UNTANGLED

The 3rd Open Virtual Expert Café

June 21st, 2022, 4 pm CEST

Ursula Holtgrewe, Martina Lindorfer, Nela Šalamon

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101004776

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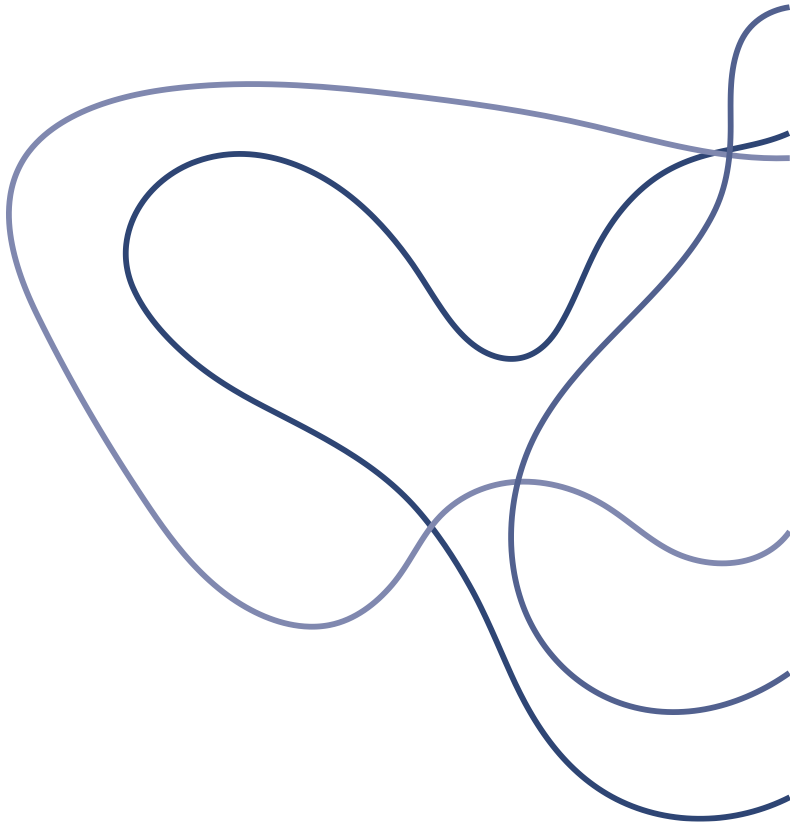
Rules of the game



The format

- A low-threshold virtual forum for exchange on globalization, digitization, demographic change, work and employment
- news, ideas, results, collaborations
- Everybody's welcome to contribute or listen and comment!
- Contributors have a 5 minute time slot (may be 3 minutes) and 1 ppt slide (headline, keywords, links, contact data!) to present projects, ideas, results, partner searches …
- A quarterly 90-minute virtual meeting
- Next Session (save the date!): **31 August 2022, 15h CEST (tbc)**
- Register online: https://survey3.zsi.at/index.php/566899?lang=en
- Contact: untangled@zsi.at
  (the team: Ursula Holtgrewe, Martina Lindorfer, Nela Šalamon)

