Distribution and Growth: How Much Can Inequality Increase in the 21st Century?

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Why inequality keeps rising?

- Long run distributional trends = key question asked by 19\textsuperscript{C} economists
- Many came with apocalyptic answers
- Ricardo-Marx: a small group in society (land owners or capitalists) will capture an ever growing share of income & wealth
  → no “balanced development path” can occur
- During 20\textsuperscript{C}, a more optimistic consensus emerged: “growth is a rising tide that lifts all boats”
  (Kuznets 1953; cold war context)
• But inequality ↑ since 1970s destroyed this fragile consensus (US 1976-2007: ≈60% of total growth was absorbed by top 1%)  
→ 19\textsuperscript{C} economists raised the right questions; we need to address these questions again; we have no strong reason to believe in balanced development path

• 2007-2011 world financial crisis also raised doubts about balanced devt path… will stock options & bonuses, or oil-rich countries, or China, or tax havens, absorb an ever growing share of world resources in 21\textsuperscript{C} capitalism?
Convergence vs divergence

• **Convergence forces do exist**: diffusion of knowledge btw countries (fostered by econ & fin integration) & wth countries (fostered by adequate educ institutions)

• **But divergence forces can be stronger**:
  1. When top earners set their own pay, there’s no limit to rent extraction → top income shares can diverge
  2. The wealth accumulation process contains several divergence forces, especially with $r > g$ → a lot depends on the net-of-tax global rate of return $r$ on large diversified portfolios: if $r=5\%-6\%$ in 2010-2050 (=what we observe in 1980-2010 for large Forbes fortunes, or Abu Dhabi sovereign fund, or Harvard endowment), then global wealth divergence is very likely
This talk: two issues

• 1. The rise of the working rich
  (Atkinson-Piketty-Saez, « Top Incomes in the Long Run of History », JEL 2011; new results from World Top Incomes Database)
  (key mechanism: grabbing hand)

• 2. The return of wealth & inheritance
  (key mechanism: \( r > g \))
  (\( r = \) rate of return to wealth, \( g = \) growth rate)
1. The Rise of the Working Rich

• **World top incomes database**: 25 countries, annual series over most of 20C, largest historical data set

• **Two main findings**:
  - **The fall of rentiers**: inequality ↓ during first half of 20C = top capital incomes hit by 1914-1945 capital shocks; did not fully recover so far (long lasting shock + progressive taxation)

  → without war-induced economic & political shock, there would have been no long run decline of inequality; nothing to do with a Kuznets-type spontaneous process

  - **The rise of working rich**: inequality ↑ since 1970s; mostly due to top labor incomes, which rose to unprecedented levels; top wealth & capital incomes also recovering, though less fast

  → what happened?
FIGURE 1
The Top Decile Income Share in the United States, 1917-2010

Source: Piketty and Saez (2003), series updated to 2010.
Income is defined as market income including realized capital gains (excludes government transfers).
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FIGURE 2
Decomposing the Top Decile US Income Share into 3 Groups, 1913-2010
Top 1% share: English Speaking countries (U-shaped), 1910-2010

United States
United Kingdom
Canada
Australia
Ireland
New Zealand
Top 1% share: Continental Europe and Japan (L-shaped), 1900-2010
Top 1% share: Continental Europe, North vs South (L-shaped), 1900-2010

Top Percentile Share (in percent)

- France
- Germany
- Spain
- Italy
- Sweden
Top 1% share: Developing and emerging countries, 1920-2010

- China
- Indonesia
- Argentina
- India
- Singapore
- South Africa
- Mauritius
Top 1% share: Developing and emerging countries, 1920-2010

Graph showing the percentage share of the top 1% for various countries from 1920 to 2010.
Why did top incomes rise so much?

- Hard to account for observed cross-country variations with a pure technological, marginal-product story

- One popular view: US today = working rich get their marginal product (globalization, superstars); Europe today (& US 1970s) = market prices for high skills are distorted downwards (social norms, etc.)

