Topics in Macroeconomics and Labor Economics
Lecture 1: Introduction

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Course Information

- Instructor: Dr. Satoshi Tanaka
  - PhD at the University of Minnesota
  - Field of interests: Macro, Labor, and Demographics
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- Consultation hours: every day after the class

Assessment

- Submit your work for a problem set
  - Data exercise using R
  - Due by June 29 (50% of the final grade)
- Submit your research proposal/referee report
  - Due by June 29 (50% of the final grade)
- Upload your work to GitHub (https://github.com/)
  - Upload all your works for the problem set to GitHub
  - Let me know your GitHub site address by email

Introduction to Wage Inequality

Motivation

- Why do we need to study wage/earnings inequality?
- Understanding the degree and causes of it helps us design
  - Tax policies (e.g. labor income tax)
  - Social insurance policies (e.g. unemployment insurance)
  - Education policies (e.g. educational subsidy)
- Two important issues

1. Skill v.s. luck (better to provide insurance for bad lucks)
   - High salary due to his/her greater skills?
2. Efficiency v.s. equality (trade-off for a redistributional policy)
   - Is the wage inequality Pareto optimal?

Approach

1. Look at the data carefully
    - Data visualization is important
2. Build an economic model
    - Write a simplest economic model that explains the relationship
3. Bring the model to data
    - Reduced-form estimation
        - Derive a testable equation from the model and estimate it
    - Structural estimation
        - Estimate the model's underlying parameters directly

(Quasi-) Experiment

1. Randomized Control Trial (Lab or Field Experiment)
    - Clean comparison of two groups of subjects (treated and control groups), but not easy to create such an environment
2. Quasi-Experimental Methods (Check Angrist and Pischke's book)
    - 2.1 Differences-in-Differences (DID)
        - Compare changes over time between two groups (treated and control groups)
    - 2.2 Instrumental Variables (IV)
        - Use an exogenous variation to assign subjects to the treated group
    - 2.3 Regression Discontinuity Design (RDD)
        - Compare two groups (treated and control groups) at a cut-off point

Data Availability

1. Survey Data
   - U.S. Population Census, American Community Survey, 1850 - present
     - Nationally representative cross-sectional data, decennial
   - Current Population Survey (CPS), March/MORG, 1962 – present
     - Monthy or annual (March CPS) cross-sectional data. Can be use as short-panel data (MORG)
   - Panel Study of Income Dynamics (PSID), 1968 – present
     - Nationaly representative household panel data
   - National Longitudinal Survey of Youth 1979/1997 (NLSY79/97)
2. Administrative Data (matched-employer-employee panel data)
   - Social Security Administration's (SSA) Data, 1957 – present
   - U.S. Census LEHD Data, 1985 – present

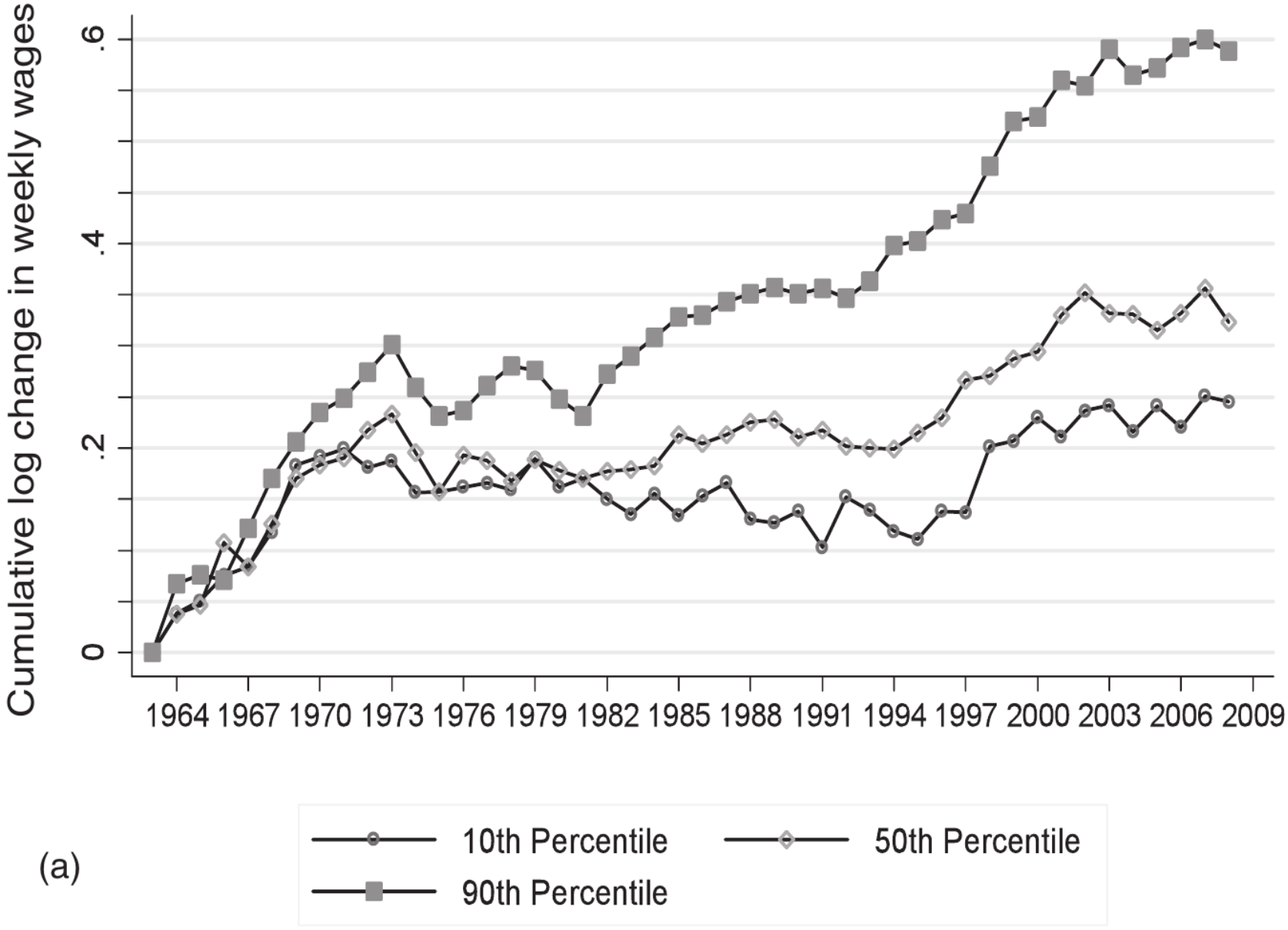
Literature of Wage/Earnings Inequality

1. First generation
   - Changes in returns to worker's skills (education and experience)
2. Second generation
   - Changes in returns to job characteristics (occupation and task)
3. Third generation
   - Explore the drivers for 1 and/or 2
   - Use between-firm variations

Empirical Facts on Inequality

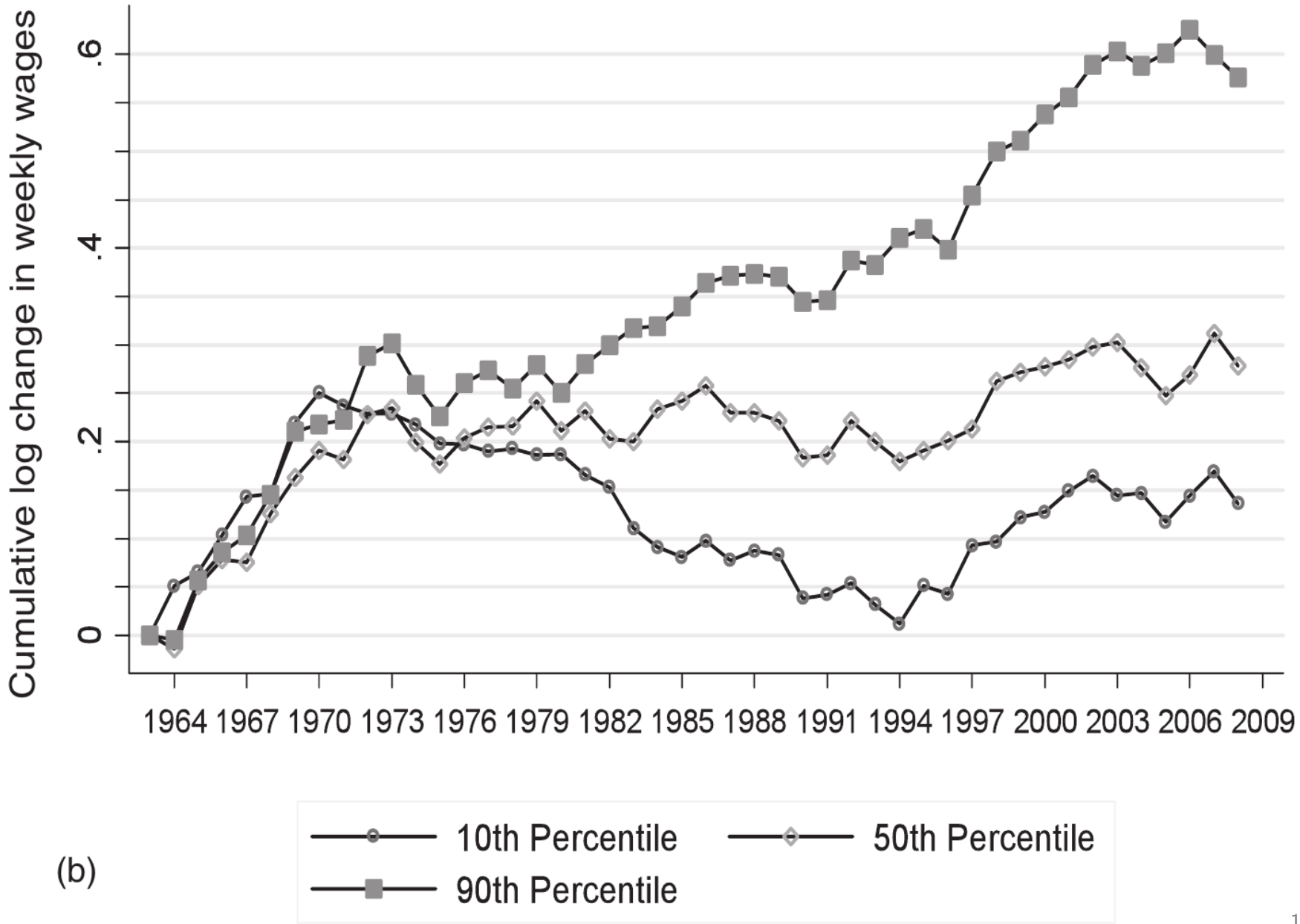
(Autor and Acemoglu, 2011, March CPS)

Change in Real Weekly Earnings, FTFY All



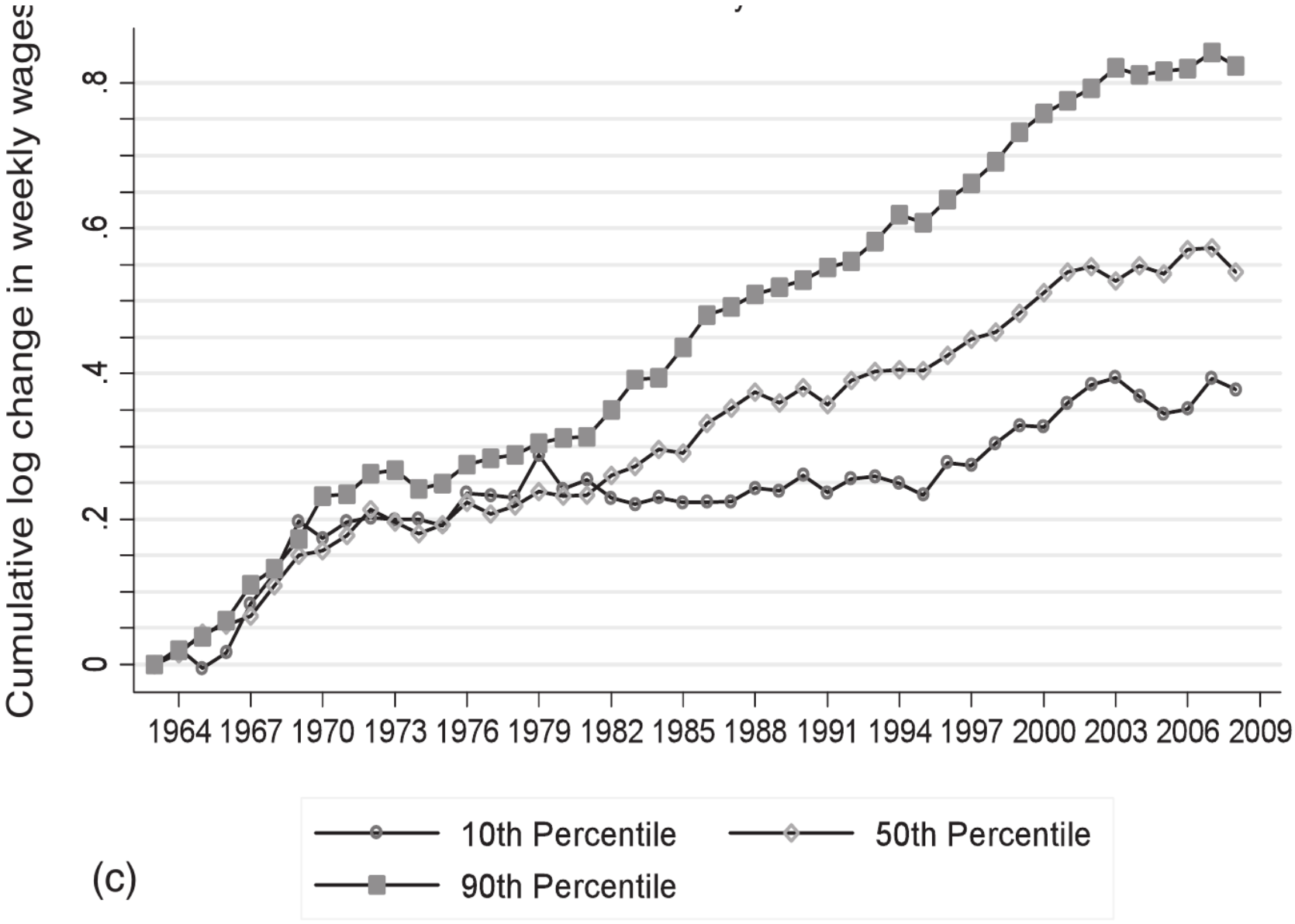
(a)

Change in Real Weekly Earnings, FTFY Males

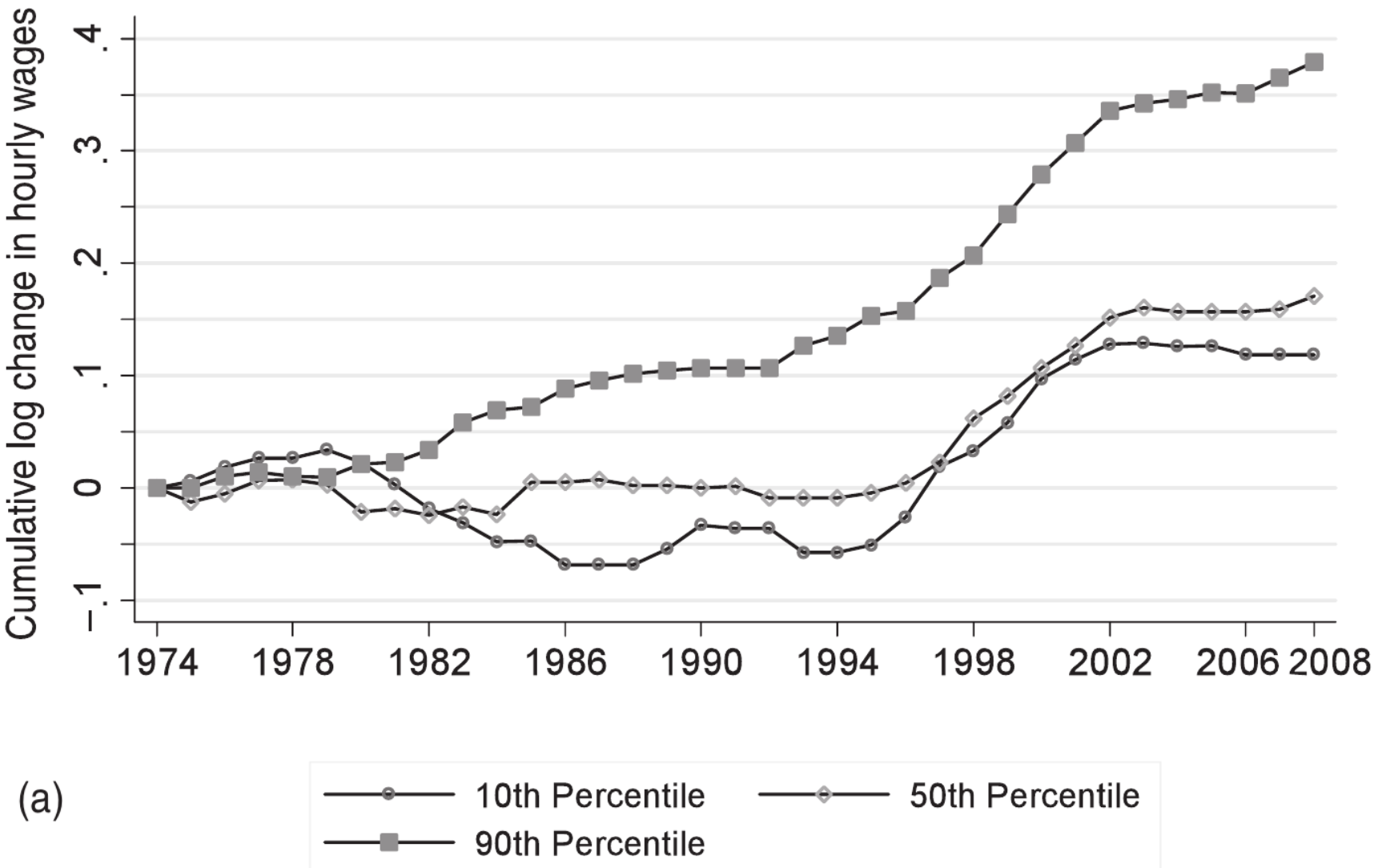


(b)