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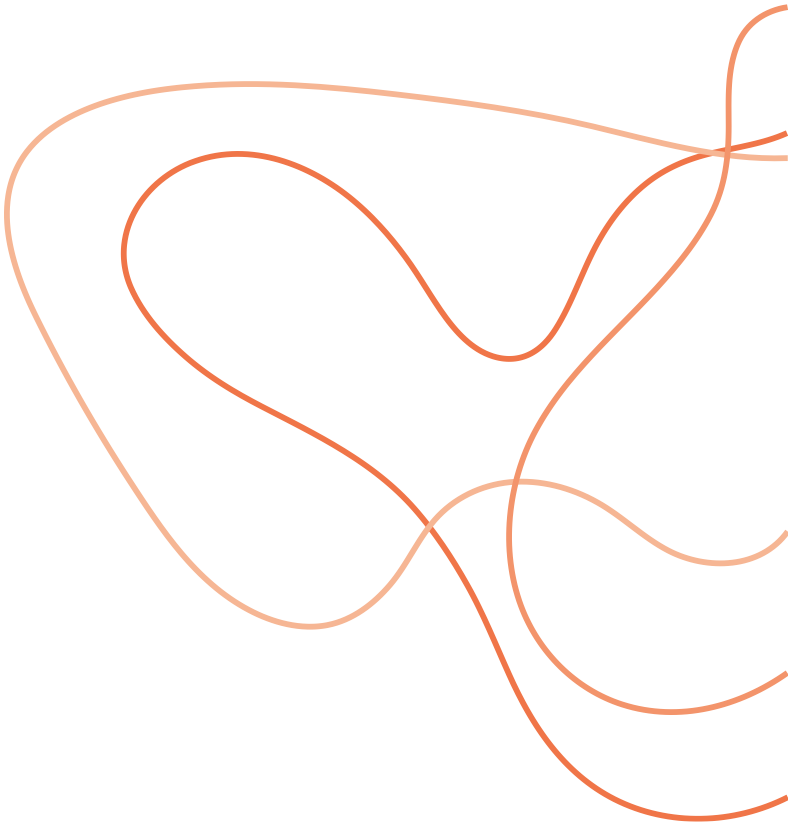
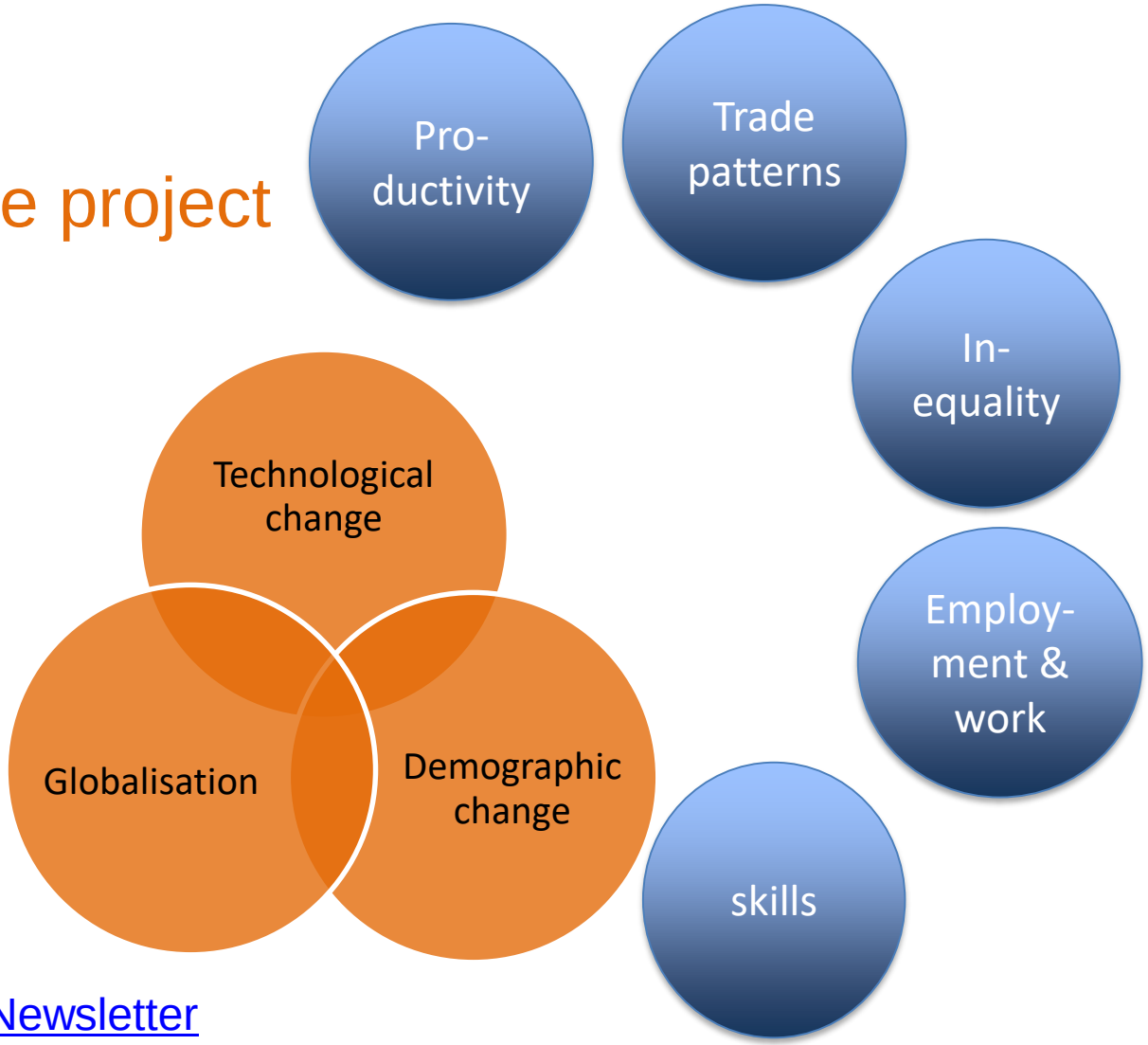
Your hosts: the UNTANGLED project



The project



Horizon Europe, Call TRANSFORMATIONS-18-2020
2/2021 – 1/2024

- Economic and social science approaches
- Scenarios
- Policy briefs
- Ongoing stakeholder engagement
- More to come!

- Newsletter
- To get more targeted information: Register for the stakeholder community

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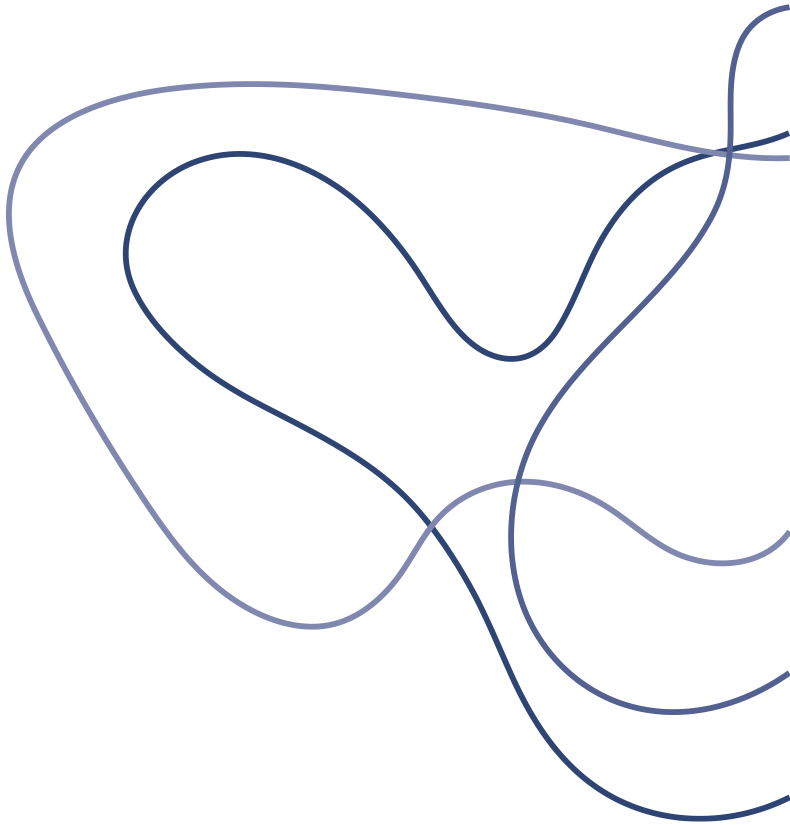
Contributions



Vassil Kirov *Bagryan Malamin*

Are Translators Afraid of Artificial Intelligence?

