



# UNTANGLED

Newsletter Issue 11 / November 2023

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As our project draws to a close, we are finalizing papers and preparing for the project's last events. In November, we will host our final conference. This event serves a dual purpose: to present the findings we've gathered over the course of more than two years on the impact of globalisation, digitalisation, and demographic changes on labour markets; and to engage in discussions with fellow scholars who are exploring similar topics. Alongside the conference we will also host a panel debate to provide input for evidence-based policies. All the details are on pages 8-9.

We're now in full-speed result dissemination mode. Two UNTANGLED papers were presented at the European Association of Labour Economists (EALE) conference, the continent's most important gathering for this field, and during a central bank conference in Warsaw.

We would also like to draw your attention to four papers that we have released in the last three months, and to our first policy brief, on fostering lifelong learning, all featured in this issue. We are also pleased to note that our papers are getting published in scientific journals and mentioned in the media.

Many thanks to everyone who's helped us along the way on our three-year journey. Now it's time to enjoy the fruit of our labours. Happy reading!

### Upcoming events

**9 November** – UNTANGLED Open Virtual Expert Café (1:00-2:30 PM CET)

**22 November** – UNTANGLED panel debate: A Golden Age for workers?

**23 November** – UNTANGLED final conference: Labour market effects and social impact of technological transformation, globalisation, and demographic change

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## GLOBALISATION FOSTERS ECONOMIC CONVERGENCE BETWEEN RURAL AND URBAN REGIONS IN THE EU

Contrary to concerns that globalisation and trade liberalisation would have negative consequences for growth and living standards in less developed areas, a recent study by Project UNTANGLED reveals that disparities in GDP per capita between rural and urban regions have decreased in the European Union over the last two decades.



In their paper “*Structural change and polarisation in the rural-urban divide*”, Roman Römisch of the Vienna Institute for International Economic Studies and Larysa Tampilina of the Kyiv School of Economics examine how globalisation has influenced regional development.

Römisch and Tampilina analysed the changes in GDP per capita across EU regions and confirmed that urban regions, on average, enjoy a 30% higher GDP per capita at Purchasing Power Standards than rural ones. However, they also observed that rural regions managed to narrow the gap with urban areas in 2000-2019.

“Even though the convergence process slowed after the 2008/2009 financial crisis, there was no indication of any increase in the polarisation of GDP per capita levels between rural and urban regions,” Römisch said. The authors argue that globalisation and structural change towards manufacturing industries played a crucial role in driving the catching-up process. Regions that successfully transitioned their production structures in favour of manufacturing, especially in technology-intensive sectors, benefitted in terms of faster economic growth and higher levels of economic development. These gains applied to all types of regions, irrespective of their level of urbanisation. In turn, the findings suggest that supporting the industrialisation of EU regions, in particular less developed ones, might be a recipe for strengthening economic convergence within the EU.

The paper highlights the crucial role of EU cohesion policy in reducing economic polarisation and facilitating growth in less developed regions. These regions face more challenging conditions than their urban counterparts, making them less attractive for investment. By supporting the development of transport and energy networks and broadband internet, or by investing in the upskilling and competitiveness of small and medium enterprises, the EU could increase these regions’ attractiveness. The crucial point is that this support needs to take place in a coordinated way, to address the many disadvantages of the less developed regions with a holistic approach.

“Although this kind of support is a challenging task, often criticised for inefficient allocation of public money, we show that EU and national regional policies can help level the playing field for rural regions,” Tampilina said. “As a result, regional disparities can be tamed.”

The paper shows that by addressing the unique challenges faced by rural areas, economic policies at various levels of government can play a pivotal role in fostering regional development.

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Römisch, R., & Tampilina, L. (2023). *Structural change and polarisation in the rural-urban divide* (Deliverable 4.8). Leuven: UNTANGLED project 1001004776 – H2020.

To read the paper, click [here](#).