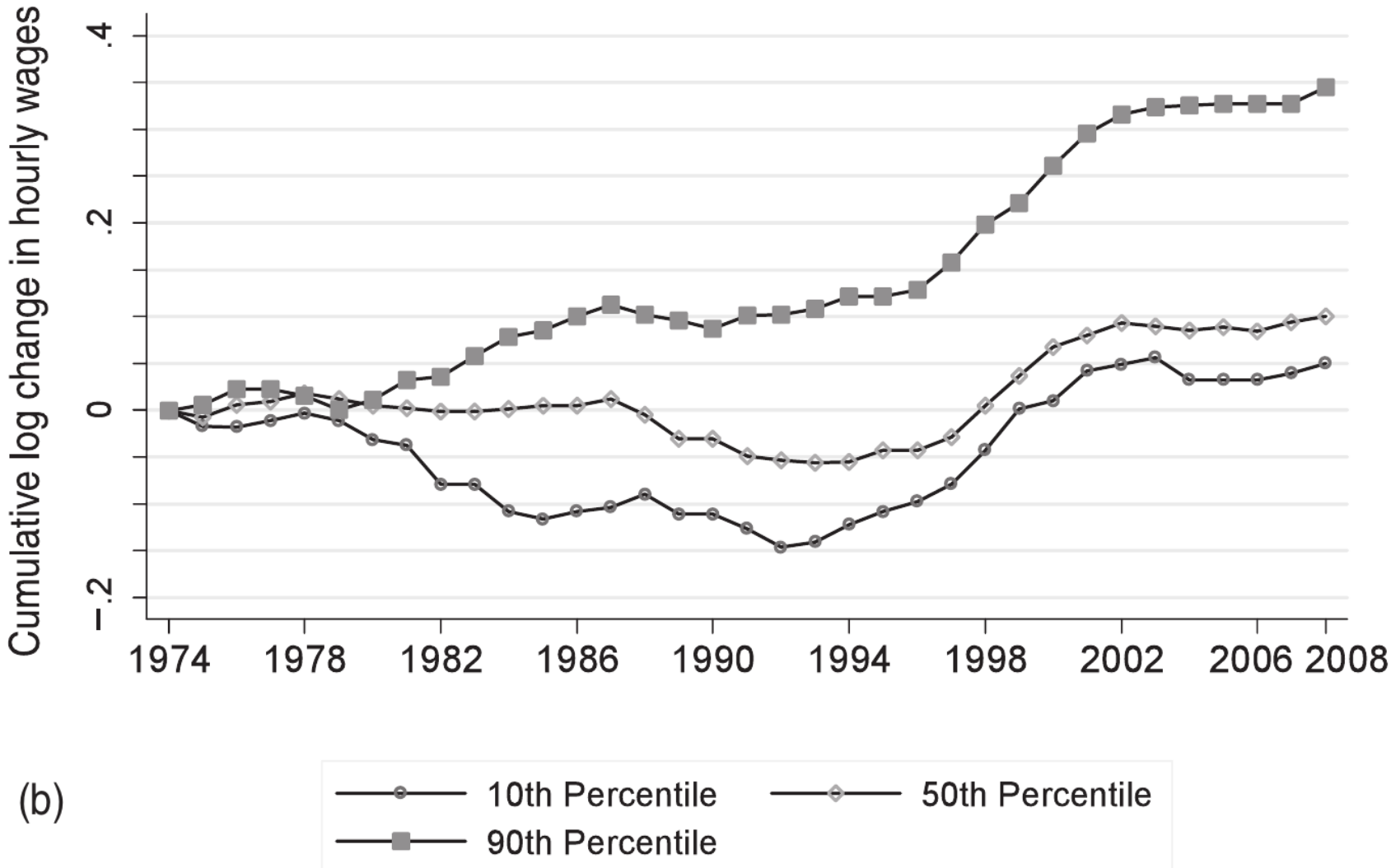
Change in Real Weekly Earnings, FTFY Females



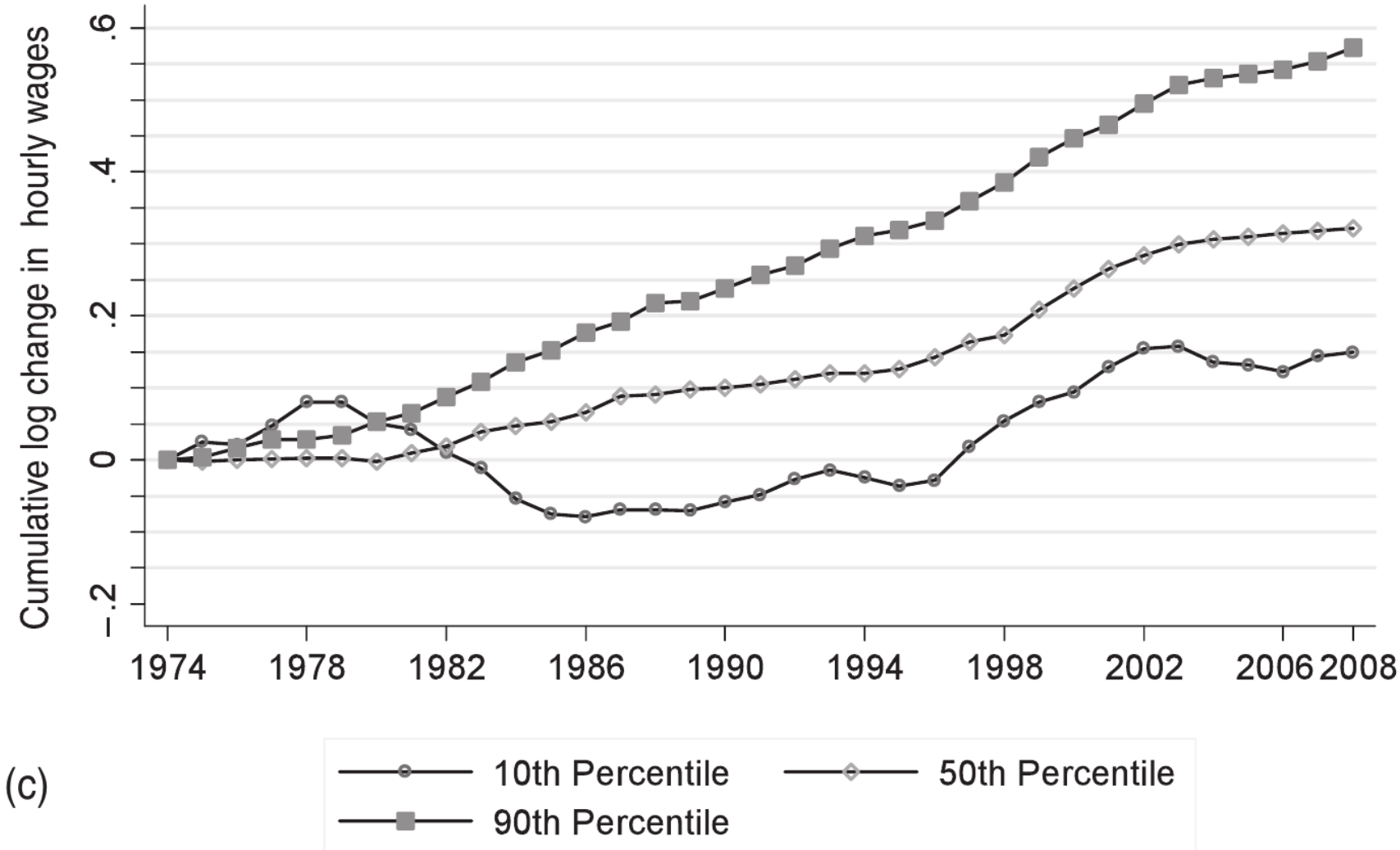
Change in Real Hourly Earnings, FTFY All



Change in Real Hourly Earnings, FTFY Males



Change in Real Hourly Earnings, FTFY Females



(c)

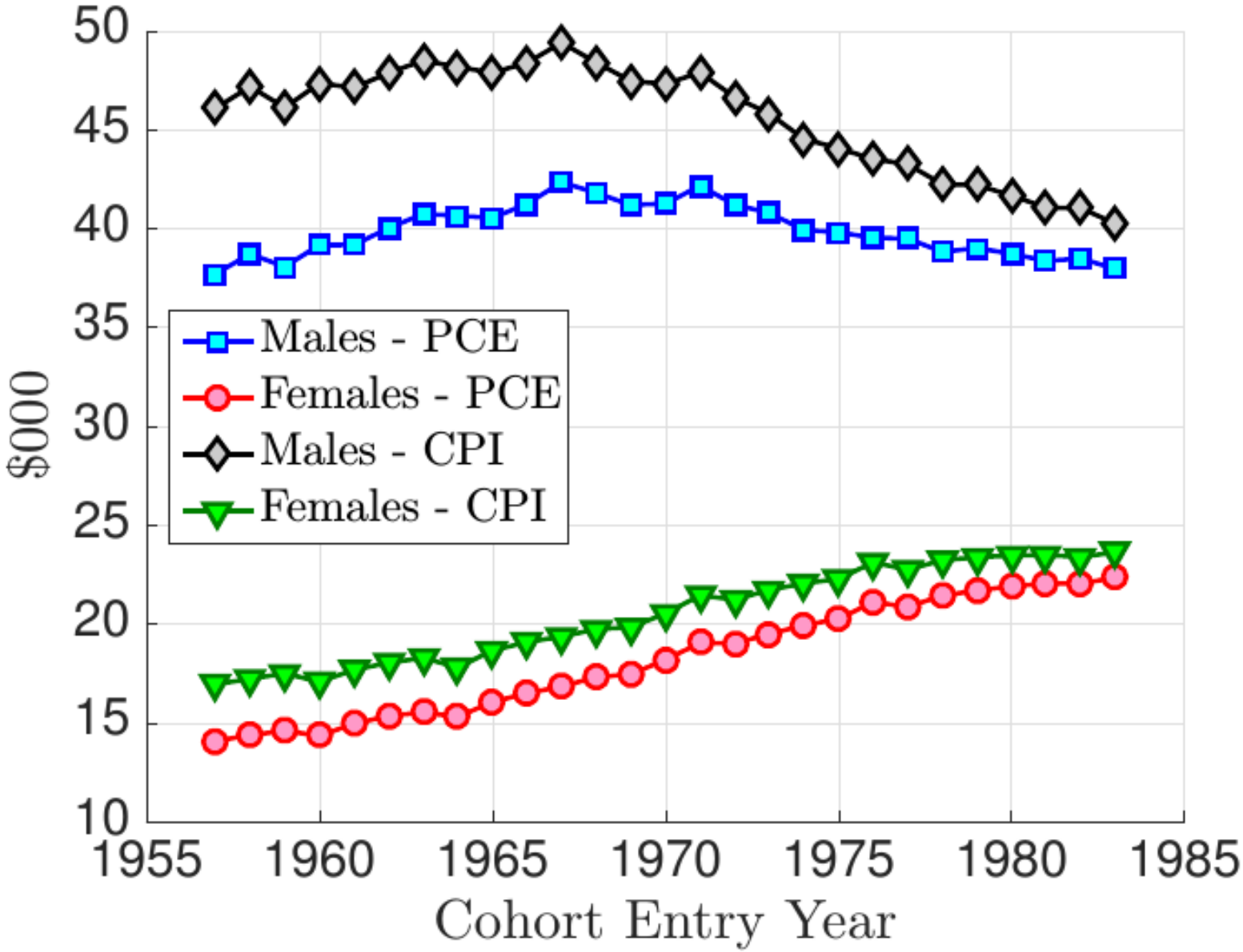
International Comparison

- Very large increases: US, UK, Germany
- Modest increases: Australia, Canada, Japan, Spain, and Sweden
- No noticeable changes: France and Italy
- Modest falls: Netherlands
- Large falls: South Korea

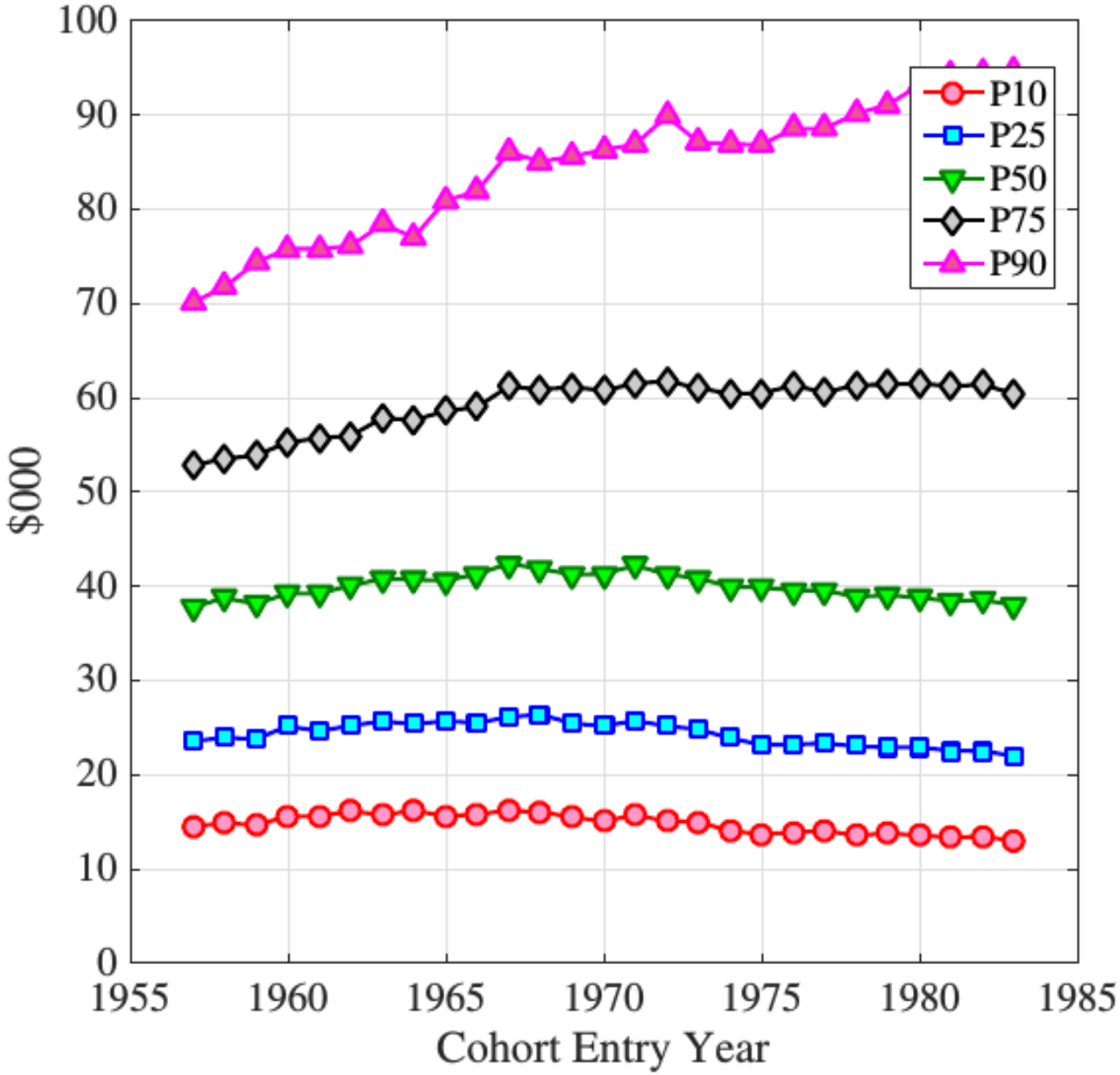
Lifetime Income Inequality

(Guvenen et al, 2017, SSA Data)

