{1}{r}\right).$$

Now,

$$\varepsilon^Y + \frac{1}{r} = \frac{\alpha r + (1-\alpha)(r+\delta)}{r(1-\alpha)(r+\delta)} = \varepsilon^K \cdot \frac{r + (1-\alpha)\delta}{r},$$

so that

$$-\frac{\partial q}{\partial r} = \varepsilon^K \left(q + V\frac{(1-\alpha)\delta}{r}\right).$$

Dividing by q,

$$\varepsilon^q = \varepsilon^K \left(1 + \frac{V}{q}\frac{(1-\alpha)\delta}{r}\right) > 0, \tag{A.2}$$

since every factor is positive.

3. Positivity of ε^A

Now let us focus on ε^A. The aggregate semi-elasticity of asset demand can be decomposed

as a wealth-weighted sum of individual semi-elasticities:

$$\varepsilon^{A} = \frac{d \log A}{dr} = \frac{1}{A} \sum_{i} \frac{da_i}{dr} = \frac{1}{A} \sum_{i} a_i \, \varepsilon^{a_i}. \tag{A.3}$$

Each individual semi-elasticity can in turn be decomposed into a direct effect and an indirect effect through the wage:

$$\varepsilon^{a_i} = \frac{d \log a_i(z, r, w(r))}{dr} = \frac{\partial \log a_i}{\partial r} + \frac{\partial \log a_i}{\partial \log w} \cdot \frac{d \log w}{dr} = \varepsilon^{a_i, r} + \varepsilon^{a_i, w} \, \varepsilon^{w, r}. \tag{A.4}$$

From the firm's first-order condition $(r + \delta) = \frac{\alpha}{\mu} Z K^{\alpha - 1}$, we obtain

$$\varepsilon^{w,r} \equiv \frac{d \log w}{dr} = -\frac{\mu K}{w}. \tag{A.5}$$

Applying the Implicit Function Theorem to the household's Euler equation yields

$$\frac{\partial a_i}{\partial r} = \frac{\sigma a_i^2 + \beta a_i^{\sigma_a + 1} c_i^{1 - \sigma}}{D_i}, \qquad \frac{\partial a_i}{\partial w} = \frac{\sigma z_i a_i}{D_i}, \tag{A.6}$$

where $D_i \equiv \sigma_a w z_i - (\sigma - \sigma_a) r a_i$. Converting to (semi-)elasticities,

$$\varepsilon^{a_i, r} = \frac{\partial \log a_i}{\partial r} = \frac{\sigma a_i + \beta a_i^{\sigma_a} c_i^{1 - \sigma}}{D_i}, \qquad \varepsilon^{a_i, w} = \frac{\partial \log a_i}{\partial \log w} = \frac{\sigma w z_i}{D_i}. \tag{A.7}$$

Substituting into the aggregate decomposition,

$$\varepsilon^{A} = \frac{1}{A} \sum_{i} a_i \left(\frac{\sigma a_i + \beta a_i^{\sigma_a} c_i^{1 - \sigma}}{D_i} - \frac{\sigma w z_i}{D_i} \cdot \frac{\mu K}{w} \right) = \frac{\sigma}{A} \sum_{i} \frac{a_i}{D_i} (a_i - \mu K z_i) + \frac{\beta}{A} \sum_{i} \frac{a_i^{\sigma_a + 1} c_i^{1 - \sigma}}{D_i}. \tag{A.8}$$

The second sum is manifestly positive since $a_i^{\sigma_a + 1} c_i^{1 - \sigma} / D_i > 0$ for all i under our maintained assumption $D_i > 0$. For the first sum, we show that $\sum_i (a_i / D_i)(a_i - \mu K z_i) > 0$. Using $a_2 - \mu K z_2 = (A - \mu K) - (a_1 - \mu K z_1)$, we write

$$\sum_{i} \frac{a_i}{D_i} (a_i - \mu K z_i) = \underbrace{(a_1 - \mu K z_1)}_{>0} \underbrace{\left(\frac{a_1}{D_1} - \frac{a_2}{D_2} \right)}_{>0} + \underbrace{\frac{a_2}{D_2}}_{>0} \underbrace{(A - \mu K)}_{\geq 0}, \tag{A.9}$$

a sum of two non-negative terms, the first strictly positive. We verify each sign in turn.

(i) $a_1 - \mu K z_1 > 0$. We show that $a_1/z_1 > a_2/z_2$. This suffices because cross-multiplying yields $a_1 z_2 > a_2 z_1$, and substituting $z_2 = 1 - z_1$:

$$a_1(1 - z_1) > a_2 z_1 \quad \Longleftrightarrow \quad a_1 > (a_1 + a_2) z_1 = A z_1.$$

Moreover, $A \geq \mu K$ since $A = q = K + \alpha \frac{\mu - 1}{\mu} \frac{Y}{r}$ and $\alpha Y = \mu(r + \delta)K$ yield $A = K\big(1 + \frac{(\mu-1)(r+\delta)}{r}\big) \geq \mu K$, so $a_1 > A z_1 \geq \mu K z_1$.

We prove $a_1/z_1 > a_2/z_2$ by contradiction; the argument uses the steady-state Euler equation and therefore holds at the steady state only. Suppose $a_1/z_1 \leq a_2/z_2$, i.e. $a_1 z_2 \leq a_2 z_1$. From the budget constraint $c_i = a_i r + w z_i$,

$$c_1 a_2 - c_2 a_1 = w(a_2 z_1 - a_1 z_2) \geq 0,$$

so $c_1/c_2 \geq a_1/a_2$. Now, the Euler equation $c_i^{\sigma} a_i^{-\sigma_a} = 1 - \beta(1 + r)$ takes the same value for both agents, so

$$\left(\frac{c_1}{c_2}\right)^{\sigma} = \left(\frac{a_1}{a_2}\right)^{\sigma_a} \quad \Longrightarrow \quad \frac{c_1}{c_2} = \left(\frac{a_1}{a_2}\right)^{\sigma_a/\sigma}.$$

Both agents are on the stable branch of the steady-state equation (Assumption 1), along which $\partial a/\partial z = \sigma w a/D > 0$, so $z_1 > z_2$ implies $a_1 > a_2$ and $a_1/a_2 > 1$. Because $\sigma_a/\sigma < 1$ (the non-homotheticity assumption), concavity of $t \mapsto t^{\sigma_a/\sigma}$ implies $(a_1/a_2)^{\sigma_a/\sigma} < a_1/a_2$, so $c_1/c_2 < a_1/a_2$. This contradicts $c_1/c_2 \geq a_1/a_2$.

(ii) $a_1/D_1 > a_2/D_2$. Cross-multiplying, $a_1 D_2 - a_2 D_1 = \sigma_a w(a_1 z_2 - a_2 z_1) > 0$, where the inequality follows from $a_1/z_1 > a_2/z_2$ established in (i).

(iii) $A \geq \mu K$. This follows from $A = K\big(1 + (\mu - 1)(r + \delta)/r\big) \geq \mu K$, with equality under perfect competition ($\mu = 1$).

4. $\varepsilon^q > \varepsilon^Y$

From the production function, $\varepsilon^Y \equiv -d\log(Y)/dr = \alpha\varepsilon^K$. Using our previous result, we have

$$\varepsilon^q - \varepsilon^Y = \varepsilon^K\left(1 + \frac{V}{q}\frac{(1-\alpha)\delta}{r}\right) - \alpha\varepsilon^K = \varepsilon^K(1-\alpha)\left(1 + \frac{V}{q}\frac{\delta}{r}\right) > 0.$$

5. The wage

Since $w = (1-\alpha)Y$, $d\log w = d\log Y = -\varepsilon^Y dr = -\alpha\varepsilon^K dr > 0$, which is item 2 of the proposition.

A.4 Proof of Proposition 2

We show that $\varepsilon^{a_1} > \varepsilon^{a_2}$, which implies that $\varepsilon^{a_1} > \varepsilon^A$.

Preliminary: $D_i > 0$ **for** $i = 1, 2$**.**
Recall that $D_i \equiv \sigma_a w z_i - (\sigma - \sigma_a) r a_i$, so that $D_i > 0$ is equivalent to $ra_i/c_i < \sigma_a/\sigma$, which Assumption 1 imposes on both agents: each is at the saddle-path-stable root of its steady-state equation (Online Appendix A.2). Since $a_1/z_1 > a_2/z_2$ (step 3(i) of Proposition 1) and ra_i/c_i increases with a_i/z_i, the condition binds for the rich agent.