AI is expected to cause job losses in general, initially in professions associated with routine activities, and subsequently in the field of creative professions. Most Bulgarian translators perceive artificial intelligence and automatization as threats to the profession. According to them the digital technologies and AI will modify the profession by relieving human translators of the routine, technical part of the job.

- → Digitalisation will not lead to job losses, but rather a change in work - tasks will change.
- → Expectations of a deterioration in the quality of work as a result of digitalisation are also not confirmed yet.
- → Translators have a positive attitude towards the introduction of new technologies.
- → Digital transformation is also associated with positive consequences related to the elimination of routine work.
- → Predictions about the disappearance of the translation profession are premature.

Kirov, V.; Malamin, B. Are Translators Afraid of Artificial Intelligence? *Societies* **2022**, *12*, 70.
https://doi.org/10.3390/soc12020070 ***https://www.mdpi.com/2075-4698/12/2/70***

societies

Advanced Digital Technologies and Investment in Employer Training: Complements or Substitutes?

Giorgio Brunello (Padua University)
Desiree Ruckert (EIB)
Christoph Weiss (EIB)
Patricia Wruuck (EIB)

WORK IN PROGRESS

Motivation

- Automation and digitalization (ADT) have accelerated after the pandemic (McKinsey, 2021)

- Adult learning is seen as a crucial policy instrument for the re-training and up-skilling of workers whose jobs are being affected by ADT (Nedelkoska and Quintini, 2018)

ADT and employer training

- Employers are key actors in the provision of training. Do they train more as they invest in ADT?
- Answer not clear a priori
  - Adopting ADT may require worker re-training (Draca et al, 2006)
  - New skills could be obtained by hiring rather than training
  - Tasks could change and require less/more training
  - ADT may facilitate the use of e-learning, which reduces the cost of training
- No empirical evidence to date

The approach of this paper

- We investigate whether and how a change in the cost of ADT (e.g. a decline in the price of robots), which influences the adoption of ADT, affects the training stock per employee
- We have access to firm-level data that have information on
  - The adoption of ADT
  - The investment in training, which we use to compute the training stock per employee $T_{it} = t_{i,t-1} + (1-\delta)T_{i,t-1}$
- The EIBIS survey by EIB covers the 27 EU states, the UK and the US for the period 2018-2020

Adoption of digital technologies

- We use the survey question:
- “Can you tell me for each of the following digital technologies if you have heard about them, not heard about them, implemented them in parts of your business or whether your entire business is organized around them?”
- Technologies include: robotics; platforms, 3d printers, drones, internet of things, AI and big data

Percent adopting digital technologies. 2020

	Manufacturing	Construction	Services	Infrastructure
3 D printers	20.9	9.2	-	5.9
Robots	25.3	-	-	-
Internet of things	48.4	33.5	43.2	53.9
Artificial Intelligence	11.3	-	12.7	21.3
Virtual Reality	-	10.3	10.1	-
Drones	-	24.5	-	-
Platforms	-	-	47.9	56.8

Digital intensity D

- We compute digital intensity as a discrete variable equal to 0 (no implementation); 1 if a firm has implemented in part of its business at least one of the four digital technologies specific to the sector; 2 if the firm's entire business is organized around at least one of the four technologies.

Our model

- Monopolistically competitive firms that maximize profits
- With constant returns to scale, a decline in the price of ADT increases (reduces) the training stock per employee T if ADT and T are complements (substitutes) in production

Estimation

- We estimate an augmented production function
- $y_{it} = \beta_0 + \beta_e e_{it} + \beta_k k_{it} + \beta_T T_{it} + \beta_D D_{it} + \beta_{TD}(T_{it} D_{it}) + \beta_X X_{it} + \omega_{it} + \varepsilon_{it}$
- Since total factor productivity ω is correlated with employment, capital, training and ADT, we use a control function approach (Ackerberg, Caves and Frazer, 2015)

Effects of digital intensity on productivity. Dependent variable: log real VA

Log employment (E)	0.887***
	(0.038)
Log capital stock (K)	0.152***
	(0.017)
Digital intensity (D)	0.026***
	(0.009)
Training stock per employee (T)	0.030***
	(0.009)
T x D	-0.008***
	(0.003)
$\alpha + \delta - 1$	0.038
	(0.037)
Number of observations	15,562

Each variable is filtered from country by year, country by sector, sector by year and size by year fixed effects. Additional controls include firm age, subsidiary status, share of medium to high skilled occupations in 2017, dummies for the presence of a monitoring system and pay for performance. Bootstrapped standard errors with 200 replications.

Tentative conclusions and policy implications

- ADT technologies and training are substitutes in production. A decline in the price of ADT increases ADT and reduces T
- Possible reasons could be
  - The tasks filled by labour are modified by ADT so that less training is required
  - New skills are hired from the market
  - Lower unit costs of training
- Often advocated re-training following ADT may be more difficult in practice if employers have an incentive to train less

Next steps

- Look at ADT technologies separately
- Country differences in labour market institutions
- Differences by sector

Summary as presented during the Expert Café

- Do employers train more as they invest in advanced digital technologies (ADT)?
- Yes if ADT and training are complements in production
- No if they are substitutes
- We use firm level data from EIBIS and show that ADT and training per employee are substitutes
- Possible reasons could be
  - The tasks filled by labour are modified by ADT so that less training is required
  - New skills are hired from the market
  - Lower unit costs of training
- Interested? You can find the first draft of the paper at the following link
  - https://cms.e.jimdo.com/app/s5551274472d96b4e/pad6abe9f70c8c5ff?safemode=0&cmsEdit=1