## HOW GLOBALISATION AND TECHNOLOGICAL CHANGE RESHAPE JOBS IN DEVELOPING COUNTRIES: INSIGHTS FROM UNTANGLED SOUTH AFRICAN CASE STUDIES

By fostering demand for new types of services, globalisation has the potential to positively impact employment in developing countries. Still, technological advances might result in job losses, a trend illustrated by two case studies conducted on the South African economy and labour market.



The Development Policy Research Unit at the University of Cape Town, a partner of Project UNTANGLED, has released two working papers that examine the effects of globalisation and technological advances on South Africa's insurance and Business Process Outsourcing (BPO) sectors.

A case study of the BPO sector shows that globalisation has played a pivotal role in the creation of new employment opportunities and has the potential to reduce inequality in South Africa, a country dealing with one of the world's highest unemployment rates, exceeding 30 percent. The authors of the study demonstrate that this positive outcome was achieved through a collaboration between the government and various social partners. Together, they attracted substantial foreign investment into the sector and managed its growth by leveraging the country's comparative advantages, such as lower operating costs for businesses, a highly skilled workforce, and cultural affinity with other English-speaking countries.

"A key discovery is that globalisation presents opportunities for growth in the service sectors of developing countries like South Africa," said Zaakhir Asmal, Research Officer at the Development Policy Research Unit (DPRU) at the University of Cape Town. "However, to maximise the gains and ensure inclusive growth, stakeholders must take a coordinated approach that targets specific outcomes, such as job quality and upgrading skills." The paper highlights several critical challenges that must be tackled to facilitate the continued growth of the sector. These include addressing spatial inequality and improving working conditions.

In the case study examining the impact of technology adoption within the South African insurance sector, it becomes evident that technological innovations are likely to result in job losses, while the impact on job quality remains uncertain. The authors analysed the changes taking place in the sector, driven by the entry of new InsureTech startups that integrate big data and AI into their operations and product offerings. The paper reveals that with the influx of disruptors and the increasing prevalence of technology in the sector, significant skill gaps start to emerge as a major concern for insurance companies. This requires reskilling and changes in organisational culture that can bridge the knowledge and technology divide in the workforce.

The authors' findings underscore a concerning trend: technological innovation is likely to widen inequality in South Africa, as it benefits individuals with highly developed skills, often from more affluent socio-economic backgrounds. In light of these observations, it becomes clear that innovation in the insurance industry needs to be carefully managed, with policies to ensure that the benefits apply to everyone in society, not just a few.

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Allen Whitehead, C., Asmal, Z. and Bhorat, H. (2023). *Co-ordination to support inclusive growth in developing countries in the context of globalization: The case of the business process outsourcing sector in South Africa*. Development Policy Research Unit Working Paper 202307. DPRU, University of Cape Town.

Asmal, Z., Bhorat, H., Martin, L. and Rooney, C. (2023). *Technological Change and Workplace Innovation in the Insurance Sector in South Africa: Disruption with the Potential for Social Good in a Developing Country Context?* Development Policy Research Unit Working Paper 202306. DPRU, University of Cape Town.



## SOCIAL BENEFITS KEY TO CUSHIONING AUTOMATION'S IMPACT ON HOUSEHOLD INCOME INEQUALITY IN THE EU

Welfare systems in Europe play a crucial role in mitigating the negative effects that robot adoption has on wages and employment, a new UNTANGLED study finds.



The rapid expansion of automation has raised concerns for workers' welfare, as robots are often implemented to improve efficiency and hence may replace humans. In the United States, the displacement of jobs due to automation has substantially reduced wages and employment, especially for those at the lower end of the wage scale. But in a study of 14 European countries between 2006 and 2018, a period of intensive robot adoption in the European Union, researchers found that tax and benefit policies largely absorbed labour market shocks caused by automation.

