

TASK CHANGES AND LABOUR DEMAND IN MAIN EUROPEAN COUNTRIES

SOME FURTHER EVIDENCE



Sergio De Nardis, Francesca Parente

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PRESENTATION OUTLINE

- A task-dependent wage share:
 - The Acemoglu-Restrepo framework (2019)
- Change in task content of production:
 - Methodology and decomposition exercise
- Labor displacement and reinstatement:
 - Country comparisons in the EU
 - Sectoral contributions to estimated effects
- Model specification and further research:
 - Conclusions on preliminary evidence and drivers of change

TASK CONTENT OF PRODUCTION AND AUTOMATION

- Production requires the completion of a range of tasks
 - Human labor: L; Capital: K, (i.e. machinery and software)
- The *task content of production* is determined by the allocation of tasks to production factors, **L** and **K**
- The introduction of new technologies (e.g. automation) can:
 - increase productivity of L and K at tasks they currently perform
 - impacts allocation of tasks to production factors
 - enables K to be substitute for L in a range of tasks
 - generate new tasks in which L has a competitive advantage
- Induced effects on labor demand, labor share and wages

THE ACEMOGLU-RESTREPO DECOMPOSITION 1/2

To account for the changes in the Labor demand:

- **Wage Bill** = Value added x Labor share
- Effect of **automation** on Labor demand
= Productivity effect + *Displacement* effect
- Effect of **new tasks** on Labor demand
= Productivity effect + *Reinstatement* effect
- Effect of **Factor augmenting technologies** on Labor demand
= Productivity effect + *Substitution* effect