Thank you

Investing in Europe's digital transformation

Christoph Weiss & Désirée Rückert

European Investment Bank

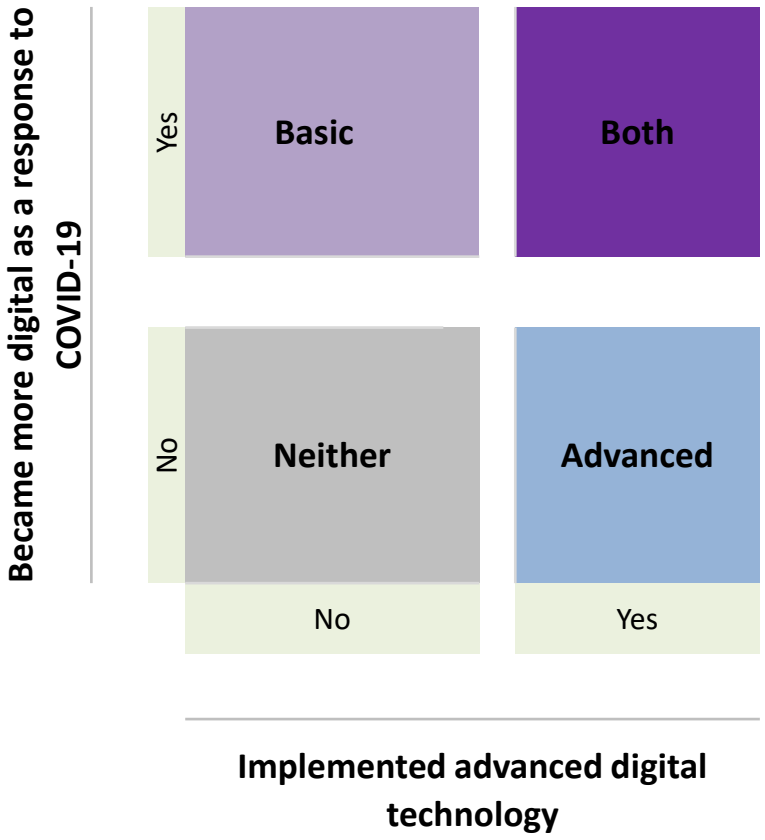
June 21, 2022


DIGITALISATION
IN EUROPE 2021-2022
Evidence from
the EIB Investment Survey
European
Investment
Bank
The EU bank

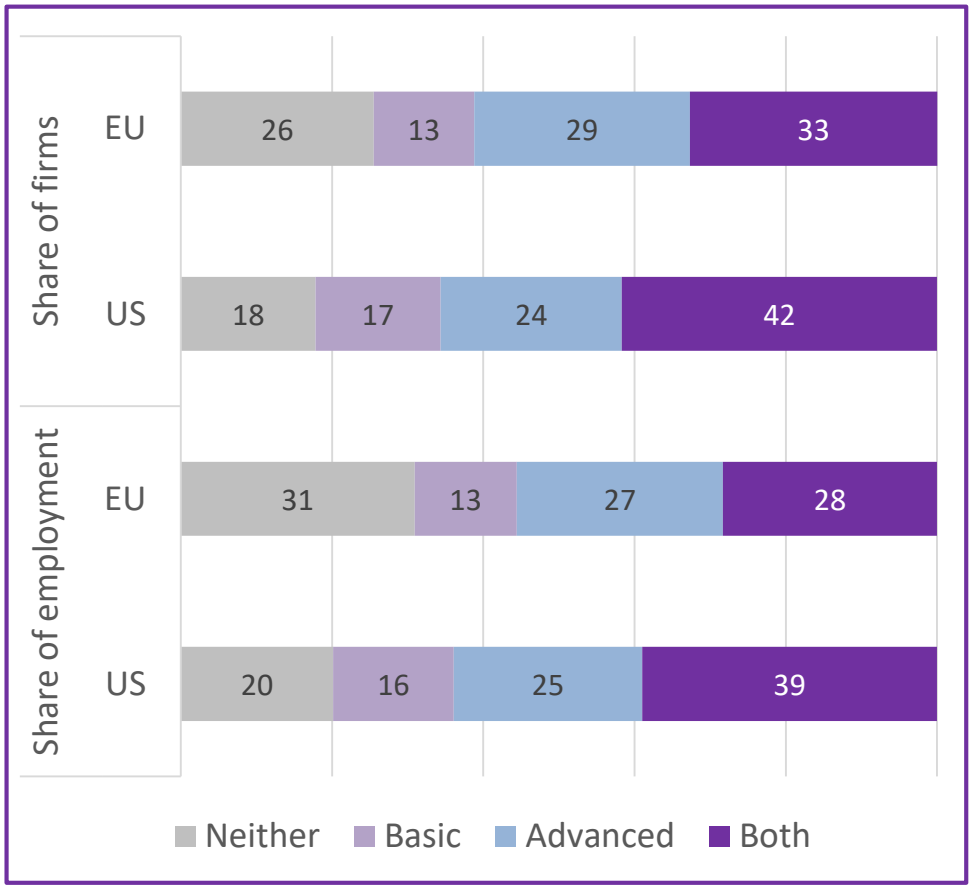

Deep tech innovation in
smart connected technologies
A comparative analysis of SMEs in Europe and the United States
April 2022
European
Investment
Bank
The EU bank