From equation (A.8), the individual total semi-elasticity reads

$$\varepsilon^{a_i} = \frac{\sigma(a_i - \mu K z_i) + \beta a_i^{\sigma_a} c_i^{1-\sigma}}{D_i}. \tag{A.10}$$

Since $D_1, D_2 > 0$, the sign of $\varepsilon^{a_1} - \varepsilon^{a_2}$ is determined by the numerator

$$\mathcal{N} \equiv \left[\sigma(a_1 - \mu K z_1) + \beta a_1^{\sigma_a} c_1^{1-\sigma}\right] D_2 - \left[\sigma(a_2 - \mu K z_2) + \beta a_2^{\sigma_a} c_2^{1-\sigma}\right] D_1.$$

Separating the σ and β terms,

$$\mathcal{N} = \underbrace{\sigma\left[(a_1 - \mu K z_1) D_2 - (a_2 - \mu K z_2) D_1\right]}_{\mathcal{N}_1} + \underbrace{\beta\left[a_1^{\sigma_a} c_1^{1-\sigma} D_2 - a_2^{\sigma_a} c_2^{1-\sigma} D_1\right]}_{\mathcal{N}_2}.$$

First term. Expanding,

$$(a_1 - \mu K z_1)D_2 - (a_2 - \mu K z_2)D_1 = (a_1 D_2 - a_2 D_1) - \mu K(z_1 D_2 - z_2 D_1).$$

From step 3(ii) of Proposition 1, $a_1 D_2 - a_2 D_1 = \sigma_a w(a_1 z_2 - a_2 z_1)$. For the second cross-product, substituting $D_i = \sigma_a w z_i - (\sigma - \sigma_a) a_i r$ gives

$$z_1 D_2 - z_2 D_1 = (\sigma - \sigma_a) r(a_1 z_2 - a_2 z_1).$$

Combining,

$$\mathcal{N}_1 = \sigma(a_1 z_2 - a_2 z_1)\big[\sigma_a w - \mu(\sigma - \sigma_a) r K\big].$$

Since $a_1/z_1 > \mu K$ (step 3(i): $a_1 > A z_1 \geq \mu K z_1$), the condition $D_1 > 0$ implies $\sigma_a w > (\sigma - \sigma_a) a_1 r / z_1 > \mu(\sigma - \sigma_a) K r$. Together with $a_1 z_2 - a_2 z_1 > 0$, this yields $\mathcal{N}_1 > 0$.

Second term. From the steady-state Euler equation $c_i^{\sigma} a_i^{-\sigma_a} = k$, where $k \equiv 1 - \beta(1 + r) > 0$ as in Online Appendix A.2, we obtain $a_i^{\sigma_a} = c_i^{\sigma}/k$ and hence $a_i^{\sigma_a} c_i^{1-\sigma} = c_i/k$. Therefore

$$\mathcal{N}_2 = \frac{\beta}{k}(c_1 D_2 - c_2 D_1).$$

Using the budget constraint $c_i = a_i r + w z_i$ together with the cross-products computed above,

$$\begin{aligned} c_1 D_2 - c_2 D_1 &= r(a_1 D_2 - a_2 D_1) + w(z_1 D_2 - z_2 D_1) \\ &= r\,\sigma_a w(a_1 z_2 - a_2 z_1) + w(\sigma - \sigma_a) r(a_1 z_2 - a_2 z_1) \\ &= \sigma w r(a_1 z_2 - a_2 z_1) > 0, \end{aligned}$$

so $\mathcal{N}_2 > 0$.

Since $\mathcal{N} = \mathcal{N}_1 + \mathcal{N}_2 > 0$, we conclude $\varepsilon^{a_1} > \varepsilon^{a_2}$. From the weighted-average decomposition $\varepsilon^A = (a_1/A)\,\varepsilon^{a_1} + (a_2/A)\,\varepsilon^{a_2}$, this implies $\varepsilon^{a_1} > \varepsilon^A$, i.e. $\varepsilon^{a_1} - \varepsilon^A > 0$. Since $dr < 0$, the trickle-down effect $(\varepsilon^{a_1} - \varepsilon^A)\,dr < 0$: the wealth of the rich declines proportionally more than aggregate wealth.

A.5 Proof of Proposition 3

We maintain $\beta = 0$ throughout.

Welfare derivative. With $\beta = 0$, per-period utility at the steady state is $U_i = c_i^{1-\sigma}/(1-\sigma) + a_i^{1-\sigma_a}/(1-\sigma_a)$. By the envelope theorem, the welfare effect of a marginal price change on agent i (at initial wealth a_i) is

$$\frac{dU_i}{dr} = c_i^{-\sigma}\left[a_i + z_i\frac{dw}{dr}\right].$$

From the production side, $w = (1-\alpha)ZK^{\alpha}$ and $(r+\delta) = \frac{\alpha}{\mu}\frac{Y}{K}$, so that $dw/dr = -\alpha Y/(r+\delta) = -\mu K$. Using the household first-order condition $c_i^{-\sigma} = a_i^{-\sigma_a}$:

$$\frac{dU_i}{dr} = a_i^{-\sigma_a}(a_i - \mu K z_i).$$

Monotonicity of $\Phi(a) \equiv a^{-\sigma_a}(a - \mu K z(a))$. Substituting $z(a) = (a^{\phi} - ar)/w$ from the budget constraint ($c = a^{\phi}$ and $c = ar + wz$, with $\phi \equiv \sigma_a/\sigma$):

$$\Phi(a) = \left(1 + \frac{\mu K r}{w}\right)a^{1-\sigma_a} - \frac{\mu K}{w}\,a^{\phi-\sigma_a}.$$

The exponents are $1-\sigma_a > 0$ (since $\sigma_a < 1$) and $\phi - \sigma_a = \sigma_a(1-\sigma)/\sigma < 0$ (since $\sigma > 1$). Differentiating:

$$\Phi'(a) = \underbrace{(1-\sigma_a)\left(1 + \frac{\mu K r}{w}\right)a^{-\sigma_a}}_{>0} + \underbrace{\frac{\mu K}{w}\cdot\frac{\sigma_a(\sigma-1)}{\sigma}\cdot a^{\phi-\sigma_a-1}}_{>0} > 0,$$

since both terms are strictly positive. Therefore $a_1 > a_2$ implies $\Phi(a_1) > \Phi(a_2)$, i.e., $dU_1/dr > dU_2/dr$. Since $dr < 0$:

$$\Delta U_2 = \frac{dU_2}{dr}\,dr > \frac{dU_1}{dr}\,dr = \Delta U_1.$$

Full redistribution at $\mu = 1$. Under perfect competition, $V = 0$ so $A = K$. From step 3(i)

of Proposition 1, $a_1/z_1 > K > a_2/z_2$, and therefore:

- $a_1 - Kz_1 > 0$, so $dU_1/dr > 0$: the rich loses welfare when r falls.
- $a_2 - Kz_2 < 0$, so $dU_2/dr < 0$: the poor gains welfare when r falls.

Hence the price effect is fully redistributive: $\Delta U_1 < 0 < \Delta U_2$.

A.6 Proof of Proposition 4, Item 1

To show that an increase in markups increases the equilibrium interest rate, we totally differentiate the equilibrium condition $A(r, \mu) = q(r, \mu)$ and obtain

$$dr^{\mu} = \frac{\varepsilon^{q,\mu} - \varepsilon^{A,\mu}}{\varepsilon^{A} + \varepsilon^{q}} d\mu > 0,$$

where $\varepsilon^{A,\mu} \equiv \partial \log A / \partial \mu < 0$ is the partial-equilibrium effect of markups on aggregate savings through the wage, and $\varepsilon^{q,\mu} \equiv \partial \log q / \partial \mu$ the partial-equilibrium effect of markups on the value of firms. This is positive as long as $\varepsilon^{q,\mu} > \varepsilon^{A,\mu}$, which we verify below.

We maintain $\beta = 0$ throughout, and evaluate locally at $\mu = 1$. The numerical values reported below refer to the two-agent economy with $\beta = 0$ at the parameter values of Section 4 of the main text ($\sigma = 2$, $\sigma_a = 0.89$, $\alpha = 1/3$, $\delta = 0.047$), with $z_1 = 0.7$ and Z set so that $r = 3\%$ at $\mu = 1$; $z_1 = 0.8$ gives the same signs.

Preliminaries: $dr/d\mu > 0$.

We first show that, in partial equilibrium (holding r constant), an increase in μ increases q. Write gross monopoly rents as $\Pi = \alpha \frac{\mu - 1}{\mu} Y$. Then

$$\frac{\partial q}{\partial \mu} = \frac{\partial K}{\partial \mu} + \frac{1}{r} \frac{\partial \Pi}{\partial \mu}.$$

For the rent term, using the product rule:

$$\begin{aligned}\frac{\partial \Pi}{\partial \mu} &= \alpha Y \cdot \frac{1}{\mu^2} + \alpha \frac{\mu - 1}{\mu} \cdot \frac{\partial Y}{\partial \mu} \\ &= \frac{\alpha Y}{\mu^2} - \alpha \frac{\mu - 1}{\mu} \cdot \frac{\alpha Y}{(1-\alpha)\mu} \\ &= \frac{\alpha Y}{\mu^2}\left(1 - \frac{\alpha(\mu-1)}{1-\alpha}\right) = \frac{\alpha Y}{\mu^2} \cdot \frac{1 - \alpha\mu}{1-\alpha}.\end{aligned}$$

Combining and substituting $\alpha Y = \mu(r+\delta)K$:

$$\frac{\partial q}{\partial \mu} = \frac{K}{(1-\alpha)\mu r}\big(\delta - \alpha\mu(r+\delta)\big) = \frac{K(r+\delta)}{(1-\alpha)\mu r}\left(\frac{\delta}{r+\delta} - \alpha\mu\right).$$

