Colloque international

DARES
direction de l'animation de la recherche, des études et des statistiques

OIT

Polarisation(s)
sur les marchés du travail

Colloque international • Polarisation(s) sur les marchés du travail
Colloque international • Polarisation(s) sur les marchés du travail
Colloque international • Polarisation(s) sur les marchés du travail
Colloque Mardi 19 juin 2018 du travail
Colloque du travail
Colloque international • Polarisation(s) sur les marchés du travail
Colloque international • Polarisation(s) sur les marchés du travail
Colloque international • Polarisation(s) sur les marchés du travail

SALLE PIERRE LAROQUE - PARIS

Liberté • Égalité • Fraternité
RÉPUBLIQUE FRANÇAISE
MINISTÈRE DU TRAVAIL

Colloque international DARES

Polarisation(s)
sur les marchés du travail

Job Polarization, Structural Transformation and Biased Technological Change

Zsófia L. Bárány and Christian Siegel
Sciences Po & CEPR and University of Kent

Job polarization

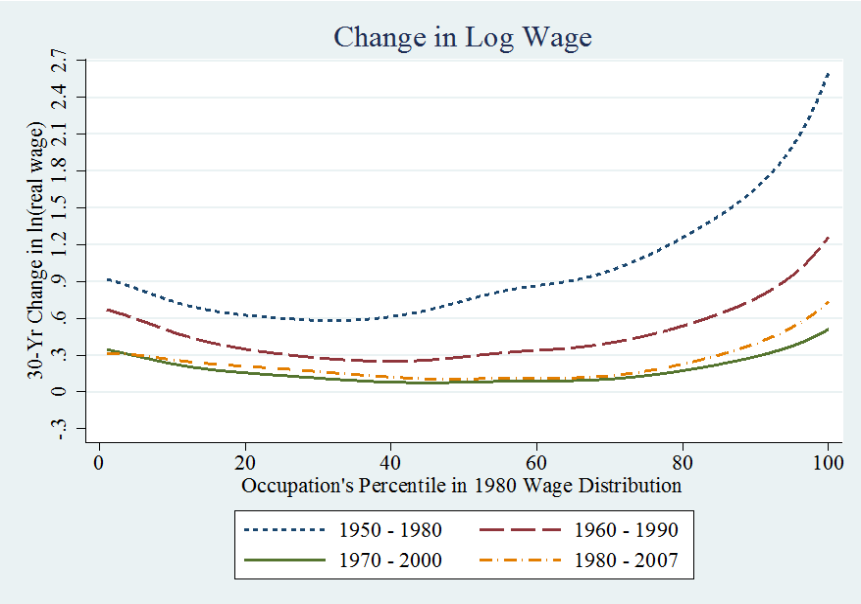
a widely documented phenomenon in developed countries since the 1980s

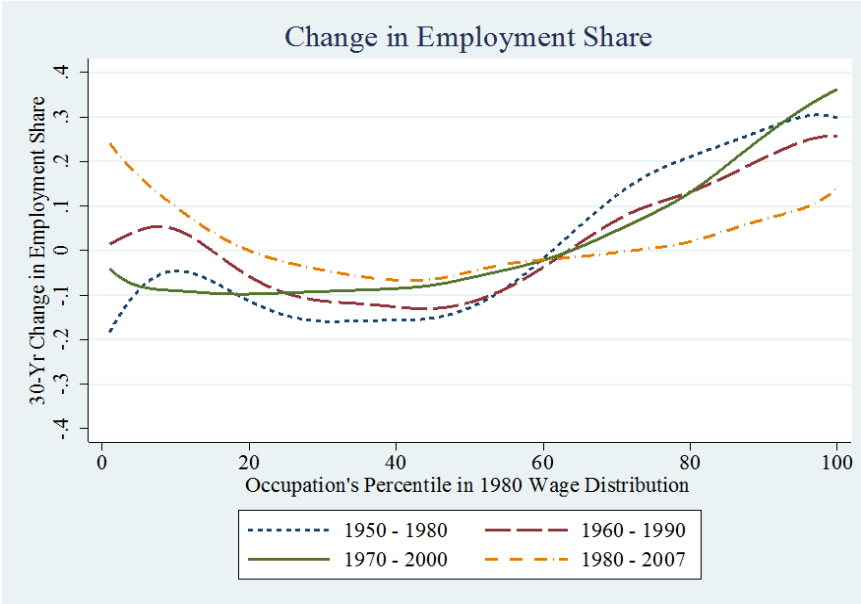
- employment shifting from middle to low- and high-income occupations
- average wage growth slower for middle-income occupations than

