



UNTANGLED

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FROM THE EDITORS

With this issue of the Newsletter, our three-year voyage of exploration is drawing to a close. Whether you've been with us since the start or are only joining us now, we're glad to be able to share this journey with you!

We're confident that our 18 research papers, six reports, five policy briefs and one e-book are helping our stakeholders understand and respond to the effects on labour markets of globalisation, technological transformation and demographic change — ultimately contributing to shared prosperity. In this issue, Project Coordinator Mikkel Barslund provides a summary of our findings.

We also provide summaries of the three policy briefs we have released in recent months. They suggest ways to support migration and labour mobility; recommend policies supporting inclusive labour markets; and propose tools to ensure the quality of new and existing jobs. We also look at recent research papers, and present takeaways from our final conference and policy debate. Both events gave us an opportunity to share our results with a variety of audiences and engage in debate with other scholars and stakeholders working on labour markets.

Where do we go from here? Our website will remain in operation, ensuring that our results are available here for future researchers and policymakers to draw on. And each institution and researcher is already building on those results through new projects, both individual and collaborative — including initiatives with contacts we've made over the course of the project.

Happy reading!



UNTANGLING EUROPE'S LABOUR MARKETS: INSIGHTS FROM PROJECT UNTANGLED



Mikkel Barslund

Three years ago, Project UNTANGLED set out to explore how technological transformation, globalisation and demographic change are affecting Europe's labour markets, aiming to assist in the formulation of an effective policy response. We took a holistic approach to understanding these megatrends. Now that the project has drawn to a close, it's time to sum up what we've discovered along our three-year journey.

Overall, we found that European labour markets have held up well over the past 20 years, though certain demographic groups have done better than others. By some measures, more Europeans are working than ever before. If anything, working conditions improved in 2005-2021, and there was no unambiguous effect of technology or ageing on working conditions.

Still, men with low educational attainment were a significant exception to the overall positive trend. One reason is the ageing of this demographic group: the level of education has increased substantially, and there are fewer young people with low educational attainment joining the workforce. The average age of men in this group is higher today than before, and unskilled men over 50 work a lot less than other demographic groups.

Welfare states are important to cushion the impact of labour market transitions. We found that inequality at the individual level rises when automation causes workers to lose their jobs and wage income. But thus far, automation hasn't deepened inequalities among Europe's households. Why not? Because of social policy — various types of benefits and safety nets. We can see this clearly in the countries where most people lost jobs because of automation, which also have very generous welfare states. We did not find a general increase in inequality, nor that workers are receiving a smaller share of their economies' output.

In terms of skills, the share of people receiving training has gone up, and some gaps in training received have narrowed — among countries, education levels and low and highly digitalised firms. This is significant because training remains important for wage increases. Our research suggests that globalisation did not significantly impact total employment, but may have shifted relative demand towards craft and skilled workers. For the impact at the regional level, findings are ambiguous. There does not seem to have been an increase in regional polarisation between urban and rural regions over the past 20 years, and globalisation may have had a converging effect.

According to UNTANGLED research, the gender pay gap is due in part to women working in more routine occupations. Our results show that the pay penalty on women in these occupations is small in countries with stronger legislation on gender equality and more egalitarian norms. In general, incentive pay schemes in companies tend to narrow the gender pay gap.

While we are proud of the results we have achieved and our contribution to the policy debate, we also realise that there is much more to be said and done on the issues that Project UNTANGLED explored. In our individual institutions and the other projects we are engaged in, we can already see how the results of Project UNTANGLED are providing a foundation for others to build on. This gives us confidence that our three-year journey of exploration will have a lasting legacy in Europe and beyond.

ALMOST 50 SCHOLARS GRAPPLE WITH LABOUR-MARKET ISSUES AT UNTANGLED FINAL CONFERENCE

The final conference of Project UNTANGLED, “*Labour Market Effects and Social Impact of Technological Transformation, Globalisation, and Demographic Change*”, provided an opportunity to share our outcomes and engage in discussions with fellow scholars studying labour market trends.