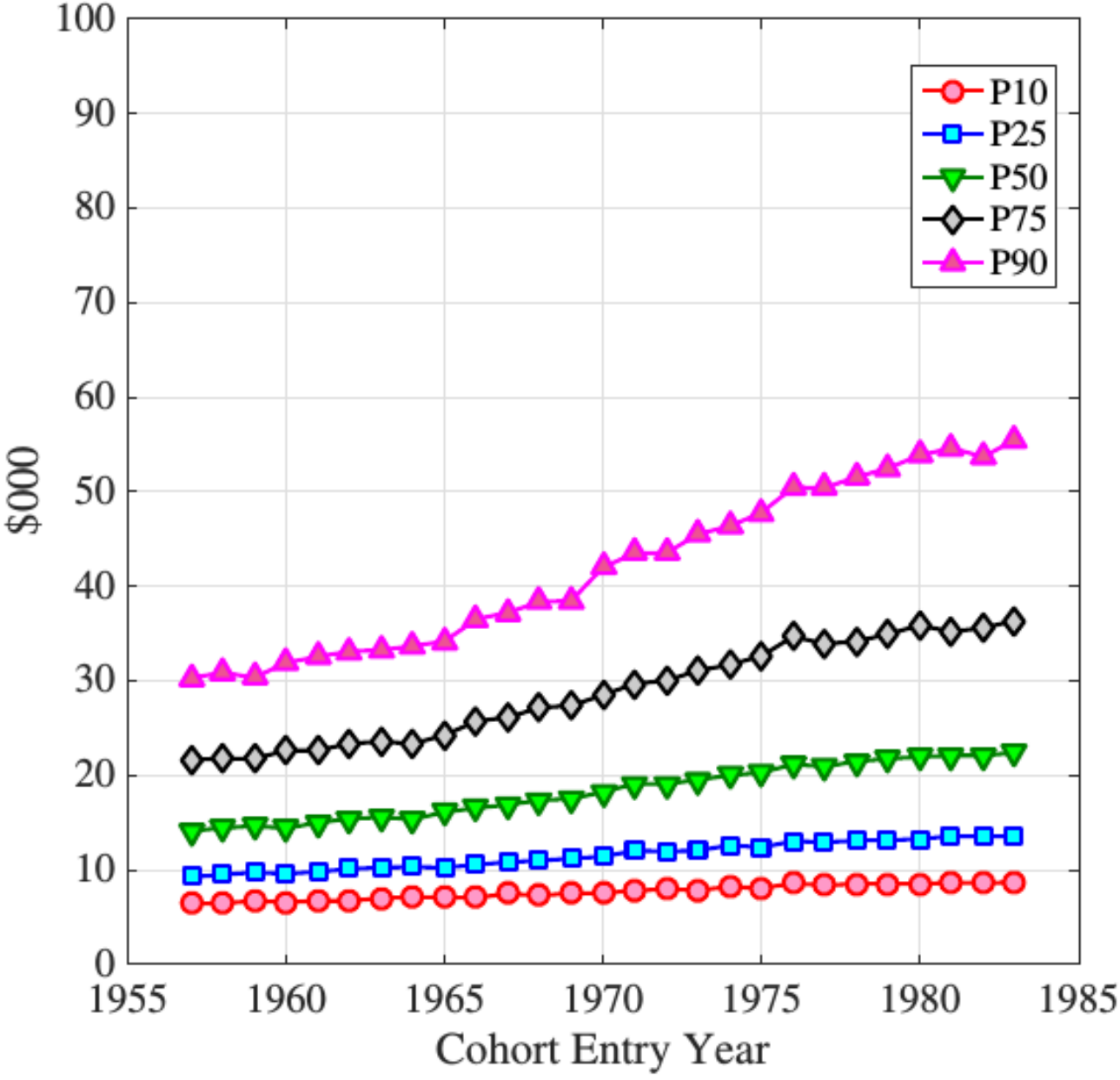
Median Lifetime Income by Cohort



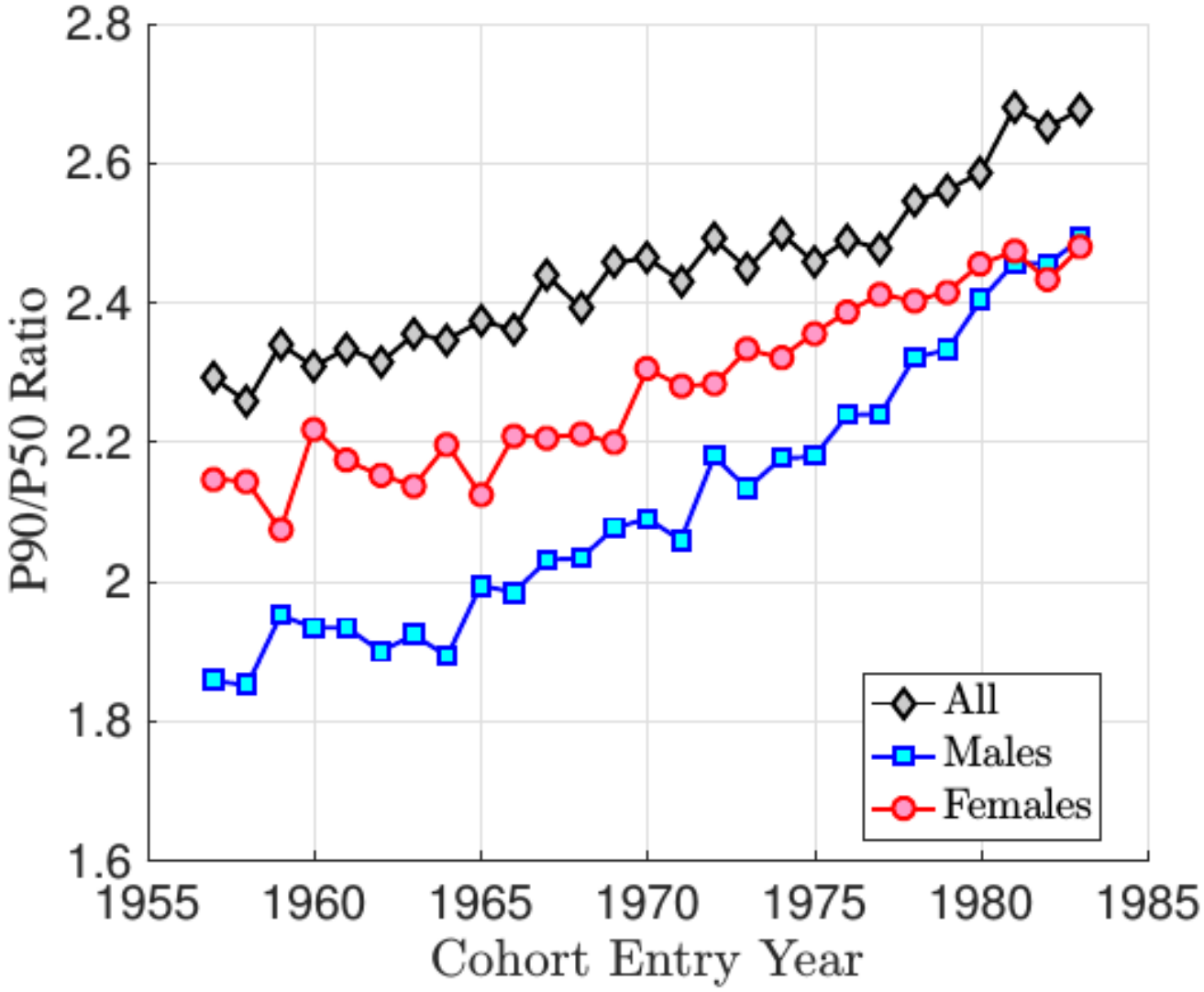
Percentiles of Lifetime Income by Cohort, Males



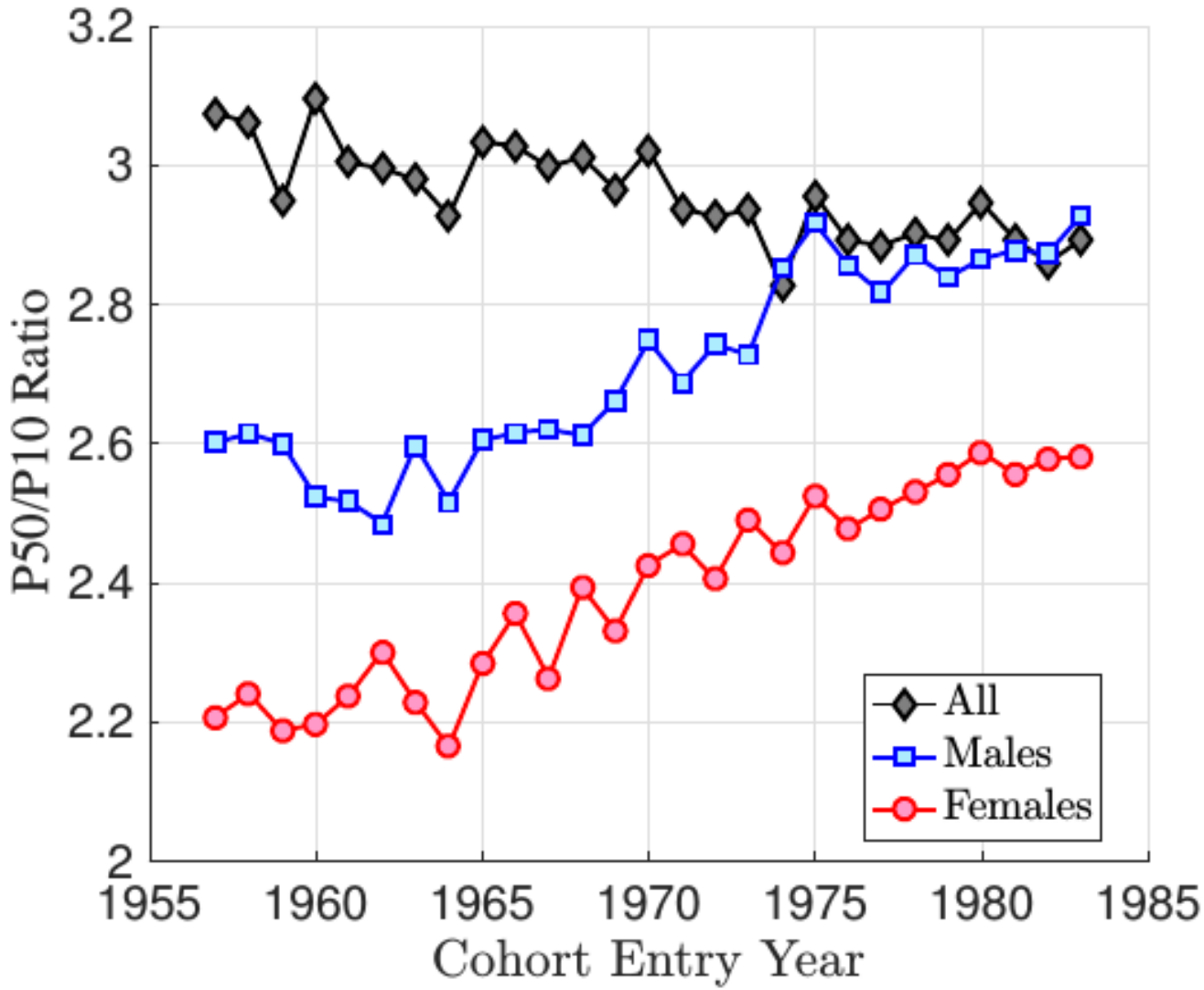
Percentiles of Lifetime Income by Cohort, Females