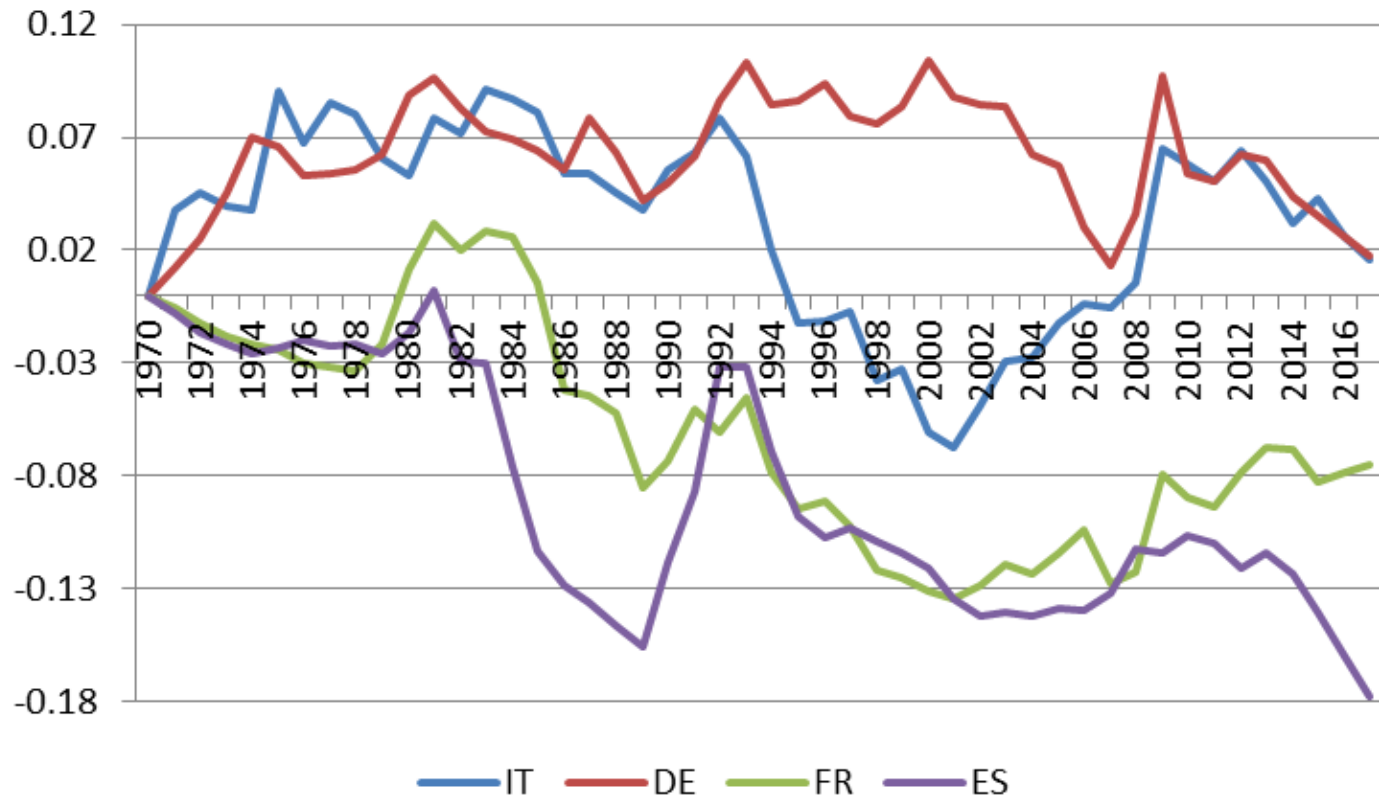
THE ACEMOGLU-RESTREPO DECOMPOSITION 2/2

A multisector perspective adds the *Composition* effect:

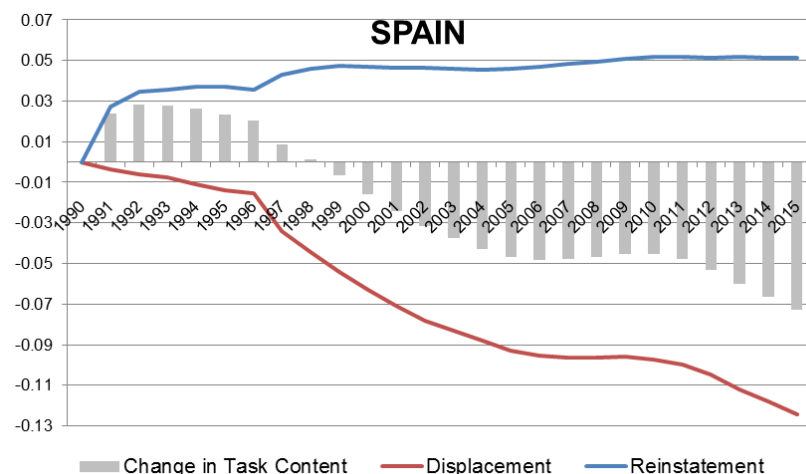
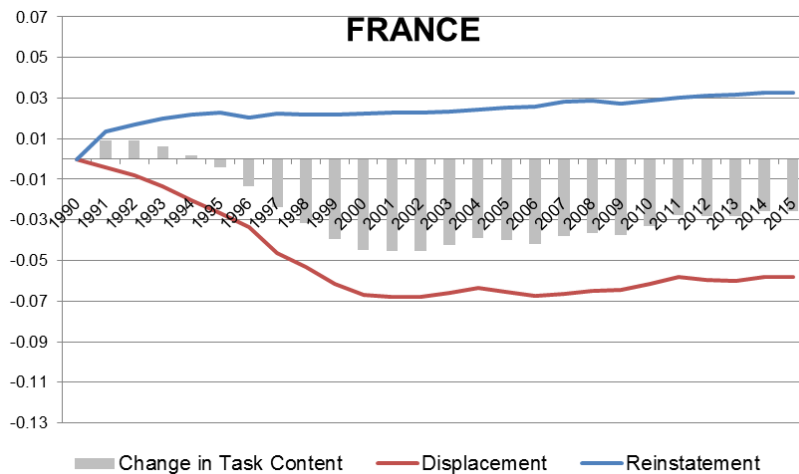
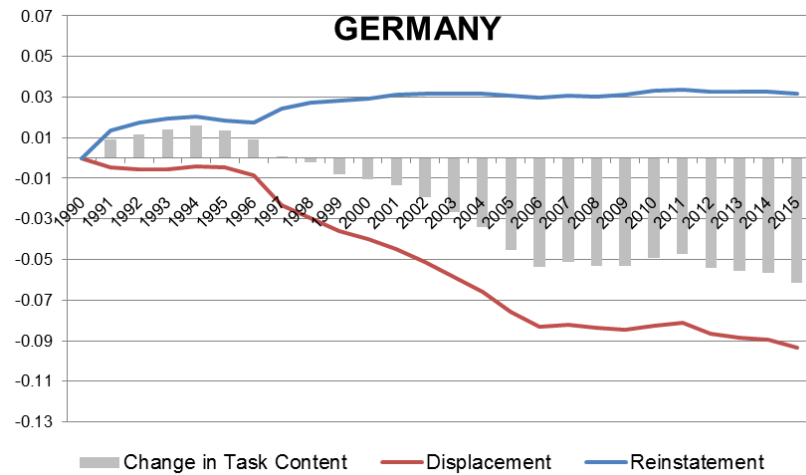
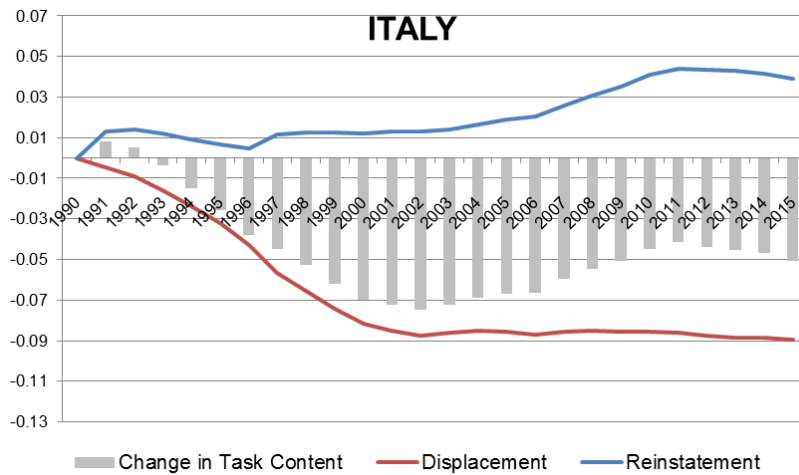
- Change in aggregate **Wage bill** = *Productivity* effect + *Composition* effect + *Substitution* effect + Change in task content
- **Change in task content** in sector i =
= Percent change in **Labor Share** in i – *Substitution* effect in i
 - *Displacement* effect: change in task content <0
 - *Reinstatement* effect: change in task content >0

