Automation, Globalization and Vanishing Jobs: A Labor Market Sorting View

Comments by

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THE PAPER

- A new theory of the employment consequences of technological change
  - Embedded in a standard matching model (partial equ.)
  - With testable implications

- New measurement of “selectivity”: sorting into occupations/sectors of activity

TECHNOLOGICAL CHANGE

- A taxonomy of technological change

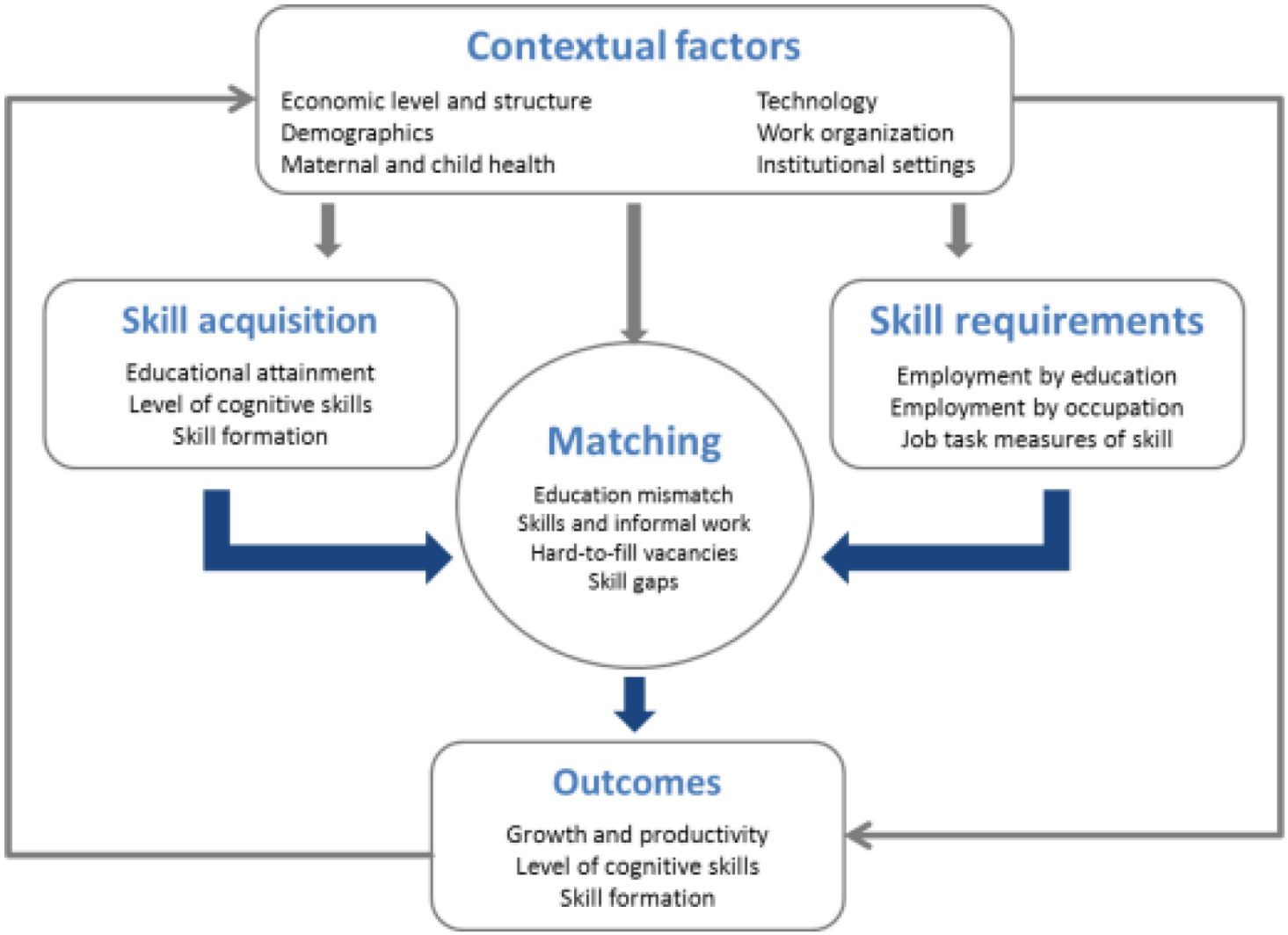
	Skill-biased TC (Worker characteristics)	Routine-biased TC (Job characteristics)	Core-Biased TC (Match characteristics)
New Products	Innovation	Innovation	Innovation
New Production Processes	Automation Off-shoring	Automation Off-shoring	**Automation** **Off-shoring**