A substantial share of EU firms did not invest in digitalisation

Corporate digital profiles



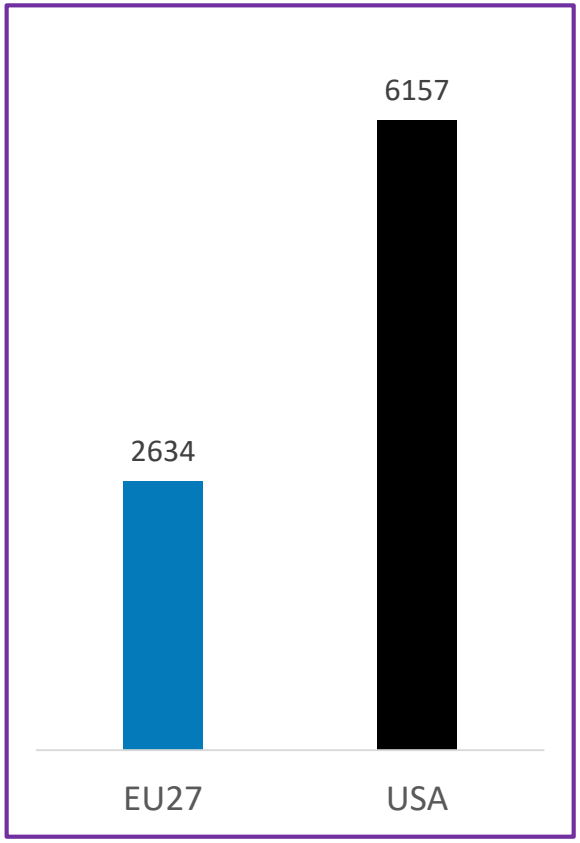
Corporate digital profiles: EU vs US in %



Source: EIBIS 2021, Eurostat, OECD Structural Business Statistics, and US Census Bureau.

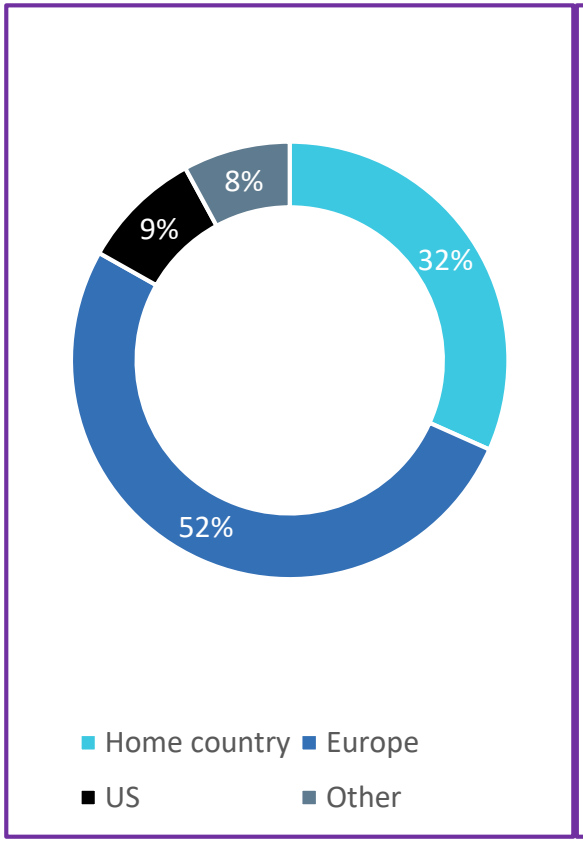
EU SMEs lag US SMEs in deep tech innovation

4IR SMEs: EU vs US

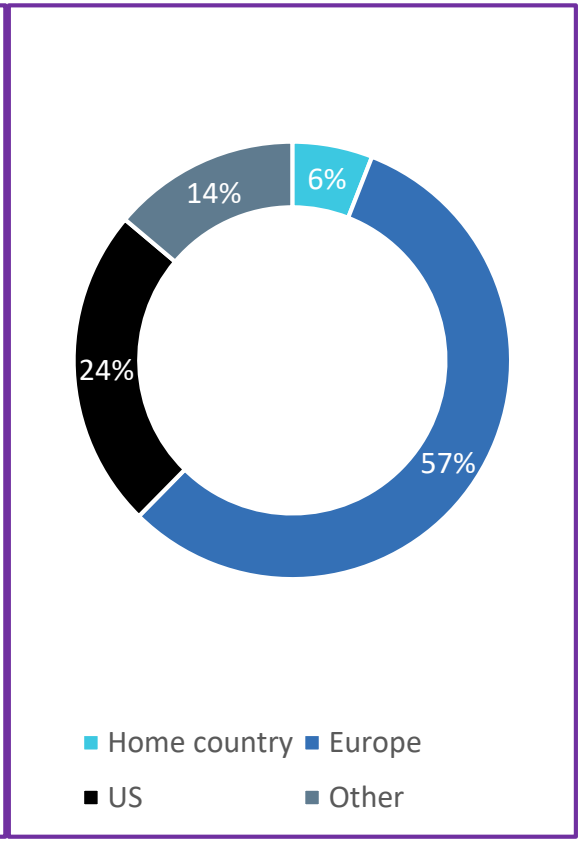


Geographical market of 4IR EU SMEs

Current



Future



Source: Crunchbase and Orbis, EIB – EPO 4IR Survey (2021)

UNTANGLED CASE STUDIES:
Machinery Manufacturing and Food Industry in Italy

Acciarini C. (University of Rome1); Pompei F. (University of Perugia)

MEGATRENDS

Globalisation

- Expansion of export and outward FDI for the company producing packaging machines
- Expansion of export for the company producing pasta

Technology use

- Interconnected equipment and IoT in the factory producing pasta (Incentives from Industry 4.0 Plan)
- Skilled human labour only, to produce customised and sophisticated packaging machines

Demographic change

- Increasing incidence of workers aged 50 or more in the workforce of food and machinery tool industries (combined effect of demography and pension reform).

CASE STUDY

Food Industry and Machinery Manufacturing in Italy

Specialised Suppliers
Machine Tools Industry /Software developers

Dominated Suppliers
Food Industry

IMPACTS

Employment

- No reduction on employment thanks to the expansion of international markets.
- For example, by outsourcing the production of components and retaining R&D, industrial design, assembling and testing functions, this medium-sized company combines software and mechanical parts of sophisticated packaging machines exclusively using human labour.