"While the installation of industrial robots slightly decreased wages and reduced employment among the most exposed workers, the effect on household disposable income inequality was relatively small," said Karina Doorley, a researcher at the Economic and Social Research Institute in Dublin, and a co-author of the paper. "Welfare and social benefits were a principal reason for this."

The study shows that while inequality has widened in many countries in the last 15-20 years, it was not driven by robot adoption, but by other factors and policy choices that limited income redistribution. Doorley and her co-authors used data from several EU sources, including the EU Structure of Earnings Survey, the EU Labour Force Survey, and the EU Statistics on Income and Living Conditions, to estimate the effects of robot penetration on wages and employment rates. Next, they used these estimates to calculate wages and employment rates that would have been recorded in 2018 if robot penetration had remained at the 2006 level in each country. Finally, they injected the resulting data into EUROMOD, a tax-benefit microsimulation model, to assess the anticipated effects on household incomes.

The automation-driven increase in household income inequality was most pronounced in Eastern European countries that witnessed increases in robot penetration, such as Slovakia and Hungary. However, the magnitude was small: in all countries studied, it was below 1.5% of the 2018 value of the Gini index, much lower than the actual changes in Gini indices in most countries between 2006-2018.

Automation had a minor impact on household income inequality even though it widened wage inequality and market income inequality to a larger extent. "In most countries, workers more exposed to robots tend to live with other household members with similar exposure," the researchers wrote. "This pattern slightly amplified the automation shock at the household level, but the size of this effect was tiny, especially compared to the role of benefits." They found that in general, benefit systems played a dominant role in cushioning market income losses, while taxes had a more muted role. Past studies into the drivers of income inequality have focused on the role of tax-benefit systems and demographic change, but this is the first evaluation to isolate the effect of automation, the authors said. There are some limitations to the findings. First, the simulations did not consider behavioural responses to automation. Second, changes in non-labour market incomes, fertility, and household structures were not included in the calculation.

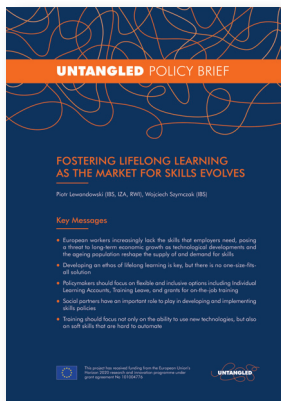
Still, the findings paint a less gloomy picture of robots' role in Europe's economic development, the authors said. "Automation will affect the future of work, but robots explain only a minor share of changes in household income inequality in the countries that we studied," said Piotr Lewandowski, head of the Institute for Structural Research and a co-author of the paper. "Tax-benefit systems were, and will continue to be, essential to mitigating the effects of automation shocks."

Doorley, K., Gromadzki, J., Lewandowski, P., Tuda, D., and Van Kerm, P. (2023). *Automation and Income Inequality in Europe* (Deliverable 3.5). Leuven: UNTANGLED project 1001004776-H2020.

The paper is available [here](#).

## UNTANGLED POLICY BRIEF ON LIFELONG LEARNING

As European employers grapple with a shortage of skills, decision makers must implement policies that support lifelong learning, tailor-made reskilling programmes, and new attitudes toward adult education, according to a recommendation from Project UNTANGLED.



Some skills are being made obsolete by automation, while at the same time the demand for people who can perform non-routine tasks is increasing, an UNTANGLED policy brief shows. Meanwhile, technology-driven changes are increasing demand for digital skills, and certain social skills, such as independence and enthusiasm, have also gained importance. Demand may shift again if artificial intelligence contributes to the automation of more non-routine skills. Employees' self-perception of being under-skilled has also increased, the researchers find. "Technological progress increases the value of new skills that younger workers tend to have an advantage in and diminishes the value of older skills that more senior workers possess," said Piotr Lewandowski, head of the Institute for Structural Research, a member of the UNTANGLED consortium. "As population ageing reduces the number of labour market entrants in Europe, investing in the skills of prime-aged and older workers becomes essential."