- Contribution: Process innovation in a matching model
- Hypothesis: “Better matches” enjoy a comparative advantage at exploiting new technologies.
- (Trade-offs among different “TCs”. More on this below).

FRAMING THE PAPER INTO THE LITERATURE

- Task-based framework: Productivity, replacement, reinstatement effect (i.e., Acemoglu and Restrepo 2018 and …)
- Robotics/AI: Complements/Substitutes to Labour?
- Jobs as combinations of tasks; workers as combinations of skills
- Technological change:
  - Redefinition of tasks/jobs
  - New skills requirements
  - Trade-off automation-innovation (Basso-Jimeno, 2019)

Figure 1. Economic context and skills mismatch



Source: ILO (2013).

THE THEORY: MAIN RESULTS

- TC makes firms/workers to be more choosy about matches

- Not Job-to-Job flows + Exogenous job destruction

➔ Exacerbates search frictions (and restrict "acceptance sets" of matches)

- TC:
  - ↑ mismatch
  - ↑ productivity
  - ↑ unemployment (U-shape)
  - ↑ wage and earnings inequality (reinforced by wages depending on mismatch)

- Robust to alternative specifications (including vertical heterogeneity)

EMPIRICS: MEASUREMENT

Table 1. Frequently discussed types of skills mismatch

Skill shortage (surplus)	Demand (supply) for a particular type of skill exceeds the supply (demand) of people with that skill
Skill gap	Type or level of skills is different from that required to adequately perform the job
Vertical mismatch	The level of education or qualification is less or more than required
Horizontal mismatch	The type/field of education or skills is inappropriate for the job
Overeducation (undereducation)	Workers have more (less) years of education than the job requires
Overqualification (underqualification)	Workers hold a higher (lower) qualification than the job requires
Skills obsolescence	Skills previously used in a job are no longer required and/or skills have deteriorated over time

Source: ILO (2013).

EMPIRICS: MEASUREMENT (in the paper)

- Index of selectivity "Sectoral specialisation of occupations"
  - Meaning?
  - Alternative interpretations?
  - Small sample in EULFS to observe 92 occupations X 11 sectors?
  - Do all occupations perform the same tasks in all the sectors?)
- Automation: Routine Task Intensity, Acemoglu-Autor 2011 (
  - Look at IFR data on robots by sectors/countries?
- Offshoring: Gurus' opinions, Blinder-Krueger, 2013
  - Changes in recent years: De-Globlalisation?

EMPIRICS: RESULTS

- Automation and offshoring ↑ selectivity
- Non-linear effects: RTI ↑ SSO when RTI was high in 1995, less so when RTI was low (Table 2)
- SSO ↓ Employment (in a similar non-linear fashion)
- (Less clear when looking at educational mismatch, unemployment duration)
- Counterfactual: Employment losses due to automation/offshoring quite different across countries
  - Due to employment policies/labour market institutions?