Hence $\partial q/\partial \mu > 0$ if and only if $\mu < \delta/[\alpha(r+\delta)]$, which is satisfied at $\mu = 1$ for standard calibrations. Evaluating at $\mu = 1$, where $V = 0$ so that $q = K$:

$$\varepsilon^{q,\mu}\Big|_{\mu=1} \equiv \frac{1}{q}\frac{\partial q}{\partial \mu}\Big|_{\mu=1} = \frac{\delta}{r} - \frac{\alpha}{1-\alpha}. \tag{A.11}$$

Effect of μ on savings supply. A change in μ also affects aggregate savings at fixed r through the wage. From the firm FOC, $\partial w/\partial \mu|_r = -\alpha w/[(1-\alpha)\mu] < 0$. With $\beta = 0$, the steady-state Euler equation gives $c_i = a_i^{\phi}$ where $\phi \equiv \sigma_a/\sigma \in (0,1)$. Combined with the budget constraint, $a_i^{\phi} - a_i r = w z_i$. Applying the IFT:

$$\frac{\partial a_i}{\partial \mu}\Big|_r = \frac{z_i}{D_i^*} \cdot \frac{\partial w}{\partial \mu}\Big|_r = -\frac{\alpha w z_i}{(1-\alpha)\mu D_i^*},$$

where $D_i^* \equiv \phi a_i^{\phi-1} - r > 0$. Therefore

$$\varepsilon^{A,\mu} \equiv \frac{\partial \log A}{\partial \mu}\Big|_r = -\frac{\alpha w}{(1-\alpha)\mu A}\sum_i \frac{z_i}{D_i^*} < 0. \tag{A.12}$$

At $\mu = 1$, using $\alpha w/[(1-\alpha)A] = \alpha Y/A = (r+\delta)$:

$$|\varepsilon^{A,\mu}|\Big|_{\mu=1} = (r+\delta)\sum_i \frac{z_i}{D_i^*}. \tag{A.13}$$

Totally differentiating $A(r,\mu) = q(r,\mu)$:

$$\frac{dr}{d\mu} = \frac{\varepsilon^{q,\mu} - \varepsilon^{A,\mu}}{\varepsilon^{A} + \varepsilon^{q}} > 0, \tag{A.14}$$

since both $\varepsilon^{q,\mu} > 0$ and $-\varepsilon^{A,\mu} > 0$.

1. ε^q increases with μ.

A change in μ affects ε^q both directly (through the firm valuation) and indirectly (through the equilibrium interest rate):

$$\frac{d\varepsilon^q}{d\mu} = \underbrace{\left.\frac{\partial \varepsilon^q}{\partial \mu}\right|_r}_{\text{direct}} + \underbrace{\frac{\partial \varepsilon^q}{\partial r} \cdot \frac{dr}{d\mu}}_{\text{indirect}}. \tag{A.15}$$

Recall that $\varepsilon^q = \varepsilon^K + \delta(\mu - 1)/(r\Delta)$ where $\Delta \equiv \mu r + (\mu - 1)\delta$. Differentiating and evaluating at $\mu = 1$:

$$\left.\frac{\partial \varepsilon^q}{\partial \mu}\right|_r = \frac{\delta}{r^2} > 0, \qquad \frac{\partial \varepsilon^q}{\partial r} = -\frac{\varepsilon^K}{r+\delta} < 0.$$

The direct effect is positive: higher markups raise firm valuations, increasing the sensitivity of asset supply to the interest rate. The indirect effect is negative: higher markups raise the equilibrium r, which reduces ε^q. Substituting $dr/d\mu$ from (A.14):

$$\frac{d\varepsilon^q}{d\mu} = \frac{\delta}{r^2} - \frac{\varepsilon^K}{r+\delta} \cdot \frac{\varepsilon^{q,\mu} - \varepsilon^{A,\mu}}{\varepsilon^K + \varepsilon^A}.$$

Since $\varepsilon^K + \varepsilon^A > \varepsilon^K$, the indirect term is bounded above (in absolute value) by its value at $\varepsilon^A = 0$:

$$\frac{d\varepsilon^q}{d\mu} > \frac{\delta}{r^2} - \frac{\varepsilon^{q,\mu} - \varepsilon^{A,\mu}}{r+\delta} = \frac{1}{r+\delta}\left(\frac{\delta^2}{r^2} + \frac{\alpha}{1-\alpha} - |\varepsilon^{A,\mu}|\right). \tag{A.16}$$

This is positive provided

$$|\varepsilon^{A,\mu}| < \frac{\delta^2}{r^2} + \frac{\alpha}{1-\alpha} \equiv \bar{\varepsilon}. \tag{A.17}$$

The threshold $\bar{\varepsilon}$ is of order $(\delta/r)^2$. Since $\sum_i z_i = 1$, $|\varepsilon^{A,\mu}| \leq (r+\delta)/\min_i D_i^*$, so condition (A.17) holds whenever $\min_i D_i^* > (r+\delta)/\bar{\varepsilon}$, a mild strengthening of the regularity

condition $D_i^* > 0$ of Assumption 1. At the calibrated values, $\bar{\varepsilon} \approx 3.0$, $(r+\delta)/\bar{\varepsilon} \approx 0.03$, $D_1^* = 0.036$ and $|\varepsilon^{A,\mu}| = 1.6$, so the condition holds; $d\varepsilon^q/d\mu = 24$, the sum of a direct effect of 52 and an effect of -28 through the equilibrium rise in r.

2. ε^A increases with μ.

The total change in ε^A along the equilibrium path decomposes as

$$\frac{d\varepsilon^A}{d\mu} = \underbrace{\left.\frac{\partial \varepsilon^A}{\partial \mu}\right|_r}_{\text{cross-partial}} + \underbrace{\frac{d^2 \log A}{dr^2} \cdot \frac{dr}{d\mu}}_{\text{convexity}}. \tag{A.18}$$

The convexity term is a product of two positive factors. We prove $d^2 \log A/dr^2 > 0$.

With $\beta = 0$, the budget equation is $a_i^\phi - a_i r = w z_i$. Define $D_i^* \equiv \phi a_i^{\phi-1} - r > 0$. The IFT gives $da_i/dr = \eta_i/D_i^*$, where $\eta_i \equiv a_i - K z_i$. Differentiating once more (using $dD_i^*/dr = \phi(\phi-1)a_i^{\phi-2}a_i' - 1$ and $d\eta_i/dr = a_i' + K\varepsilon^K z_i$),

$$\frac{d^2 a_i}{dr^2} = \frac{2\eta_i}{(D_i^*)^2} + \frac{K\varepsilon^K z_i}{D_i^*} + \frac{\phi(1-\phi)\, a_i^{\phi-2}\, \eta_i^2}{(D_i^*)^3}. \tag{A.19}$$

The last term is non-negative because $\phi(1-\phi) > 0$: the concavity of the non-homothetic consumption function $c = a^\phi$ generates convexity in the savings response. At $\mu = 1$, $K = A$ so $\eta_1 + \eta_2 = 0$; write $\eta \equiv \eta_1 > 0$. Each summed component of $d^2A/dr^2 = \sum_i d^2 a_i/dr^2$ is positive:

(i) $2\eta\left[(D_1^*)^{-2} - (D_2^*)^{-2}\right] > 0$, since $a_1 > a_2$ and $\phi - 1 < 0$ imply $D_1^* < D_2^*$.

(ii) $K\varepsilon^K\left[z_1/D_1^* + z_2/D_2^*\right] > 0$.

(iii) $\phi(1-\phi)\eta^2\left[a_1^{\phi-2}/(D_1^*)^3 + a_2^{\phi-2}/(D_2^*)^3\right] > 0$.

It remains to show the stronger result $d^2 \log A/dr^2 > 0$, i.e. $A \cdot d^2A/dr^2 > (dA/dr)^2$. Since $(dA/dr)^2 = \eta^2(D_2^* - D_1^*)^2/[(D_1^*)^2(D_2^*)^2]$, term (i) alone suffices:

$$A \cdot (\text{i}) - (dA/dr)^2 = \frac{\eta(D_2^* - D_1^*)}{(D_1^*)^2(D_2^*)^2}\left[2A(D_1^* + D_2^*) - \eta(D_2^* - D_1^*)\right].$$

The bracket is positive: $2A > \eta$ (since $\eta = a_1 - Az_1 < Az_2 < A$) and $D_1^* + D_2^* > D_2^* - D_1^*$ (since $D_1^* > 0$). Terms (ii) and (iii) only add to the surplus. Therefore $d^2 \log A / dr^2 > 0$.

The cross-partial $\partial \varepsilon^A / \partial \mu|_r$ captures how the *slope* of the savings function shifts when markups change at fixed r. Its sign is ambiguous in general. However, $d\varepsilon^A / d\mu > 0$ whenever the convexity term dominates:

$$\left| \left. \frac{\partial \varepsilon^A}{\partial \mu} \right|_r \right| < \frac{d^2 \log A}{dr^2} \cdot \frac{dr}{d\mu}. \tag{A.20}$$

At the calibrated values, the cross-partial is -32 and the convexity term, the product of $d^2 \log A / dr^2 = 732$ and $dr/d\mu = 0.11$, is 80, so condition (A.20) holds and $d\varepsilon^A / d\mu = 48$. Together with Step 1, $\varepsilon^A + \varepsilon^q$ rises with μ, from 24.2 at $\mu = 1$ to 28.4 at $\mu = 1.1$ and 30.2 at $\mu = 1.2$, and for a given $\partial \log A$ the equilibrium fall in r shrinks, which is item 1.