→ very naïve view of the top end labor market…

& very ideological: we have zero evidence on the marginal product of top executives; it could well be that prices are distorted upwards…
• A more realistic view: grabbing hand model = marginal products are unobservable; top executives have an obvious incentive to convince shareholders & subordinates that they are worth a lot; no market convergence because constantly changing corporate & job structure (& costs of experimentation → competition not enough)

→ when pay setters set their own pay, there’s no limit to rent extraction... unless confiscatory tax rates at the very top

(memo: US top tax rate (1m$+) 1932-1980 = 82%)

(no more fringe benefits than today)

(see Piketty-Saez-Stantcheva, NBER WP 2011)
Top Income Tax Rates 1910-2010

2. The return of wealth & inheritance

- The rise of top incomes should fuel the rise of top wealth

- But there are other long-run effects explaining the return of wealth & inheritance

- Two different effects (could go separately):

  (2a) The return of wealth
      (Be careful with « human capital » illusion: human k did not replace old-style financial & real estate wealth)

  (2b) The return of inherited wealth
      (Be careful with « war of ages » illusion: the war of ages did not replace class war)
2a. The return of wealth

- The « human capital » illusion: « in today’s modern economies, what matters is human capital and education, not old-style financial or real estate wealth »
- Technocratic model: Parsons, Galbraith, Becker
  (unidimensional class structure based upon human K)
- But the share of old-style capital income (rent, interest, dividend, etc.) in national income is the same in 2010 as in 1910 (about 30%), and the ratio between aggregate private wealth and national income is also the same in 2010 as in 1910 (about 600%)
- Today in France, Italy, UK: $\beta = W/Y \approx 600\%$
  Per adult national income $Y \approx 30 000\€$
  Per adult private wealth $W \approx 200 000\€$
  (wealth = financial assets + real estate assets – financial liabilities)
  (on average, households own wealth equal to about 6 years of income)
Wealth-income ratio in France 1820-2010

Aggregate private wealth as a fraction of national income
Wealth-income ratio: France vs UK 1820-2010

• There are several long-run effects explaining the return of high wealth-income ratios:
  - it took a long time to recover from world war shocks
    (1913 stock mkt & real estate capitalization recovered during 2000s)
  - financial deregulation & tax competition → rising capital shares and wealth-income ratios
  - growth slowdown in rich countries: \( r > g \)
    → rise of wealth-income and inheritance-income ratios
    + rise of wealth inequality (amplifying mechanism)
    \( (r = \text{rate of return to wealth}, g = \text{productivity growth + pop growth}) \)

• **Aggregate effect:** Harrod-Domar-Solow formula: \( \beta^* = s/g \)
  \( (\beta^* = \text{wealth-income ratio}, s = \text{saving rate}) \)
  (i.e. \( s=10\%, g=2\% \rightarrow \beta^*=500\% \); if \( g=1\% \), then \( \beta^*=1000\% \))
  (i.e. if we save 10% of income each year, then in the long run we accumulate 5 years of income if growth rate is 2%)
  → highly unstable process if growth rate is low
2b. The return of inherited wealth

- In principle, one could very well observe a return of wealth without a return of inherited wealth
- I.e. it could be that the rise of aggregate wealth-income ratio is due mostly to the rise of life-cycle wealth (pension funds)
- Modigliani life-cycle theory: people save for their old days and die with zero wealth, so that inheritance flows are small
- However the Modigliani story happens to be wrong (except in the 50s-60s, when there’s not much left to inherit…)
- Inheritance flow-private income ratio $B/Y = \mu m W/Y$
  (with $m =$ mortality rate, $\mu =$ relative wealth of decedents)
- $B/Y$ has almost returned to 1910 level, both because of $W/Y$ and because of $\mu$: with $g \text{ low} \& r > g$, $B/Y \rightarrow \beta/H$
  $\rightarrow$ with $\beta=600\%$ & $H=\text{generation length}=30 \text{ years}$, then $B/Y \approx 20\%$, i.e. annual inheritance flow $\approx 20\%$ national income
Figure 1: Annual inheritance flow as a fraction of national income, France 1820-2008