Held on 23 November at HIVA KU-Leuven, the conference comprised nine sessions, featuring 30 presentations and drawing 47 participants from research institutes and universities across Europe. “We had a very productive day, filled with discussions of the dynamic changes occurring in the labour market, such as emerging forms of work, the well-being of workers, and the impact of AI and other technologies on occupations, tasks, and wages,” says Mikkel Barslund, who coordinates the UNTANGLED research consortium. “I am particularly pleased that we could also exchange ideas with our colleagues from other Horizon projects, such as Pillars, GI-NI, and TransEuroWorks.”

The event also features a keynote from Melanie Arntz (ZEW), “De-Routinization in the Fourth Industrial Revolution — Firm-Level Evidence”, who showed that the diffusion of frontier technologies is likely to accelerate deroutinisation.

More information on the conference can be found [here](#). A video report is available [here](#).



NAVIGATING THE PATH TO A GOLDEN AGE FOR WORKERS: INSIGHTS FROM THE UNTANGLED DEBATE

If we are about to enter a golden age for workers, marked by higher wages, better working conditions, and the eradication of particularly hazardous tasks, then the trajectory of technological progress and the shift toward a green economy must be meticulously guided. Policies must be established to ensure that no one is left behind. This is the pivotal takeaway from the recent UNTANGLED debate.



During the 22 November online debate, moderator **Karolien Lenaerts** (HIVA-KU Leuven) posed the question of whether we are approaching a golden age for workers. In response, most panellists agreed that growing labour shortages are exerting upward pressure on wages and working conditions, theoretically brightening the prospects for employees.

Frank Siebern-Thomas (Fair, Green, and Digital Transitions, Research Unit, DG Employment, Social Affairs and Inclusion, European Commission) highlighted that three-fourths of European SMEs currently face skills and labour shortages, while two-thirds of European companies cannot find IT specialists. While optimistic about worker prospects, he underscored the risks and structural challenges that EU governments and firms must address. These challenges include reskilling the European workforce to adapt to evolving job roles resulting from technological advances and the transition to a green economy.

Siebern-Thomas also noted that the European Commission is aware of these challenges and committed to addressing them through initiatives such as the European Year of Skills, focusing on upskilling, training, and innovation initiatives across member states. "Is this a golden age for workers? Maybe, but much depends on policies and their effective implementation," Siebern-Thomas said.

> NAVIGATING THE PATH TO A GOLDEN AGE FOR WORKERS: INSIGHTS FROM THE UNTANGLED DEBATE

Melanie Arntz (ZEW), also optimistic about workers' prospects, emphasised additional challenges that must be addressed for a golden age to materialise. She said particular attention should be directed to taxes and transfer systems and how they create incentives for working full-time. Arntz also raised concerns about AI and other technologies potentially devaluing certain skills and knowledge, leading to declining returns on formal education.

"It will be more difficult for people to guess what the return on formal education will be, which means they may underinvest in education because they might not be sure how much they'll get out of it," she said. "Therefore, we should provide as much transparency as we can on all these trends, so people can orient themselves around this new labour market." Arntz also highlighted another challenge: technology-driven mental stress among workers.

Marguerita Lane (Future of Work team, OECD) focused on the positive impact AI can have on the workforce. She highlighted the technology's potential to boost productivity, alleviate sluggish growth, reduce the need for human labour in routine and manual work, and liberate workers from unsafe, repetitive, and monotonous tasks. Lane stressed that AI also has the potential to bridge inequality by enabling lower-skilled workers to level up. Similar to previous speakers, Lane emphasised that these positive outcomes can only materialise with the right policies and social safety nets in place.

"It is about policy choices; in this disruptive time, we need a smooth transition, and for this we need public services, governments, and companies to support workers displaced by new technologies," Lane said.