Skills

- Soft skills shortage is much more urgent than the lack of qualified personell on the job market.
- The company operating in food industry implicitly talked about a lack of ICT-complementary soft skills among its employees, such as autonomy, coordination and collaborative behaviour.

Job quality

- Due to robots and 4IRTs the quality of manual labour improved in the company producing pasta.
- Increasing robot exposure causes reduction on hours worked, temporary, precarious and compartimentalised jobs, unions say

Inequality

- Within firm wage inequality is not a problem for the company producing software and AI, because it is based on a reward system paying for effort and performance
- Increasing adoption of 4IRTs causes segregation of low educated people, migrants and women in low paid jobs
- This causes both within and between firm inequality that policy has to cope with, unions say

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101004776

Open Virtual Expert Café on digitalisation, globalisation, migration, work, employment, skills

POLITECNICO DI MILANO





The rise of the digital service economy in European regions and its impact on intraregional wage inequalities

Roberta Capello, Camilla Lenzi and Elisa Panzera

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INTRODUCTION

Radical and **complex transformations** are taking place in contemporary economies and society because of the **exponential evolution** and **global adoption** of the **new technologies** (e.g. artificial intelligence, smart automation, Internet of Things).

Two main technological transformations are at work:

Industry 4.0 describes a process of increasing digitalisation, robotisation and automation of the manufacturing environment, enriched with the creation of digital value chains to enable inputs from suppliers and customers, and between business partners (Lasi et al., 2014).

The digital service economy refers to the different forms and modes with which final services are created and offered, which drastically change the way business is done, work is regulated, people behave, leading to a profound transformation in the economy and in the society. It includes phenomena like the sharing economy (e.g. BlaBlaCar), the bundling of product and services by manufacturing firms (e.g. IBM), the online service economy (e.g. Uber) up to e-commerce (e.g. Amazon).

Very few is known about the second transformation.

Still open issues

The *Digital Service Economy* is a complex phenomenon, that requires to be studied more in depth.

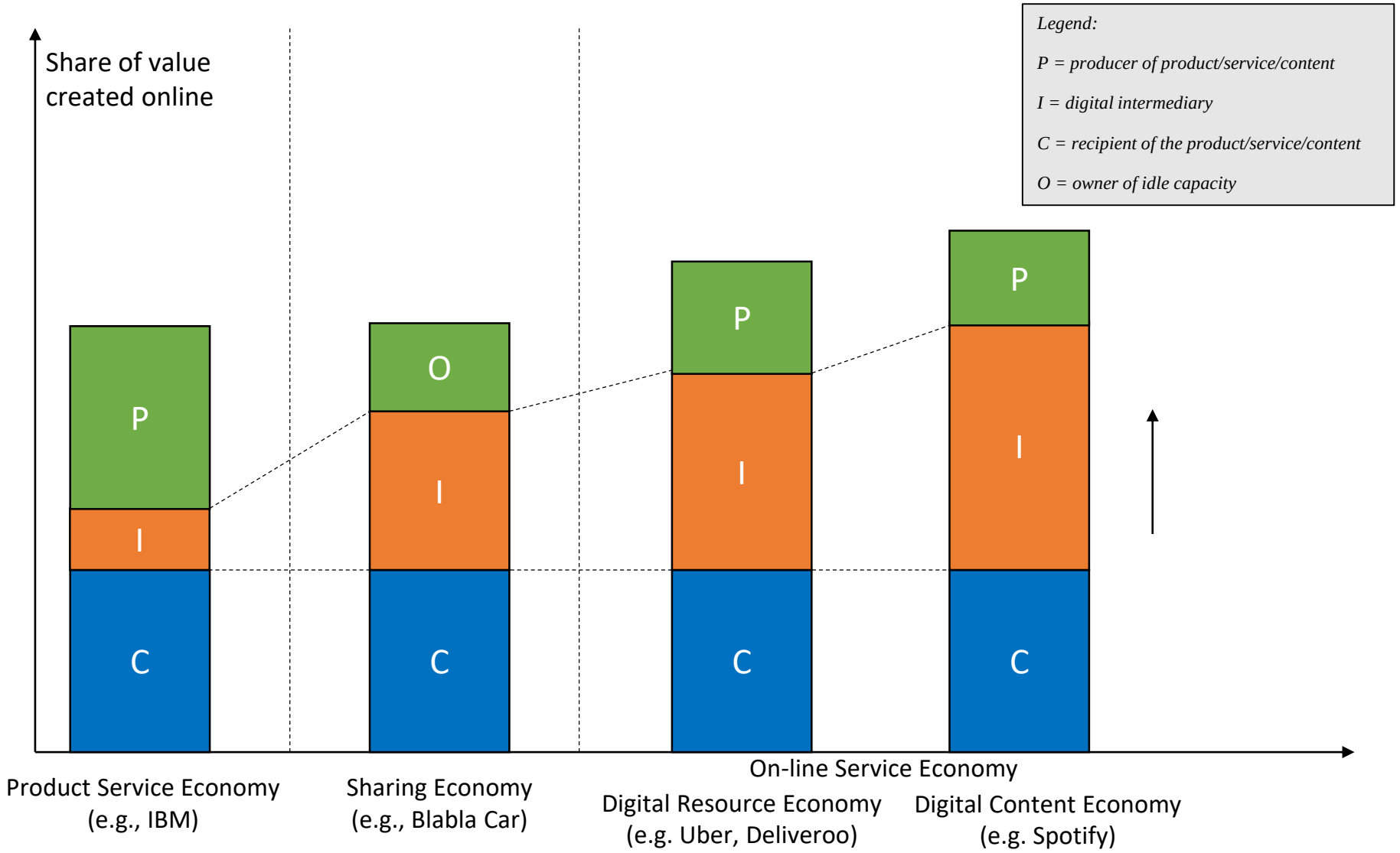
Questions like:

- What are the similarities and differences between the different digital platforms like BlaBlaCar, or Uber or Spotify?
- Where is the digital service economy developed? Do all regions have the same technological transition towards such a digital economy?

have never been tackled.