- Economic flow (computed from national wealth estimates, mortality tables and observed age-wealth profiles)
- Fiscal flow (computed from observed bequest and gift tax data, inc. tax exempt assets)
Figure 2: Annual inheritance flow as a fraction of disposable income, France 1820-2008

- Economic flow (computed from national wealth estimates, mortality tables and observed age-wealth profiles)
- Fiscal flow (computed from observed bequest and gift tax data, inc. tax exempt assets)
• An annual inheritance flow around 20%-25% of disposable income is a very large flow

• E.g. it is much larger than the annual flow of new savings (typically around 10%-15% of disposable income), which itself comes in part from the return to inheritance (it’s easier to save if you have inherited your house & have no rent to pay)

• An annual inheritance flow around 20%-25% of disposable income means that total, cumulated inherited wealth represents the vast majority of aggregate wealth (typically above 80%-90% of aggregate wealth), and vastly dominates self-made wealth
• Main lesson: with \( r > g \), inheritance is bound to dominate new wealth; the past eats up the future

Note: \( r \) = rate of return to capital = \( \frac{\text{net profits} + \text{rents}}{\text{net financial} + \text{real estate wealth}} \); \( g \) = growth rate \( (g+n) \)

• Intuition: with \( r > g \) & \( g \) low (say \( r = 4\%-5\% \) vs \( g = 1\%-2\% \)), wealth coming from the past is being capitalized faster than growth; heirs just need to save a fraction \( \frac{g}{r} \) of the return to inherited wealth → \( b_y = \frac{\beta}{H} \) (with \( \beta = \frac{W}{Y} \))

→ with \( \beta = 600\% \) & \( H = 30 \), then \( b_y = 20\% \)

• It is only in countries & time periods with \( g \) exceptionally high that self-made wealth dominates inherited wealth (OECD in 1950s-70s or China today)

• \( r > g \) also has an amplifying effect on wealth inequality
### Table 3: Intra-cohort distributions of labor income and inheritance, France, 1910 vs 2010

<table>
<thead>
<tr>
<th>Shares in aggregate labor income or inherited wealth</th>
<th>Labor income 1910-2010</th>
<th>Inherited wealth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top 10% &quot;Upper Class&quot;</td>
<td>30%</td>
<td>1910</td>
</tr>
<tr>
<td>incl. Top 1% &quot;Very Rich&quot;</td>
<td>6%</td>
<td>2010</td>
</tr>
<tr>
<td>incl. Other 9% &quot;Rich&quot;</td>
<td>24%</td>
<td></td>
</tr>
<tr>
<td>Middle 40% &quot;Middle Class&quot;</td>
<td>40%</td>
<td></td>
</tr>
<tr>
<td>Bottom 50% &quot;Poor&quot;</td>
<td>30%</td>
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</tbody>
</table>
Back to distributional analysis: macro ratios determine who is the dominant social class

- 19\textsuperscript{c}: top successors dominate top labor earners → rentier society (Balzac, Jane Austen, etc.)
- For cohorts born in 1910s-1950s, inheritance did not matter too much → labor-based, meritocratic society
- But for cohorts born in the 1970s-1980s & after, inheritance matters a lot → 21\textsuperscript{c} class structure will be intermediate between 19\textsuperscript{c} rentier society than to 20\textsuperscript{c} meritocratic society – and possibly closer to the former
- The rise of human capital & meritocracy was an illusion .. especially with a labor-based tax system
Figure 15: Cohort fraction inheriting more than bottom 50% lifetime labor resources (cohorts born in 1820-2020)

- ■ benchmark scenario
- ▲ low-growth, high-return scenario
Figure 14: Top 1% successors vs top 1% labor income earners (cohorts born in 1820-2020)

- ■ top 1% inheritance resources as a fraction of bottom 50% labor resources
- □ top 1% labor resources as a fraction of bottom 50% labor resources
- △ low-growth, high-return scenario
What have we learned?