Robert Stehrer (wiiw) took a less optimistic stance on the prospects for workers. Citing recent literature, he argued that the impact of new technologies such as AI on the labour market may not be very significant, and might not help overcome labour shortages. Stehrer also highlighted that the shrinking and ageing of the EU population places a burden on the healthcare and pension systems. According to Stehrer, it is plausible that we are entering a period of secular stagnation: a prolonged period of negligible economic growth.

"Even if there are higher wages, these will need to be taxed to meet the demands of the healthcare and pension system," Stehrer concluded.

The discussion also covered areas such as working conditions, the challenges faced by platform workers, the potential and the difficulties of undeclared work, opportunities for migration to the EU, and gender dimensions within the workforce. Additionally, it explored how the evolving labour market is influencing the welfare state.

The UNTANGLED debate sheds light on the broad and diverse landscape of opportunities and challenges that makes up today's labour market. The path to any golden age for workers must pass through that terrain, and technological advances in and of themselves aren't enough to ensure a safe journey. Instead, it will require thoughtful implementation of policies that uphold the well-being and resilience of the workforce in the face of unprecedented changes.

You can watch the conversation between Melanie Arntz, Robert Stehrer and Mikkel Barslund [here](#).

UNTANGLED WEBINAR EXPLORES IMPACT OF DIGITALISATION AND AI ON THE LABOUR MARKET

The UNTANGLED webinar on 18 January 2024 brought together 22 participants to discuss technological changes, digitalisation, and the adoption of artificial intelligence, and how these trends affect employment, job quality, and skills.



In the first of three presentations, **Ursula Holtgrewe** (ZSI) discussed Project UNTANGLED case studies in manufacturing and financial services, which examined the impact of digitalisation and globalisation on employment, job quality and inequality. The research revealed that technological changes and their adoption are characterised by incremental advances, rather than disruptive innovations. Holtgrewe pointed out that analysis of employment showed (skilled) staff shortages in all cases, leading to intense competition for highly skilled workers across sectors.

However, labour shortages did not necessarily improve job quality and wages. At the same time, automation posed a risk to low-skilled workers, for instance in the manufacturing sector, even though for now the replacement of workers by robots has been compensated for by expanding markets. Regarding skill changes, the UNTANGLED researchers found that automation could lead to upskilling and retraining workers in both sectors. However, inequality persisted in training and learning, with more opportunities reserved for highly skilled employees. Discussing job quality changes, Holtgrewe argued that the automation of routine-intensive tasks led to work intensification, which limited the space for teamwork and peer learning.

Anna Milanez (OECD) presented cross-country case studies exploring the impacts of AI technologies on the labour market. Researchers demonstrated that manufacturing and finance companies adopted several AI technologies, including computer vision, natural language processing, and machine learning. Among the occupations most often impacted by technological changes were customer service representatives and maintenance & repair workers. Milanez emphasised that redundancies were rare due to the limited advancement of AI technologies. Instead, automation targeted minor tasks within jobs. Labour shortages caused worker reallocation within firms, and companies prioritised improved product or service quality over labour cost savings. Milanez also argued that the impacts of AI and AM on job quality are mixed. While AI technologies were credited with improving physical safety, working conditions, mental well-being, and engagement, conflicting perspectives existed, with workers often expressing ambivalence and reporting increased work intensity and stress.

Trine Pernille Larsen and **Anna Ilsøe** (FAOS) discussed their new research on the Danish manufacturing sector, AI adoption, and its effects. Their data showed that the industry recently increased its use of AI and Algorithmic Management (AM) technologies. They also addressed recent debates in Denmark caused by the widespread adoption of technology, which centred around worker surveillance, data security, health and safety risks, legal implications, and the impact on wages and working conditions. Larsen and Ilsøe also presented their findings on how AI affects job tasks, training, and mobility.