A.7 Proof of Proposition 4, Items 2 and 3

Part 1: $|(\varepsilon^{a_1} - \varepsilon^A) dr|$ decreases with μ (holding $\varepsilon^{a_1} - \varepsilon^A$ constant).

From the definition of the trickle-down effect,

$$|(\varepsilon^{a_1} - \varepsilon^A) dr| = \frac{(\varepsilon^{a_1} - \varepsilon^A)\, \partial \log A}{\varepsilon^A + \varepsilon^q}.$$

Since $\partial \log A$ is held fixed and $\varepsilon^A + \varepsilon^q$ increases with μ (item 1), $|(\varepsilon^{a_1} - \varepsilon^A) dr|$ decreases with μ to first order (holding $\varepsilon^{a_1} - \varepsilon^A$ constant).

Part 2: $\Omega \equiv \varepsilon^{a_1} / \varepsilon^A$ decreases with μ (under $\beta = 0$, at $\mu = 1$).

We maintain $\beta = 0$, $F = 0$ and evaluate locally at $\mu = 1$. Decompose the total derivative as

$$\frac{d\Omega}{d\mu} = \underbrace{\left. \frac{\partial \Omega}{\partial \mu} \right|_r}_{\text{direct}} + \underbrace{\left. \frac{\partial \Omega}{\partial r} \right|_\mu \cdot \frac{dr}{d\mu}}_{\text{indirect}}.$$

We show that the indirect effect is negative and dominates.

Step 1: Closed form. With $\beta = 0$, the Euler equation gives $c_i = a_i^{\phi}$ where $\phi \equiv \sigma_a/\sigma \in (0,1)$, and the budget constraint reads $a_i^{\phi} - a_i r = w z_i$. Define $D_i^* \equiv \phi a_i^{\phi-1} - r > 0$. As in the proof of item 1, the total derivative of individual savings with respect to r is $da_i/dr = \eta_i/D_i^*$ where $\eta_i \equiv a_i - K z_i$. At $\mu = 1$, $K = A$ (since $V = 0$), so $\eta_1 + \eta_2 = 0$; write $\eta \equiv \eta_1 > 0$. The log semi-elasticities are

$$\varepsilon^{a_1} = \frac{\eta}{a_1 D_1^*}, \qquad \varepsilon^{A} = \frac{\eta(D_2^* - D_1^*)}{A D_1^* D_2^*},$$

where $D_2^* > D_1^*$ since $a_1 > a_2$ and $\phi < 1$ imply $a_1^{\phi-1} < a_2^{\phi-1}$. Taking the ratio:

$$\Omega = \frac{A D_2^*}{a_1(D_2^* - D_1^*)}. \tag{A.21}$$

Step 2: $d\log\Omega/dr < 0$ at fixed μ. Differentiating (A.21) logarithmically with respect to r:

$$\frac{d\log\Omega}{dr} = \underbrace{(\varepsilon^{A} - \varepsilon^{a_1})}_{<0} + \underbrace{\frac{D_1^{*\prime} D_2^* - D_2^{*\prime} D_1^*}{D_2^*(D_2^* - D_1^*)}}_{<0}, \tag{A.22}$$

where $D_i^{*\prime} \equiv dD_i^*/dr = \phi(\phi-1)a_i^{\phi-2}\eta_i/D_i^* - 1$. The first term is negative because $\Omega > 1$ (Proposition 2). For the second, the cross-product evaluates to

$$D_1^{*\prime} D_2^* - D_2^{*\prime} D_1^* = \underbrace{\phi(\phi-1)}_{<0}\,\eta\left[\frac{a_1^{\phi-2} D_2^*}{D_1^*} + \frac{a_2^{\phi-2} D_1^*}{D_2^*}\right] - \underbrace{(D_2^* - D_1^*)}_{>0}, \tag{A.23}$$

which is strictly negative since both terms have the same sign. Therefore $d\log\Omega/dr < 0$.

Step 3: Indirect effect dominates. Since $d\log\Omega/dr < 0$ and $dr/d\mu > 0$, the indirect effect reduces Ω. The direct effect $\partial\Omega/\partial\mu|_r$ works through the wage at a fixed r and has no definite sign, so item 3 holds whenever

$$\left.\frac{\partial\Omega}{\partial\mu}\right|_r < -\left.\frac{\partial\Omega}{\partial r}\right|_{\mu} \cdot \frac{dr}{d\mu}. \tag{A.24}$$

At the calibrated values, the direct effect is 1.9 and the indirect effect -5.1, so $d\Omega/d\mu =$

-3.2: Ω falls from 1.34 at $\mu = 1$ to 1.20 at $\mu = 1.1$ and 1.16 at $\mu = 1.2$.

Implication for the trickle-down effect. The trickle-down effect can be decomposed as

$$|(\varepsilon^{a_1} - \varepsilon^A)dr| = \underbrace{(\Omega - 1)}_{\text{excess sensitivity}} \cdot \underbrace{\frac{\varepsilon^A}{\varepsilon^A + \varepsilon^q}}_{\equiv s} \cdot \partial \log A,$$

where s denotes the demand share of asset-market clearing. As μ increases, $\Omega - 1$ falls (item 3) and $\varepsilon^A + \varepsilon^q$ rises (item 1), while the rise in ε^A itself works in the other direction, so the net effect is not signed in general. At the calibrated values, $(\Omega - 1)\, s$ falls from 0.066 at $\mu = 1$ to 0.059 at $\mu = 1.1$ and 0.057 at $\mu = 1.2$: for a given $\partial \log A$, the trickle-down effect weakens with the markup.

B Additional Details on Calibration

B.1 Deriving the Pareto tail in a Heterogeneous-agent model

The proof draws heavily on Gaillard et al. (2023). We derive the asymptotic right tails of the wealth and the consumption distributions in a simpler framework without scale and type dependence. All variables are detrended by $(1+g)^t$, $\tilde{\beta}$ is the detrended discount factor, and we write $R \equiv (1+r)/(1+g)$ for the gross return on detrended wealth.

The problem of the household writes

$$V(a_t, z_t) = \frac{c_t^{1-\sigma}}{1-\sigma} + \gamma \frac{(a_{t+1} + \zeta)^{1-\sigma_a}}{1-\sigma_a} + \tilde{\beta}(1-\xi)\mathbb{E}[V(a_{t+1}, z_{t+1})]$$

subject to

$$a_{t+1} + c_t = R\, a_t + z_t w$$

and a zero borrowing constraint

$$a_{t+1} \geq 0.$$

Households are subject to persistent idiosyncratic productivity shocks z_t and to random death shocks arriving with probability ξ. The Euler equation of the household is

$$c_t^{-\sigma} = (1-\xi)\tilde{\beta}R\,\mathbb{E}[c_{t+1}^{-\sigma}] + \gamma\,(a_{t+1}+\zeta)^{-\sigma_a}\,.$$

The key thing to note is that, when $a \to \infty$, labor income $z_t w$ becomes negligible and we can abstract from uncertainty coming from idiosyncratic productivity shocks. The problem now writes

$$V(a_t) = \frac{c_t^{1-\sigma}}{1-\sigma} + \gamma\frac{(a_{t+1}+\zeta)^{1-\sigma_a}}{1-\sigma_a} + \tilde{\beta}(1-\xi)V(a_{t+1})$$

subject to

$$c_t + a_{t+1} = R\,a_t.$$

The Euler equation now writes

$$c_t^{-\sigma} = (1-\xi)\tilde{\beta}R\,c_{t+1}^{-\sigma} + \gamma\,(a_{t+1}+\zeta)^{-\sigma_a}\,.$$

where $c_t + a_{t+1} = R\,a_t$. Guess that $c = Ba^{\sigma_a/\sigma}$, this implies that

$$a' = R\,a - c = R\,a - Ba^{\sigma_a/\sigma}.$$

This implies that as $a \to \infty$, $a' \sim R\,a$: detrended wealth of the rich grows at $(1+r)/(1+g)$. We use a guess and verify technique. As $a \to \infty$, we have

$$c' = B(a')^{\sigma_a/\sigma} = B(R\,a - Ba^{\sigma_a/\sigma})^{\sigma_a/\sigma} = B(R\,a)^{\sigma_a/\sigma}$$

$$c^{-\sigma} = (1-\xi)\tilde{\beta}R\,B^{-\sigma}(R\,a)^{-\sigma_a} + \gamma(R\,a)^{-\sigma_a},$$

using $a' \sim R\,a$ in the taste-for-wealth term as well, so that

$$c = [R\,a]^{\sigma_a/\sigma}\Big[(1-\xi)\tilde{\beta}R\,B^{-\sigma} + \gamma\Big]^{-1/\sigma}.$$

Which verifies our guess. To find B, solve

$$B = R^{\sigma_a/\sigma}\Big[(1-\xi)\tilde{\beta}R\,B^{-\sigma}+\gamma\Big]^{-1/\sigma}$$

with a numerical solver. A surviving household therefore has $a' \sim R\,a$, while a dying household's wealth is reset to the bequest endowment, which is negligible in the tail.