Moreover, our impression is that they are sources of inequalities, with different degrees of intensity.

THE DIGITAL SERVICE ECONOMY: ITS VALUE CREATION MODELS



THE DIGITAL SERVICE ECONOMY: IDENTIFICATION OF DIFFERENT MODES ACCORDING TO VALUE CREATION

- **Product service economy**

  Servitisation is a strategy put in place by manufacturing firms to offer services together with the product (Rabetino et al., 2021 and Baines et al., 2017).

- **Sharing economy**

  It is associated with the creation of new online markets for under-utilised assets (e.g. a spare seat in a car, a spare bedroom, spare time) which are made temporarily accessible to other users upon payment, on the basis of a peer-to-peer exchange (Frenken and Schor, 2017).

  Example: BlablaCar

- **Online service economy**

  It refers to a situation in which digital platforms provide services, products or contents (e.g. mobility solutions, food and beverage services, payment systems) without owning the assets necessary to produce and/or deliver such services or goods.

  Importantly, the online service economy rests on the dematerialisation of assets or products enabled by the unbundling of products from the service a product can offer.

  Example OF Digital Resource Economy: Uber, Deliveroo,

  Example of Digital Content Economy: Spotify

DIGITAL SERVICE ECONOMY IN EUROPE

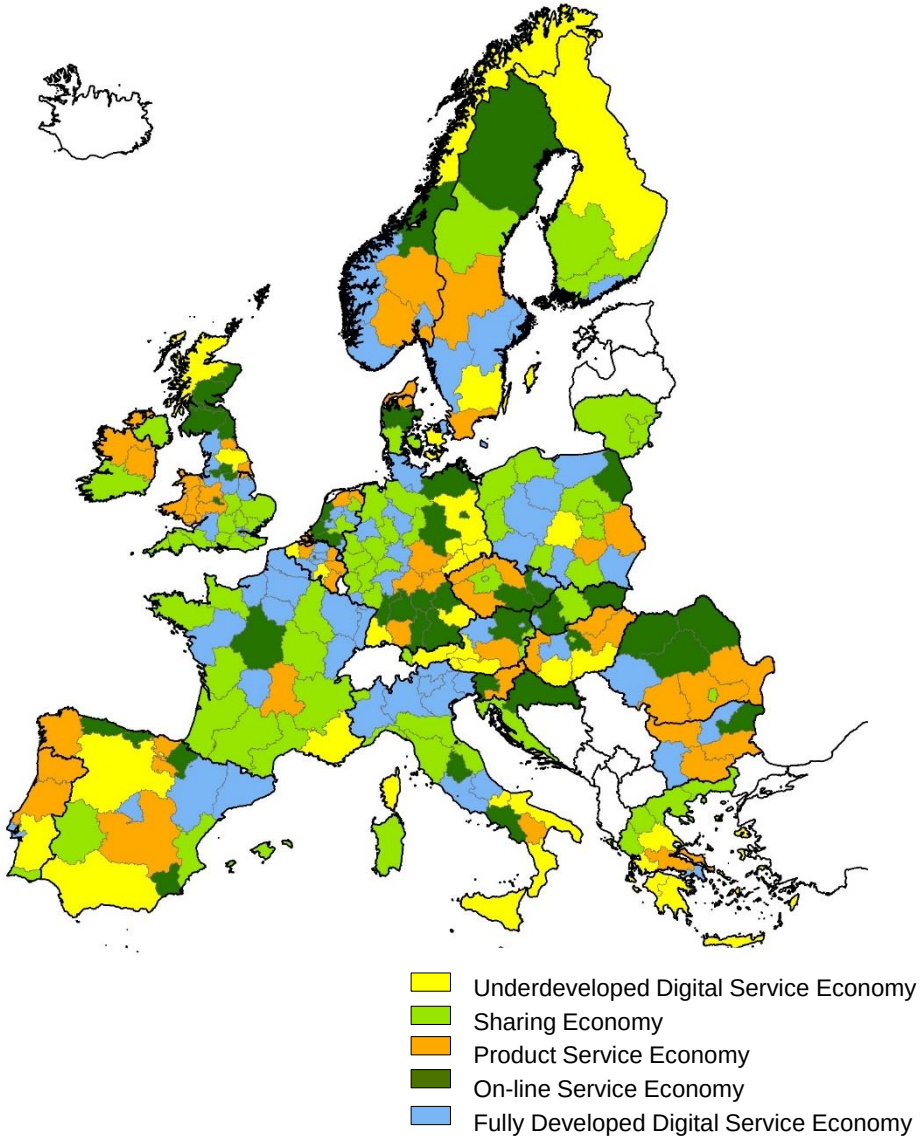
The most advanced areas of Europe and most of the regions hosting capital cities present a *fully developed Digital Service Economy* (exceptions: Eastern countries capital cities with *Sharing Economy*)

The *Sharing Economy* involves both advanced and relatively marginal regions

The *Product Service Economy* is widely diffused in regions with a strong industrial specialisation profile

The *On-line Service Economy* is well distributed across European countries and includes several intermediate areas.

Marginal and less-developed regions are not at all affected by the new value creation models, thus presenting an *Underdeveloped Digital Service Economy*



DIGITAL SERVICE ECONOMY AND INTRA REGIONAL WAGE INEQUALITIES IN EUROPE

Regions with a fully developed digital service economy register the highest increase in intra-regional wage inequalities. The share of people earning the 90% highest wage within areas increases.

The sharing economy is also a source of intra-regional wage inequalities, due to its effect on the competition of off-line business as usual activities.

The pervasiveness of each single digital service economy value creation model in isolation is not sufficient to affect intraregional wage inequalities, except for the sharing economy.