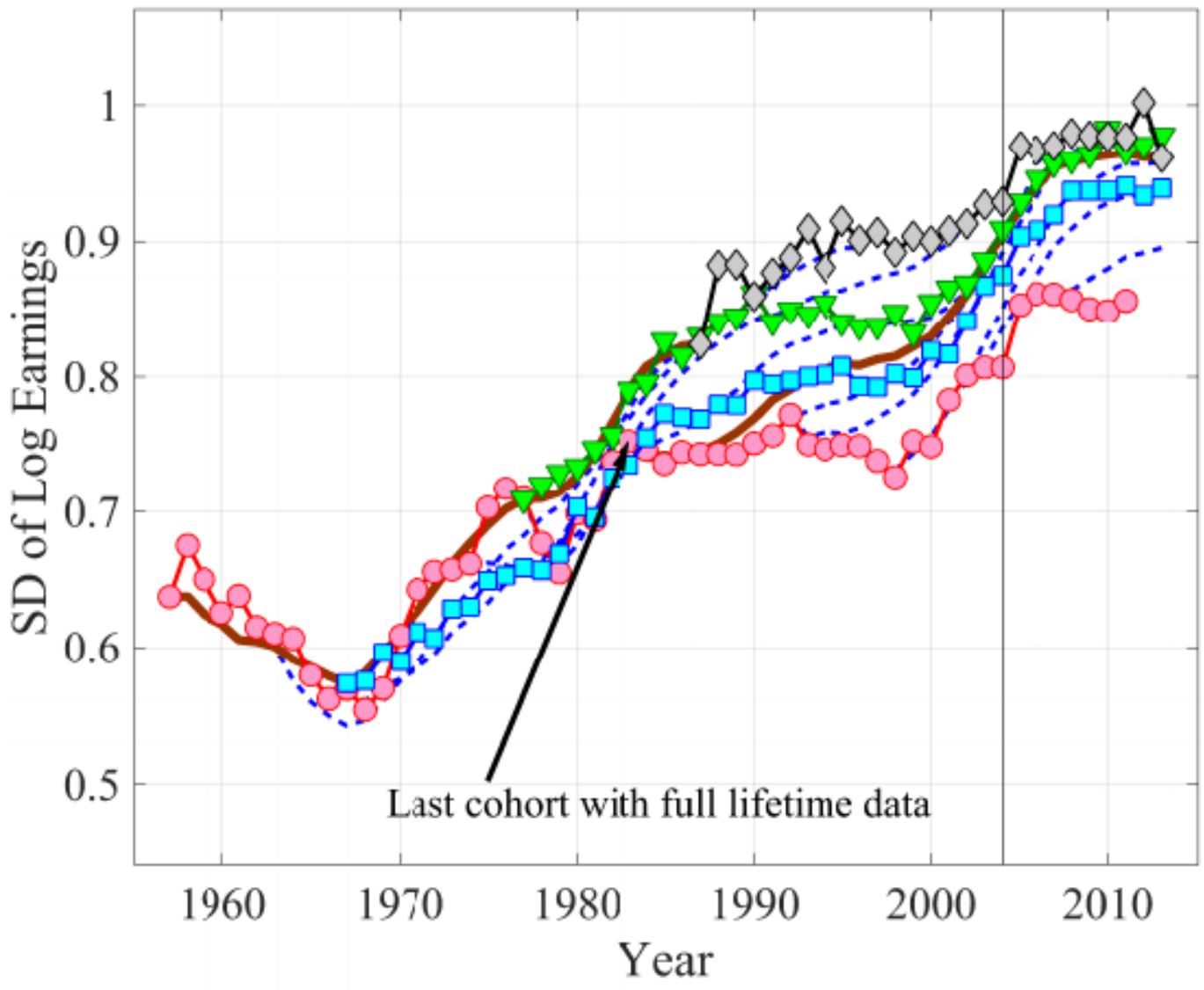
P90/P50 Ratio



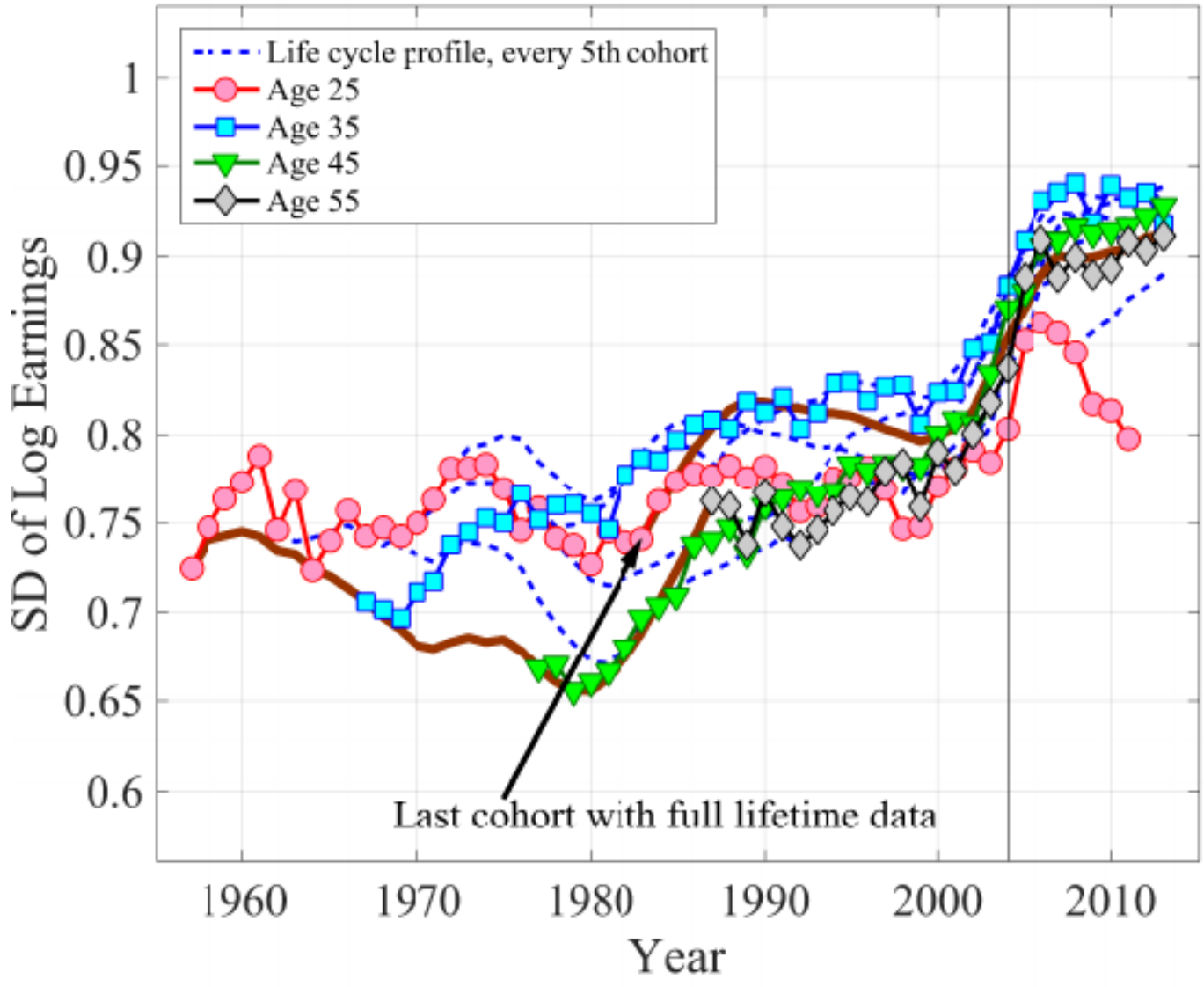
P50/P10 Ratio



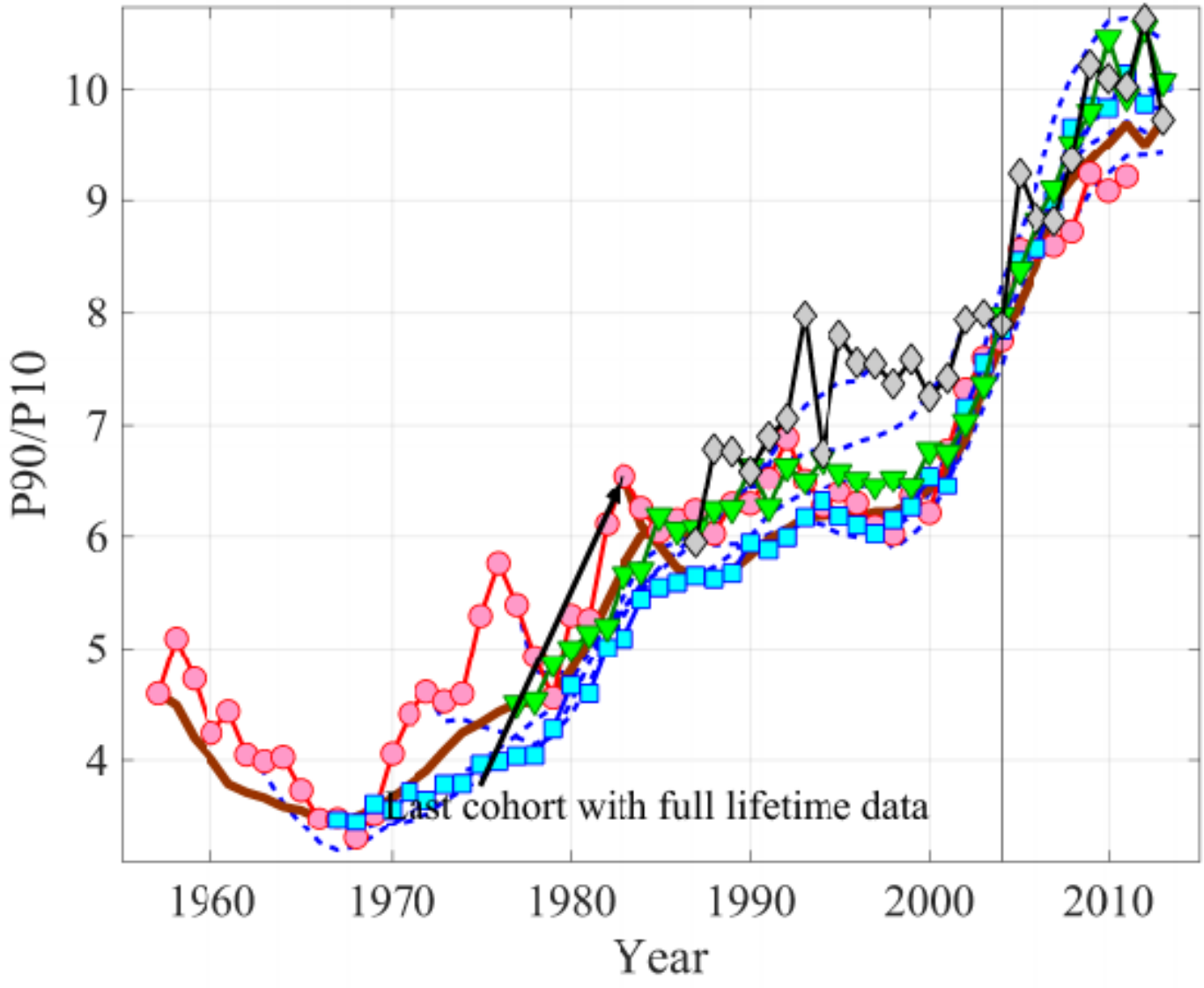
Standard Deviation of Log Earnings by Age, Males



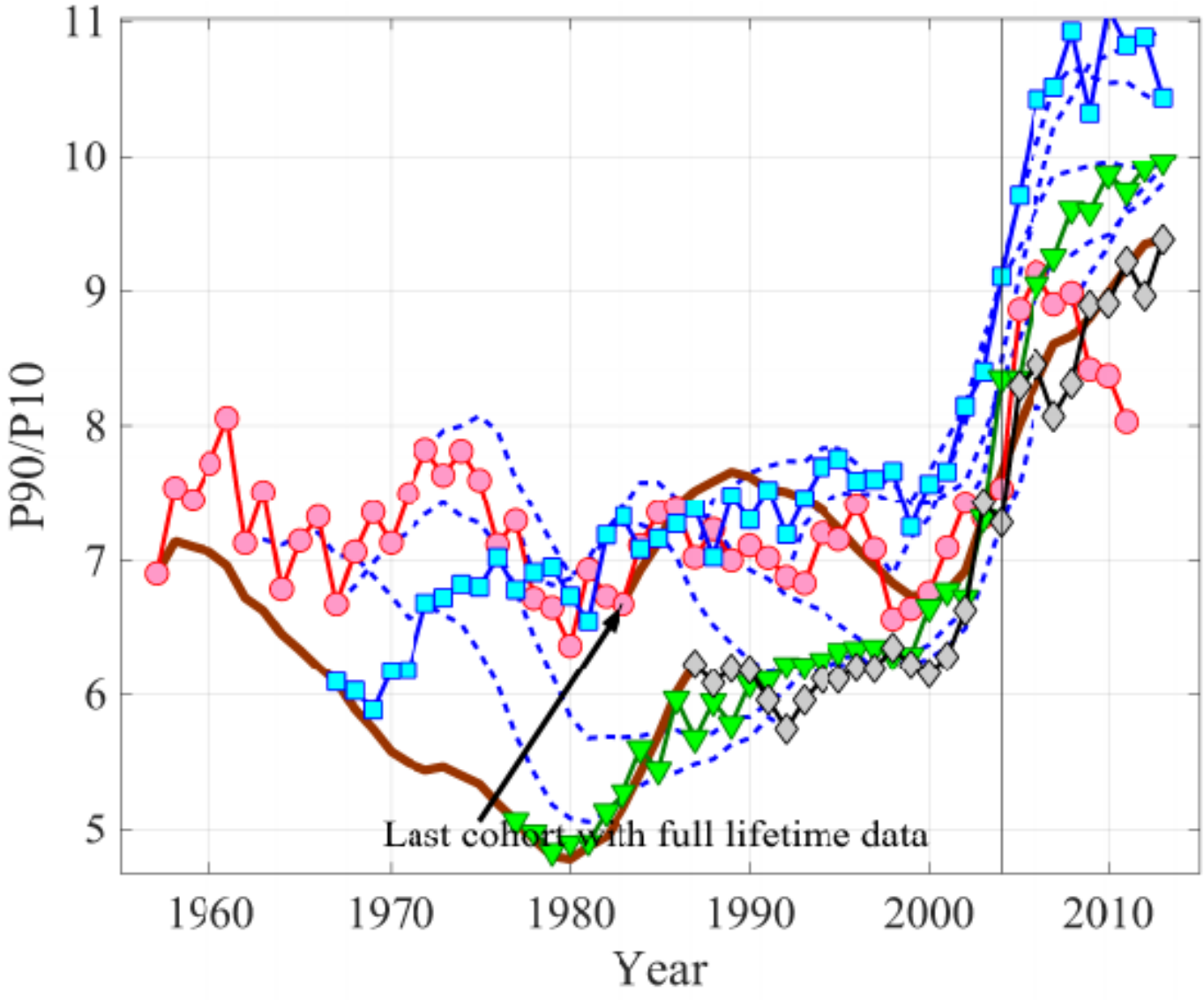
Standard Deviationof Log Earnings by Age, Females



P90/P10 Ratio of Log Earnings by Age, Males



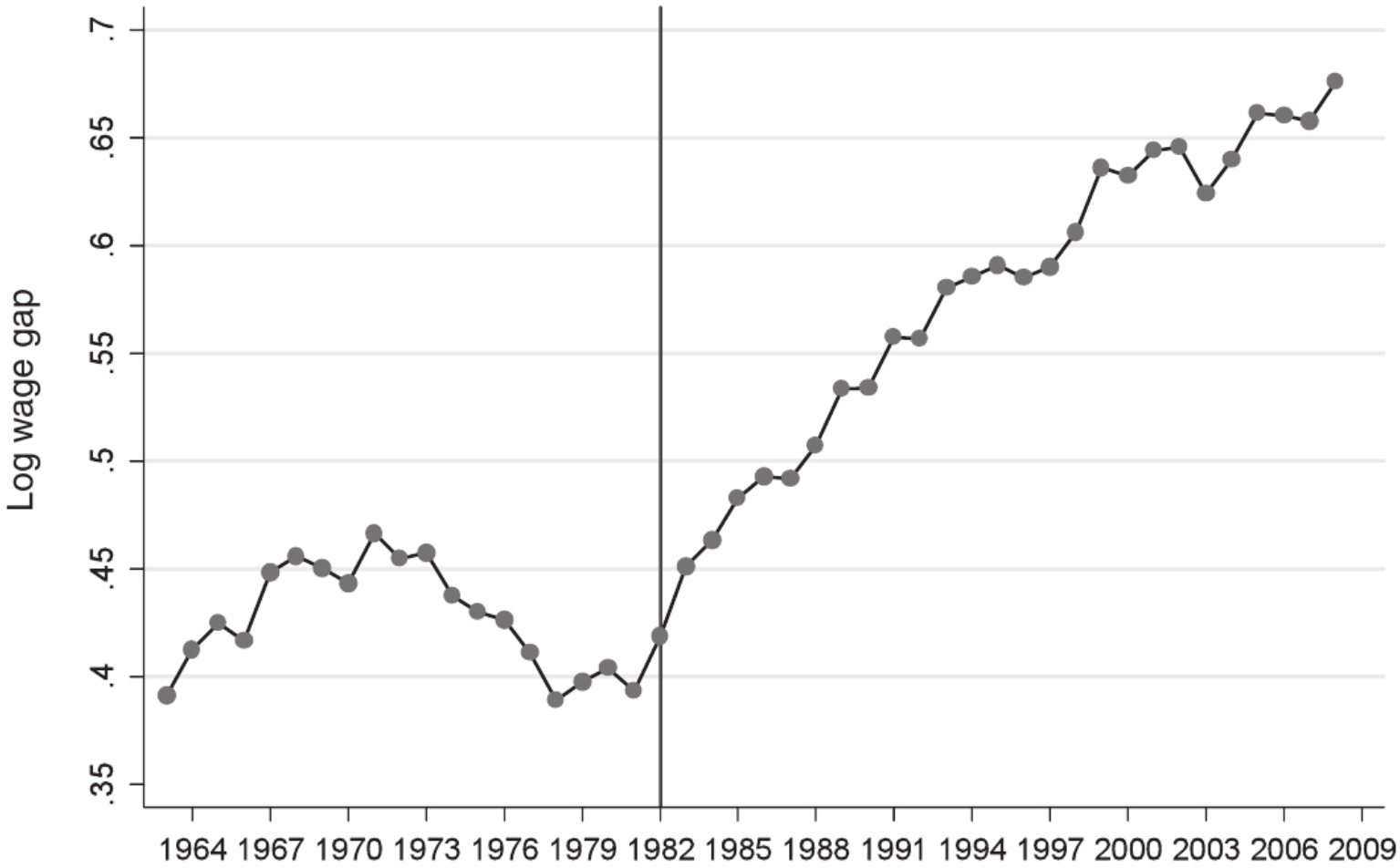
P90/P10 Ratio of Log Earnings by Age, Females



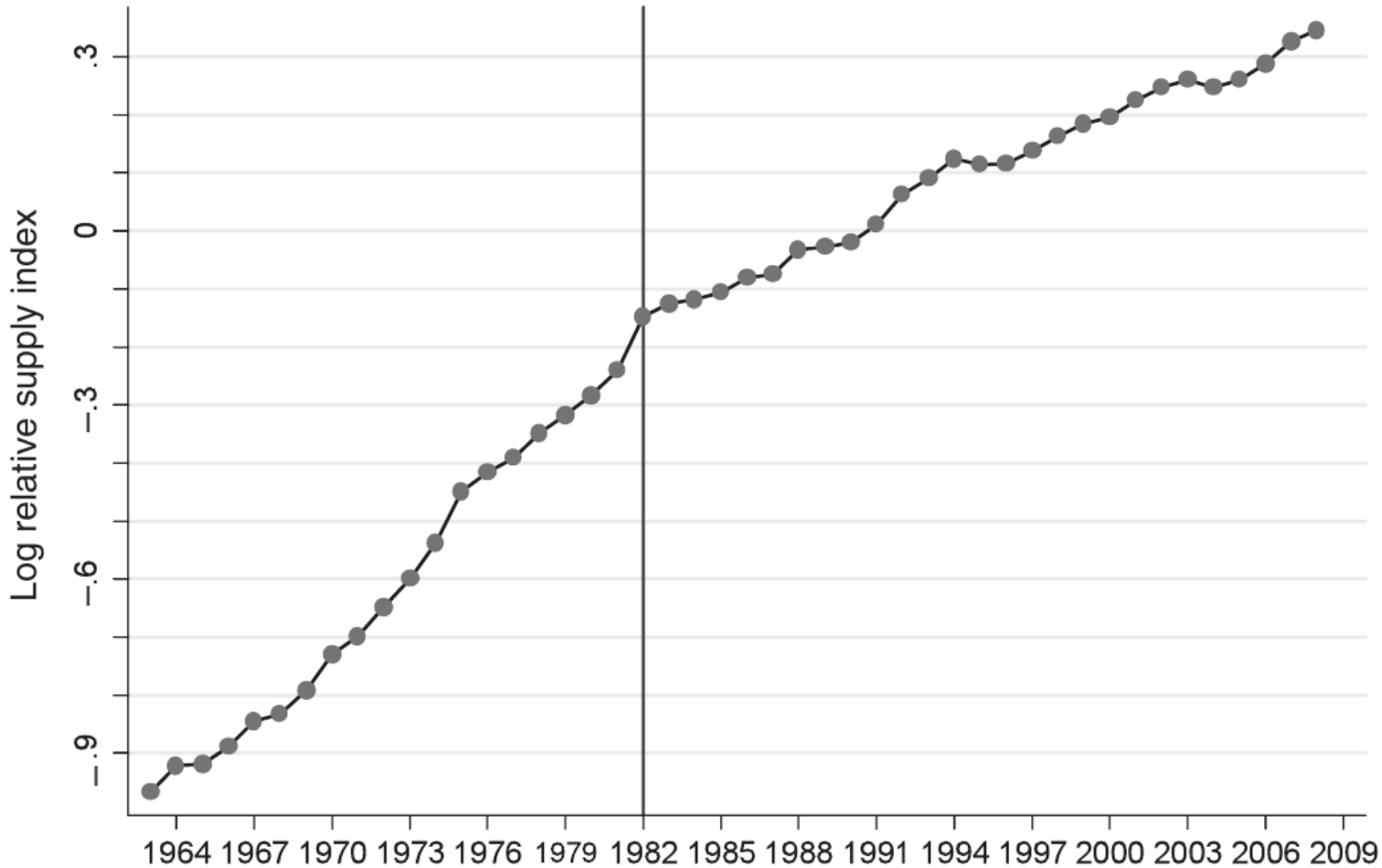
Skill Premium

(Autor and Acemoglu, 2011, March CPS)