TO EASE EU LABOUR SHORTAGES, POLICIES SHOULD ATTRACT, INTEGRATE MIGRANTS

Migration can play a crucial role in addressing labour shortages in the European Union if protections and support systems are improved for both internal and external migrants, UNTANGLED researchers said in a policy brief. They recommend adopting financial incentives to support mobility; improving recognition of foreign qualifications; and facilitating access to citizenship.



The document highlights the challenges to Europe from an ageing population, labour market shortages, and skill mismatches. Migration from non-EU countries and internally within the EU emerges as a central theme in addressing these issues. Drawing on the project's research findings, expert consultations, and stakeholder inputs, researchers identified policies that can be implemented, improved or need further consideration.

“We should remember that migration can lead to job creation, improve productivity, stimulate innovation, and contribute to international trade,” said Klavs Cipriks, co-author of the brief and researcher at ESRI. “The ageing of the EU population reinforces the need to recruit workers from outside the EU, so lawmakers should shape policies that help integrate them.” In recent years, member states have observed relatively high migration to the EU and within the bloc. UNTANGLED findings show that the education level of incoming workers varies significantly based on their region of origin, requiring tailored approaches to improve their adaptation and integration. Enhancing geographical mobility between European regions can efficiently address some labour market imbalances and improve economic performance, the UNTANGLED researchers found. They advocate for national-level financial incentives, including reimbursing regional mobility costs and supporting people moving to different areas. Additionally, they propose introducing preferential tax schemes to attract high-skilled foreigners, enhancing fiscal incentives. “Empirical evidence shows that tax incentives are an effective policy to encourage labour mobility, especially among high-income workers and professions with little location-specific human capital,” said Ronald Bachmann, co-author of the study and researcher at the RWI — Leibniz Institute for Economic Research. “Strengthening policies that offer residence and work permits for non-EU individuals to meet labour market demand will be crucial.”

The researchers point to insufficient standardisation of qualifications requirements as one significant barrier to cross-border mobility. While this has improved in recent years, with the European Qualifications Framework playing a pivotal role in facilitating recognition of minimum requirements for authorisation to work in specific occupations across the EU, stronger implementation is needed, the researchers found. Improving recognition of foreign qualifications can help professions which struggle to fill vacancies, such as healthcare.

Another major barrier to labour movement within the EU and the integration of immigrants is a lack of language proficiency, according to the policy brief. “Several EU member states provide publicly funded language courses,” said Klavs Cipriks. “More countries must follow suit, ensuring free or affordable access to language training. It is impossible to overstate the role language skills play in the integration of migrants and their engagement in the labour market.” Another way to foster the societal integration of immigrants is to facilitate access to host country citizenship, the researchers found, adding that the liberalisation of birth-right citizenship also significantly improves the school performance of immigrants’ children.

Klavs Cipriks, Seamus McGuinness, Paul Redmond, Ludvine Martin, Joël Machado, Bertrand Verheyden, Ronald Bachmann and Julia Bredtmann. (2024) *UNTANGLED Policy brief: Supporting migration and labour mobility* (Deliverable D7.5) Leuven: UNTANGLED project 1001004776 — H2020.

The policy brief can be found [here](#).

EUROPE SHOULD PRIORITISE ACTIVE POLICIES TO FIGHT LABOUR SHORTAGES

Policymakers in the European Union should address labour-market challenges by prioritising active, targeted measures to increase workforce participation and employment, attract and integrate migrants in crucial sectors such as healthcare, and fight gender discrimination, Project UNTANGLED researchers recommend.



Active measures such as public employment services, training, employment incentives, supported employment and rehabilitation, direct job creation, and start-up incentives work better than passive ones, which include out-of-work income maintenance and early retirement plans, according to a policy brief by Fabrizio Pompei of the University of Perugia. The document draws on three years of Project UNTANGLED findings, expert consultations, and stakeholder inputs.