at both extremes

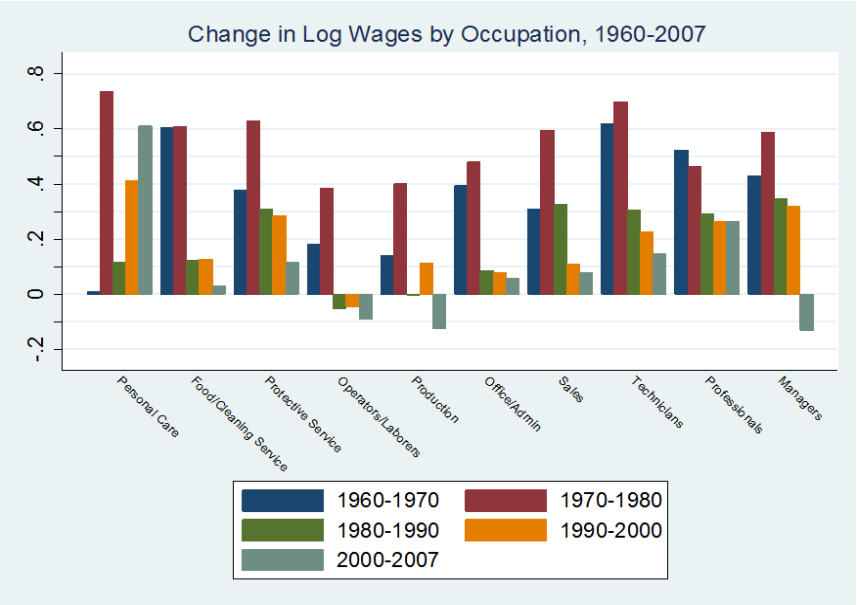
➔ In terms of occupations polarization started in the 1950/60s in the US

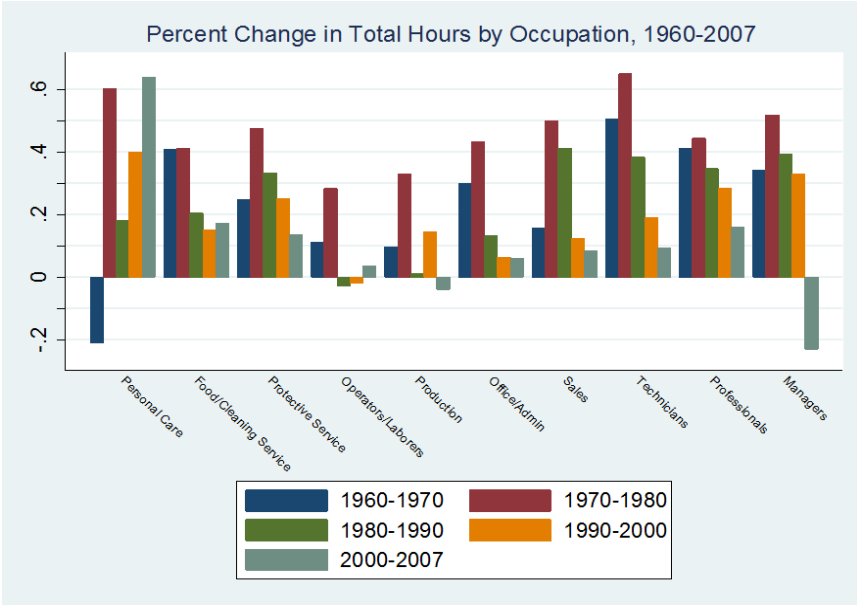
Job polarization for fine occupational categories





Job polarization for broader occupational categories





Structural transformation

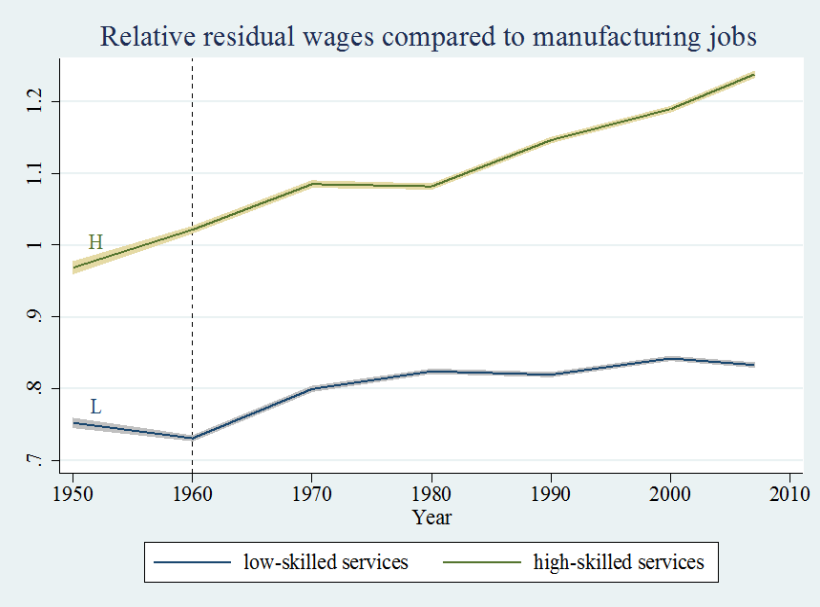
Widely documented phenomenon for both developed and emerging countries:

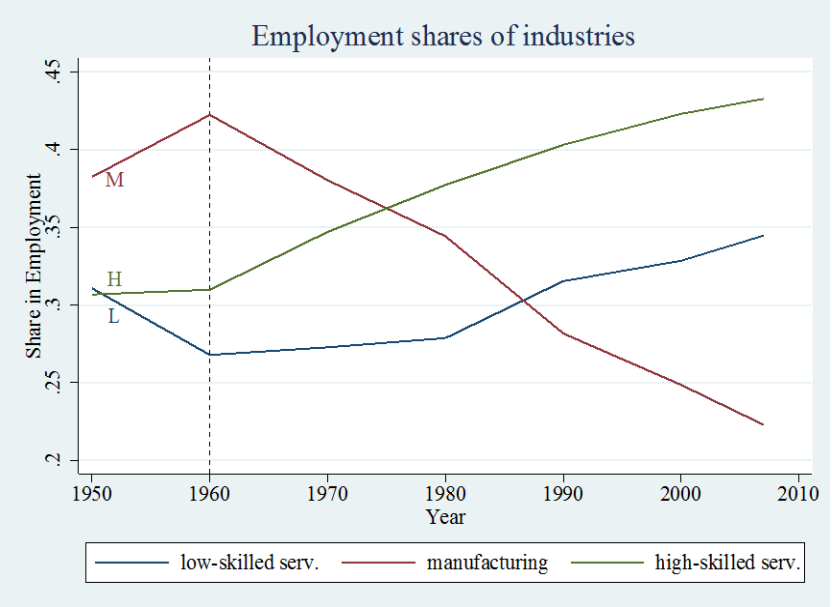
- Reallocation of employment and economic activity across broad sectors of the economy
- From agriculture to manufacturing, from manufacturing to services

➔ Break services in two: low- and high-skilled

➔ Show that there is employment and wage polarization across broadly defined sectors

Polarization for three broad sectors





Occupational employment share change

Decompose the change in an occupation's employment share into

- a between industry component: due to changes in employment across industries
- a within industry component: due to changes in employment within industries, across occupations

➔ Between ¼ and ½ is due to between industry changes

Decomposition of employment change 1960-2007

	Manual	Routine	Abstract
Total	5.68	-19.14	13.46
Between	3.07	-6.32	3.24
Within	2.61	-12.82	10.21

Occupational relative wage change

Decompose the change in an occupation's relative wage to

- an industry component: reallocation of labor within occupations between industries & change in industry relative wage
- a within industry component: change in within industry occupational wage premium

➔ Between ½ and all is due to the industry component

Decomposition of wage changes 1960-2007

	Manual/Routine	Abstract/Routine
Total	0.31	0.24
Industry	0.15	0.25
Occupation	0.16	-0.01