We can now derive the Pareto tail in this case. Beare & Toda (2022) show that the stationary wealth distribution has a Pareto upper tail, characterized by the moment generating function

$$M_{ss'}(z) = \mathbb{E}[e^{z\log G'}|s_t = s, s_{t+1} = s'] = \mathbb{E}[G'^z|s_t = s, s_{t+1} = s'].$$

In our case, define $s = 0$ an alive household and $s = 1$ a dead household. We have

$$G_{s=0} = R, \quad G_{s=1} = 0$$

The matrix $M(z) = (M_{ss'}(z))$ thus writes

$$M(z) = \begin{bmatrix} R^z & 0 \\ R^z & 0 \end{bmatrix}$$

And the Pareto tail exponent θ^a is then defined by

$$\rho(P \circ M(z)) = 1$$

where $\circ$ is the Hadamard (entrywise) product and ρ the spectral radius. We have

$$P \circ M(z) = \begin{bmatrix} (1-\xi)R^z & 0 \\ (1-\xi)R^z & 0 \end{bmatrix}$$

And we have $\rho(P \circ M(z)) = (1-\xi)R^z = 1$. Solving for z yields

$$z = \theta^a = \frac{-\log(1-\xi)}{\log R} = \frac{-\log(1-\xi)}{\log\left(\frac{1+r}{1+g}\right)}$$

which is the Pareto tail. Without growth ($g = 0$) the drift is $1 + r$ and the same tail requires a much higher death rate.

To obtain the Pareto tail for consumption, note that $c = Ba^{\sigma_a/\sigma}$ implies that $a = c^{\sigma/\sigma_a}B^{-\sigma/\sigma_a}$. We know that a follows a Pareto distribution with tail θ^a. Thus,

$$P(c > x) = P(Ba^{\sigma_a/\sigma} > x) = P\left(a > \frac{x}{B}^{\sigma/\sigma_a}\right)$$

Since we know that $P(a > y) \sim Cy^{-\theta^a}$, we have $P(c > y) \sim C\left((y/B)^{\sigma/\sigma_a}\right)^{-\theta^a}$. This means that the distribution for consumption follows a Pareto distribution with tail

$$\theta^c = \theta^a \sigma/\sigma_a.$$

Now, Gaillard et al. (2023) show that in the U.S., $\theta^c/\theta^a \approx 2.24$. Setting $\sigma = 2$, this implies $\sigma_a = 0.89$.

With $r = 3\%$, $g = 1.5\%$ and a Pareto tail for wealth of $\theta^a = 1.35$, this yields a probability to die of

$$\xi = 1 - R^{-\theta^a} = 1 - \left(\frac{1+r}{1+g}\right)^{-\theta^a} \approx 0.020,$$

against $1 - (1+r)^{-\theta^a} \approx 0.04$ without growth.

B.2 The 1970 wealth distribution in the model and in the data

Table B.1 reports the 1970 distribution of wealth in the model and in the data.[21] The model matches the top shares, where one-asset models with precautionary saving alone fall short: the taste for wealth makes the rich save almost all of their income (their policy

[21] Online Appendix D describes the numerical solution method.

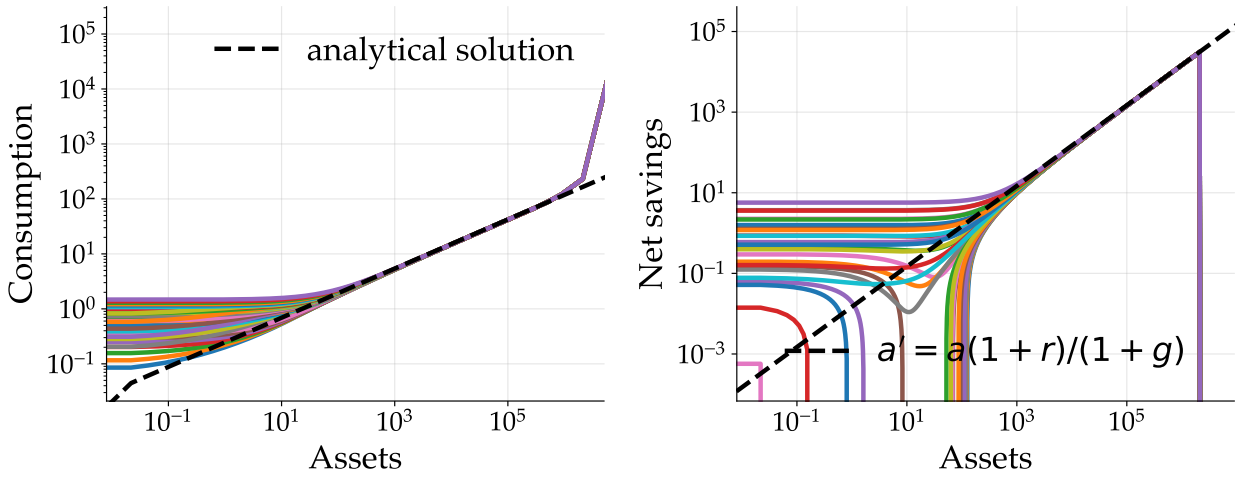


Figure B.1: Policy function for savings and consumption at the steady state

Note: The first panel shows the consumption function, as a function of wealth (x-axis), and idiosyncratic types (different colors), versus our analytical solutions for high levels of wealth. The second panel plots the policy function for the change in wealth ($a' - a$) versus the approximation $a' = a(1+r)/(1+g)$.

function converges to $a' = a(1+r)/(1+g)$, Figure B.1), and the death probability keeps the distribution from degenerating.

Table B.1: Distribution of wealth in the baseline model for the year 1970

Name	Bottom 50%	Next 40%	Top 10%	Top 1%	Top 0.1%	Top 0.01%	r	A/Y
Model	6.6	33.0	60.4	26.9	11.0	4.4	3.0	3.7
Data PSZ	1.0	29.9	69.1	26.9	9.5	3.3		

Note: This table shows the distribution of wealth in the baseline model, along with the equilibrium interest rate and wealth-to-output ratio, in levels. For example, the 'Top 10%' column of the model row is the top 10% wealth share in percent.

B.3 Contribution of each ingredient to the 1970 wealth distribution

Table B.2 removes one ingredient of the model at a time, keeping the calibration otherwise unchanged.[22] The taste for wealth is what generates the concentration: without it, the top 1% share falls by 19.1 percentage points and the top 0.1% share by 9.7. Removing imperfect competition at fixed technology lowers the top 1% and top 0.1% shares by

[22]Without the taste for wealth, we re-solve β to keep r at 3% and the wealth-to-output ratio at its baseline value; keeping β at its calibrated value would imply an interest rate near 100%. In the other rows β stays at its baseline value and r adjusts to clear the asset market. Because the model is non-linear, the rows do not add up to the baseline.

about 5 percentage points, because the economy then holds its wealth as physical capital, which lowers the interest rate by 0.8 percentage points and raises wages; the fall in r hits the wealthy, whose income is mostly financial, while the rise in w benefits the bottom of the distribution. Paying bequests equally rather than in proportion to permanent income barely moves the top shares. Removing idiosyncratic productivity shocks raises the top 1% share by 31 percentage points: as in Hubmer et al. (2021), these shocks generate precautionary saving at the bottom of the distribution and smooth the wealth distribution, so their variance lowers rather than raises wealth inequality.

Table B.2: Contribution of different channels to steady state wealth shares

#	Scenario	Bottom 50%	Next 40%	Top 10%	Top 1%	Top 0.1%	Top 0.01%	r	A/Y
1	Homothetic prefs. ($\gamma = 0$)	8.4	14.2	-22.7	-19.1	-9.7	-4.2	0.0	0.0
2	Perfect competition ($\mu = 1$)	-0.9	1.7	-0.9	-4.8	-4.8	-3.2	-0.8	-120.9
3	No prop. inheritance	2.8	-1.0	-1.8	0.1	0.7	0.7	0.1	-9.1
4	No trans. shocks ($\sigma_\varepsilon = 0$)	-6.5	-20.9	27.3	30.6	26.2	20.3	0.5	-50.7

Note: This table displays the p.p. change in the wealth distribution, the interest rate, and the wealth-to-output ratio, for each quantile after removing a given feature of the model, keeping the calibration constant. For example, the first row reports the effect of removing the non-homothetic taste for wealth ($\gamma = 0$): the top 1% wealth share changes by -19.1 p.p. and the interest rate by 0.0 p.p. (from 3.0% to 3.0%).

B.4 Marginal propensities to save by permanent income type

Table B.3 reports the marginal propensity to save of each permanent income type in the baseline steady state: the additional wealth accumulated over six years after a small permanent rise in post-tax labor income, divided by the cumulated additional income, at fixed prices.

Table B.3: Marginal propensity to save by permanent income group

Bottom 50%	Next 40%	Next 9%	Next 0.9%	Top 0.1%
0.12	0.32	0.59	0.81	0.86

Note: This table shows the marginal propensity to save (MPS) for each permanent income group at the initial steady state: the additional wealth accumulated over 6 years after a small permanent rise in post-tax labor income, divided by the cumulated additional income (prices held fixed).

B.5 Unit of observation: equal-split adjustment of the SCF

The Distributional National Accounts of Piketty et al. (2018) report inequality statistics per *equal-split adult*: for married couples, total household income and wealth are divided equally between the two spouses, and each spouse is treated as a separate observation.