“The European labour market is in good shape, but these megatrends and recent challenges such as geopolitical tensions and the Covid-19 pandemic have threatened job quality, working conditions and labour supply,” Pompei said. “Demographic shifts will only deepen the problem of labour shortages, so we have to do everything we can to mobilise existing reserves and resources. We can achieve that by prioritising social inclusion and new measures combating relatively low workforce participation among vulnerable social groups, older women, migrants, and people without digital skills or internet access.”

Many social policies today are inefficient and do not address the source of the problem, Pompei found. European countries still have a disproportionate number of participants in passive labour market policies, compared to more efficient active ones.

Similarly, the increasing use of automation technologies is affecting wages and employment, leading to unequal distribution of labour income. However, the degree to which inequality in the labour market translates into income inequality in households depends on government policies that redistribute resources to low-income working-age households, specifically non-pensioners in the poorest quartile of the population, Pompei found. For instance, social transfers are crucial for reducing the risk of poverty and income inequality for women and children.

“The pandemic has made it clear that labour shortages cannot be solely attributed to wages and income, as the multidimensional aspect of job quality is crucial to understanding the situation in some sectors and labour markets,” Fabrizio Pompei said. “Inadequate working conditions arising from a mismatch between job demands — including physical and psychological hazards, high work intensity and irregular working hours — and available job resources, such as task discretion, flexible work hours and training opportunities, have resulted in strained environments. This is particularly evident in sectors such as healthcare and transport.”

To simultaneously address the three issues of job quality, integration of migrants and labour shortages in strained sectors, policymakers have to adopt a holistic approach. While there is no single solution for all EU countries and policies have to be tailored to social conditions, certain programmes can serve as a blueprint for efficient reforms. In particular, Germany’s Concerted Action on Care (Konzertierte Aktion Pflege, KAP) serves as a model for addressing all three challenges simultaneously, with a specific emphasis on sectors such as healthcare.

> EUROPE SHOULD PRIORITISE ACTIVE POLICIES TO FIGHT LABOUR SHORTAGES

UNTANGLED research finds that wage-based incentives alone are insufficient for retaining or recruiting staff; they must be complemented by factors such as access to training and greater autonomy over working hours.

Certain issues of job quality are caused by labour shortages, which can be partially addressed by the migration of workers from outside the EU. In this area, researchers point out that the mismatch between labour demand in European companies and labour supply from non-European migrants may be caused by the difficulties migrants face in having their formal qualifications recognised in the EU.

For policymakers, therefore, the issue of migrants' diploma recognition should be one of the priorities for inclusive policies. The Swedish Fast Track is an example of a successful programme that facilitates the recognition of migrants' qualifications gained abroad, and provides advice, information and training to validate skills for both migrants and employers, as well as training on the language, local culture and institutions.

Finally, institutions providing employment services and those delivering social services, for example addressing challenges related to housing, mental health and personal financial difficulties, must have the capacity and willingness to cooperate, Pompei said.

Fabrizio Pompei. (2023). UNTANGLED *Policy brief: Policies for inclusive labour markets* (Deliverable 7.6)
Leuven: UNTANGLED project 1001004776 – H2020.

The policy brief can be found [here](#).



POLICY SHOULD BOOST WORKER WELL-BEING AMID DIGITALISATION, AGEING, RESEARCHERS SAY

As rapid digitalisation and the ageing of the population present new labour-market challenges such as teleworking, hyperconnectivity, platform employment, and healthcare staffing shortages, the best policy responses are those that prioritise the well-being of workers, according to UNTANGLED researchers.



In the policy brief: ‘Ensuring the quality of new and existing jobs’, researchers looked into recent policy proposals aiming to enhance both work and life quality and the delicate balance between them. Drawing on findings from the project, expert consultations, and stakeholder inputs, they identify areas of policy that can be improved or need further consideration.

While labour markets in the EU are doing well, technological advances and demographic changes will affect not only the number but also the quality of jobs in the coming years,” said Mikkel Barslund, UNTANGLED project coordinator and research manager at HIVA-KU Leuven, who co-authored the policy brief. “We need to ensure that the policies we are implementing now will contribute to shared prosperity.”