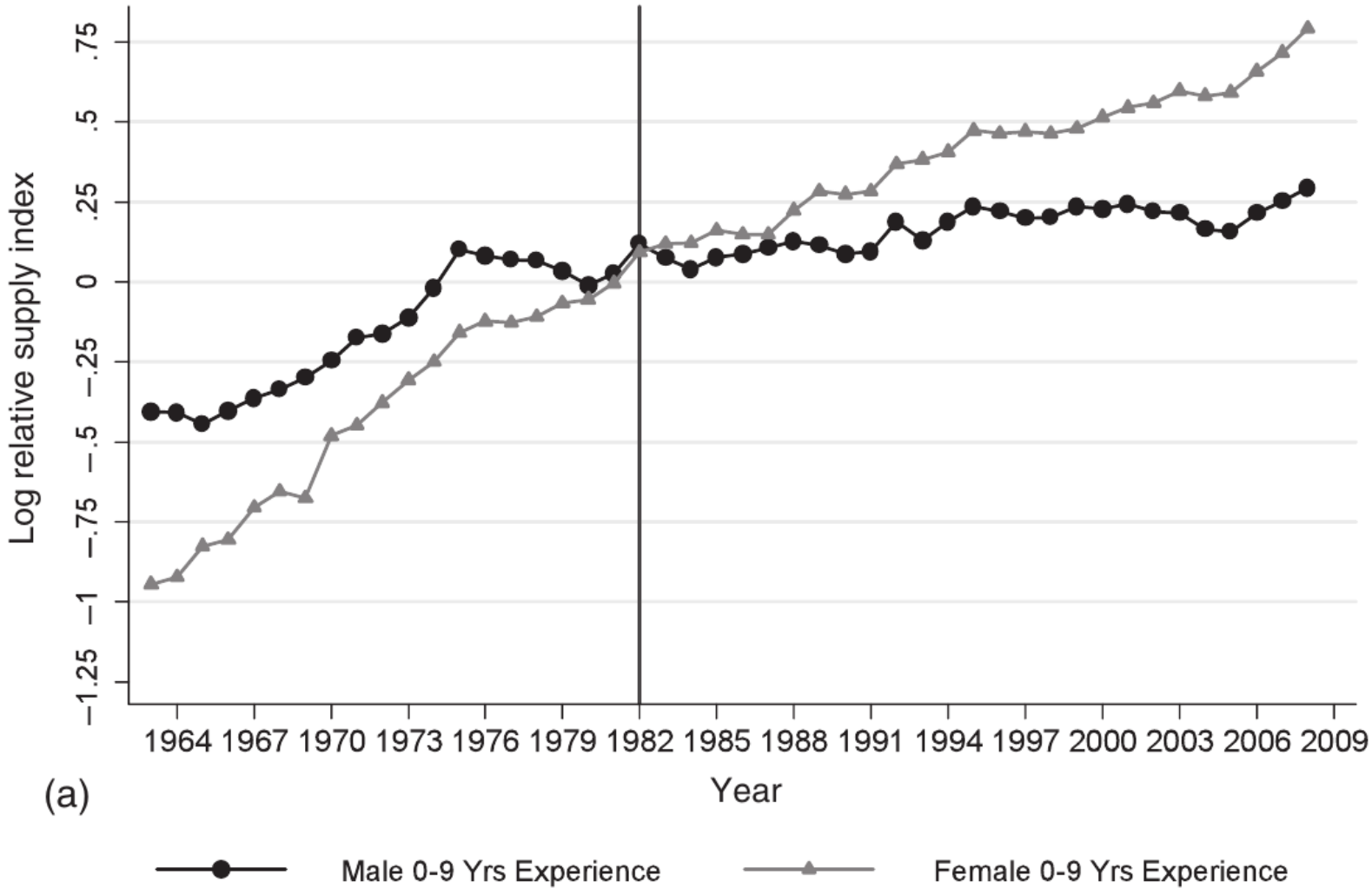
College/High-School Log Weekly Wage Ratio



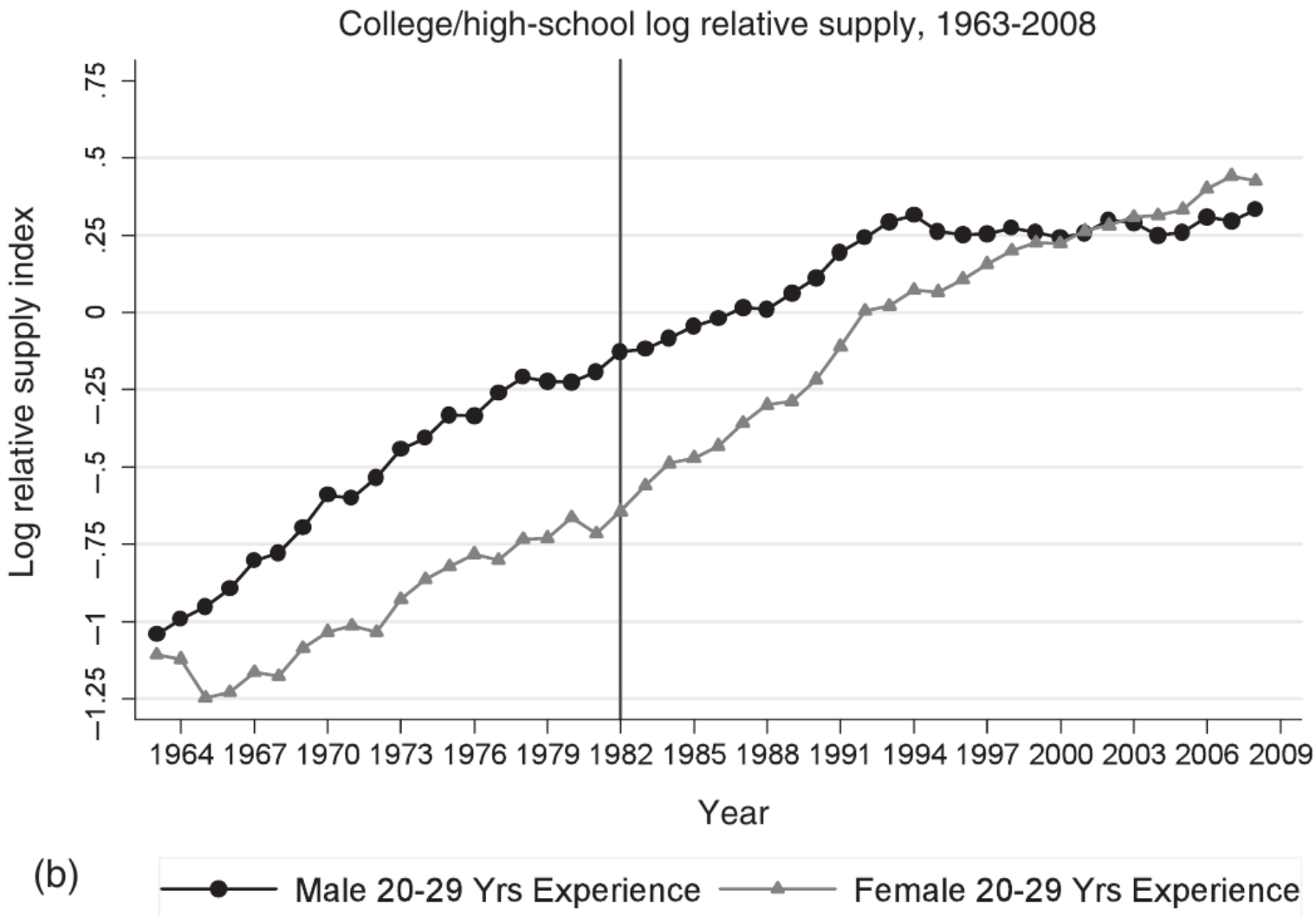
College/High-School Log Relative Supply



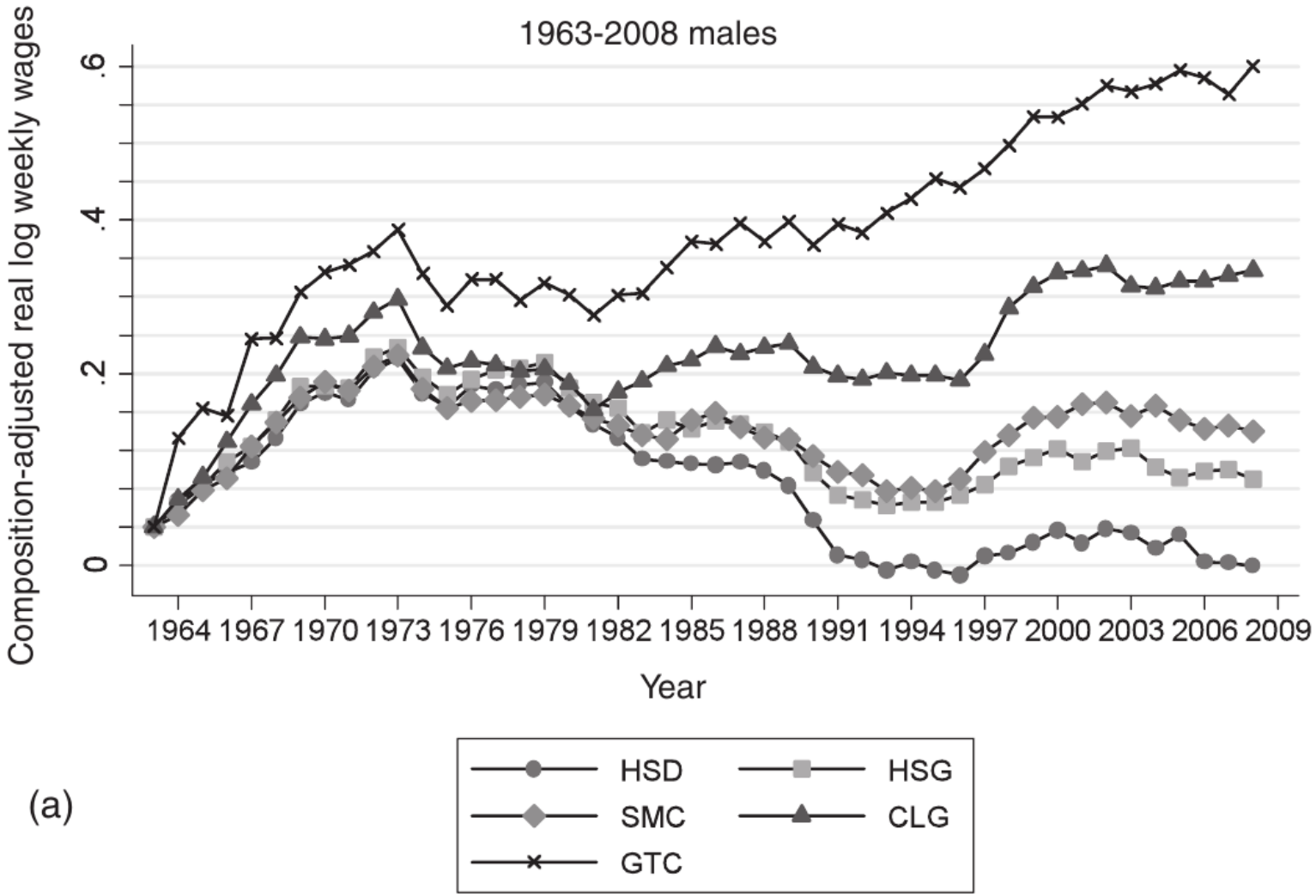
College/High-School Log Relative Supply



College/High-School Log Relative Supply

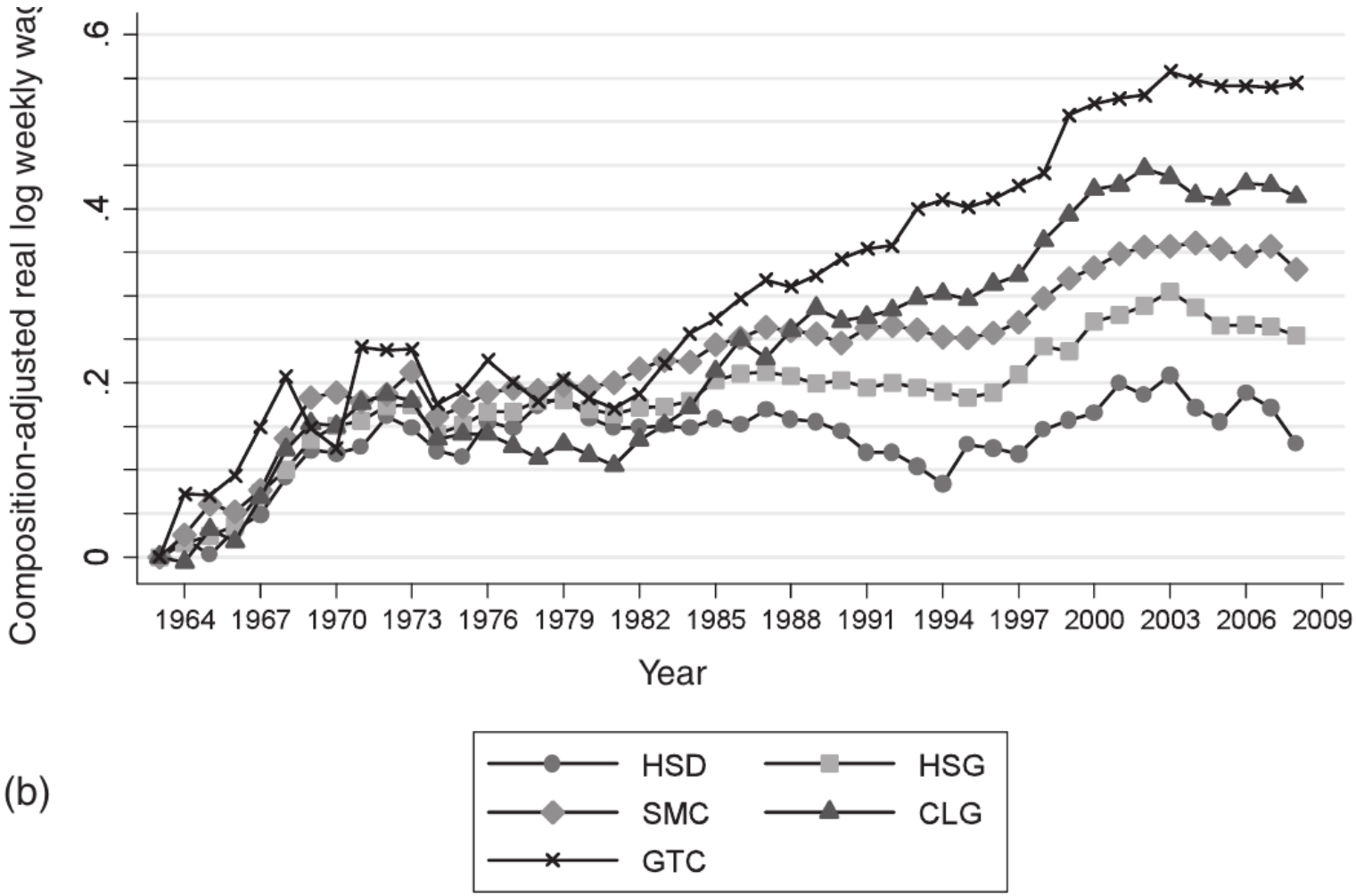


Real Log Weekly Wages, FTFY Male



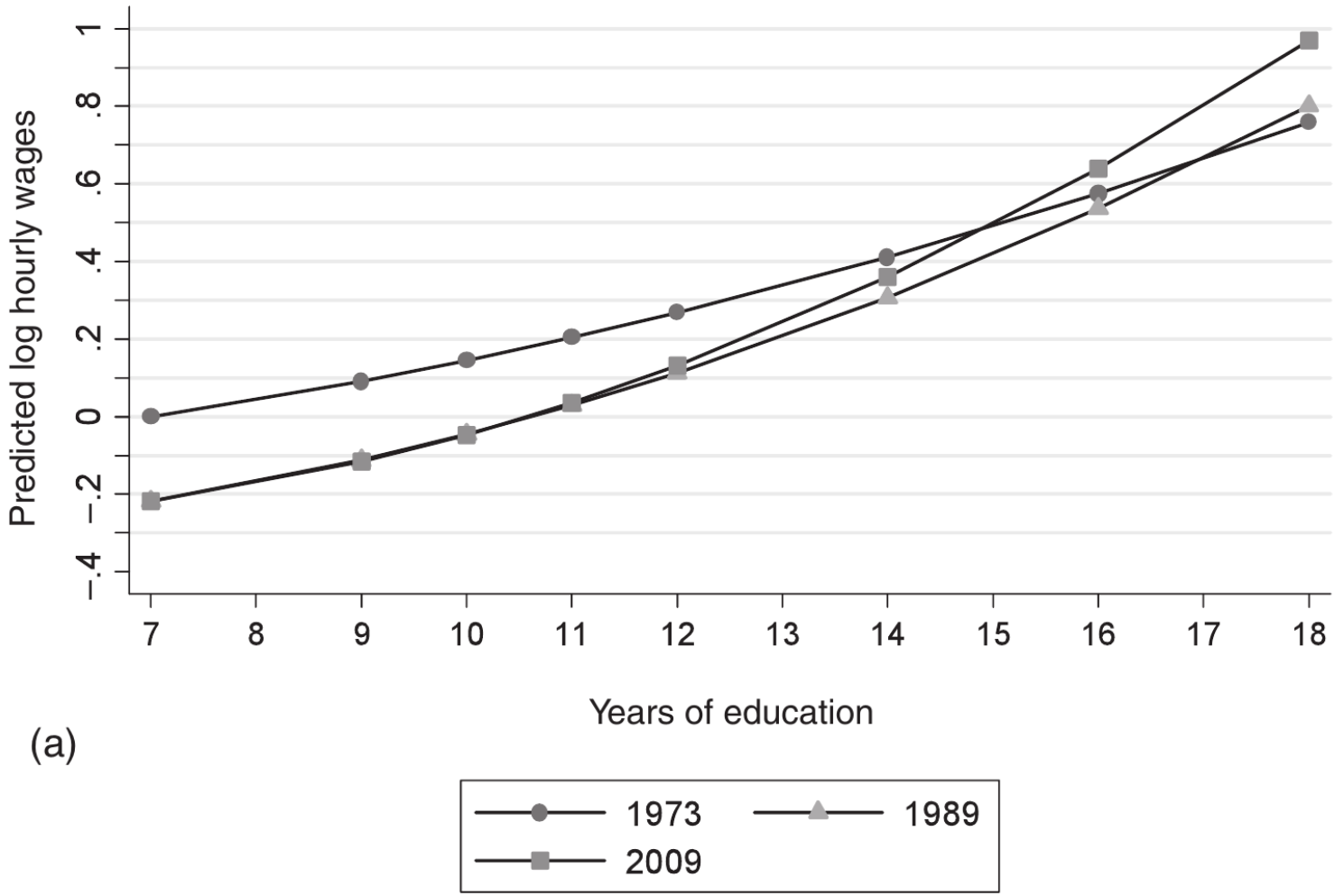
(a)