To address the skill mismatch, the European Union named 2023 the European Year of Skills, with the aim that by 2030, 60% of adults will participate in training each year, increasing the employment rate to 78%. Despite the need for upskilling and reskilling, the number of adults in training is low in Europe, ranging from slightly over 25% in Nordic countries to less than 10% in Eastern Europe (measured for the four weeks prior to the date they were surveyed). UNTANGLED researchers argue that when providing opportunities for adults to upgrade their skills and qualifications, companies and policymakers should take into account that employees' training needs vary and depend on many factors including age, gender, family, current skills, industry, and where they live. Unfortunately, the available training is scarce and doesn't always match these needs. "Data show that more than half of adults don't see the point of training, suggesting that offerings should be improved, and more has to be done to raise awareness and outreach," Lewandowski said. "Meanwhile there is also a group of employees who want to train but are stymied by time constraints and high costs."

UNTANGLED researchers advocate looking into successful programmes and initiatives, including the introduction of on-the-job training grants, Individual Learning Accounts, and Training Leave. Individual Learning Accounts, introduced in France, are like virtual savings accounts where balances accumulate over time that can be used to fund training, allowing workers to choose the skills that are most important to them. Over 2 million workers in France have used ILAs. Training Leave programmes operating in Sweden let workers take time off from their jobs to improve their skills. This allows overcoming the problem of not having enough time, which stops almost 30% of workers from training. Giving financial help to workers taking leave and offering longer leaves could encourage more participation. "Sweden's long-term Training Leave programme addresses key obstacles employees face when thinking about training: it offers financial help and flexibility in choosing training," said Wojciech Szymczak from the Institute for Structural Research, who co-authored the policy brief.

Finally, Lewandowski and Szymczak suggest expanding on-the-job training opportunities in small and medium-sized companies. Smaller companies often can't afford proper training for their workers; policymakers could help by covering the cost. For example, Dutch authorities successfully introduced a programme that reimbursed training costs for such companies, leading to over 180,000 training projects in 2019. Policymakers should take local conditions into account when implementing the recommendations, consulting with social partners such as trade unions and employers' organisations, the authors say.

Lewandowski, P., & Szymczak, W. (2023). *UNTANGLED Policy brief: Fostering lifelong learning as the market for skills evolves* (Deliverable 7.3). Leuven: UNTANGLED project 1001004776 – H2020.

You can read the policy brief [here](#).

## UNTANGLED RESEARCHERS PRESENT PAPERS AT THE EALE CONFERENCE

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Two papers from Project UNTANGLED were presented at the European Association of Labour Economists (EALE) conference, held in Prague on 21-23 September.

In the session on Mobility, chaired by UNTANGLED researcher **Piotr Lewandowski** (Institute for Structural Research – IBS), **Ludivine Martin** from LISER (the Luxembourg Institute of Socio-Economic Research) presented research on the skills supplied by migrant workers to the French and German labour markets. The paper, co-authored with **Ronald Bachmann** (RWI – Leibniz-Institut für Wirtschaftsforschung) and **Bertrand Verheyden** (LISER), analyses data on the distribution of migrants across various business sectors, occupations and regions, as well as education levels and age groups. The authors identify the occupations that are under- or over-supplied and assess the role of migrants in addressing the labour shortages faced by France and Germany.

**Karina Doorley** (ESRI) presented another UNTANGLED study, investigating how robot penetration impacted income inequality in 14 European countries in 2006-2018. This paper, co-authored with **Dora Tuda** (ESRI), **Philippe Van Kerm** (LISER), **Piotr Lewandowski**, and **Jan Gromadzki** (IBS), reveals that while automation did contribute to widening income inequality in European countries, its impact was relatively small. The study highlights that European countries' tax and benefit systems effectively absorbed the wage and employment shocks resulting from automation, with benefits playing a particularly significant role, especially in Western Europe. These findings suggest that welfare states in Europe are more effective in mitigating the effects of automation than the system in the United States.