The COVID-19 crisis accelerated the adoption of working-from-home, praised by many for fostering employee autonomy, reducing work pressure, and increasing work effort. However, with the surge in teleworking, the drawbacks have become more apparent, including hindering team collaboration, triggering feelings of isolation, and extending working hours. Furthermore, the fact that not all workers can perform their tasks from home worsens working workplace relations and creates inequality. To address these challenges, UNTANGLED researchers argue that employers and employees should discuss and agree on the optimal number of teleworking days and workplace rules.

Digitalisation and teleworking have also blurred the lines between home and work life, prompting employees to respond to calls, texts, and emails at all hours. Several EU countries have implemented or are considering legislation safeguarding the “right to disconnect” to prevent burnout and help workers re-establish work-life balance. Yet Ludvine Martin, a researcher at the Luxembourg Institute of Socio-Economic Research (LISER), part of the UNTANGLED consortium, cautions against one-size-fits-all solutions, such as blocking server usage during weekends, and emphasises the need for tailored strategies that take into account sector, occupational, and technological nuances of work outside regular hours.

Another technological development, the emergence of platforms such as Uber, Deliveroo and Bolt, has given rise to new forms of work that are organised and regulated in new ways. Platform workers, representing around 5% of employees, are exposed to limited labour protections, predominantly low and irregular income, and lack of control over working conditions. Due to their relatively new status, unregulated nature, and fast development, platform jobs create challenges that policymakers are now trying to address at the EU and national levels. The UNTANGLED researchers argue that in addition to regulating their legal employment status, granting platform workers collective bargaining rights is also crucial for improving their well-being, social protection and fair working conditions.

“Many challenges in regulating platform work arise from its uncertain legal status and varied regulations across countries,” said co-author Adrien Thomas, a researcher at LISER. “Governments and the EU have to define the status of platform workers and whether they should be considered employees or independent workers. Digital platform companies often position themselves as mere ‘intermediaries’ between service providers and clients, aiming to evade the responsibilities of an employer.”

> POLICY SHOULD BOOST WORKER WELL-BEING AMID DIGITALISATION, AGEING, RESEARCHERS SAY

A few months ago the EU reached a provisional agreement on the Platform Work Directive, which aims to ensure the correct classification of platform workers' employment status. The new rules introduce a presumption of an employment relationship, and still need to be adopted by both the European Parliament and the Council to enter into force.

At the same time as workers, companies and governments are wrestling with the implications of these new technologies, the ageing population is becoming a major challenge for labour markets, increasing the demand for health and long-term care (LTC) workers. Many EU member states are already grappling with significant labour shortages in these sectors, marked by low pay, high turnover, and poor working conditions. LTC workers are particularly exposed to a lack of full-time work.

Urging prompt government action, the UNTANGLED researchers propose policies to attract and retain workers in the health and LTC sectors, including raising wages, improving working conditions, and increasing staffing ratios to lighten workloads. Governments could also use their influence to encourage private facilities that receive public funds to adhere to collective bargaining agreements or meet higher job-quality standards, such as minimum wages. Policymakers should also explore strategies for attracting migrant workers, such as programmes that help integrate foreign workers into local systems and re-evaluation of qualification and language requirements, the researchers said.

Barslund, M. et al. (2023). UNTANGLED *Policy brief: Ensuring the quality of new and existing jobs* (Deliverable 7.2) Leuven: UNTANGLED project 1001004776 — H2020.

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



DIGITALISATION AND AUTOMATION PROVE BENEFICIAL FOR GLOBAL PRODUCTION, UNTANGLED STUDY FINDS

The recent slump in international trade was not a result of advances in digitalisation and automation, a new UNTANGLED study finds. In fact, the adoption of robots and widespread use of information and communications technologies are strengthening the global organisation of production rather than leading to reshoring, as some have assumed.