• A world with $g$ low & $r > g$ is gloomy for workers with zero initial wealth… especially if global tax competition drives capital taxes to 0%… especially if top labor incomes take a rising share of aggregate labor income

→ A world with $g = 1-2\%$ (=long-run world technological frontier?) is not very different from a world with $g = 0\%$ (Marx-Ricardo)

• From a $r$-vs-$g$ viewpoint, 21\textsuperscript{c} maybe not too different from 19\textsuperscript{c} – but still better than Ancien Regime… except that nobody tried to depict AR as meritocratic…
The meritocratic illusion

Democracies rely on meritocratic values: in order to reconcile the principle of political equality with observed socio-economic inequalities, they need to justify inequality by merit and/or common utility.

• **But effective meritocracy does not come naturally from technical progress & market forces; it requires specific policies & institutions**

• Two (quasi-)illusions: (1) human K didn’t replace financial K (2) war of ages didn’t replace war of classes

• « Meritocratic extremism »: the rise of working rich & the return of inherited wealth can seem contradictory; but they go hand in hand in 21\textsuperscript{o} discourse: in the US, working rich are viewed as the only cure against the return of inheritance – except of course for bottom 90% workers…
• More competitive & efficient markets won’t help to curb divergence forces:

(1) Competition and greed fuel the grabbing hand mechanism; with imperfect information, competitive forces not enough to get pay = marginal product; **only confiscatory top rates can calm down top incomes**

(2) The more efficient the markets, the sharper the capital vs labor distinction; with highly developed k markets, any dull successor can get a high rate of return
• r>g = **nothing to do with market imperfections**
• Standard model: r = δ+σg > g (Golden rule)

→ The important point about capitalism is that r is large (r>g → tax capital, otherwise society is dominated by rentiers), volatile and unpredictable (→ financial crisis)
Supplementary slides
TOP INCOMES OVER THE 20TH CENTURY

A Contrast Between Continental European and English-Speaking Countries

Edited by A. B. Atkinson & T. Piketty

TOP INCOMES GLOBAL PERSPECTIVE

Edited by A. B. Atkinson & T. Piketty
Table 1. Top Percentile Share and Average Income Growth in the US

<table>
<thead>
<tr>
<th>Period</th>
<th>Average Income Real Annual Growth (1)</th>
<th>Top 1% Incomes Real Annual Growth (2)</th>
<th>Bottom 99% Incomes Real Annual Growth (3)</th>
<th>Fraction of total growth captured by top 1% (4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1976-2007</td>
<td>1.2%</td>
<td>4.4%</td>
<td>0.6%</td>
<td>58%</td>
</tr>
<tr>
<td>Clinton Expansion</td>
<td>4.0%</td>
<td>10.3%</td>
<td>2.7%</td>
<td>45%</td>
</tr>
<tr>
<td>1993-2000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bush Expansion</td>
<td>3.0%</td>
<td>10.1%</td>
<td>1.3%</td>
<td>65%</td>
</tr>
<tr>
<td>2002-2007</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Computations based on family market income including realized capital gains (before individual taxes).
Incomes are deflated using the Consumer Price Index (and using the CPI-U-RS before 1992).
Column (4) reports the fraction of total real family income growth captured by the top 1%.
For example, from 2002 to 2007, average real family incomes grew by 3.0% annually but 65% of that growth accrued to the top 1% while only 35% of that growth accrued to the bottom 99% of US families.
Figure 9: Observed vs simulated inheritance flow B/Y, France 1820-2100

- Observed series
- Simulated series (2010-2100: g=1.7%, (1-t)r=3.0%)
- Simulated series (2010-2100: g=1.0%, (1-t)r=5.0%)
The future of global inequality

- **Around 1900-1910**: Europe owned the rest of the world; net foreign wealth of UK or France >100% of their national income (>50% of the rest-of-the-world capital stock)

- **Around 2050**: will the same process happen again, but with China instead of Europe?