The Survey of Consumer Finances (SCF), by contrast, uses the household—or more precisely, the *primary economic unit* (PEU)—as its unit of observation. All income and wealth variables are reported at the household level, without distinguishing between spouses.

To ensure comparability between the two data sources, we convert the SCF to a per-adult basis by applying an equal-split adjustment: for each married or partnered household (identified by the `MARRIED` variable in the SCF), we divide all dollar-denominated variables by two and multiply the survey weight by two. Single-person households are left unchanged. This transformation ensures that top shares and portfolio compositions computed from the SCF are measured on the same per-adult basis as the PSZ distributional data and as the agents in our model.

B.6 Calibration of the exogenous portfolio share

We follow Auclert & Rognlie (2018) and calibrate our portfolio share function on data from the Survey of Consumer Finances, using all available waves from 1989 to 2019, converted to a per-adult basis. The narrow share, used in the baseline, is the share of net worth held in claims on firms, with the same definition as the risky assets of Figure 4:

$$\text{narrow share} = \frac{\text{EQUITY} + \text{BUS} + \text{OTHNFIN}}{\text{NETWORTH}},$$

where EQUITY is equity held directly and indirectly through mutual funds, retirement accounts, annuities and trusts, BUS is private business equity, and OTHNFIN other nonfinancial assets. The broad share, used in the robustness analysis, adds housing and other

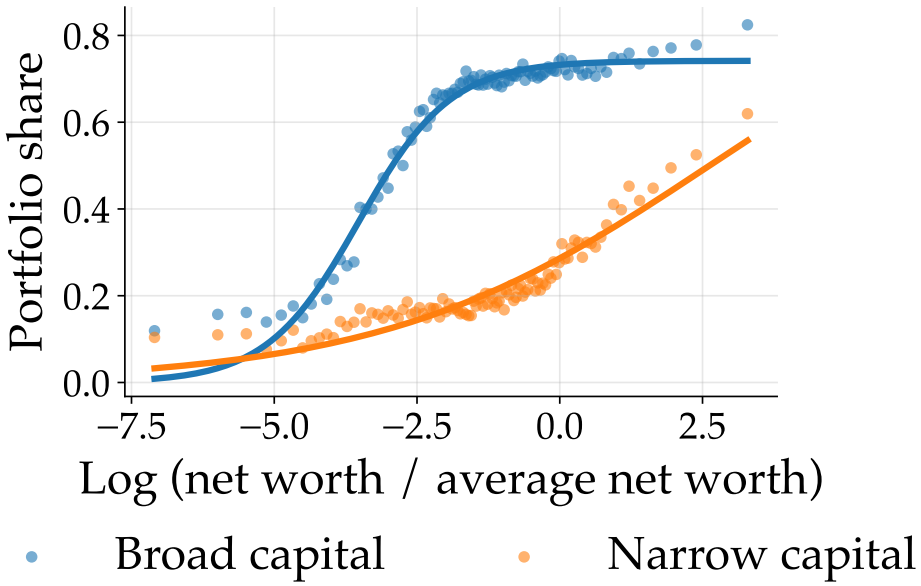


Figure B.2: Portfolio shares in the SCF and in the model

real estate net of the debt secured on it:

$$\text{broad share} = \frac{\text{EQUITY} + \text{BUS} + \text{OTHNFIN} + \text{net housing}}{\text{NETWORTH}},$$
$$\text{net housing} = \text{HOUSES} + \text{ORESRE} + \text{NNRESRE} - \text{MRTHEL} - \text{RESDBT}.$$

We compute weighted averages of each share by centile of net worth relative to the wave mean and fit the logistic function of Equation (3) on these centile averages, with the level parameter bounded by one since the model caps the share at one.

Figure B.3 and Table B.4 document the composition of wealth by wealth group in the distributional national accounts of Piketty et al. (2018) and in the SCF: equity and business wealth dominate at the top, housing in the bottom 90%, and unrealized capital gains are a larger share of net worth at the top.

Table B.5 reports the share of net worth, of claims on firms and of claims on firms plus net housing held by each wealth group in the SCF: the bottom half of the distribution owns almost none of either risky aggregate, and the two definitions differ in how they split the rest between the next 40% and the top 1%.

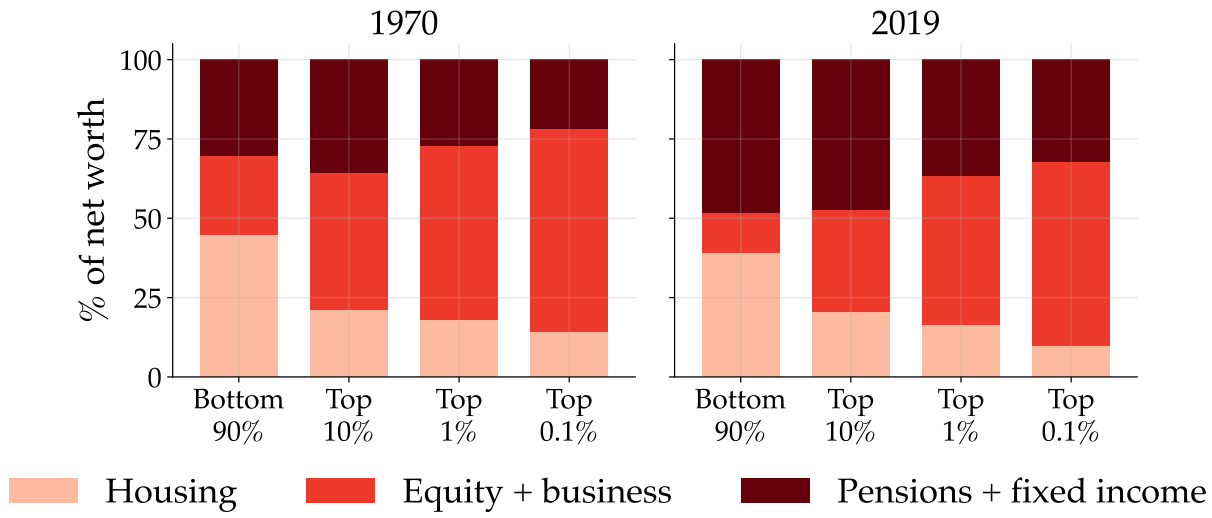


Figure B.3: Composition of net worth by wealth group, 1970 and 2019

Note: Distributional national accounts (Piketty et al. 2018), equal-split adults. Housing is net of mortgages; fixed-income claims are net of non-mortgage debt.

B.7 Markups over Time in De Loecker et al. (2020)

In the series of De Loecker et al. (2020), the average markup between 1970 and 2017 is 1.39, and the average between 1960 and 1980 is 1.3. Our baseline of 1.2 is at the lower end of the 1960s and 1970s values; the main text reports results for μ between 1.0 and 1.3.

Table B.4: Portfolio composition by wealth group

	DINA 1970		DINA 2019		SCF 1989-2019		
	Housing	Equity+business	Housing	Equity+business	Housing	Equity+business	Capital gains
Bottom 90%	44.8	24.8	39.1	12.6	53.4	28.1	32.2
Top 10%	21.2	43.1	20.6	32.0	25.3	55.3	38.0
Top 1%	18.0	54.8	16.5	46.9	18.2	66.0	45.6
Top 0.1%	14.3	63.8	10.0	57.8	13.9	73.1	54.1

Note: Percent of the group's net worth. DINA: Piketty, Saez and Zucman (2018, update 2023), Appendix Tables E2, E2b, E2c, equal-split adults; housing is net of mortgages, equity + business = equities + business assets; the remainder is pensions and fixed-income claims net of non-mortgage debt. SCF: equal-split adults, means over the 1989-2019 waves; housing is net of mortgages, equity + business = BUS + EQUITY + OTHNFIN, capital gains = unrealized capital gains (KGTOTAL) in percent of net worth; bottom 90% = all households minus the top 10%.

Table B.5: Ownership of net worth and of risky assets by wealth group

	Net worth	Firm claims (narrow)	Firm claims and net housing (broad)
Bottom 50%	4.6	1.7	4.0
Next 40%	27.7	15.9	25.8
Top 10%	67.7	82.3	70.1
Top 1%	31.3	45.7	34.2
Top 0.1%	11.4	18.3	12.8

Note: Share of the aggregate held by each wealth group, in percent, averaged over the 1989–2019 waves of the SCF (equal-split adults, sample of the portfolio fit of Online Appendix B.6). Firm claims are BUS + EQUITY + OTHNFIN; net housing is HOUSES + ORESRE + NNRESRE - MRTHEL - RESDBT. Groups are ranked by net worth within each wave.

C Additional Quantitative Results

This section reports additional quantitative results. Table C.1 reports the long-run changes in prices and quantities between the 1970 and 2019 steady states, and Table C.2 the steady-state general-equilibrium effect on wealth shares, the counterpart of Table 3 in the main text: the decline in r lowers the top shares and the bequest flow raises the bottom shares, and the total effect lowers the top 1% share by 6.8 points under perfect competition and by 6.5 points with markups.

Figure C.1 decomposes the general-equilibrium effect on the average wealth of each group, channel by channel, after a one-time shock, and Figure C.2 shows the composition of income along the wealth distribution in the first period of the shock, in the baseline model.

