The Allocation of Teaching Talent and Human Capital Accumulation

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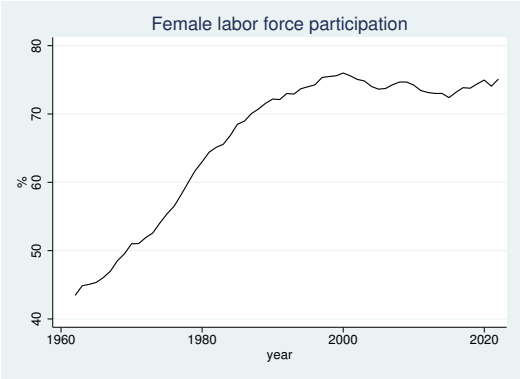
Motivation

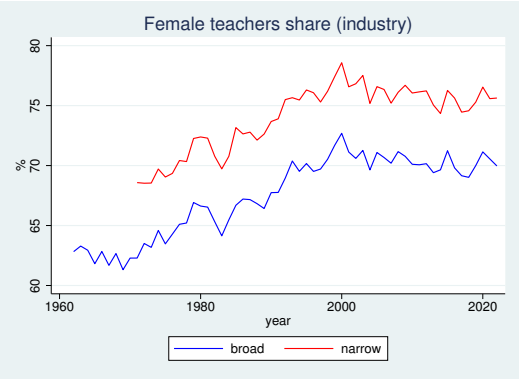
How have changes in the labor market in last 60 years affect teaching input to human capital?

- US has seen big increases in real expenditures per student
- Decline class size (larger teaching input per student)
- Failure to improve teaching outcomes?
- Teacher quality shown to be important, unrelated to observables
  - e.g. Hanushek & Riven (06), Rockoff et al (11), Chetty Friedmann & Rockoff (14)
- At same time big changes in labor market. Female participation $\uparrow\uparrow$
- Discrimination $\downarrow$ Did this change the talent / human capital of teachers?
- Problem: difficulty to measure **true ability**

Big picture context

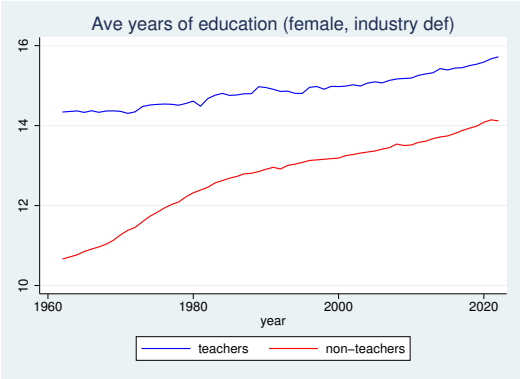
Data from the CPS ASEC (1962-2022) extra

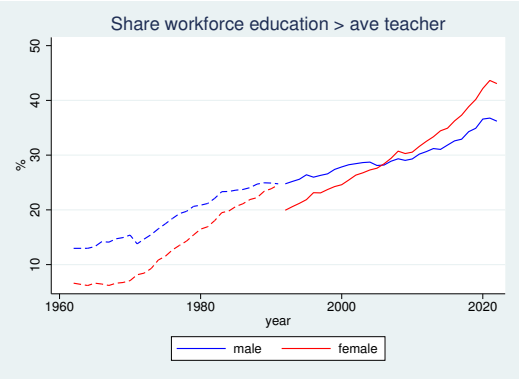




Education level rising faster outside teaching sector

Particularly for women (CPS ASEC, 1962-2022) men





This paper's contribution

1. Highlights a new allocation channel for human capital / growth
2. Uses new (old) data source to investigate relative skill/quality of teachers
   - *Project Talent* dataset $\rightarrow$ document skills of 1960s cohort
   - maps via O-NET to get measure of ability vs skills requirements by occupation
3. Extends the Hsieh et al (2019) framework with teaching sector
   - introduces trade-off between static and dynamic efficiency
   - emphasize the non-linear wage function of teaching sector
   - characterize model with single aggregate human capital moment
4. Estimates model to find role of teacher allocation (work in progress)