It is rather the spatial combination of all value creation models that matters in affecting such inequalities, adding, or even multiplying, the effects of single transformations.

Popular fears about the possible consequences of the diffusion of the new technologies are not fully misplaced and tackling wage inequalities is likely to represent a priority in the policy agenda in the next future.

KU LEUVEN HIVA

RESEARCH INSTITUTE FOR WORK AND SOCIETY

Presentation LAMARTRA project: green skills and green jobs

Arthur Apostel & Mikkel Barslund (HIVA - KU LEUVEN)

UNTANGLED café

21/06/2022

LAMARTRA is financed by the Belgian Science Foundation under contract B2/202/P3/LAMARTRA.

General approach

RQ: impact of low-carbon transition on Belgian labour market?

=> identification/characterisation of green jobs needed

Framework: occupations as bundles of tasks

Idea: link data on green skills to Belgian labour market microdata

Data/empirical approach

Green skills databases

- ONET: links 1000+ US occupations to tasks/skills
- ESCO: links 3000+ EU occupations to tasks/skills
- For both databases, subset of green tasks/skills is defined

Belgian LFS micro data

- Available at ISCO 4-digit level (435 occupations)
- Very detailed characteristics (NACE 5-digit level, educational attainment, …)

Some challenges

Different conceptualisations of green

- Process-based
- Output-based

Identification of brown jobs

- Process-based definition? Might change in future…

Data issues

- Aggregation required (but frequently done in literature)

THANK YOU

More info about the LAMARTRA project here: www.lamartra.be

arthur.apostel@kuleuven.be

LAMARTRA is financed by the Belgian Science Foundation under contract B2/202/P3/LAMARTRA.

KU LEUVEN HIVA

Measuring digital skills in labour force surveys

Mikkel Barslund & Karolien Lenaerts (KUL-HIVA)

Motivation: *Digital Skills* increasingly important in the labour market.

Measurement of Digital Skills allows for better understand of dynamics of LM

Background: Existing surveys measuring digital skills (PIAAC & Eurostat). But 'small' & irregular.

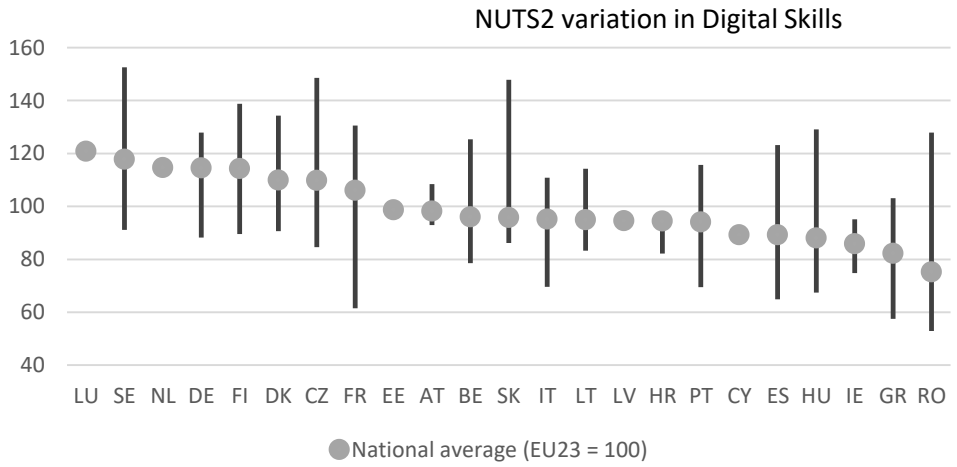
LFS are regular and have large samples (allowing for extensive subsample analysis).

Methodology: Identify Digital Skills via EC's ESCO framework – very detailed description of occupations (3000+) and skills (13000+) (computer and ICT skills / more broad skills via DigComp framework.

Occupations have 4-digit ISCO codes -> for each occupation a digital skills intensity index defined from the digital skills used in the occupation.

LFS: ISCO 3(4)-digit code available at individual level.

Merging with Digital Skills intensity gives a measure of 'average' digital skills uses for a person with a given occupation.



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Keynote Speakers are confirmed

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Cape Town, South Africa | December 14 & 15, 2022

"The Challenge of Creating Better Jobs in Developing Countries"

KEYNOTE SPEAKERS

Oriana Bandiera

Sir Anthony Atkinson Professor of Economics, London School of Economics.

Ragui Assaad

Professor of Planning & Public Affairs, Humphrey School of Public Affairs, University of Minnesota.

WORLD BANK GROUP Jobs | IZA Institute of Labor Economics | UNITED NATIONS UNIVERSITY UNU-WIDER | DPRU DEVELOPMENT POLICY RESEARCH UNIT | ibs institute for structural research | HKUST IEMS INSTITUTE FOR EMERGING MARKET STUDIES | CREA

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Draft Programme (as at 20 June 2022)

DAY 1:

Plenary:

Policy Panel "Youth Unemployment in Africa"

Conference Dinner:

Two Oceans Aquarium

Day 2:

Special Sessions:

#1: Jobs after COVID-19 & Patterns of Structural Change (*Flagship World Bank Report*)

#2: Gender, Growth and Labour Markets in low-income countries (*IZA G²LM | LIC program*)

#3: The Job Creation Potential of IWOSS - Industries without Smokestacks (*Brookings & DPRU*)

Key Dates

- **1 June** – Call for papers OPEN
- **1 July** – Deadline for paper submission
- July-August – Review & selection
- **5 Sept** – Notifications of acceptance / rejection
- **30 Sept** – Full paper deadline for accepted speakers
- Sept/Oct/Nov – Registration, visa applications, travel bookings
- **14 & 15 December** – Conference

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ALDGATE STRATEGY GROUP

Contact

Twitter@UntangledEU

Facebook.com/UntangledEU

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