## VENTURINI PRESENTS UNTANGLED RESEARCH IN WARSAW

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**Francesco Venturini** of Università degli Studi di Perugia presented UNTANGLED research at the 5th Joint Conference of Polish and Hungarian Central Banks in Warsaw on 15 September. He showed that the development of artificial intelligence (AI) can act as a driver of productivity, but it also reduces demand for lower and medium-skilled workers.

In his presentation, “*Development of AI: Productivity and Distributive Effects in Europe*”, Francesco Venturini shared the results of his work with Fabrizio Pompei, demonstrating that the productivity of firms developing AI is 13.7% higher than of those who are not innovating in this field. The generation of AI technologies also helps laggard firms catch up with the productivity leaders.

AI development also has a significant impact on the share of labour in regional income (gross value added, GVA). Researchers found that AI reduces labour share and widens regional income disparities. While the share of regional income for highly skilled labour remains unaffected, that of medium-skilled workers decreases by 3%, and that of low-skilled workers decreases by 9 % with the doubling of AI-related innovation. Therefore, AI seems to contribute to an uneven distribution of wage income.

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You can access Francesco Venturini's presentation [here](#).

For a deeper dive into UNTANGLED research on AI, read Fabrizio Pompei and Francesco Venturini's paper by clicking [here](#).

## UPCOMING EVENTS:

## UNTANGLED TO HOLD OPEN VIRTUAL EXPERT CAFÉ

The eighth UNTANGLED Open Virtual Expert Café will take place on 9 November from 1:00-2:30 PM CET.

This is an open format driven by participants' contributions. It can be a platform for you to promote an ongoing project or research, tap into attendees' collective intelligence for a specific question or simply enjoy a dynamic conversation on the subjects UNTANGLED is exploring. It is an informal online gathering among colleagues, to enable exchange between experts, researchers and stakeholders from the fields of digitalisation, globalisation, migration, work, employment, skills etc. and promote exchange and communication.

Active contributions consist of one slide (to be submitted to [untangled@zsi.at](mailto:untangled@zsi.at) beforehand) and a 5-minute presentation ("elevator pitch"). Listening, receiving information and asking questions is just as welcome. Further contact and networking is up to participants. Slides and announcements will be shared among participants and/or publicly.

Contributions can be:

- any information on an ongoing initiative, project or a result,
- a future-oriented announcement (call for papers, event invitation, search for collaborators)
- a question asked of participants.

**UNTANGLED**  
OPEN VIRTUAL EXPERT CAFÉ

**9 November**  
**1:00-2:30 pm CET**





## UNTANGLED PANEL DEBATE — A GOLDEN AGE FOR WORKERS?

### Event Details:

**Date:** 22 November  
**Time:** 3:30-5:30 PM CET  
**Location:** France Room,  
 Thon Hotel, Wetstraat  
 75 – 1040 Brussels

### Panelists:

**Melanie Arntz**  
 (Professor, ZEW)

**Stijn Broecke**  
 (Senior economist, OECD)

**Manuela Geleng**  
 (Director for Jobs  
 and Skills in DG EMPL)

**Robert Stehrer**  
 (Research director, wiiw)

### Moderator:

**Karolien Lenaerts**  
 (Coordinator, WeLaR Horizon  
 Europe project)

To attend this debate, please  
 register [here](#).

The UNTANGLED project will host a panel debate, “A Golden Age for Workers?” on 22 November in Brussels.

We will examine pressing concerns such as chronic labour shortages; AI’s impact on jobs; caring for the elderly; job market inequality; the influence of Large Language Models (LLMs) on high-skilled roles; and green transition champions.