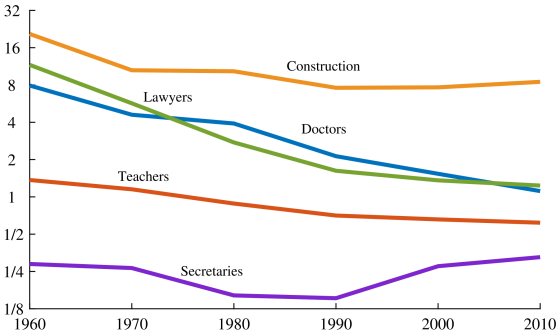
Discussant's literature review: relation to Hseih (19)

Studied role of falling discrimination in US growth

- Many skilled occupations increasing share of women and black men (1960-2010)
- Falling discrimination $\rightarrow$ skilled in groups not allocated to comparative advantage
- Improvement in the allocation is a source of growth
  - fall in barriers: 42% increase in GDP and 24% increase in GDP per capita
  - participation key margin
  - find **human capital** barriers most important
- White women: Big fall for lawyers and doctors ($10 \rightarrow 2$)
  - Still a small decline for teachers ($\tau < 1$)
- Identification heavily dependent on Frechet distributional assumption
  - change in wage per skill unit offset by change in quality
  - only average wage gaps (by group) matter

Results from Hseih (2019)

Large decline in barriers in skilled sectors. Find teachers also underwent decline



(a) Occupational barriers

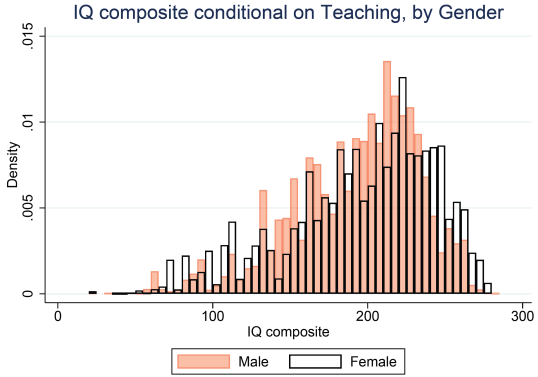
Empirical findings

Makes use of aptitude tests across three cohorts

- Make use of an old dataset Project TALENT: 377,000 high school students in 1960
- Includes measures of aptitude and panel to follow outcomes
- Fairly high attrition rate: 18% respondents after 11 years
  - but no obvious bias on observables
- Teachers have higher maths and verbal scores than other occupations and NILF
- Men and woman have similar maths, verbal and IQ scores
- Some evidence of higher ability females in teaching

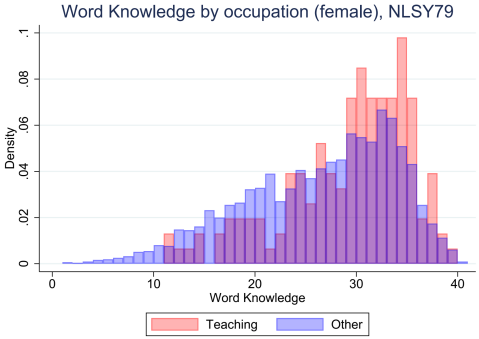
How much difference in selection on ability?

Evidence from the Project TALENT survey, aged 30

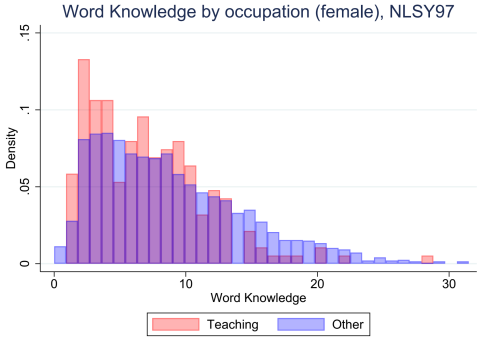


Are these comparable distributions?

Evidence that relative teaching quality has fallen. Verbal scores in the NLSY



(a) NLSY 79



(b) NLSY 97

- Also relative to paper measure a bit unstable?

Key simplification: why only aggregate human capital matters

- Changes in teacher ability offset by changes in class size in human capital production
  - Better teachers teach bigger classes

$$N(h'_{T,g})^{-\sigma}(h'_{T,g})^{\beta} = N(h_{T,g})^{-\sigma}h_{T,g}^{\beta}$$

- Only moment of aggregate human capital matters: $\tilde{H}_T = \sum_{g=1}^{G}\int_0^{\infty} h_{T,g}^{\beta/\sigma}dF_T(h_{T,g})$
- Allow for simple characterization of aggregates
  - Full path of human capital still (potentially) matters
- Nice trick. Makes model tractable. Strong implications?

