

Task 4.2

Offshoring and automation and their impact on the demand for typical and atypical jobs

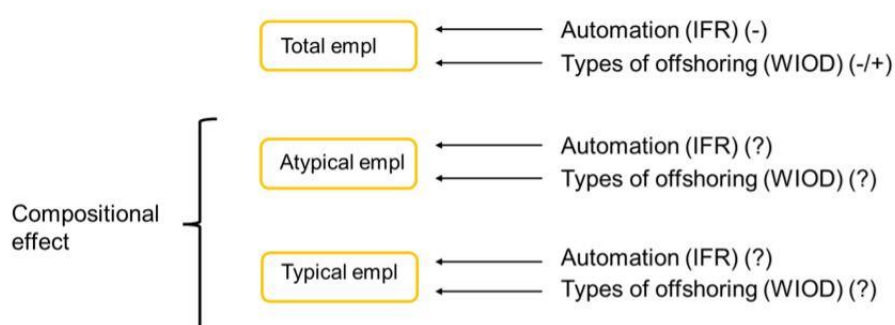
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1. Task description

This task will focus on assessing the role of offshoring and automation for the demand of atypical jobs, in particular those not fully covered by the welfare state provisions. We will estimate conditional labour demand functions and determine the effect of offshoring (inter- and intra-industry, manufacturing vs. services, developed vs. developing country) and automation on labour demand for typical versus atypical jobs (if possible, differentiated by education and gender). We will also study if institutional setting (employment protection, unionisation) attenuates the impact of offshoring and automation.

Figure 1. Overview of Task 4.2

3-pronged approach (conditional labour demand functions)



2. Background/setting

In many parts of the world – particularly in many industrialized countries – atypical, non-standard forms of employment (i.e. temporary employment, marginal employment, part-time employment, temporary agency work or any other form of multi-party employment relationship, bogus or dependent self-

employment) have proliferated in sectors and occupations where they did not previously exist (ILO, 2016). The reasons for this proliferation are multifaceted and vary substantially across countries. The expansion of global supply chains and the internationalisation of the world's production system or the advent and diffusion of new technologies are among the key reasons for this proliferation. The need/call for employment flexibilization is seen as a key driving force.

3. State of the art

A rich strand of literature looks at the labour market effects of globalisation or technical change (including digitalisation and automation) (see, e.g., Crinò, 2012; Hijzen and Swaim, 2007; Ornaghi et al., 2017; Autor and Salomons, 2018; Carbonero et al., 2020) but focuses on total employment (or further differentiates by level of education or type of occupation to tease out which type of workers/occupations are affected the most) while the type/quality of employment has received little attention so far. Some notable exceptions either look at the risk of automation or offshorability – such as Nedelkoska and Quintini (2018) or Malo and Cueto (2019) – or provide direct estimates of the relationship between non-standard types of work and exposure to trade and automation – such as Rutledge et al. (2019).

As concerns the former, Nedelkoska and Quintini (2018) compare the median risk of automation by contract type and show that temporary agency contracts and training contracts have the highest risk of automation while open-ended contracts, similar to fixed-term contracts, show the lowest risk of automation. Relatedly, Malo and Cueto (2019) focus on the Spanish labour market and show that while the offshorability risk is higher among workers in standard employment, automation risk is unrelated to non-standard work arrangements.

Concerning the latter, Rutledge et al. (2019) examine for the US over the period 1998-2012 whether workers in areas more exposed to trade and automation are more likely to be in non-traditional arrangements, or transition from traditional to non-traditional work. Their findings suggest that globalization does not have a major effect, while automation does: a 1-standard deviation increase in the use of industrial robots is associated with an 11-percent increase in non-traditional employment.

4. Advancement compared to the state of the art

The novelty of the task is twofold: (i) it studies the impact of offshoring and automation for the demand for different types of jobs: typical and atypical employment. It therefore addresses an important gap in the

literature; (ii) it pursues a *joint* analysis of two megatrends which helps to establish their relative importance and to identify the megatrend with the relative strongest impact on the demand for typical/atypical employment

5. Research to be done

The analysis will be conducted at the detailed 2-digit industry-level. In view of the limited coverage of robotisation beyond manufacturing, the analysis will focus on the manufacturing sector only. Unconditional and conditional labour demand functions will be calculated which help to establish the total effect of offshoring and automation, as well as the underlying substitution and scale effects, on the demand for total employment, typical as well as atypical employment, differentiated by education and gender. In this context, the role of the institutional setting (employment protection, unionisation) as moderator will also be addressed.

6. Methodology

Descriptive analysis of how the demand for typical/atypical jobs has changed over time, by country and industry; similar analysis for offshoring and automation

Econometric analysis of the role played by offshoring (narrow/broad, manufacturing, from developed/developing countries) and automation (robotisation) for the demand of typical and atypical jobs; methodological approach: unconditional and conditional labour demand functions (OLS & SUR); IV estimates to address endogeneity issues

7. Data sources

- EU-SILC: from selected NSOs (AT, BE, FR, ES, etc.) which is available at the more detailed NACE-level (while the one available at Eurostat is too crude, particularly when it comes to the manufacturing sector); indicators to be extracted: typical/atypical employment, wages
- EU-KLEMS: output, capital stock, intermediate input prices
- WIOD: World Input Output Dataset – to calculate different offshoring measures
- IFR: Robots data from the International Federation of Robotics – for the robot density indicator
- EU-LFS: Labour Force Survey – complementary

References

- Autor, D., and Salomons, A. (2018). Is automation labour-displacing? Productivity growth, employment, and the labour share, NBER Working Paper No. 24871.
- Crinò, R. (2012). Service Offshoring and the Skill Composition of Labour Demand. *Oxford Bulletin of Economics and Statistics*, 74, 20-57.
- Carbonero, F., Ernst, E., and Weber, E. (2020). Robots Worldwide: The Impact of Automation on Employment and Trade, Beiträge zur Jahrestagung des Vereins für Socialpolitik 2020: Gender Economics, ZBW - Leibniz Information Centre for Economics, Kiel, Hamburg.
- Hijzen, A., and Swaim, P. (2007). Does offshoring reduce employment?, *National Institute Economic Review* No. 201.
- ILO (2016). Non-standard employment around the world: Understanding challenges, shaping prospects, Geneva.
- Malo, M., and Cueto, B. (2019). Do old and new labour market risks overlap? Automation, offshorability, and non-standard employment. MPRA.
- Nedelkoska, L. and Quintini, G. (2018). Automation, skills use and training. *OECD Social, Employment and Migration Working Papers*, No. 202, OECD, Paris.
- Ornaghi, C., Van Beveren, I., and Vanormelingen, S. (2017). The impact of service and goods offshoring on employment : Firm-level evidence. *National Bank of Belgium Research Working Paper* No. 319.
- Rutledge, M.S., Wettstein, G., and King, S.E. (2019). Will more workers have nontraditional jobs as globalization and automation spread? *Center for Retirement Research Working Paper* 2019-10