We will also explore the skills that will remain relevant in the evolving job market. Are we entering a period of plentiful jobs, and broad-based productivity and wage increases? Or are we on the verge of a period where the returns on education and skills will change – unpredictably – for all? What role will globalisation play in this? How can we fill (low-paying) care jobs? What role is there for the European Commission? What should policymakers do to address these challenges and reap opportunities, and what constraints do they face?

## UNTANGLED PANEL DEBATE

### A GOLDEN AGE FOR WORKERS ?

 **22 NOVEMBER, 3:30-5:30**

				
Melanie Arntz <b>PROFESSOR</b> ZEW	Stijn Broecke <b>SENIOR</b> ECONOMIST OECD	Manuela Geleng <b>DIRECTOR</b> JOBS AND SKILLS DG EMPL	Robert Stehrer <b>RESEARCH</b> DIRECTOR WIIW	Karolien Lenaerts <b>MODERATOR</b> COORDINATOR WELAR PROJECT





## UNTANGLED TO HOLD FINAL CONFERENCE ON 23 NOVEMBER

The Project UNTANGLED final conference, “*Labour market effects and social impact of technological transformation, globalisation and demographic change*” will take place at KU Leuven on the Campus of Social Sciences on 23 November 2023 and feature a keynote address from Prof. Dr. Melanie Arntz, Deputy Head of ZEW’s Labour Markets and Social Insurance Research Unit.

We will talk about the implications of technological transformation, globalisation and demographic change for:

- Heterogeneous impacts of megatrends on labour market outcomes
- Work-related migration and skills
- Education and future skill needs, productivity growth
- (Regional / Rural-urban / EU) convergence / divergence, EU economic governance
- Developments in trade and global value chains
- Technology and human capital
- (Wage / regional) inequality
- Welfare states and social policy

Melanie Arntz, who is also Leibniz Professor of Labour Economics at Heidelberg University, will discuss “*Different Perspectives on the Digital Transformation of the Labour Market.*”

Registration deadline for all attendees is **12 November**. You can register [here](#).

**UNTANGLED CONFERENCE**

Labour market effects and social impact of technological transformation, globalisation and demographic change

KU LEUVEN, 23 NOVEMBER 2022

## UNTANGLED RESEARCH PUBLISHED IN SCIENTIFIC JOURNALS

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An UNTANGLED paper by Cristiano Perugini and Fabrizio Pompei on the impact of performance-based remuneration on the gender pay gap has recently been published in *Industry and Innovation Journal*.

Cristiano Perugini & Fabrizio Pompei (2023) *Pay incentives, intangibles, and gender wage inequality*, *Industry and Innovation*. The paper can also be accessed [here](#).

A paper from Project UNTANGLED by Cecilia Jona-Lasinio and Francesco Venturini, who show that European companies prioritising employee training tend to offer substantially higher salaries, has been published in the *International Journal of Manpower*.

Jona-Lasinio, C. and Venturini, F. (2023), "*On-the-job training, wages and digitalisation: evidence from European firms*", *International Journal of Manpower*, Vol. ahead-of-print No. ahead-of-print. You can also access the paper [here](#).

## IN THE MEDIA

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*The spread of automation in Europe and the impact on family income inequality*, *FBK Magazine*, October 2, 2023

*Europe's welfare systems 'cushion' negative impact of automation on employment*, *Robotics and Automation News*, October 13, 2023

*Social benefits key to cushioning automation's impact on household income inequality in Europe*, *Manufacturing Journal*, October 10, 2023

## UNTANGLED PARTNERS

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ZENTRUM FÜR SOZIALE INNOVATION  
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d'Orléans



UNTANGLED is a three-year interdisciplinary Horizon 2020 research project that seeks to examine the interconnected trends of globalisation, demographic change and technological transformation, and their effects on labour markets in the European Union and beyond. By engaging a broad range of stakeholders, including companies and civil society organisations, we will develop practical policy proposals to help governments cushion the negative impacts of these trends and ensure their benefits are enjoyed fairly across regions and sectors.

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