Job polarization and structural change

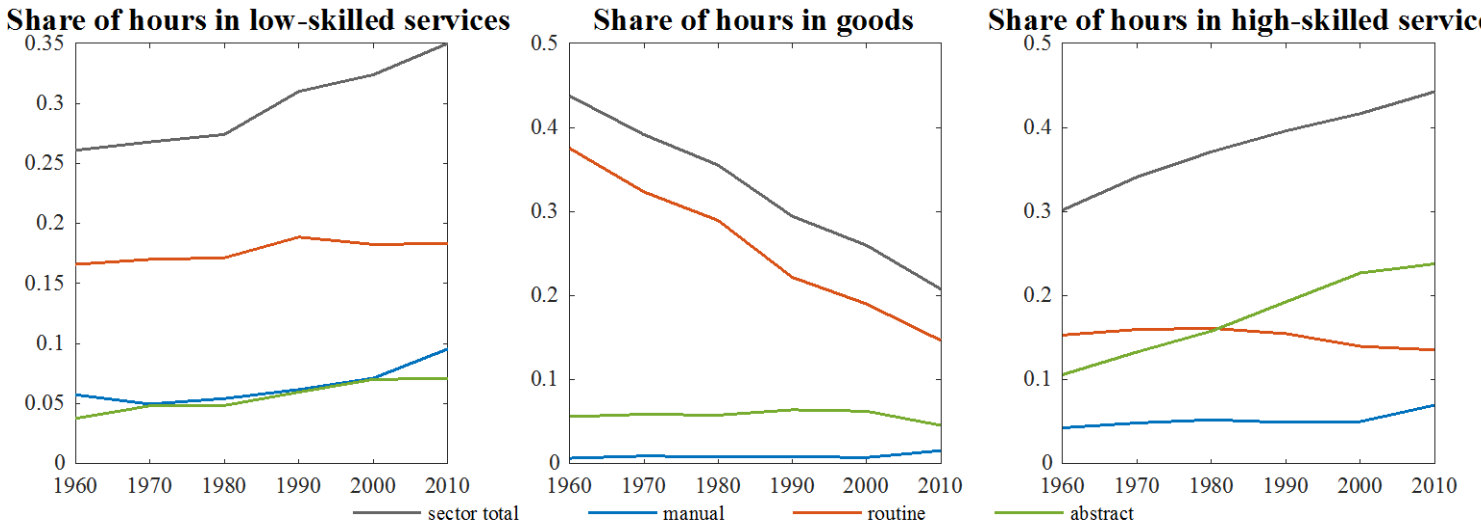
Patterns suggest that the two phenomena are closely linked.

Both phenomena explained by differential productivity growth:

- polarization focuses on differences across occupations
  ICT and routinization
- structural change focuses on differences across sectors
  higher productivity growth in agriculture and manufacturing than in services

➔ Difficult to identify the bias of technology

Sector and sector-occupation employment shares 1960-2010



Model to identify the nature of technological change

- Goal: identify technology that is biased towards certain factors of production
- Need to specify a production function
- Assume a very flexible production function in each sector: manual, routine and abstract occupational labor is combined to produce sector output
- Key: assume that productivity is specific to the job of a worker, defined by both the sector and the occupation

➔ We can identify these sector-occupation cell level productivity paths from the data

Model to identify the nature of technological change

How did productivities have to evolve to observe the patterns we see in the data?

- occupational income shares within sectors ➔ within sector relative productivity of occupations
- relative prices across sectors ➔ relative productivity across sectors
- growth of GDP per worker over time ➔ evolution of productivity over time

Decomposing productivity growth

Decompose the extracted sector-occupation cell productivity growth into different components

- ➔ Sector and occupation components jointly explain almost 75%
- ➔ General purpose technologies (TFP) hardly explain anything
- ➔ Most is explained by occupation specific growth
- ➔ Some role for sector specific growth

The role of technological biases

Had productivity growth

- not been biased across sectors, or
- not been biased across occupations

what would the path of occupational employment (and other outcomes) have looked like?

Construct a model with occupational choice by workers, and sector consumption choice by households that matches the data for extracted productivity paths.

Feed in productivity paths shutting down different components and compare model predictions with data.

Fraction of change predicted by each component

	Sector & occupation	Occupation	Sector
Occupational employment	101%	102 to 112%	5 to 20%

Fraction of change predicted by each component

	Sector & occupation	Occupation	Sector
Occupational employment	101%	102 to 112%	5 to 20%
Occupational wages	100%	101 to 110%	6 to 21%

Fraction of change predicted by each component

	Sector & occupation	Occupation	Sector
Occupational employment	101%	102 to 112%	5 to 20%
Occupational wages	100%	101 to 110%	6 to 21%
Sector employment	108 to 120%	118 to 134%	50 to 85%

Fraction of change predicted by each component

	Sector & occupation	Occupation	Sector
Occupational employment	101%	102 to 112%	5 to 20%
Occupational wages	100%	101 to 110%	6 to 21%
Sector employment	108 to 120%	118 to 134%	50 to 85%
Sector prices	279 to 593%	547 to 1816%	-190 to -520%

Summary

1. Polarization started earlier
2. Polarization and structural transformation are closely linked
3. Identify the evolution of productivities at the sector-occupation level
4. Decompose these into neutral, sector and occupation components
5. Sector and occupation components jointly explain a large fraction of productivity changes and observed outcomes
6. Largest role for occupation specific growth, but non-negligible role of sector specific and sector-occupation specific technologies