- **Bottom line**: international inequalities even less meritocratic than domestic inequalities; e.g. oil price level has nothing to do with merit; the fact that Greece pays interest rate r=10% on its public debt has nothing to do with merit; the price system has nothing to do with merit…
• Assume global convergence in per capita output $Y$ & in capital intensity $K/Y$
• With large differences in population & fully integrated $K$ markets & high world rate of return $r$ (low $K$ taxes)
Then moderate differences in savings rate (say, $s=20\%$ in China vs $s=10\%$ in Europe+US, due to bigger pay-as-you-go pensions in Old World, traumatized by past financial crashes)
can generate very large net foreign asset positions
→ under these assumptions, China might own a large part of the world by 2050
• Likely policy response in the West: K controls, public ownership of domestic firms, etc.
• **But this is not the most likely scenario:** a more plausible scenario is that global billionaires (located in all countries… and particularly in tax havens) will own a rising share of global wealth
• A lot depends on the net-of-tax global rate of return $r$ on large diversified portfolios
• If $r=5\%-6\%$ in 2010-2050 (=what we observe in 1980-2010 for large Forbes fortunes, or Abu Dhabi sovereign fund, or Harvard endowment), then global divergence is very likely
• Both scenarios can happen

• But the « global billionaires own the world » scenario is more likely than the « China own the world » scenario

• And it is also a lot harder to cope with: we’ll need a lot of international policy coordination; without a global crackdown on tax havens & a coordinated world wealth tax on the global rich, individual countries & regions will keep competing to attract billionaires, thereby exacerbating the trend

→ Free, untaxed world K markets can easily lead to major imbalances & global disasters
Figure 13: The share of inheritance in lifetime resources received by cohorts born in 1820-2020

- ■ average inheritance as a fraction of average lifetime labor income resources (all inheritance and labor resources capitalized at age 50)
- △ low-growth, high-return scenario
Figure 17: Cohort fraction inheriting more than bottom 50% lifetime labor resources (cohorts born in 1820-2020)

- ■ benchmark scenario
- ▲ low-growth, high-return scenario
Computing inheritance flows: simple macro arithmetic

\[ \frac{B_t}{Y_t} = \mu_t \ m_t \ \frac{W_t}{Y_t} \]

- \( \frac{W_t}{Y_t} = \) aggregate wealth/income ratio
- \( m_t = \) aggregate mortality rate
- \( \mu_t = \) ratio between average wealth of decedents and average wealth of the living (\( = \) age-wealth profile)

→ The U-shaped pattern of inheritance is the product of three U-shaped effects
<table>
<thead>
<tr>
<th></th>
<th>Real growth rate of national income</th>
<th>Real growth rate of private wealth</th>
<th>Savings-induced wealth growth rate</th>
<th>Capital-gains-induced wealth growth rate</th>
<th>Memo: Consumer price inflation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1820-2009</td>
<td>1.8%</td>
<td>1.8%</td>
<td>2.1%</td>
<td>-0.3%</td>
<td>4.4%</td>
</tr>
<tr>
<td>1820-1913</td>
<td>1.0%</td>
<td>1.3%</td>
<td>1.4%</td>
<td>-0.1%</td>
<td>0.5%</td>
</tr>
<tr>
<td>1913-2009</td>
<td>2.6%</td>
<td>2.4%</td>
<td>2.9%</td>
<td>-0.4%</td>
<td>8.3%</td>
</tr>
<tr>
<td>1913-1949</td>
<td>1.3%</td>
<td>-1.7%</td>
<td>0.9%</td>
<td>-2.6%</td>
<td>13.9%</td>
</tr>
<tr>
<td>1949-1979</td>
<td>5.2%</td>
<td>6.2%</td>
<td>5.4%</td>
<td>0.8%</td>
<td>6.4%</td>
</tr>
<tr>
<td>1979-2009</td>
<td>1.7%</td>
<td>3.8%</td>
<td>2.8%</td>
<td>1.0%</td>
<td>3.6%</td>
</tr>
</tbody>
</table>
Figure 3: Mortality rate in France, 1820-2100

