THE HISTORICAL EVOLUTION OF THE WEALTH DISTRIBUTION: A QUANTITATIVE-THEORETIC INVESTIGATION

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This paper employs the benchmark heterogeneous-agent model used in macroeconomics to examine drivers of the rise in wealth inequality in the U.S. over the last thirty years. Several plausible candidates are formulated, calibrated to data, and examined through the lens of the model. There is one main finding: by far the most important driver is the significant drop in tax progressivity that started in the late 1970s, intensified during the Reagan years, and then subsequently flattened out, with only a minor bounce back. The sharp observed increases in earnings inequality, the falling labor share over the recent decades, and potential mechanisms underlying changes in the gap between the interest rate and the growth rate (Piketty's r-g story) all fall far short of accounting for the data.
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I. The Model

A. Consumers

Time is discrete and there is a continuum of infinitely lived, ex ante identical consumers (dynasties). Preferences are defined over infinite streams of consumption with von Neumann-Morgenstern utility in constant relative risk aversion (CRRA) form:

$$u(c) = \frac{c^{1-\gamma}}{1-\gamma} \tag{1}$$

In period t, a consumer discounts the future with an idiosyncratic stochastic factor β_t that is the realization of a Markov process characterized by the conditional distribution $\Gamma\beta(\beta_{t+1}|\beta_t)$, giving rise to the following objective:

$$\max_{(c_t)_{t=0}^{\infty}} \left\{ u(c_0) + \mathbb{E}\left[\sum_{t=1}^{\infty} \prod_{s=0}^{t-1} \beta_s u(c_t) \right] \right\}. \tag{2}$$

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Labor supply is exogenous. Each period t, a consumer supplies a stochastic amount $l_t = l_t(p_t, \nu_t)$ of efficiency units of labor to the market that depends on a persistent component $p_t \sim \Gamma_p(p_t|p_{t-1})$ and a transitory component $\nu_t \sim \Gamma_\nu(\nu_t)$. Taking as given a competitive wage rate w_t, her earnings are $w_t l_t$. Asset markets are incomplete: consumers cannot fully insure against idiosyncratic shocks, but instead have access only to a single asset that pays a gross return $(1+r_t\eta_t)$, where r_t is the average market return and $\eta_t \sim \Gamma_\eta(\eta_t)$ is a transitory idiosyncratic shock. The decision problem of the consumer can be stated parsimoniously in recursive form:

$$V_t(x_t, p_t, \beta_t) = \max_{a_{t+1} \geq a} u(x_t - a_{t+1}) + \beta_t \mathbb{E}[V_{t+1}(x_{t+1}, p_{t+1}, \beta_{t+1}|p_t, \beta_t)] \tag{3}$$

$$\text{subject to} \;\; x_{t+1} = a_{t+1} + y_{t+1} - \tau_{t+1}(y_{t+1}) + T_{t+1} \tag{4}$$

$$y_{t+1} = r_{t+1}\eta_{t+1}a_{t+1} + w_{t+1}l_{t+1}(p_{t+1}, \nu_{t+1}) \tag{5}$$

Given cash-on-hand x_t (all resources available in period t), the optimal savings decision and the resulting value function depend solely on the persistent component in the earnings process p_t and the current discount factor β_t. Conditional on (p_t, β_t), the expectation is taken over (p_{t+1}, β_{t+1}) as well as the transitory shocks to earnings ν_{t+1} and the return on capital η_{t+1}. Gross income y_t is subject to an income tax $\tau_t(\cdot)$ and each consumer receives a uniform lump-sum transfer T_t.

B. Production, government, and equilibrium

Firms are perfectly competitive and can be described by an aggregate constant returns to scale production function $F(K_t, L)$ that yields a wage rate per efficiency unit of labor $w_t = \frac{\partial F(K_t,L)}{\partial L}$ as well as an (average) market return on capital $r_t = \frac{\partial F(K_t,L)}{\partial K} - \delta$, where $\delta \in (0,1)$ is the depreciation rate. Aggregate labor supply L is normalized to one throughout.

The government redistributes aggregate income by means of a uniform lump-sum payment, which amounts to a constant fraction $\lambda \in [0,1]$ of aggregate tax revenues. The remainder is spent in a way such that marginal utilities of agents are not affected.

A steady-state equilibrium of this economy is characterized by a market clearing level of capital $K^\star$ and a lump-sum transfer $T^\star$ such that:

(i) factor prices are given by their respective marginal products $w^\star = \frac{\partial F(K^\star,1)}{\partial L}$ and $r^\star = \frac{\partial F(K^\star,1)}{\partial K} - \delta$;

(ii) given $r^\star$, $w^\star$, and $T^\star$, consumers solve the stationary version of their decision problem, giving rise to an invariant distribution $\Gamma(a, p, \beta, \nu, \eta)$;

(iii) the government redistributes a fraction λ of total tax revenues, i.e.,

$$T^\star = \lambda\tau(r^\star \eta a + w^\star l(p,\nu))d\Gamma(a,p,\beta,\nu,\eta);$$

(iv) and capital markets clear, i.e.,

$$K^\star = ad\Gamma(a,p,\beta,\nu,\eta).$$

In the benchmark perfect-foresight transition experiment, we start the economy in period t_0 in some initial steady state, described by a vector $\theta^\star$ that parametrizes the tax schedule and earnings process and by the equilibrium objects $(K^\star, T^\star)$. Agents are fully surprised and learn about a new exogenous environment $(\theta_t)_{t=t_0+1}^{t_1}$ that will prevail over some transition period $t = t_0+1, t_0+2, ..., t_1$. From t_1 onwards, the exogenous environment will once again be constant and equal to θt_1. In a perfect-foresight equilibrium, agents are fully informed about future equilibrium objects $(K_t, T_t)_{t=t_0+1}^{\infty}$ too and optimize accordingly. Capital markets clear and the fraction of tax revenues λ that is redistributed is fixed.

In an alternative myopic transition experiment, agents are surprised about the new exogenous environment and equilibrium prices every period. That is, in period $t = t_0, t_0+1, ..., t_1 1$, given a distribution $\Gamma_t(x_t, p_t, \beta_t)$, they choose a savings decision rule, $a_{t+1} = g_t(x_t, p_t, \beta_t)$, assuming that both θ_t and (r_t, w_t, T_t) will prevail forever. In period $t+1$, they are accordingly surprised that: one, the exogenous environment has changed to θ_{t+1}; and, two, that equilibrium factor returns (r_{t+1}, w_{t+1}) and transfers T_{t+1} result from capital-market clearing and government-budget balance in period $t+1$. These two informational structures are, of course, extreme. We chose them because we expect them to bracket a range of informational assumptions. Given that the results, as will be reported below, turn out to be very similar across the two structures, we are confident that our findings are robust to other variations in this dimension.