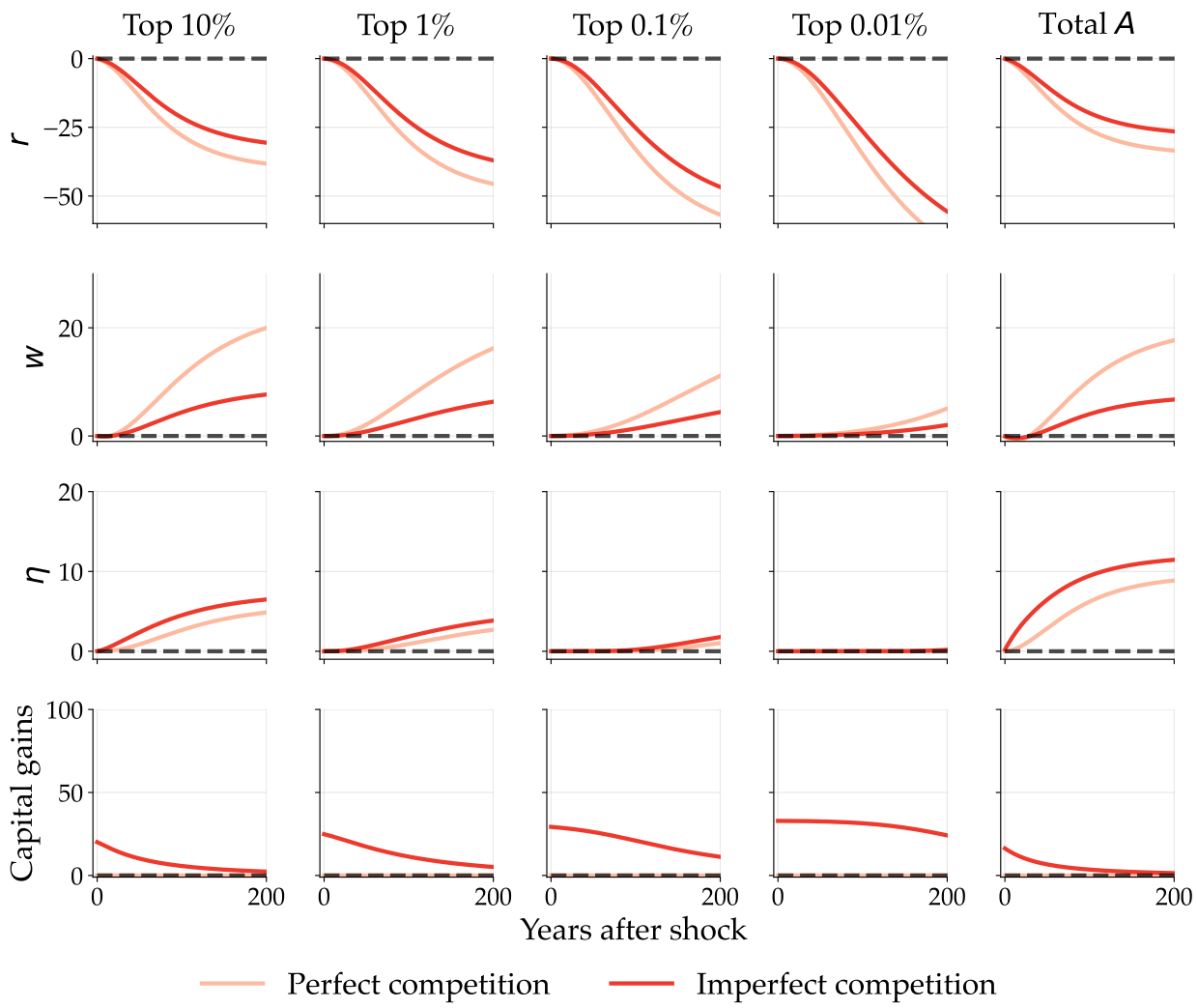


Figure C.1: Decomposition of the GE effect on the per-quantile average wealth levels.

Table C.1: Change in macro variables between initial and terminal steady states

Variable	$\mu = 1.0$	$\mu = 1.2$
r	-0.8	-0.6
w	9.6	3.8
η	29.0	36.1
Y	9.6	3.8
K	31.6	11.9
q	31.6	38.9
G	2.9	4.1

Note: This table shows the change in key macro variables between the initial (1970) and terminal steady states. The interest rate r is reported as a percentage point (p.p.) change. All other variables are reported as percentage (%) changes.

Table C.2: General equilibrium effect on wealth shares at the steady state

Variable	Model	Bottom 50%	Next 40%	Top 10%	Top 1%	Top 0.1%	Top 0.01%
r	$\mu = 1.0$	0.4	4.7	-5.1	-6.1	-5.1	-3.2
	$\mu = 1.2$	0.4	3.8	-4.3	-5.2	-4.4	-2.9
w	$\mu = 1.0$	-0.7	-1.3	2.0	0.9	0.4	0.3
	$\mu = 1.2$	-0.3	-0.6	0.9	0.4	0.2	0.1
η	$\mu = 1.0$	0.6	1.5	-2.1	-1.3	-0.6	-0.2
	$\mu = 1.2$	0.7	1.8	-2.5	-1.6	-0.7	-0.3
Total	$\mu = 1.0$	0.4	5.1	-5.5	-6.8	-5.4	-3.3
	$\mu = 1.2$	0.9	5.3	-6.1	-6.5	-4.9	-3.0

Note: This table displays the p.p. change in the wealth shares for each quantile due to the general equilibrium effect. Note that due to non-linearities in the policy functions, the sum of the partial effects does not add up to the total general equilibrium effect.

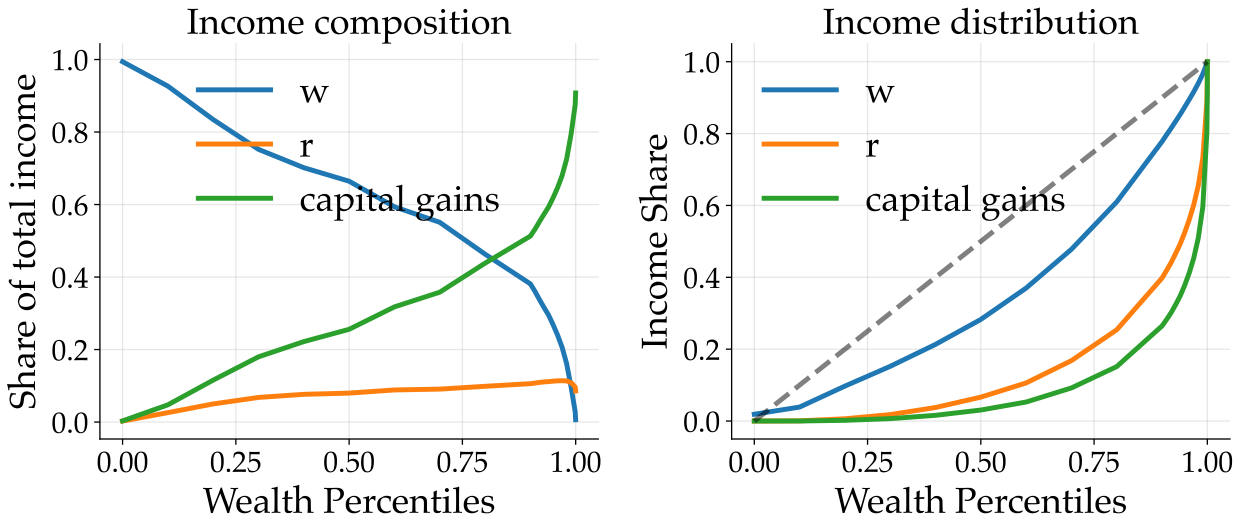


Figure C.2: Income composition and distribution along the distribution of wealth, at period $t = 0$ of a one-time permanent labor income inequality shock

C.1 Gradual Transition: Additional Results

Table C.3 and Figure C.3 compare the top wealth shares, the wealth-to-output ratio and Tobin's Q along the gradual (myopic) transition with U.S. data over 1970 to 2020; the price paths are in Section 6 of the main text. Table C.4 reports the robustness table of the main text for all six wealth groups.

Table C.3: Model and data, 1970 to 2020

	Data	Model	Price channel	Model, $\mu = 1$
Top 10% wealth share (pp)	2.35	8.05	1.28	7.43
Top 1% wealth share (pp)†	8.01	8.46	2.23	7.08
Top 0.1% wealth share (pp)†	8.11	3.43	1.65	2.28
Top 0.01% wealth share (pp)	5.86	0.58	0.88	-0.16
Wealth-to-output W/Y (pp)†	208.65	83.56	31.02	21.30
Tobin's Q (level)	0.73	0.20	0.20	0.00
Capital-gains share of Δ wealth (%)	74.30	72.87	–	0.00

Note: Changes from 1970 to 2019 (data, PSZ) and from 1970 to 2020 (model, gradual transition with annual surprises). Model: full transition at $\mu = 1.2$; the price channel holds permanent labor income at its 1970 distribution and feeds households the realized paths of r, w, capital gains and bequests; the last column is the full transition under perfect competition. †: the 1970 level of this moment is a calibration target (the top 0.1% share through the targeted Pareto tail); no change over time is targeted. The capital-gains share of accumulation is the sum of capital gains over 1971–2019 divided by the change in wealth: residual capital gains in the data (PSZ), unexpected equity revaluations in the model; Tobin's Q is an aggregate price, so its price-channel cell repeats the total. The table quantifies one mechanism: the transition includes no force other than rising permanent labor income inequality.