Quantitative model results

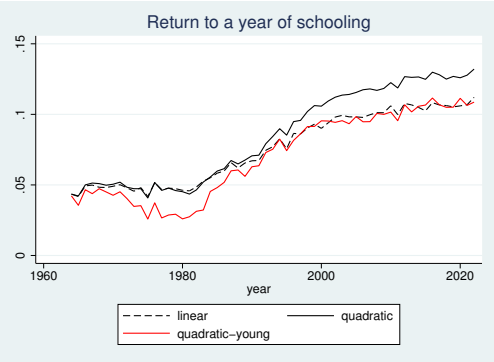
- Labor market barrier decline significantly between 1970 to 1990
  - A little between 1990 and 2010 (except home production)
  - How does this compare to Hseih (19)? Smaller decline?
    - ⋆ -ve home production: aggregate resource constraint?
- Women teachers ability distibution. 1970-90: small fall. 1990-10: larger decline
- Men first increase (70-90) then decrease (90-10)
- Reduction in teaching human capital investment $\rightarrow$ human capital falls
  - total human capital increase/same due to more low quality teachers?
- *Smaller* reduction in barriers has **larger** effect on the female teacher market
  - **Is this all participation/home production margin?** time series?

Some thoughts...

- Key for model is β/σ choice
  - Target absolute and comparative skill advantage by group
  - All sectors or teacher vs other $\rightarrow$ how informative?
  - From simplification. Implication for change in class sizes $\rightarrow$ alternative moment
  - Normalize $\sigma = 1$ but evidence suggests small(ish) effect of classroom size
- Impose fixed curvature to edu investment $e_{i,g}^{\phi}$ (vs sector specific in Hseih (19))
  - Necessary? Possibly loads variation on human capital production
- No distinction between **labor market** and **human capital** barriers ($\tau^e = 0$)
  - Without teaching doesn't matter $\rightarrow$ Hseih distinguish with cohort profiles
  - Less clean here $\rightarrow$ shows up in teacher cut-off
- Currently $\omega_T(h_{T,g}) = \kappa h_{T,g}^{\gamma}$
  - discuss alternative marginal value
  - relaxing would mean future human capital path matters
  - model predicts declining resources spent on education (teacher wage-bill)?

Occurring at the same time as an increasing returns to human capital

Coefficients from a sequence of Mincer style regressions



- Skill Biased Technical Change. Should we fix aggregate return across time?
- Consistent with decline in educational productivity in this setting?

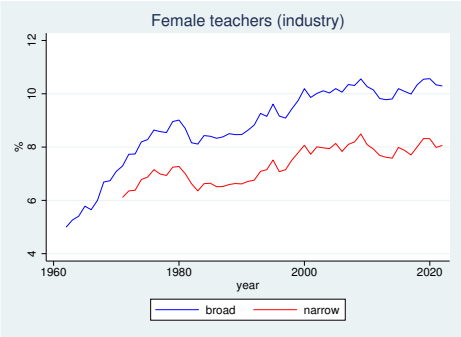
Conclusion

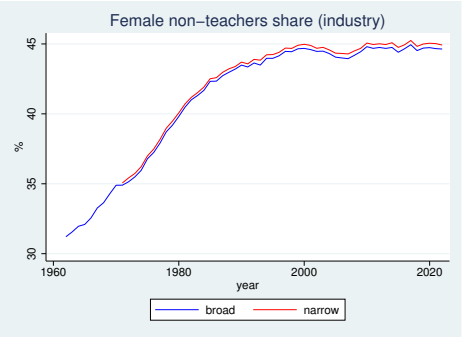
- Great new idea!
  - next steps: nice to see disaggregation
  - aggregate implications / impact on growth
  - currently even dynamic is static (fixed point)
- Careful data work provides interesting evidence on changing talent
  - comparability over time and across surveys
- Identification problem seems harder / not fully resolved
- Some counter-intuitive patterns

The End ■

Big picture context II

Data from the CPS ASEC (1962-2022) back





Big picture context III

Data from the CPS ASEC (1962-2022) back