“Digitalisation and automation aren’t as detrimental to the current organisation of production networks as previously thought,” said Isabelle Rabaud, a professor in international economics at Université d’Orléans, in France, and co-author of the study. “Rather, technologies tend to strengthen existing backward and forward links that already exist between countries,” Rabaud said. Economists have long understood that robotics and high-tech innovations can fuel productivity gains, but little attention has been paid to how technology affects where production is located globally.

This knowledge gap includes whether the adoption of robots will lead to “reshoring,” the process of returning production to Europe from abroad. To address this shortcoming, Rabaud together with colleagues from Université d’Orléans colleagues Camelia Turcu and Marcel Voia, and Robert Stehrer from the Vienna Institute for International Economic Studies, reviewed data from the OECD, the World Bank, the Centre d’Études Prospectives et d’Informations Internationales (CEPII), and the International Federation of Robotics. Using these data as inputs, the researchers created two models to test technologies’ effect on production networks.

In the first model, foreign value added in gross exports was analysed from 63 origin countries present in the imports of 27 EU destination countries. Internet use and broadband subscriptions were used to determine the role of digitalisation in the importance of backward global value chain (GVC) participation. The researchers speculated that a higher degree of diffusion of ICTs would raise backward linkages in line with easier communication and lower costs of coordination. Twenty-eight sectors in 36 non-EU countries of origin were examined. Sectors included transport, postal activities, accommodation and food services, insurance, and financial services. To capture the effects on forward GVC participation, the researchers created a second model to simulate the effect of robot use in imported intermediate products (such as raw materials, ingredients, energy, and services) on the receiving industry in the destination country.

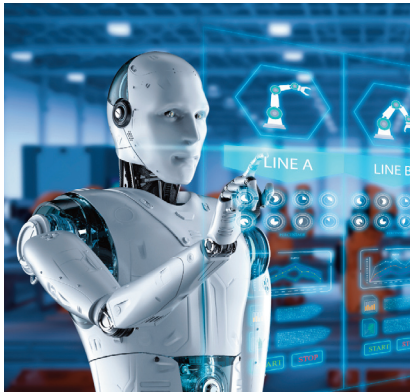
Using gravity equations, the researchers confirmed that the industrial use of robots, internet use and fixed broadband subscriptions in both origin and destination countries tend to increase forward GVC participation. Effects on backward GVC participation were more mixed. “As economist Richard Baldwin famously suggested, technology enabled localised concentration of production and trade, in what he termed ‘factory Europe,’ ‘factory Americas,’ and ‘factory Asia,’” said study co-author Stehrer. “Our findings reinforce this and confirm technology’s leading role in the regional organisation of production.”

Rabaud, I., Stehrer, R., Turcu, C., Voia, M. (2023). *The impact of technology and connectivity on trade patterns* (Deliverable 3.4). Leuven: UNTANGLED project 1001004776 — H2020.

The paper is available [here](#).

POLICYMAKERS MUST ADDRESS UNEVEN DISTRIBUTION OF BENEFITS FROM DIGITAL TRANSFORMATION

European and national policymakers must take decisive action to ensure the economic boost generated by increased digital transformation is shared fairly across regions, sectors, and occupations, a new Project UNTANGLED study recommends.



New results from UNTANGLED paint a nuanced picture of robotisation and automation's effects, helping to ease concerns about conditions for millions of workers as technological innovations enhance efficiency and replace tasks. While impacts will be heterogeneous, about 80% of 100 major European economic areas will experience net benefits in average workers' welfare. "Digital transformation represents more of an opportunity than a risk for most regions in Europe," said Michal Burzynski, a labour market research scientist at the Luxembourg Institute of Socio-Economic Research (LISER) and a study co-author. "That said, workers in some parts of Europe will be negatively affected. Understanding these implications is crucial for formulating effective policies that address the challenges, and opportunities, arising from robotisation and automation."