- Adult mortality rate (20-yr-old & over)
Figure 4: The ratio between average wealth of decedents and average wealth of the living France 1820-2008

- $\mu$ (excluding inter-vivos gifts)
- $\mu^*$ (including inter-vivos gifts)
Figure 5: Inheritance flow vs mortality rate in France, 1820-2008

- □ Annual inheritance flow as a fraction of aggregate private wealth
- ■ Adult mortality rate (20-yr-old & over)
Steady-state inheritance flows

- Standard models: \( r = \theta + \sigma g = \alpha g/s (>g) \)
- Everybody becomes adult at age \( A \), has one kid at age \( H \), inherits at age \( I \), and dies at age \( D \) \( \rightarrow I = D - H \), \( m = 1/(D - A) \)
- Dynastic or class saving: \( \mu = (D - A)/H \)
  \( \rightarrow b_y = \mu \times 1/(D - A) \beta = \beta/H \)

- Proposition: As \( g \rightarrow 0 \), \( b_y \rightarrow \beta/H \)
Figure 6: Steady-state cross-sectional age-wealth profile in the class savings model ($s_L=0$, $s_K>0$)

- (average wealth of age group)/(average wealth of adults)
Figure 7: Steady-state cross-sectional age-wealth profile in the class savings model with demographic noise

- (average wealth of age group)/(average wealth of adults)
Figure 8: Private savings rate in France 1820-2008

- Private savings (personal savings + net corporate retained earnings) as a fraction of national income
Figure 10: Labor & capital shares in national income, France 1820-2008

- ♦ Labor share
- □ Capital share
Figure 11: Rate of return vs growth rate France 1820-1913

- Rate of return on private wealth $r = \alpha/\beta$
- Growth rate of national income $g$
Figure 12: Capital share vs savings rate France 1820-1913

- Capital share $\alpha$
- Savings rate $s$
Figure 18: The share of non-capitalized inheritance in aggregate wealth accumulation, France 1850-2100

- non-capitalized inherited wealth as a fraction of aggregate private wealth
- ▲ low-growth, high-return scenario
Figure 19: The share of capitalized inheritance in aggregate wealth accumulation, France 1900-2100

- diamond: capitalized inherited wealth as a fraction of aggregate private wealth
- triangle: low-growth, high-return scenario
<table>
<thead>
<tr>
<th></th>
<th>Growth rate of national income</th>
<th>Rate of return on private wealth</th>
<th>Capital tax rate</th>
<th>After-tax rate of return</th>
<th>Real rate of capital gains</th>
<th>Rate of capital destruct. (wars)</th>
<th>After-tax real rate of return (incl. k gains &amp; losses)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1820-2009</td>
<td>1.8%</td>
<td>6.8%</td>
<td>19%</td>
<td>5.4%</td>
<td>-0.1%</td>
<td>-0.3%</td>
<td>5.0%</td>
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<td>1820-1913</td>
<td>1.0%</td>
<td>5.9%</td>
<td>8%</td>
<td>5.4%</td>
<td>-0.1%</td>
<td>0.0%</td>
<td>5.3%</td>
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<td>1913-2009</td>
<td>2.6%</td>
<td>7.8%</td>
<td>31%</td>
<td>5.4%</td>
<td>-0.1%</td>
<td>-0.7%</td>
<td>4.6%</td>
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<tr>
<td>1913-1949</td>
<td>1.3%</td>
<td>7.9%</td>
<td>21%</td>
<td>6.4%</td>
<td>-2.6%</td>
<td>-2.0%</td>
<td>1.8%</td>
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<td>1949-1979</td>
<td>5.2%</td>
<td>9.0%</td>
<td>34%</td>
<td>6.0%</td>
<td>0.8%</td>
<td>0.0%</td>
<td>6.8%</td>
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<td>1979-2009</td>
<td>1.7%</td>
<td>6.9%</td>
<td>39%</td>
<td>4.3%</td>
<td>1.0%</td>
<td>0.0%</td>
<td>5.3%</td>
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