Real Log Weekly Wages, FTFY Female



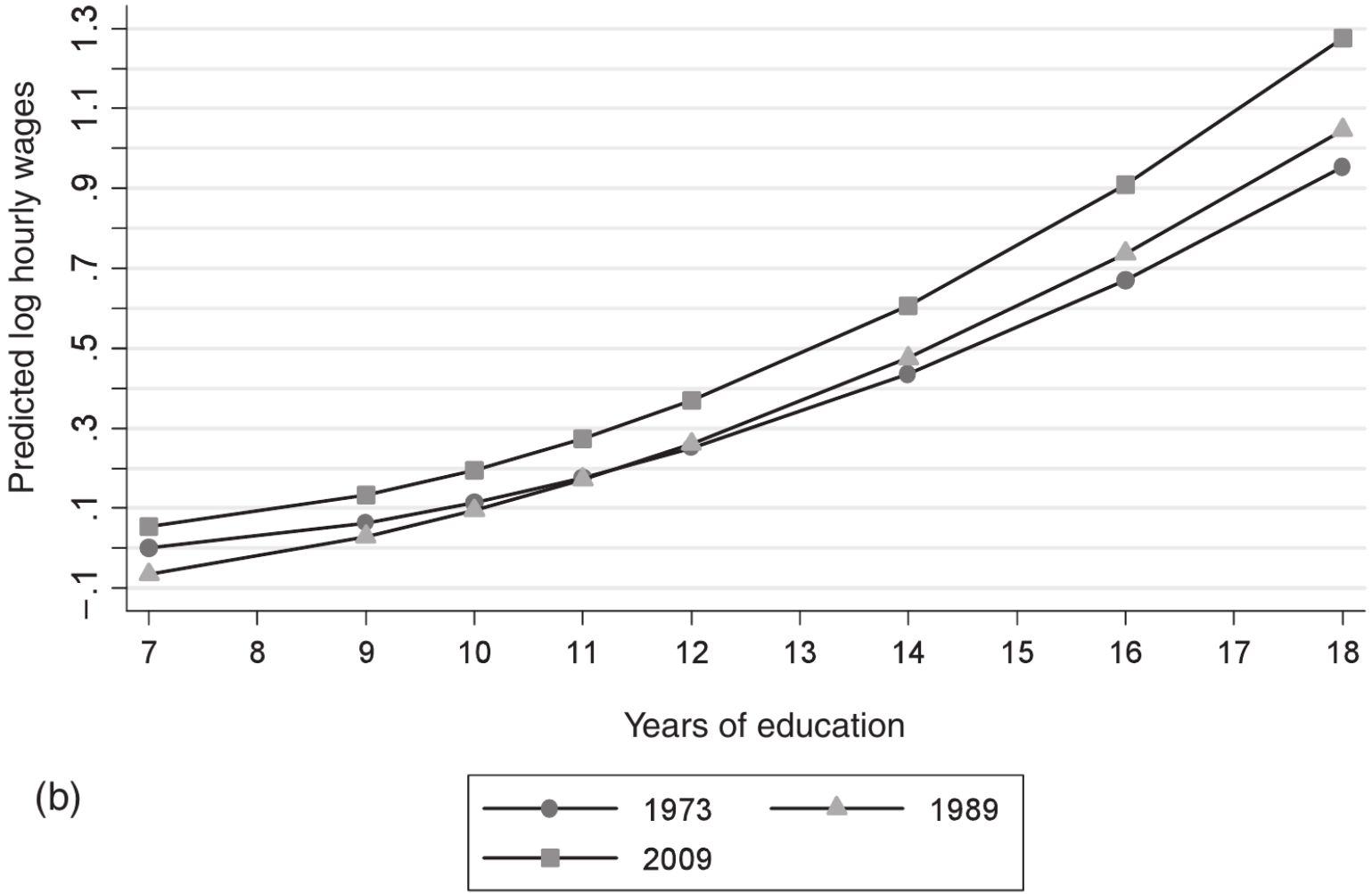
(b)

Predicted Log Hourly Wages by Yrs of Education, Males



(a)

Predicted Log Hourly Wages by Yrs of Education, Females

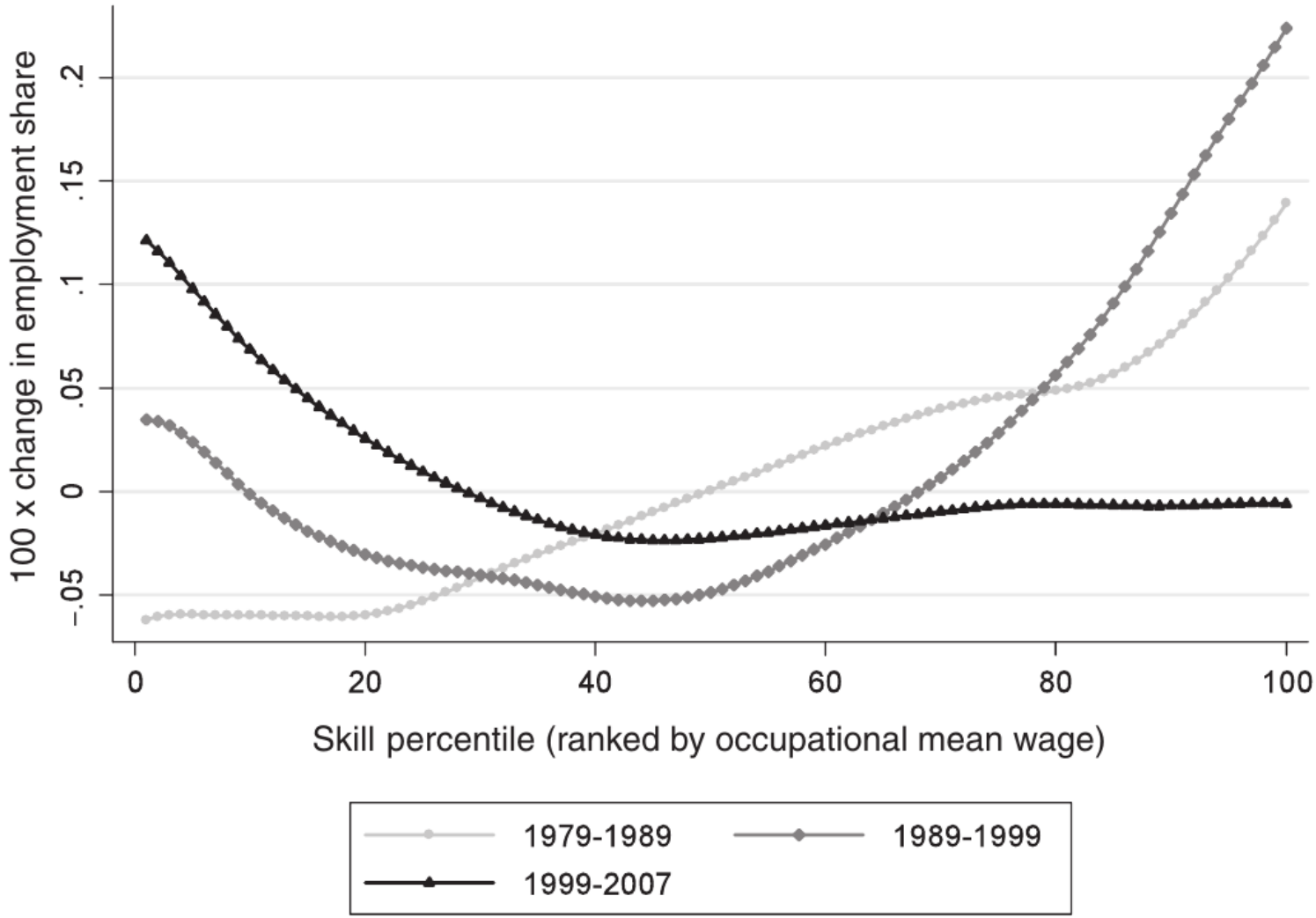


(b)

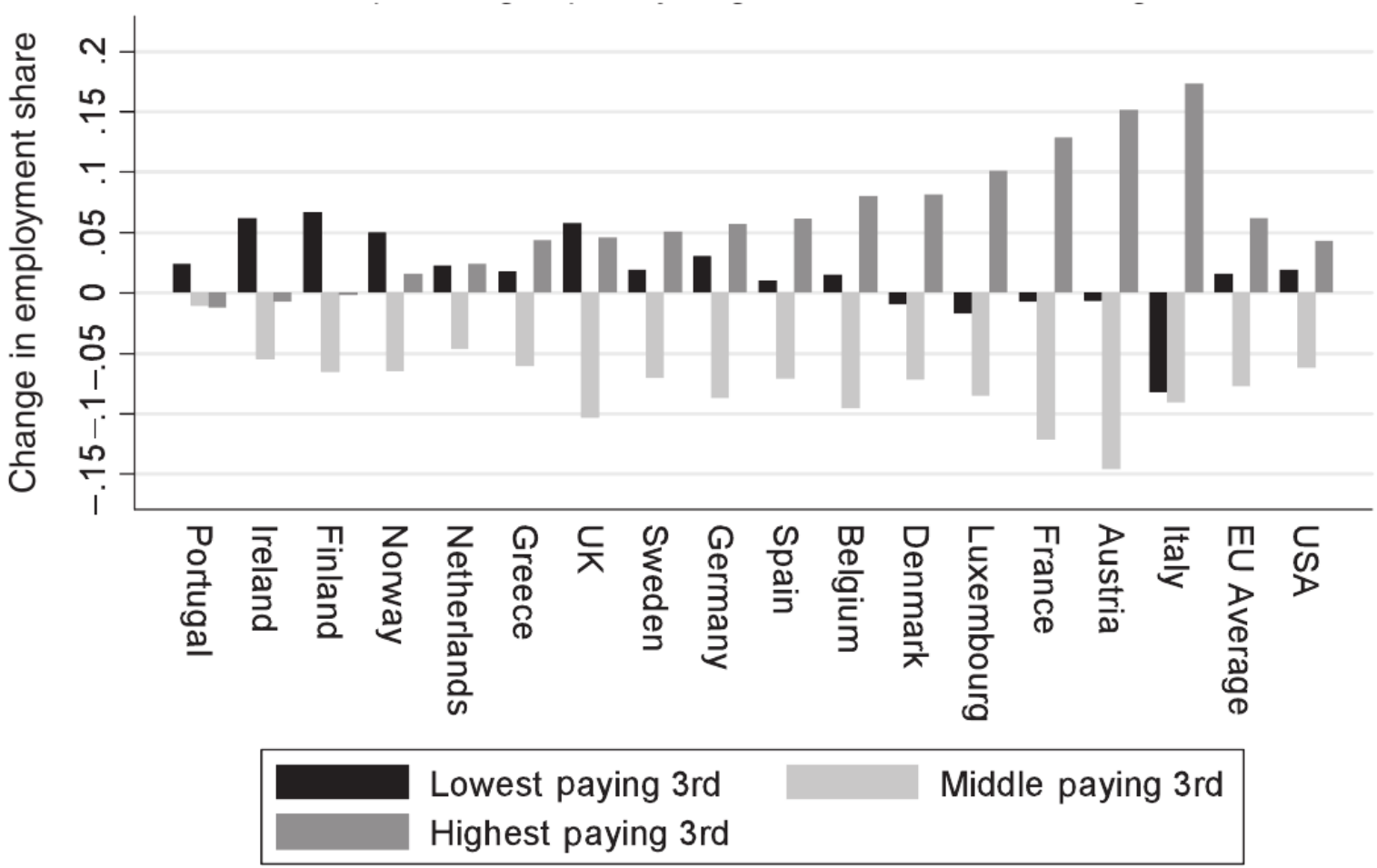
Task Approach and Job Polarization

(Autor and Acemoglu, 2011, Census, March CPS)

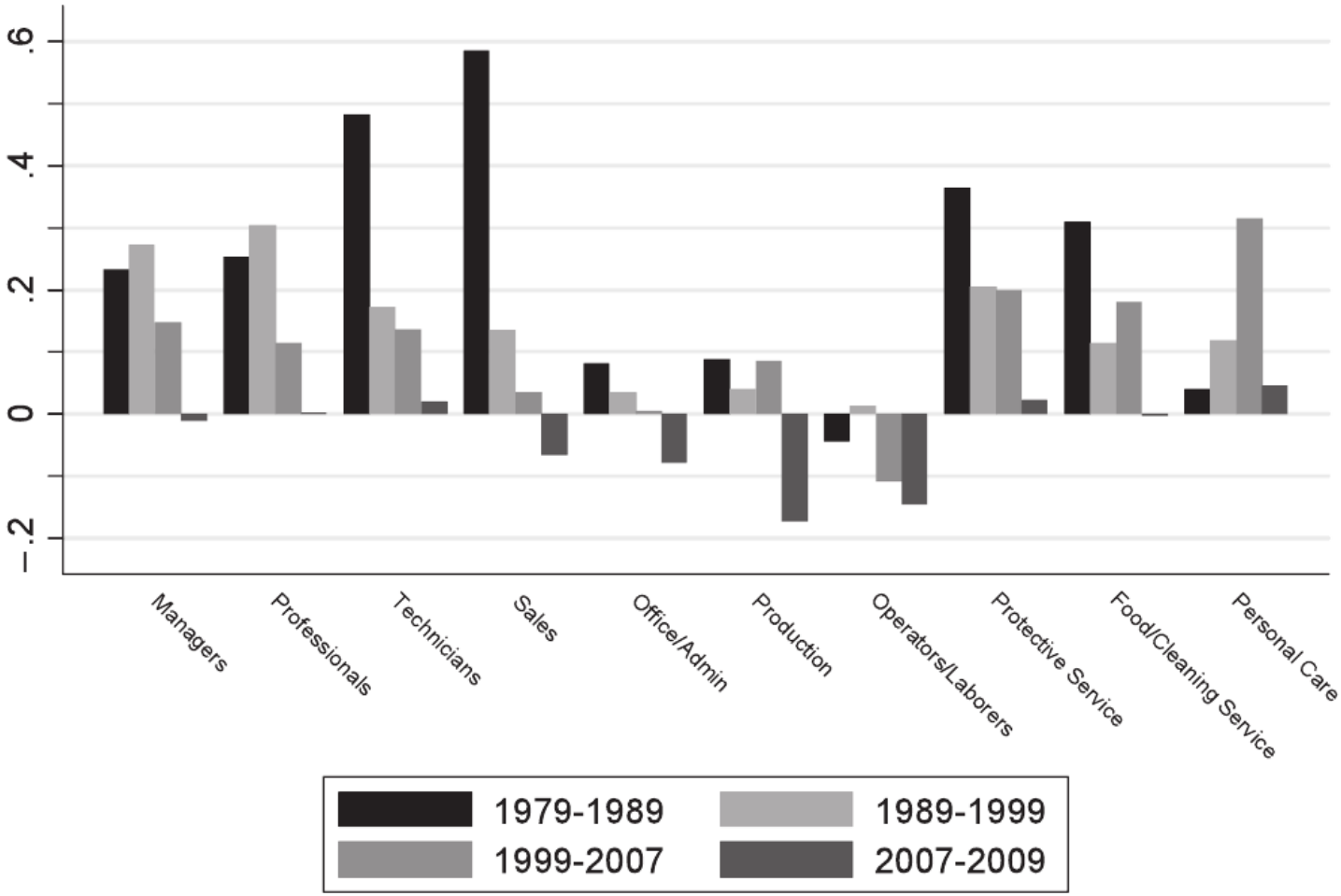
Changes in Employment by Occupational Skill Percentile