Table 5. Country-level trends in mismatch incidence, by age group

	Overeducation						Undereducation					
	15-29		30+		15+		15-29		30+		15+	
	↑	↓	↑	↓	↑	↓	↑	↓	↑	↓	↑	↓
Austria [a]	N				N			IN				
Belgium		N	N		N					N		N
Bulgaria			I	N	I			I		IN		IN
Cyprus	IN		IN		IN					I		I
Czech Republic	IN				I			IN				
Denmark	IN		N		N						N	
Estonia								I		I		I
Finland	I		I		I		IN			I		I
France [b]			N				N		IN		IN	
Germany	N		I							I		
Hungary								N				
Ireland		N		I		I						I
Israel		I		IN		IN	I			IN		IN
Netherlands	I		I	N	I		N			I	N	I
Norway		I					IN					
Poland						I		I		IN		IN
Portugal	I		N		N			IN		N		N
Russia												
Slovakia	N	I	N		N			N		IN		IN
Slovenia				I		I		I		I	N	I
Spain	N							N				
Sweden	N		I		IN					I		I
Switzerland			N		N		N				N	
UK								I		I		I
Ukraine [c]		N	N	I	N							

Source: ILO calculations based on the European Social Survey (Norwegian Social Science Data Services, 2002; 2004; 2006; 2008; 2010; 2012).
Note: 'I' shows the existence of a trend in mismatch measured using the ISCO criterion, and 'N' using the mean criterion; unless noted below, trends based on the last three rounds are shown.
a Data available only in Rounds 1-4.
b Data available only in Rounds 1-5.
c Data available only in Rounds 2-5.

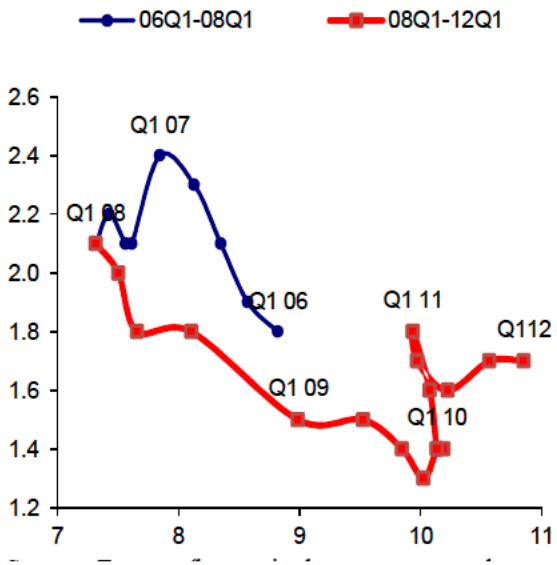
Some skepticism: Is Mismatch increasing?