C.2 Robustness Variants

Table 4 in the main text reports the price (general-equilibrium) channel effect on the average wealth level of each group in 2020, in percent of its 1970 steady-state level: the change in wealth implied by the realized paths of r, w, asset prices and bequests, holding the distribution of permanent labor income at its 1970 value. Every variant is a gradual transition fed with the same 1970–2019 path of permanent labor income inequality, and differs from the baseline in one respect.

Markup. The markup variants use annual surprises and the baseline portfolio rule. At $\mu = 1$, Z and δ are re-pinned so that r, w and the wealth-to-output ratio are the same as in

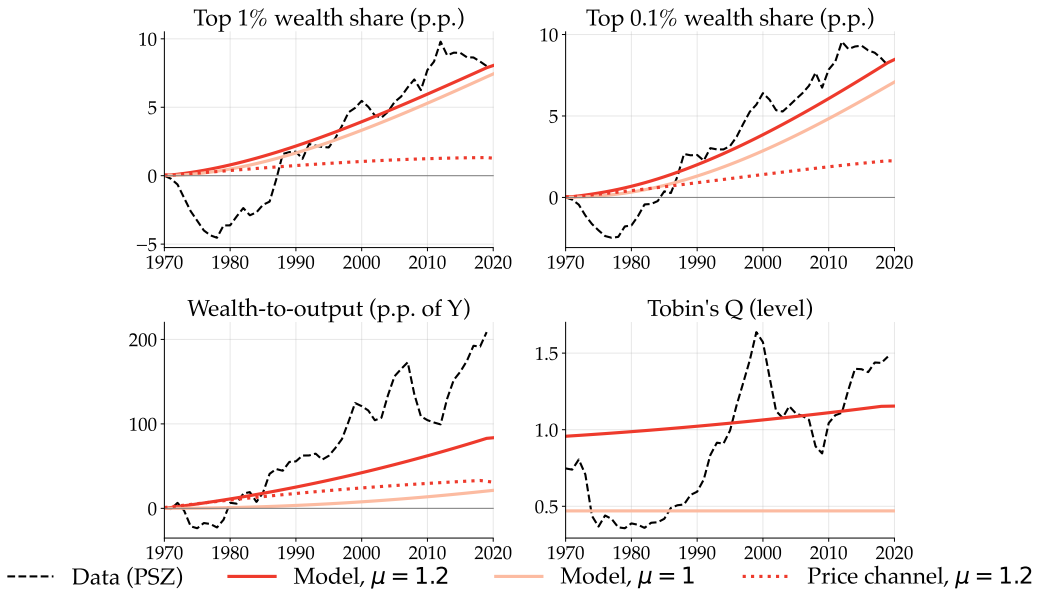


Figure C.3: Model and data over time, 1970 to 2020

Note: Top 1% and top 0.1% wealth shares and the household wealth-to-output ratio as changes since 1970 (percentage points), and Tobin's Q in levels. Data: Piketty et al. (2018), 1970 to 2019. Model: gradual transition with annual surprises, total (solid) and price channel alone (dotted), $\mu = 1.2$ and $\mu = 1$. The price channel has no separate Tobin's Q.

the baseline, which leaves the household side, and therefore the 1970 wealth distribution, unchanged; only the asset-supply side differs. At $\mu = 1.1$ and $\mu = 1.3$, technology is kept at its baseline value and β is re-solved to clear the asset market at $r = 3\%$ (Section 4 of the main text).

Portfolio rule. The baseline allocates the capital gains of each revelation date with the narrow rule fitted to the share of net worth held in claims on firms in the pooled 1989–2019 SCF (Online Appendix B.6). The broad rule adds housing net of mortgages to these claims; the constant-share rule gives every household the same exposure, so that capital gains are allocated in proportion to wealth.

Expectations. The baseline is a sequence of annual surprises: each year, households learn the current change in the income distribution and expect no further change. In the window variants, households learn the next 5 or 10 years of the inequality path at once and re-optimize when the next block is revealed. Under perfect foresight, the whole 1970–2019 path is revealed in 1970, so the revaluation of firms happens once, on impact.

Growth, bequests and taxes. The no-growth variant sets $g = 0$, recalibrates the death rate

Table C.4: Price channel effect on average wealth levels in 2020 across model variants, all wealth groups

	Bottom 50%	Next 40%	Top 10%	Top 1%	Top 0.1%	Top 0.01%	Average
Markup							
$\mu = 1.0$	-8.9	-5.2	-4.6	-4.0	-4.1	-4.3	-5.4
$\mu = 1.1$	0.6	3.2	8.7	15.0	21.9	27.1	6.3
$\mu = 1.2$ (baseline)	3.8	5.3	10.8	17.6	24.8	30.3	8.4
$\mu = 1.3$	4.9	6.0	11.3	17.9	24.8	30.1	8.9
Portfolio rule ($\mu = 1.2$)							
Broad incl. housing	6.6	7.1	8.4	10.9	12.7	13.2	7.8
Constant share	7.0	7.1	8.3	10.7	12.4	12.9	7.8
Expectations ($\mu = 1.2$)							
5-year window	3.9	5.1	10.0	16.4	23.4	28.8	7.9
10-year window	4.1	4.9	9.1	15.2	21.9	26.9	7.4
Perfect foresight	5.7	4.8	5.6	9.6	14.5	18.2	5.3
Growth, bequests, taxes ($\mu = 1.2$)							
No growth ($g = 0$)	-4.0	-3.0	-1.4	0.1	1.1	1.9	-2.3
Equal bequest redistribution	3.3	4.2	8.4	14.9	21.2	26.1	6.4
Flat labor tax ($\lambda = 0$)	6.4	8.2	15.0	23.3	32.9	40.3	12.4

Note: Price (general equilibrium) channel effect on the average wealth level of each group in 2020, in percent of its 1970 level, holding the income distribution at its 1970 value, for all six wealth groups; the variants are those of Table 4 in the main text.

to the wealth Pareto tail, and re-pins technology to the same 1970 targets for r, w and the wealth-to-output ratio, so that rents are capitalized at r instead of $r - g$. The equal-bequest variant splits the net bequest pool equally across newborn households instead of in proportion to permanent income. The flat-tax variant sets the progressivity of the labor income tax to zero, so that the shock fed to the model is the pre-tax change in permanent income shares rather than the post-tax change, which is smaller by a factor $1 - \lambda$.

D Solution Method

Household problem. We solve the household's dynamic programming problem using the endogenous grid method (EGM) of Carroll (2006). Because the wealth distribution exhibits a Pareto tail, we discretize the asset space on a non-linear grid of $n_A = 1{,}000$ points with curvature chosen to concentrate points in the empirically relevant range while extending the upper bound to $\bar{a} = 10^7$ (about 2.7 million times average wealth). We verify

ex-post that the mass of the stationary distribution at the upper bound is negligible (below 10^{-8}), ensuring that the grid does not artificially truncate the tail.

Steady state. At the steady state, the equity price follows from the no-arbitrage condition of the main text, $q = (1+g)(1-\tau_k)d/(r-g)$, reducing the general equilibrium problem to a single unknown. To calibrate the initial steady-state, we solve for the discount factor β such that the asset market clears: $A = q + B$. For the terminal steady-state (with high-inequality), we find the level of physical capital K that clears the asset market. The outer loop uses Brent's method, while each evaluation solves the full household problem via EGM.

One-time transition. We compute perfect-foresight transitions following an unexpected, permanent MIT shock to the distribution of permanent labor income. Given initial and terminal steady states, we solve for the T-period path of the capital stock $\{K_t\}_{t=0}^{T-1}$ that clears the asset market at every date. We initialize the Jacobian of the asset market clearing condition with respect to K using the sequence-space Jacobian of Auclert et al. (2021), and then update it using Broyden's method. At each iteration, given a candidate $\{K_t\}$, we compute the implied price sequences $\{r_t, w_t, q_t\}$ from the firm and arbitrage blocks, solve the household problem forward from the initial distribution, and evaluate the asset market residual. The Broyden update avoids recomputing the full $T \times T$ Jacobian at each step, making the algorithm tractable for long horizons ($T = 500$).

Myopic transition. The myopic transition models the gradual increase in permanent labor income inequality as a sequence of unanticipated MIT shocks. At each date $t \in \{1, \ldots, T_{\text{trans}}\}$, the economy is hit by a new shock to the permanent income distribution $\{z_i\}_t$, and households treat it as one-time and permanent. Conditional on the shock, they have perfect foresight over future prices. Formally, at date t we solve a full perfect-foresight transition from the current state of the economy to the new terminal steady state implied by $\{z_i\}_t$. We then extract the period-t outcomes—prices, distributions, and aggregates—and use the resulting distribution Φ_{t+1} as the initial condition for the next

shock at $t+1$. This nests a sequence of MIT-shock transitions, each solved using the Broyden algorithm described above.