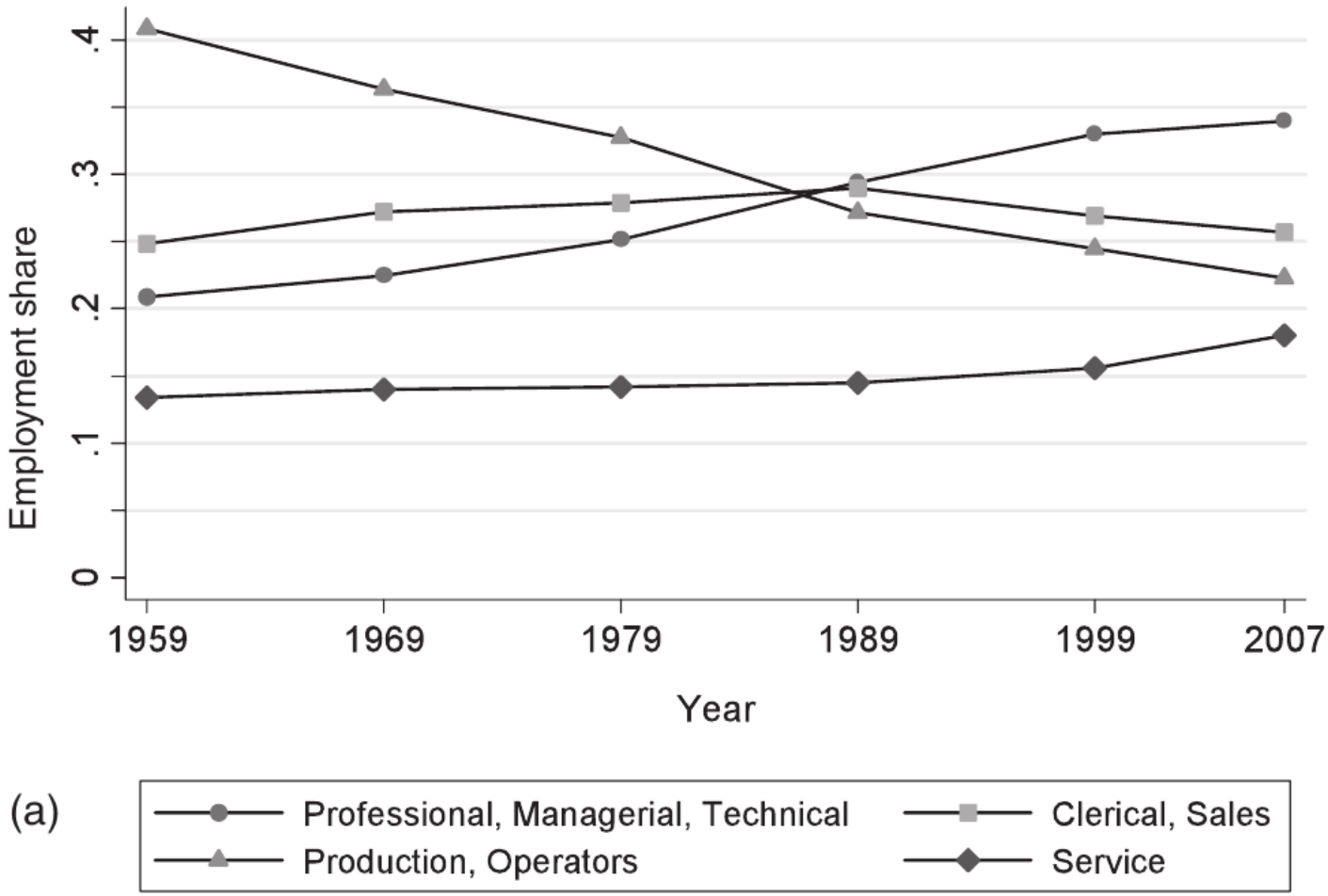
Change in Employment Shares by Occupation, Europe



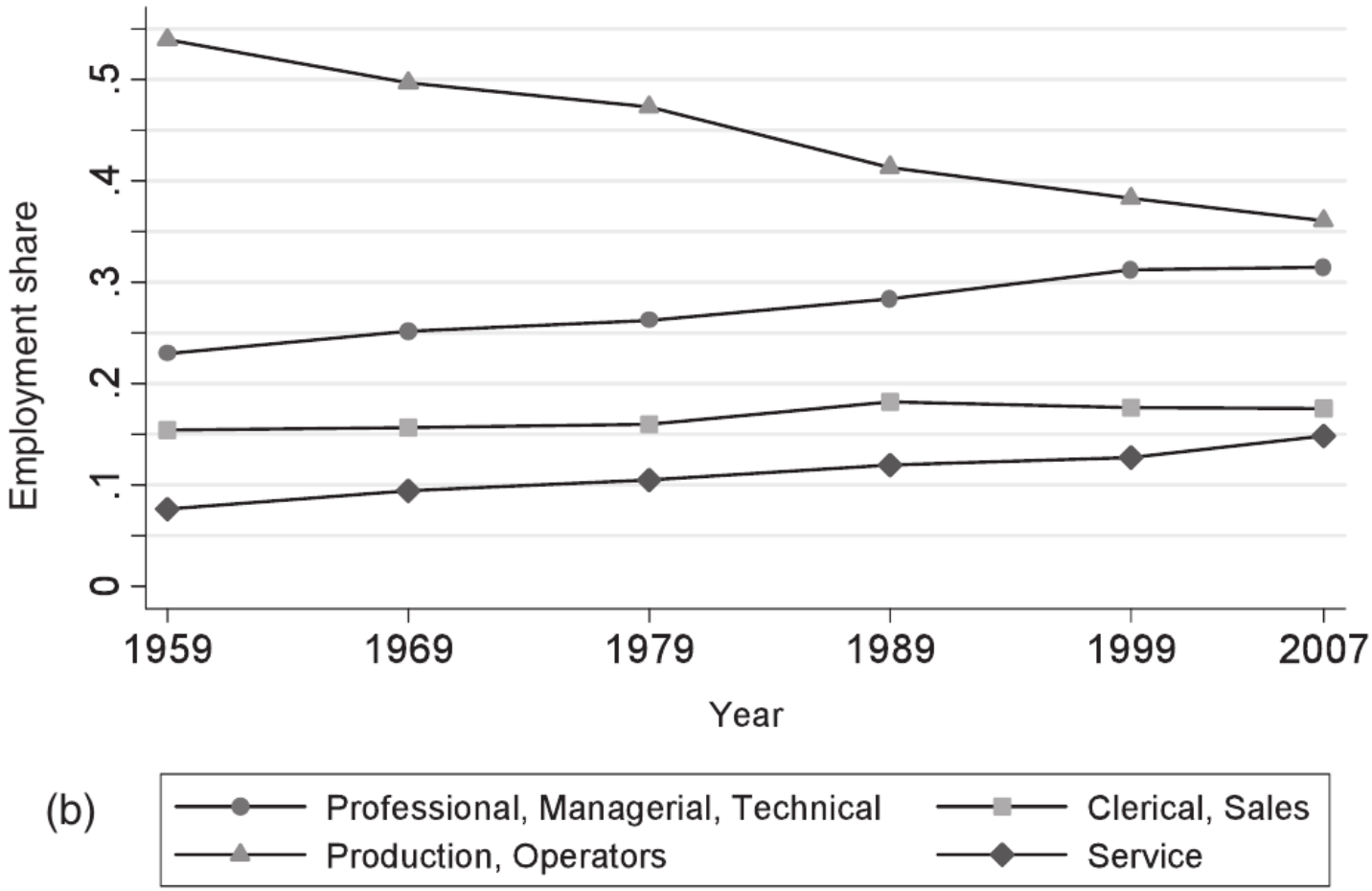
Percent Change in Employment by Occupation



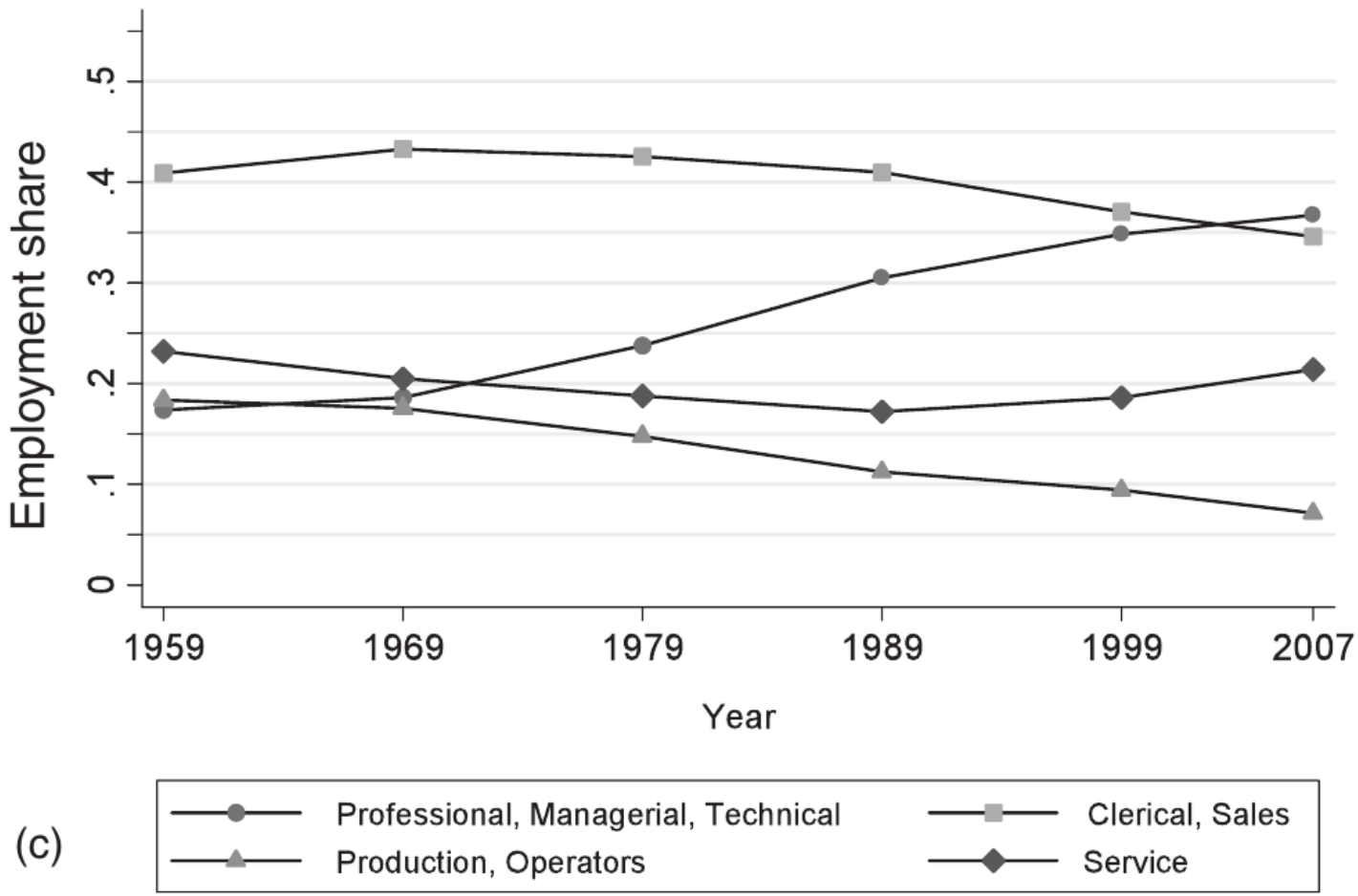
Employment Shares by Major Occupation Groups, All



Employment Shares by Major Occupation Groups, Male

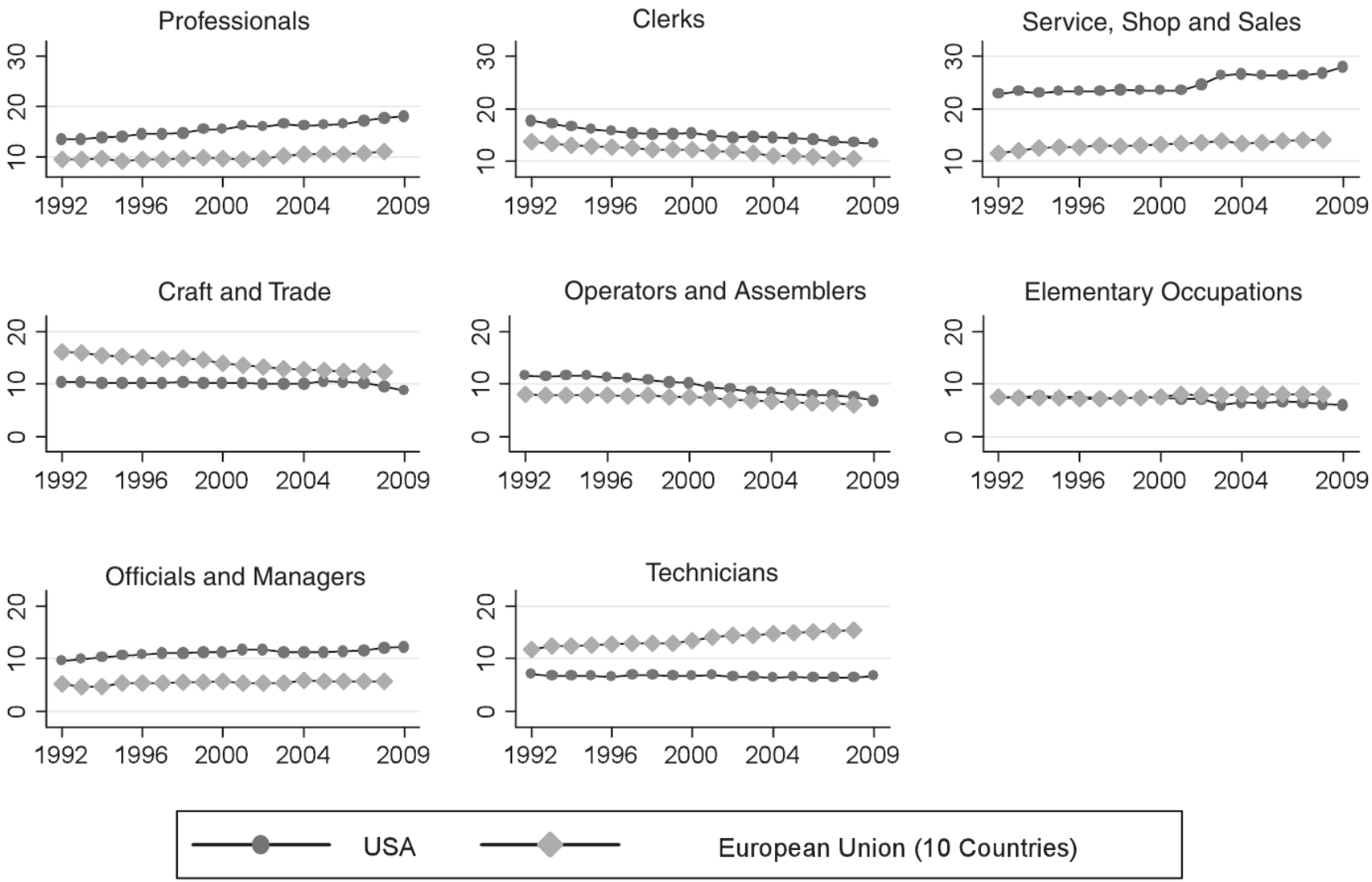


Employment Shares by Major Occupation Groups, Female

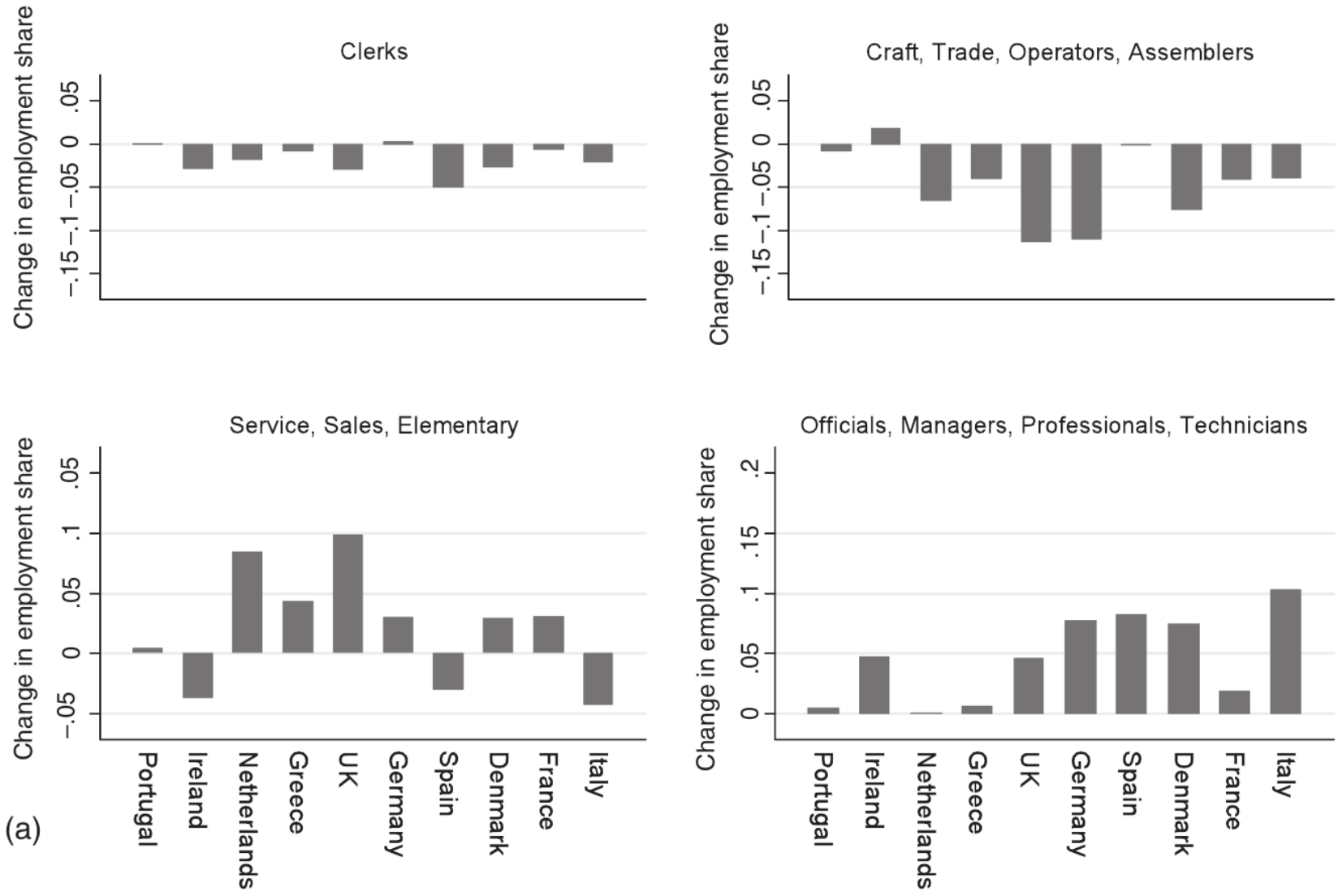


(c)