NO CLEAR TREND IN MISMATCH

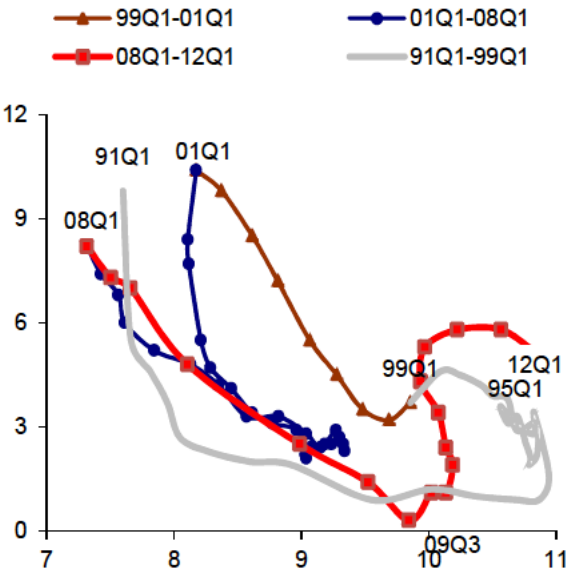
BEVERIDGE CURVES IN THE EURO AREA

Figure 1: Movements in the euro area Beveridge curve

(i) Beveridge curve for the euro area



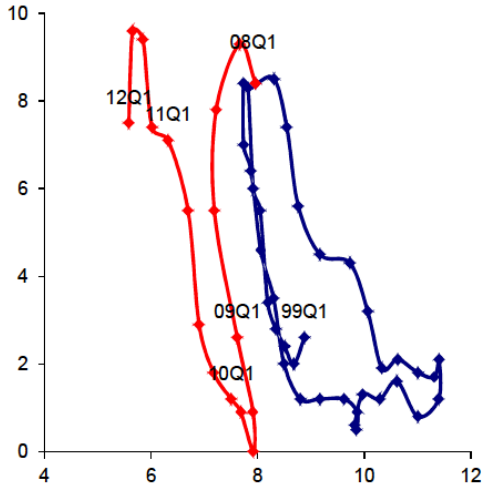
(ii) Beveridge curve for the euro area, using labour shortages



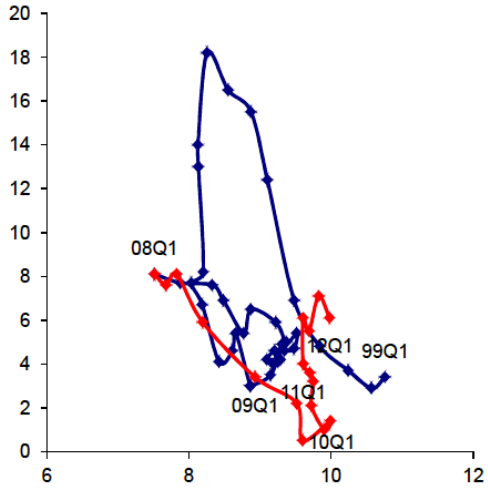
x-axis: unemployment rate (%);
y-axis: (i) Eurostat vacancy series (%); (ii) labour shortages (diffusion index)
Sources: Eurostat; own calculations.

Figure 2: Longer term Beveridge curves for euro area countries, using employers' perceptions of labour shortages as proxy for vacancy rates.

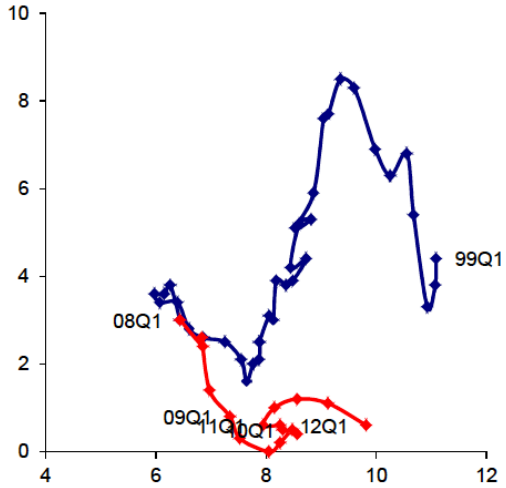
(i) Germany



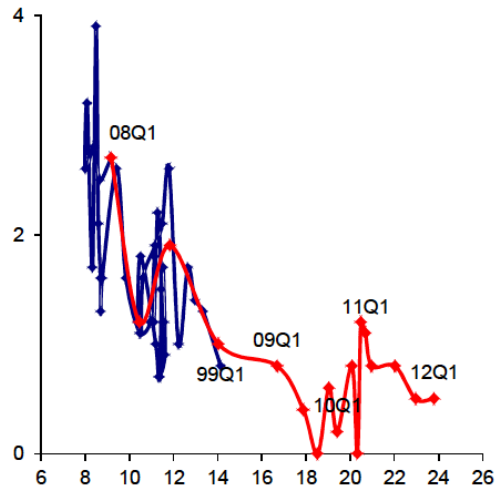
(ii) France



(iii) Italy



(iv) Spain



x-axis: unemployment rate (%);
y-axis: labour shortages (diffusion index)
Blue lines: 1999Q1-2008Q1; red lines from 2008Q1 to latest observation
Sources: Eurostat; own calculations.