



**GLOBAL TRENDS AND VARIATIONS: TECHNOLOGICAL TRANSFORMATIONS,  
GLOBALISATION, DEMOGRAPHICS – VARIETIES BY REGIME, REGION, SECTOR:  
DISRUPTION OR REITERATION?**

Expert workshop

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Abstracts:

**Cristiano Perugini: What drives the wage gap of vulnerable workers**

An increasing attention has been devoted in recent years to the firm-level drivers of wage inequality. When wage premia are asymmetric between groups of workers in the same firm, they generate heterogeneity in within-firm wage. This research focuses on the effects of a managerial practice, Incentive Pay Schemes (IPS), on the within-firm gender wage gap and explores whether the intensity of investments in intangibles at industry-level moderates the relationship IPS-gender wage gap. To this aim we use establishment level data from the Structure of Earning Surveys (SES), for the years 2006, 2010, 2014 and 2018 and five European countries (Germany, France, Italy, Spain and the UK). Data on intangible capital stocks (on 25 industries) are from EU-KLEMS database.

The analysis is carried out by means of a recursive system of equations in order to account for endogeneity/reverse causality issues and our outcomes indicate that a higher intensity of IP schemes alleviates the adjusted gender gap. However, this inequality attenuating effect of IPS materializes only in contexts less intangible capital intensive. The result is confirmed if, instead of the aggregate intangibles stock, we replicate the analysis in subsamples of high/low intensity of the three intangible capital components: (a) Software and Databases; (b) Innovative Property; (c) Economic Competencies. Interestingly, if we further break down capital stock in Economic Competencies, we find that IP schemes reduce the adjusted wage gap even in context of high expenditures in knowledge embedded in firm-specific human and structural resources, i.e.: (a) Organizational capital and (b) Training.

**Ronald Bachmann: The effects of robots on labour market transitions in the EU**

We study the effects of robot exposure on worker flows in 16 European countries. Overall, we find small negative effects on job separations and small positive effects on job findings. Labour costs are shown to be a major driver of cross-country differences: in countries with relatively low labour costs, robot exposure had more positive effects on hirings and more negative effects on separations. These effects were particularly pronounced for workers in occupations intensive in routine manual or routine cognitive tasks. For young and old workers in countries with lower labour costs, robot exposure had a beneficial effect on transitions. Our results imply that robot adoption increased employment and reduced unemployment in a number of European countries.

**Neil Foster-McGregor: The impact of automation on inequality across Europe**

Existing research suggests that automation has the potential to impact inequality through two channels, either by changing the relative wage returns for different sets of tasks or by changing the composition of employment. This paper measures the relative importance of these two channels for a sample of European countries by decomposing the effects of a set of characteristics along these two dimensions using the structure of earnings survey (SES) and data for 2002 and 2014. The approach isolates changes in the earnings distribution to identify the component that is due to changes in composition and to changes in the wage structure. We find that the risk of automation has the largest impact on inequality in our sample of European countries. The composition effect explains a large part of automation related inequality in all of the countries, but the wage effect is also relevant in half of the countries. These results confirm that the way in which technology is increasing inequality is largely due to the fact that there is a growing wage dispersion between jobs that are resilient to automation and those that are not.

### **Tommaso Ciarli: Automation waves and employment across European region**

In this preliminary work we make two main contributions to this literature. Focusing on European regions, we identify the trends in investments in the different hardware and software components of ICT (IT, CT and software) and in robots. To identify technological waves, we cluster regions in different groups, which differ by technological intensity. We study the impact of different waves of investment on employment. Secondly, we study the impact of ICTs and robots on the composition of occupations by industry-region (at ISIC 2-digit and NUTS2, respectively).

The results suggest that while we confirm no significant long-run effect of robots on employment across regions, we do find a negative short-run relation between robots and employment growth during investment accelerations, in regions that are most technology intensive. Moreover, the former has been concentrated in specific regions, pointing that the relationship is not pervasive across all European regions.

Results suggest that policy should focus on the short run impacts on employment, as in the long run a number of compensation mechanisms are in place. The heterogenous impacts suggest that policy instruments, are likely to differ substantially for regions with different initial technological and product specialisation.

### **Mikkel Barslund: Regional response to labour market shocks**

Mikkel Barslund presented initial thoughts on the framework for the analysis of how Europe's regions have responded to labour demand shocks in the past. The framework extends previous research related to the impact of migration as well as the modelling of the dynamic process of adjustment. The results will feed into the scenarios developed in WP6.

You can also include the Abstract of Maciej Albinowski (where Pjotr is co-author, but this presentation is OK for them to disseminate. Pjotr refused publication only for the other one):

### **Maciej Albinowski: The impact of technology on labour market outcomes of demographic groups**



We study the age- and gender-specific labour market effects of two key modern technologies – Information and Communication Technologies (ICT) and robots – in 14 European countries between 2010-2018. To identify the causal effects of technology adoption, we utilize the variation of capital growth between industries and apply the instrumental variables strategy proposed by Acemoglu and Restrepo (2019).

We find that the adoption of ICT and robots is beneficial for young and prime-aged women, as well as for older men. Negative effects on relative labour market outcomes are concentrated among older women and prime-aged men. Between 2010 and 2018, the growth of ICT capital played a visibly larger role in explaining changes in labour market outcomes than robot adoption.

### **Robert Stehrer: Demography, productivity growth, and capital formation**

Europe will be challenged by demographic changes over the next few decades, even under favourable assumptions about fertility and migration, but the economic effects are not yet fully understood.

This paper studies the effects of population ageing on economic growth, capital deepening and robotisation in 27 European Union (EU) labour markets. First, we econometrically assess the effects of ageing and potential labour market shortages on growth. Second, we test the hypothesis of whether ageing leads to faster adoption of new technologies. We distinguish between various capital asset types, including non-ICT and ICT capital, tangible and intangible capital and the adoption of robots. The analysis is based on Eurostat, the European Labour Force Survey (EU-LFS) and International Federation of Robotics (IFR) data.

Results indicate that ageing and demographic changes might result in secular stagnation, which decelerates the adoption of new technologies.