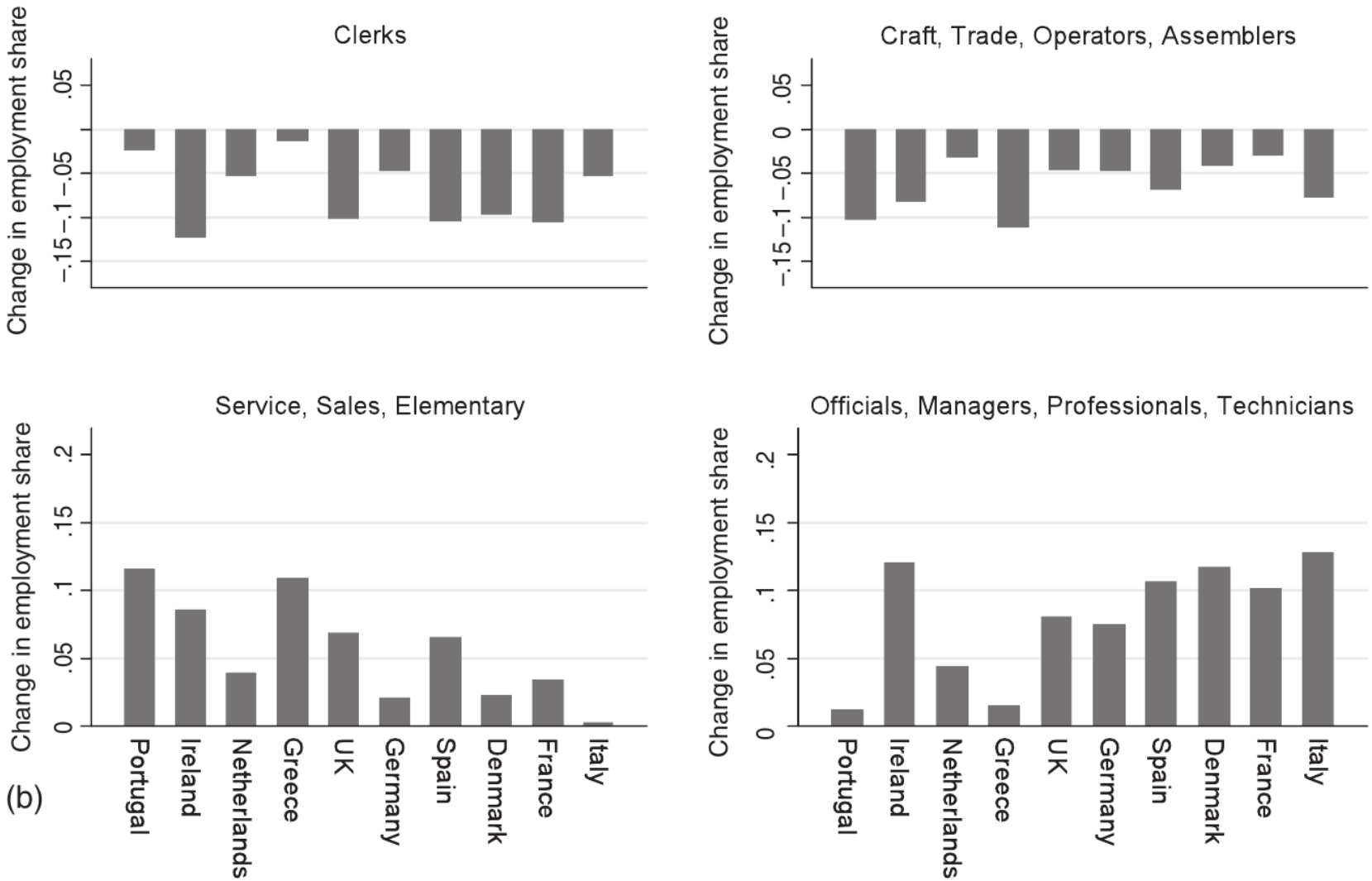
US and EU Occupational Employment Shares, Age<40



Change in Emp. Shares, Males (Age<40) by Country



Change in Emp. Shares, Females (Age<40) by Country



Between-Firm

(Autor and Acemoglu, 2011, March CPS)

Simple Framework to Decompose Earnings

- Let $w_t^{i,j}$ the log of real earnings for a worker i at firm j in period t.
- We can write

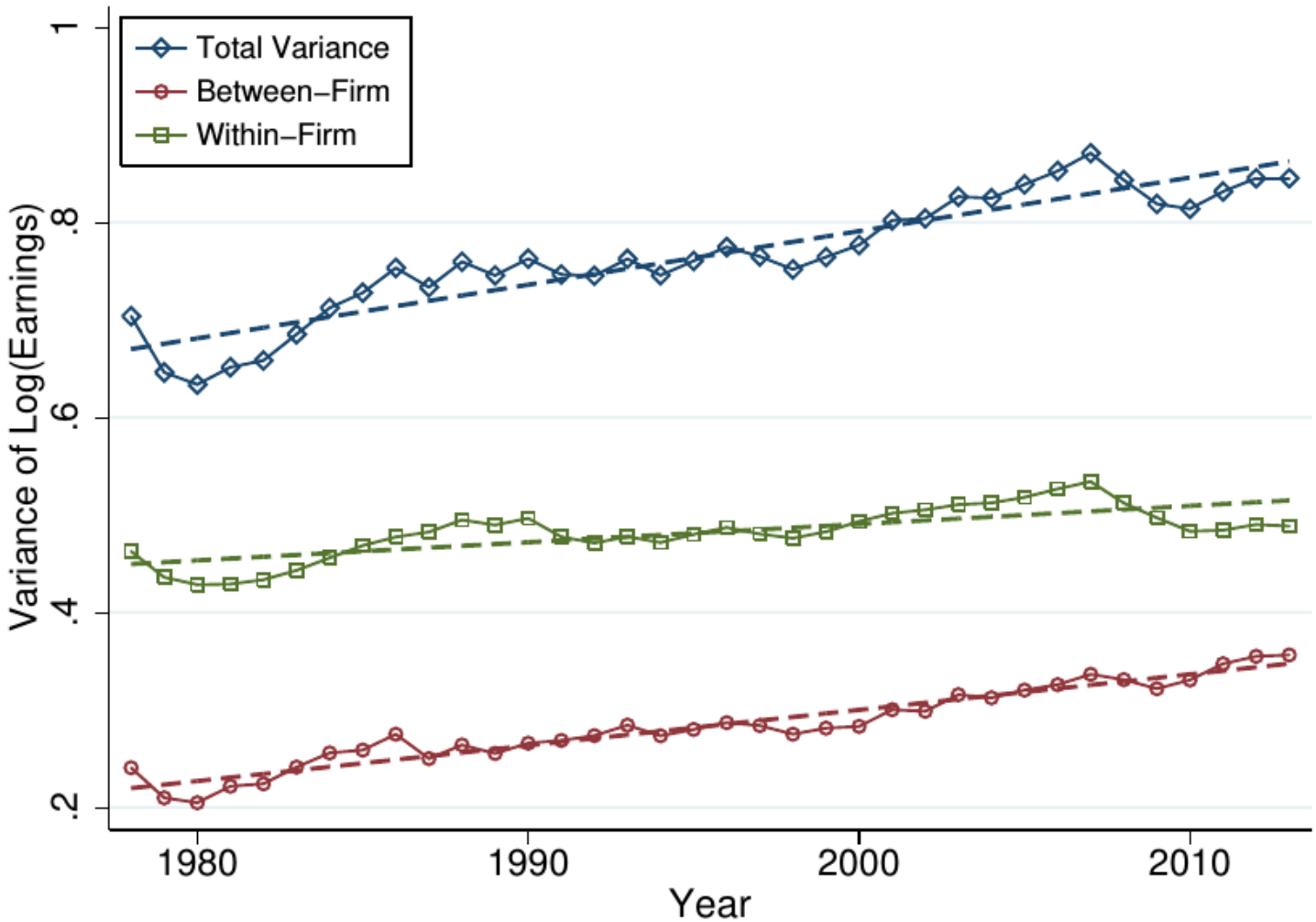
$$w_t^{i,j} \equiv \bar{w}_t^j + \left(w_t^{i,j} - \bar{w}_t^j \right),$$

  where $\bar{w}_t^j$ is the average wage at firm j in period t.

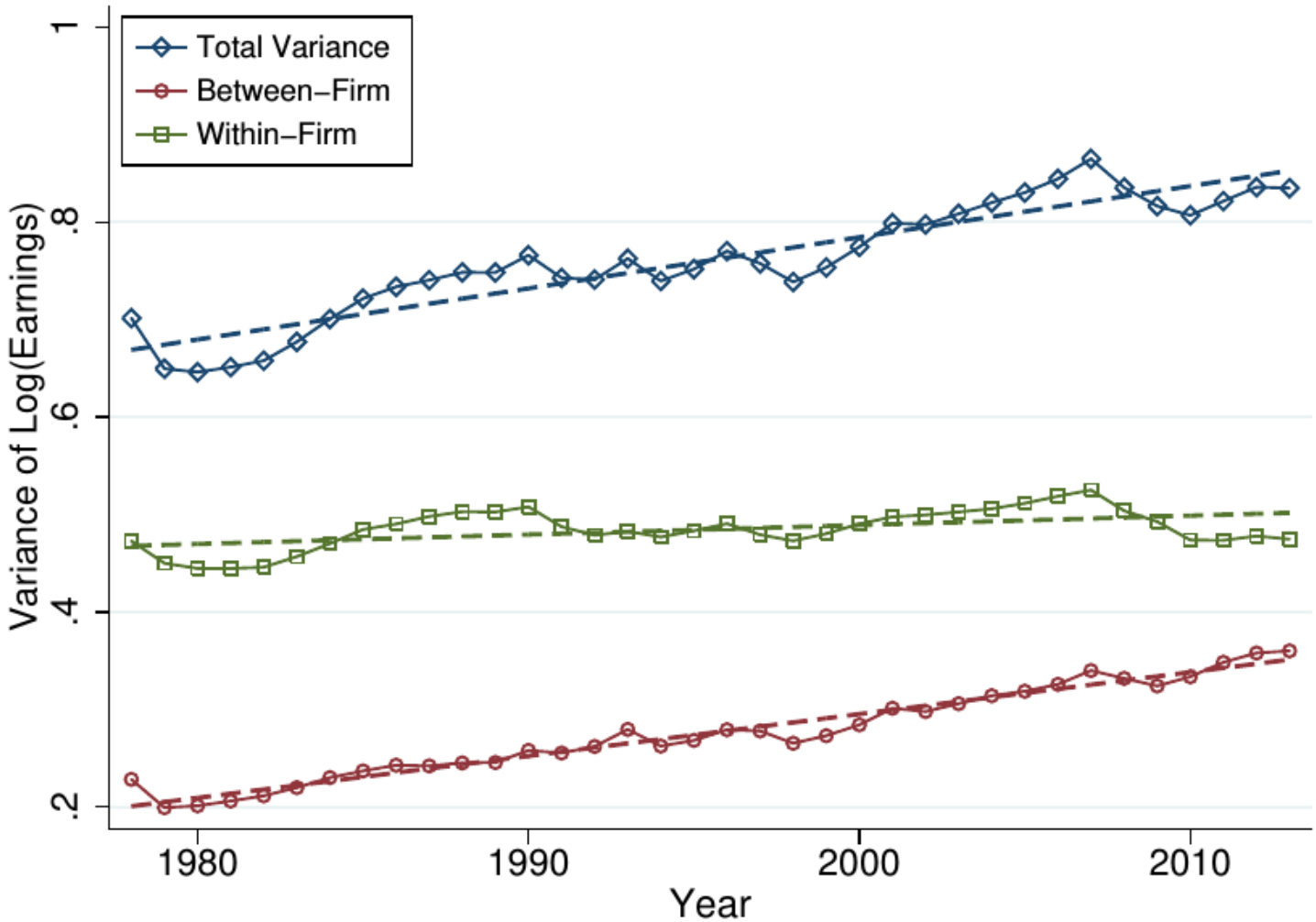
- Then, we have

$$Var_t\left(w_t^{i,j}\right) = \underbrace{Var_t\left(\bar{w}_t^j\right)}_{\text{Between-firm variance}} + \underbrace{Var_t\left(w_t^{i,j} - \bar{w}_t^j\right)}_{\text{Within-firm vriance}}.$$

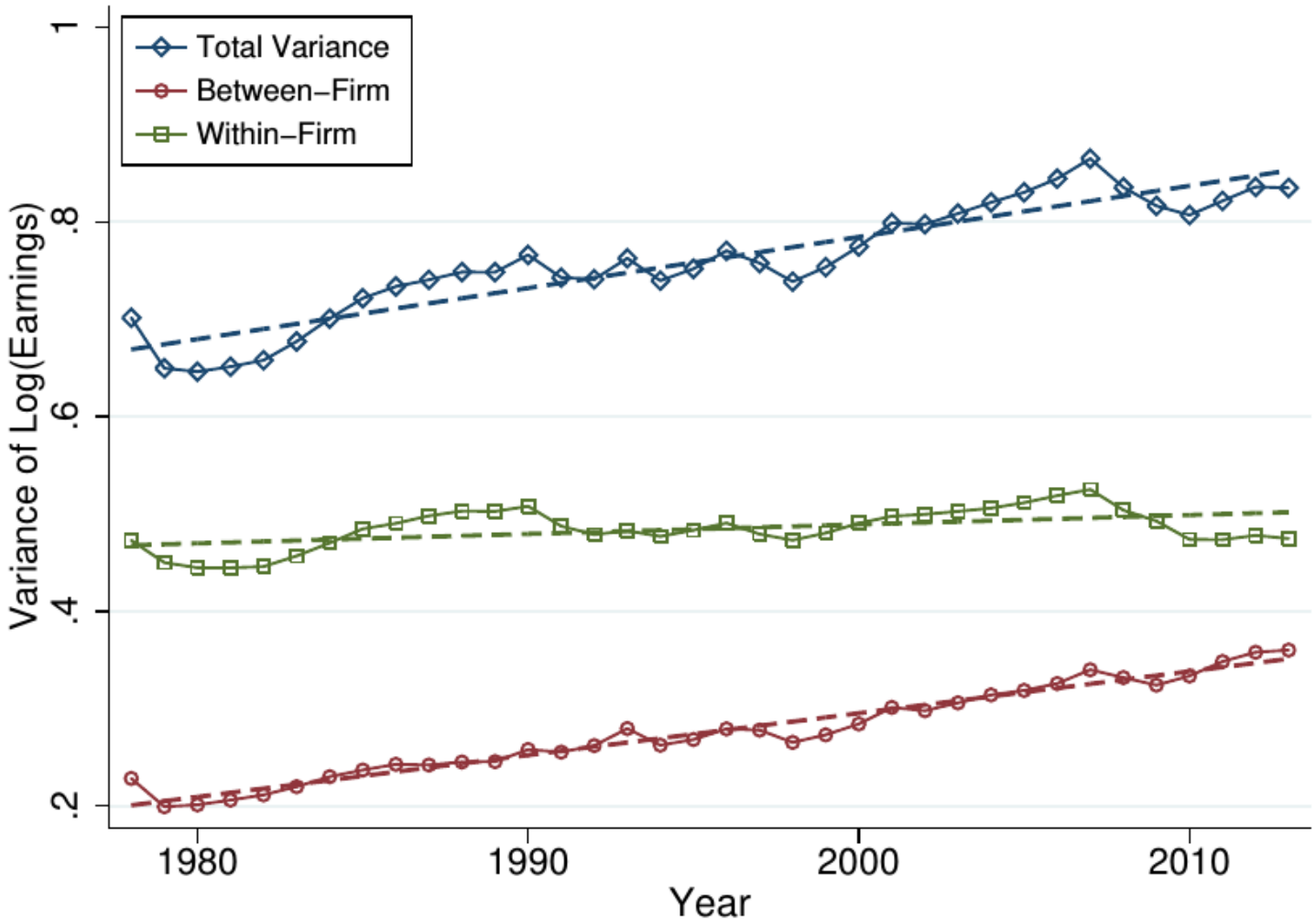
Variance in Annual Earnings Within and Between Firms



Firms with 20 to 10,000 Employees



Firms with 10,000+ Employees



Conclusion

1. Wage/earnings inequality rose sharply in the U.S. starting in the early 1980s
2. Returns to education also increased sharply despite the increasing supply of college graduates
3. The employment shares of the middle-skilled occupations dropped dramatically
4. The rise of wage/earnings inequality happened between firms