LABOUR SHARE EFFECTS

MARKET ECONOMY, 1970-2017

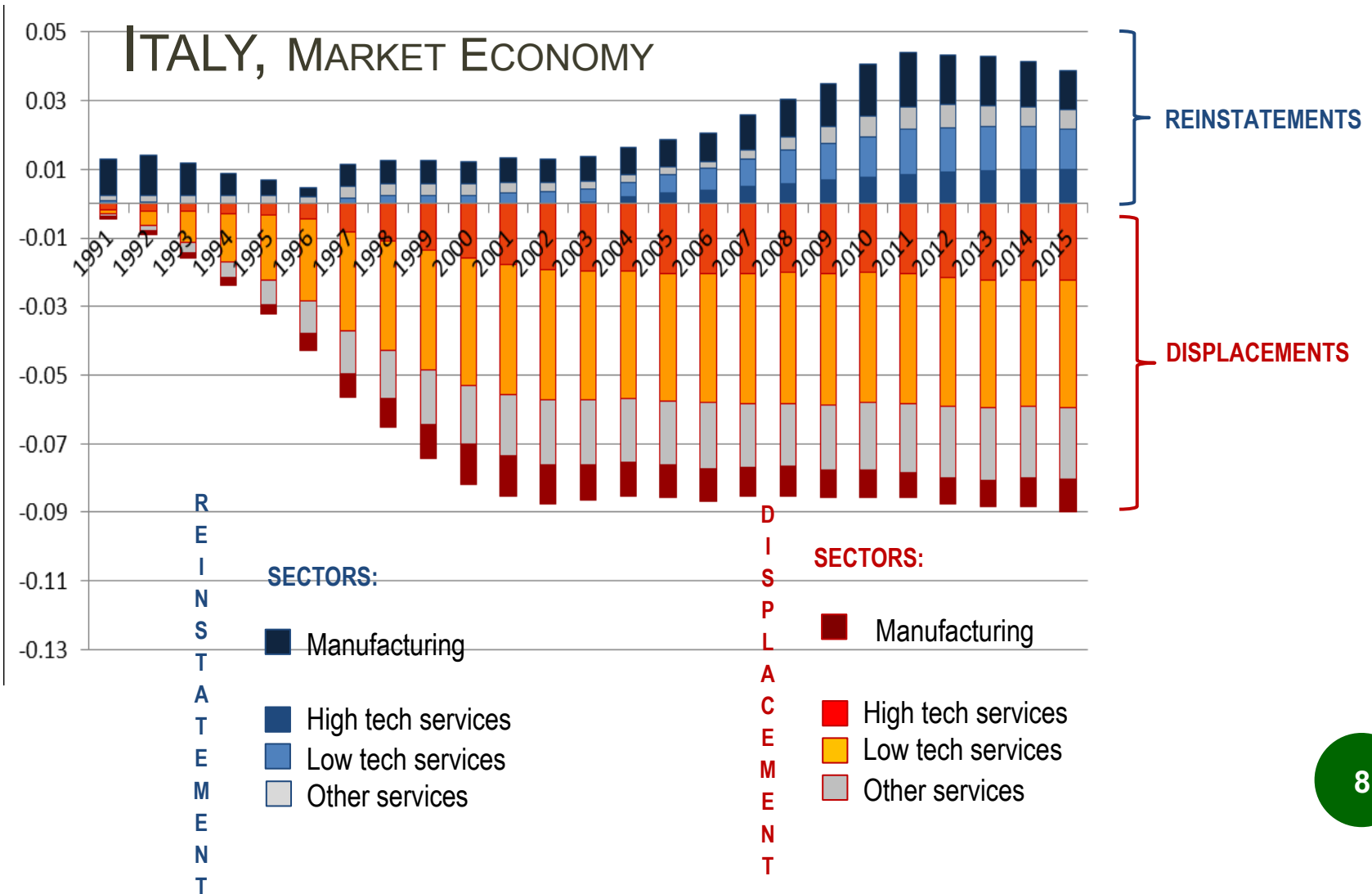


NET EFFECT: DISPLACEMENT/REINSTATEMENT MARKET ECONOMY, 1990-2017

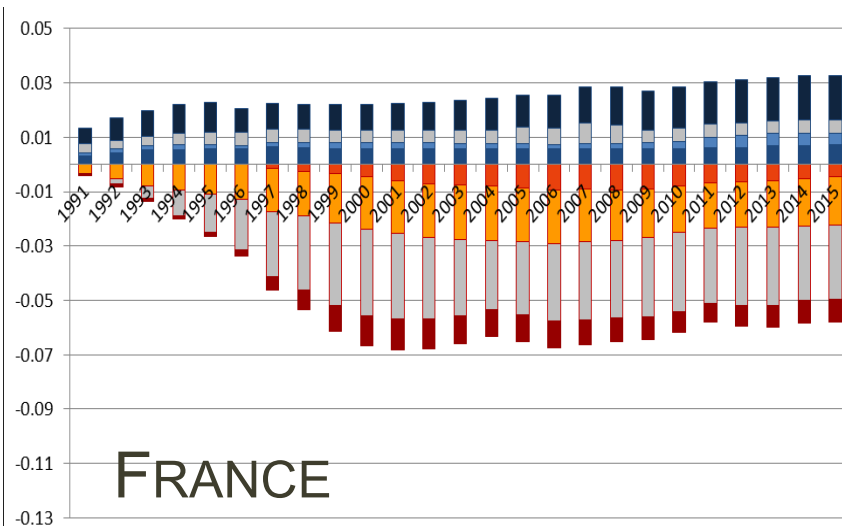
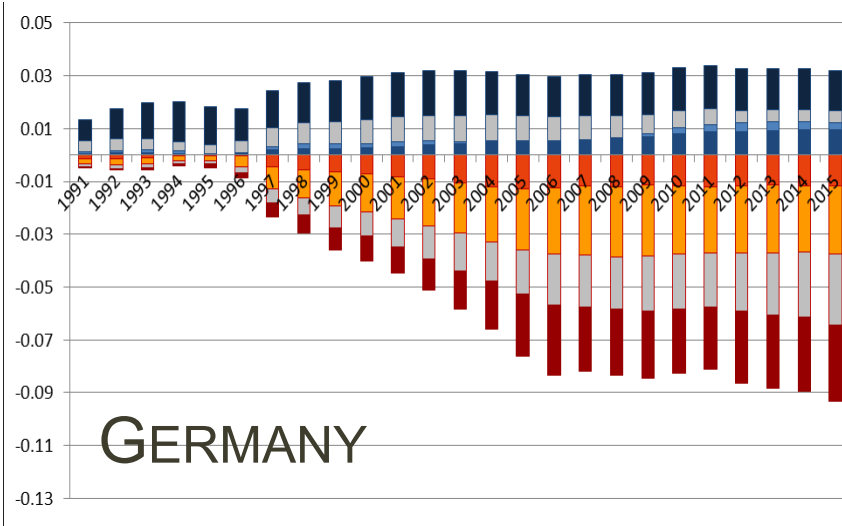


