Cultural Theory of Inequality Dynamics

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Introduction: Social norms over the relative value of consumption versus other activities (here collectively called 'leisure') and household wealth influence how much time households invest in wage earning activities. Well-endowed households optimally spend less time working for wages. This short paper formally argues that increases in societal preferences for consumption relative to leisure, increase societal consumption inequality. The reason is threefold: (1) An increase in consumption preferences drives all households into wage work but wealthy households more so. Hence, the income of wealthy households increases more on the *extensive margin.* (2) The increased labor supply drives down wages. Poor households lose more on the *intensive margin.* (3) Finally, increased labor supply drives up returns to capital, disproportionately increasing wealthy households' income. Thus, on all margins, the 'rich get richer and the poor poorer,' relatively.

Model: A continuum of households is uniformly indexed over the unit interval ($i \tilde{} U[0,1]$). They differ only in their initial endowment of capital: household i has capital endowment $\omega_i \equiv \omega[i]$, $\omega' > 0$, invested in production. Every household also has one unit of labor and decides to spend $l_i \geq 0$ in wage earning employment and enjoying the remainder $(1 - l_i)$ in leisure. Aggregate production is given by CRS Cobb-Douglas $G[K,L] = \lambda K^{\alpha} L^{1-\alpha}$ such that capital and labor are each compensated according to their marginal productivity: capital earns at rate $r \equiv G_1[K,L] = \alpha\lambda (K/L)^{\alpha-1}$ and labor earns at wage $w \equiv G_2[K,L] = (1-\alpha)\lambda (K/L)^{\alpha}$, where $K \equiv \int_0^1 \omega[i]\, di$ is aggregate capital and $L \equiv \int_0^1 l[\omega[i]]\, di$ is aggregate labor.[1] Given ω_i and the equilibrium r and w (fixed from the perspective of an atomless household), household i chooses l_i to maximize Cobb-Douglas utility

$$\max_{0 \leq l_i \leq 1} (\omega_i r + w l_i)^{\gamma} (1 - l_i)^{1-\gamma}$$

where γ represents the relative preferences for consumption over leisure. Notice that each household ends with its original wealth, since all income but only income is consumed. Thus, this (overly) simple model is steady state.

[1] CRS implies $zF[K,L] = F[zK, zL]$. Differentiaing both sides wrt z and evaluating at $z = 1$ yields $F[K,L] = F_1[K,L]K + F_2[K,L]L$ such that total product equals total income when factor inputs are compensated according to marginal product. Competition ensures these equilibrium rates.

Equilibrium: The FOC of the (logged) household objective is

$$\gamma \frac{w}{\omega_i r + w l_i} = (1-\gamma)\frac{1}{1-l_i}$$

Solving for l_i as a function of ω_i

$$l_i = \gamma - (1-\gamma)\frac{r}{w}\omega_i$$

where the ratio of rate of capital return and wage is always (due to CRS)

$$\frac{r}{w} = \frac{\alpha}{1-\alpha}\frac{L}{K}$$

Thus, aggregate labor supply satisfies

$$L = \int_0^1 \left(\gamma - (1-\gamma)\frac{\alpha}{1-\alpha}\frac{L}{K}\omega\left[i\right]\right) di = \gamma - (1-\gamma)\frac{\alpha}{1-\alpha}L$$

Solving for L:

$$L = \frac{\gamma}{1+(1-\gamma)\frac{\alpha}{1-\alpha}}$$

Comparative Statics: Household labor contribution decreases in wealth:

$$\frac{dl_i}{d\omega_i} = -(1-\gamma)\frac{r}{w} < 0$$

However, as preferences for consumption increase this difference diminishes:

$$\frac{d^2 l_i}{d\gamma d\omega_i} = \frac{r}{w} > 0$$

Aggregate labor increases as preferences for consumption increase:

$$\frac{dL}{d\gamma} = \frac{1+\frac{\alpha}{1-\alpha}}{\left(1+(1-\gamma)\frac{\alpha}{1-\alpha}\right)^2} > 0$$

Since capital is fixed, rates of capital return increase

$$\frac{dr}{d\gamma} = -(\alpha-1)\alpha\lambda\left(K/L\right)^{\alpha-2}\frac{K}{L^2}\frac{dL}{d\gamma} = \frac{1-\alpha}{L}r\frac{dL}{d\gamma} > 0$$

and wages fall

$$\frac{dw}{d\gamma} = -\alpha(1-\alpha)\lambda\left(K/L\right)^{\alpha-1}\frac{K}{L^2}\frac{dL}{d\gamma} = -\frac{\alpha}{L}w\frac{dL}{d\gamma} < 0$$

Thus, stronger consumption preferences increase the rich's income more than the poor's:

$$\frac{d^2}{d\omega_i d\gamma}\left(\omega_i r + w l_i\right) = \frac{d}{d\omega_i}\left(\omega_i\frac{dr}{d\gamma} + l_i\frac{dw}{d\gamma} + w\frac{dl_i}{d\gamma}\right) = \frac{dr}{d\gamma} + \frac{dl_i}{d\omega_i}\frac{dw}{d\gamma} + w\frac{d^2 l_i}{d\omega_i d\gamma} > 0$$

Applications: Things that increase taste for consumption γ or reduce pressures to stay out of the workforce $(1-\gamma)$, and thus increase inequality, include: (1) advertising, (2) women's entry into the workforce, (3) weaker child labor protection, (4) destruction of public goods, (5) reduction of family values, (6) decline in religion, (7) longer working hours, (8) longevity, (9) increasing retirement age, (10) celebration of "nerds," and so on.