Robot Production and Human Reproduction: Assessing the Role of Changing Labor Markets on Fertility in Europe

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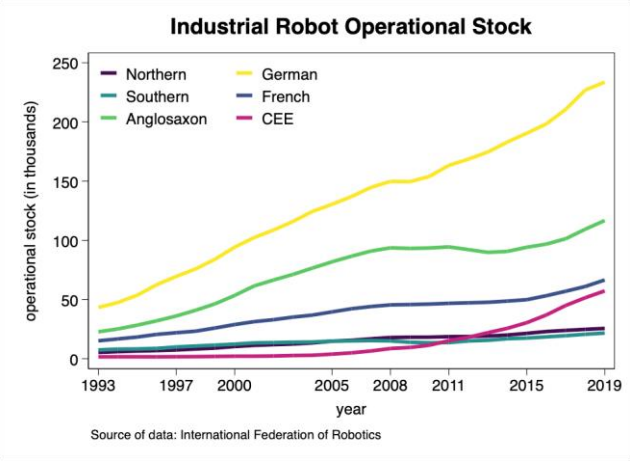
Introduction

- Having a stable job is an important precondition to childbearing (e.g. Alderotti et al., 2021).
- Finding such a job may become difficult because of a growing risk of job displacement due to robotisation
- **Our aim:** to study the effects of robot adoption on fertility in Europe



Previous research

- **US:** robot adoption leads to decline in employment, in particular among the middle educated (e.g. Acemoglu & Restrepo, 2020)
- **Europe:** less clear-cut; rather no effects on employment, but declining labour share (e.g. Chiacchio et al., 2018, Dauth et al., 2017; Autor and Salomons 2018).
- Scarce evidence on how robot adoption affects fertility. Exceptions: the study by Annelli et al. (2018) shows negative effects on marital fertility and positive on non-marital fertility (US).

Data & Methods

Coverage:

247 NUTS-2 regions for 18 EU member states and UK, 2006-2017

Data Sources:

- ***Eurostat*** data on employment rates by industry and fertility at regional NUTS-2 level,
- ***International Robot Federation*** data on stocks of robots by country and industry

Dependent Variables:

- Age-specific fertility rates, cumulated into age groups (15-19, 20-24, 25-29, 30-34, 35-49)
- Total Fertility Rates

Main explanatory variable:

Exposure to robots (Acemoglu & Restrepo, 2020)

$$APR(r,t) = \sum_i \frac{emp(r,i,t0)}{emp(r,t0)} \cdot \left(\frac{robot(i,t))}{emp(i,t0)} \right)$$

where:

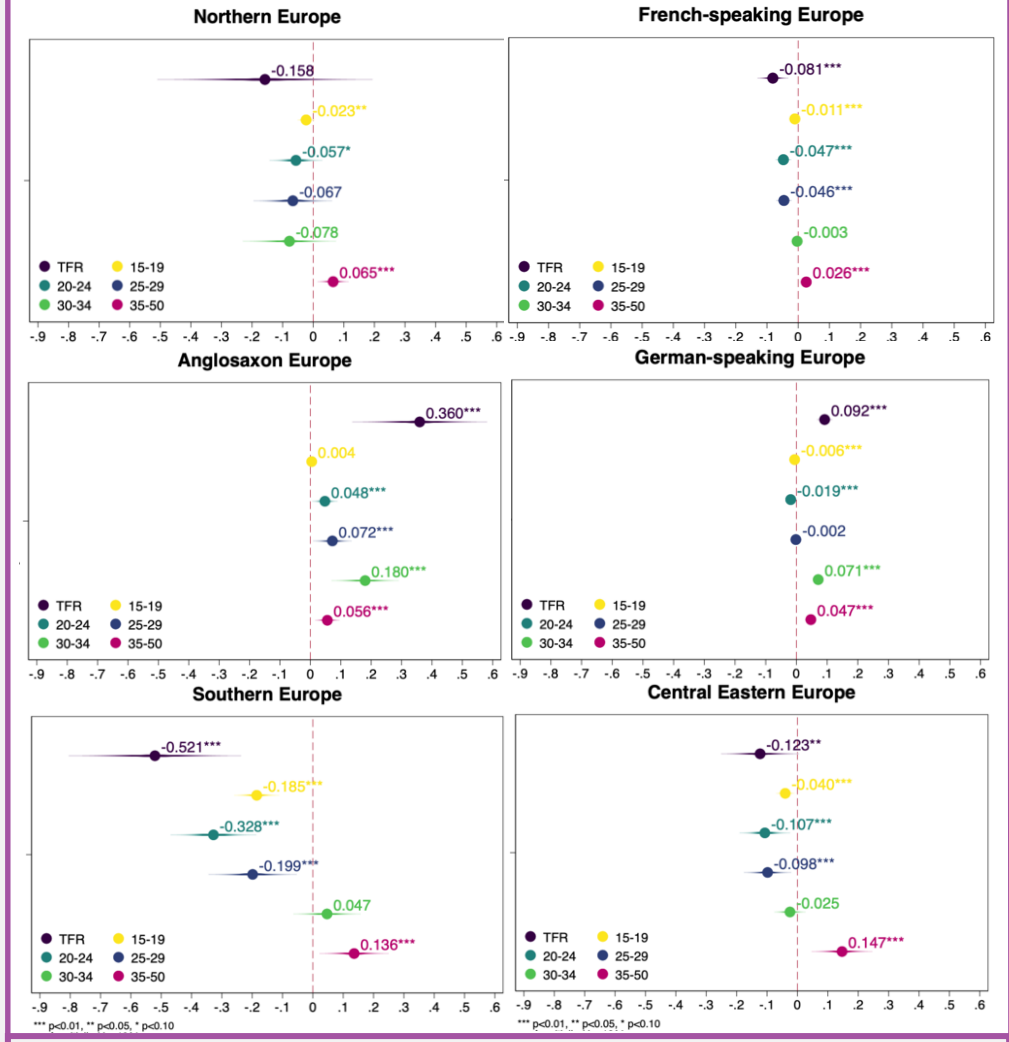
r – region, ***i*** – industry, ***t*** -time, ***t0*** – the year at the beginning of observation (1997 for Western Europe, 2006 for the Eastern Europe), ***empl*** - the number of people employeed and ***robot*** – the stock of industrial robots.

Method

- FE model with IV
- IV: exposure to robots in Germany in all countries except for Germany; for Germany: exposure to robots in Japan
- Exposure to robots interacted with country group
- Controls: Yearly dummies, GDP growth (lagged)

Findings

absolute change in the fertility rate caused by adoption of one robot per worker



- **Negative** effects of on TFR in Southern Europe, CEE and French-speaking Europe & Flemish; **positive** in German-speaking and Anglosaxon countries
- **Negative** effects most likely at young ages (20-24, 25-29), but **positive** at older reproductive ages (35+)

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