SECTORAL CONTRIBUTIONS

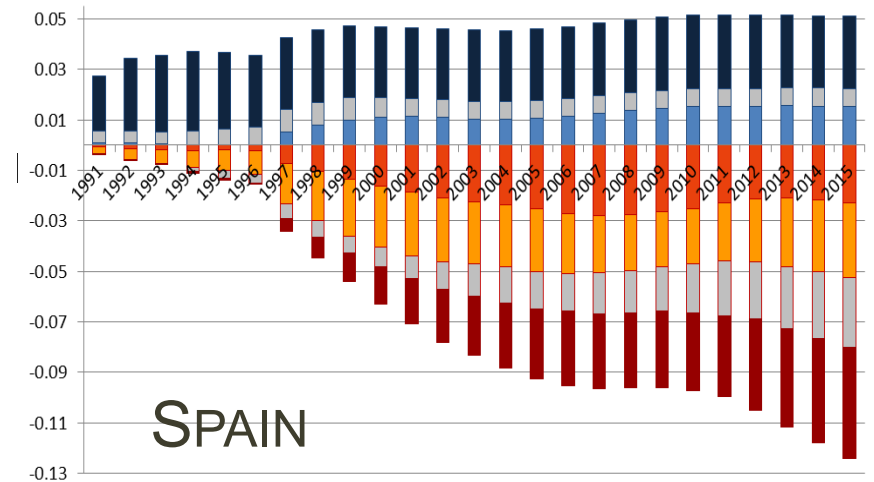
TO DISPLACEMENT AND REINSTATEMENT, 1990-2017



SECTORAL CONTRIBUTIONS TO DISPLACEMENT AND REINSTATEMENT



MARKET ECONOMY,
1990-2017



ESTIMATED EFFECTS AND DATA

- **4 countries:** IT, DE, FR, ES
- **47 years:** 1970-2017 (1995 and 1990 breaks)
- up to 38 **sectors** (MKT econ.; manufacturing; services)
- addition of price **markup effect** into the labor share specification, to account for imperfect market competition

- **Observed** variables: EUKLEMS database and NAs
 - Value added
 - Compensation of employed persons
 - Price indices for VA and production factors

- **Unobserved** variables need to be calibrated:
 - Elasticity of substitution between K and L: $\sigma < 1$ Acemoglu-Restrepo (2019); Villacorta (2020)
 - Relative growth of FA techs, A^l/A^k : average rate of labour productivity (this is an upper bound of A^l/A^k), on EUKLEMS data

CONCLUSIONS AND FURTHER STEPS

- Effects dependency on multiple factors
 - nature of affected job-tasks and elasticity of substitution K/L
 - kind of technology introduced and firms innovating capacity
 - policy choices and national welfares
- Further analyses on estimated *change in task content*
 - automatable employment shares and use of robots
 - new jobs tasks and occupations
 - skilled workers share among production sectors
 - national levels of output and productivity
 - globalization and shares of intermediate goods in international trade

THANK YOU FOR YOUR ATTENTION ☺

Sergio De Nardis: sergiodenardis@gmail.com

Francesca Parente: parentef@luiss.it

LUISS School of European Political Economy

**Via di Villa Emiliani, 14
00197 Rome, Italy**