Inequality

John Van Reenen (LSE, Centre for Economic Performance)
British Science Week, September 2014
LOTS OF INEQUALITIES!

• Inequality a major topic of economic research, especially in last 3 decades, which has seen large increase in income inequality
  – Occupy Movement
  – Thomas Piketty “Capital in 21st Century”
  – CEP video, https://www.youtube.com/watch?v=tvN8zvovDrY

• This session
  – General changes (John Van Reenen, “the 99%”) 
  – Pay at the top (Bell, “the 1%”)
  – Gender inequality (Barbara Petrongolo, the “50%”)
OUTLINE

1. Recent trends in wages

2. A framework for understanding the changes

3. Polarization & Technology

4. Conclusions
PERCENTAGE DIFFERENCE IN PAY BETWEEN TOP AND BOTTOM 10% OF EARNERS

Great Britain, 1975 to 2012

Notes: UK data, 1968-96 (NES) 1997-2012 (ASHE); (90-10 log weekly earnings ratios, full-time, 1975-2012)
CHANGE IN MALE WAGE INEQUALITY (90-10) ACROSS OECD COUNTRIES IN THE 1980s

Source: Machin and Van Reenen (2010), OECD
CHANGE IN MALE WAGE INEQUALITY (90-10) ACROSS OECD COUNTRIES IN THE 1990’s & 2000’s

Source: Machin and Van Reenen (2010), OECD
Note: Netherlands has a break in series in 1993
SKILL DIFFERENTIALS

• Higher education/skill differentials in wages are an important part of the reason for increased inequality
  – Note that even if all wage inequality was due to human capital (which it isn’t) this
    • Does not justify the level of inequality
    • Does not mean that there is nothing policy makers can do to change this (e.g. changes in schools to help disadvantaged as recommended by LSE Growth Commission)
RISING GRADUATE WAGE DIFFERENTIALS IN UK: DEGREE PREMIUM RISES FROM 39% TO 56% 1980-2011

Rising Graduate Wage Differentials (Full-Timers)

<table>
<thead>
<tr>
<th>Men</th>
<th>Women</th>
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<tr>
<td>39</td>
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FT Graduate Wage Premium, Percent

Men Women

Rising Graduate Wage Differentials (Full-Timers)
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BASIC DEMAND & SUPPLY MODEL

• Wage differences between skill groups depends on demand & supply

• BUT the supply of education has increased, so we would expect that relative wages of the educated to fall
  – Example: 4.7% of UK employees were graduates in 1979. Rose to 28.5% by 2011

• However, if demand/skils for education has risen faster than supply then skill premium will still rise

• What could have caused such an increase in skill demand? Two culprits:
  – Trade with developing countries?
  – Technology? Skill Biased Technical Change (SBTC)
TRADE NOT AS IMPORTANT AS TECHNOLOGY AS A CAUSE OF RISING SKILL DEMAND?

• Broad consensus that trade not the culprit
  – Magnitudes of trade changes too small to account for changes
  – Aggregate growth of skill shares mainly within industries (indeed, within plants)
  – No clear fall in skill premium in developing countries
CHINA’S SHARE OF ALL EU AND US IMPORTS

We use data from 1996-2007

No trade-effect on inequality consensus formed using data from 1970s to early 1990s

Source: UN Comtrade data
TECHNOLOGY LOWERS DEMAND FOR LESS SKILLED

• Skill Biased Technical Change
  – More complex technologies need more skilled workers
  – Technology measures (like IT spending) strongly correlated with demand growth for more skilled workers at firm, industry and country level
PROBLEMS WITH MODEL

- Does a reasonable job at accounting for trends in skill premium. But....

1. Changes within skill groups & cross country differences
   - Institutions very important like trade unions & Minimum Wages (limit wage inequality)

2. “Polarization” better description of post 1990 trends
   - Top skill groups continue doing well but “middle class” job growth doing worse than least skilled
1. Recent trends

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Polarization:
UK Middle Wage Jobs fall the most

Notes: Taken from Mieske (2009). Percent changes are now annualised to permit comparability across the sub-periods.
ARE ROBOTS RUBBISH?

Robo-One annual ROBOT competition in Tokyo
ARE ROBOTS RUBBISH?

Dyson
360
Eye

Robo-One annual ROBOT competition in Tokyo
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<tr>
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<th>Example of occupations</th>
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# A TAXONOMY OF TASKS: NUANCED

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<tr>
<td>Non-Routine</td>
<td>Abstract problem solving (analytic); mental flexibility</td>
<td>Managers; doctors; lawyers; scientists</td>
<td>Strongly complementary</td>
<td>High</td>
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<td>Non-Manual</td>
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<td>Clerical; Book-keepers</td>
<td>Direct substitution</td>
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<td>Environmental adaptability; Interpersonal adaptability</td>
<td>Cleaners; security guards; waiters; drivers</td>
<td>Broadly Neutral</td>
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IMPLICATIONS OF ICT AND TASK-BASED DEMAND

• Implies that technology
  – increases demand for most educated (analytical)
  – reduces demand for middle educated (routine non-manual),
  – little effect on the least educated (now, manual non-routine)
Note: Figure plots the growth from 1980-2004 of medium-skilled wage bill shares against the growth of ICT intensity (ICT/VA), by industry, averaged across countries. Lines show fitted values from regressions weighted by the cross-country average of each industry’s share in 1980 employment.
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SUMMARY

• Wage inequality UK & US since end of 1970s; same in most other OECD countries, albeit later and slower

• Technology creates long-term demand for more skilled workers and supply races to keep up.
  – Since 1990 a polarisation middle jobs is mainly suffering

• Trade with less developed countries has more indirect effect through higher competition & inducing innovation

• Policies – in long-run need to increase the supply of skills, especially for disadvantaged
MEAN YEARS OF SCHOOLING BY BIRTH COHORT

For the U.S. Born at age 30

Source: Goldin & Katz (2010), IPUMs, MORG
Note: Figure plots the growth from 1980-2004 of medium-skilled wage bill shares against the growth of ICT intensity (ICT/VA), by industry, averaged across countries. Lines show fitted values from regressions weighted by the cross-country average of each industry's share in 1980 employment (solid line for entire economy, dashed line for non-trade industries only).
MIDDLE SKILLED LOSING OUT: CHANGE IN JOB SHARES BY OCCUPATION (GROUPED BY WAGE TERCILE) 1993-2010

Source: Goos, Manning & Salomons (2014)