To evaluate the potential consequences of robotisation and automation for European labour markets, the researchers used a general equilibrium model, combined with projection scenarios, to benchmark how future technological progress may reshape labour in Europe. With data on GDP, wages, employment, education, and migration from Eurostat and the OECD, and on robotisation and automation from IFR and EU-KLEMS, the researchers quantified average wage effects and changes in wage dispersion across occupations, sectors, geographical areas, and worker groups. Overall, the researchers determined that while a strong majority of regions benefit from robotisation and automation, the effect is heterogeneous, both across and within countries. "The Paris area, Austria, Switzerland, as well as Nordic and some Baltic regions belong to the main nominal GDP winners of robotisation and automation, followed by the rest of France, the south of Germany, Benelux, and Ireland," they wrote. "A weaker positive or slightly negative impact is observed in the UK, and southern and eastern European regions." With a benchmark scenario calculated, the researchers then analysed the potential effects of robotisation and automation on workers with different origins, education levels, and skills using three scenarios of robotisation and automation: slow, medium, and fast. The slow adoption scenario will reduce average native welfare in half of the European regions. In the medium adoption scenario, average native welfare improved across Europe, except in roughly 20 regions, particularly in France and Poland. In the fast adoption scenario, the negative welfare impacts apply to fewer regions.

Across sectors, impacts on labour supply also varied. Manufacturing was projected as the most likely beneficiary of robotisation and automation in Belgian and German regions. Public administration, education, and health services were projected to gain in most regions with higher positive impacts in Nordic and Alpine countries, while transport and storage was projected to experience the highest growth in eastern Europe and Austria. In contrast, construction and financial services tended to shrink in most regions. The disparity in regional and sectoral benefits demands strong policy responses, the researchers noted. "As robotisation and automation continue to progress, it's increasingly probable that this trend will impact workers who have, thus far, been relatively unaffected," said Joël Machado, a LISER research scientist and another study co-author. "Our projected scenarios can help policymakers better target interventions that support those who are adversely affected by the digital transformation."

Burzynski, M., Machado, J., and Martin, L. (2023). *Digital transformation, demographic changes, and labour markets*. Projected implications for 100 European regions (Deliverable 6.2). Leuven: UNTANGLED project 1001004776 — H2020.

The paper is available [here](#).

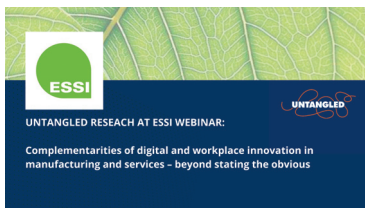
UNTANGLED RESEARCH PRESENTED AT EUROPEAN SOCIAL FORUM



Karina Doorley (ESRI) presented UNTANGLED research findings to business leaders, EU and national policymakers, social partners, civil society, and academics during the European Employment and Social Rights Forum held in Brussels on 16-17 November.

Speaking on the panel “*Poverty and Inequality Proofing of Policies for a Fair Twin Transition*”, Doorley unveiled an **UNTANGLED paper’s** findings illustrating that tax and welfare policies can alleviate the impact of automation on income inequality.

UNTANGLED RESEARCHERS DISCUSS DIGITAL AND WORKPLACE INNOVATION AT ESSI WEBINAR



UNTANGLED researchers shared the project’s findings on the adoption of organisational and digital innovations in companies from the manufacturing and services sectors at the webinar “*Harnessing the Benefits of AI, Industry 5.0, and Other Digital Innovations — More Opportunities but Also More Challenges for Social Innovations?*” organised by the European School of Social Innovation (ESSI) on 19 October.

UNTANGLED RESEARCHERS PRESENT PROJECT FINDINGS AT NARSC EVENT

Project UNTANGLED researchers discussed the digital service economy, wage inequalities, globalisation and European integration at the North American Regional Science Council (NARSC) in San Diego. The conference, held from 15-18 November 2023, attracted more than 400 participants and featured presentations of more than 350 papers.

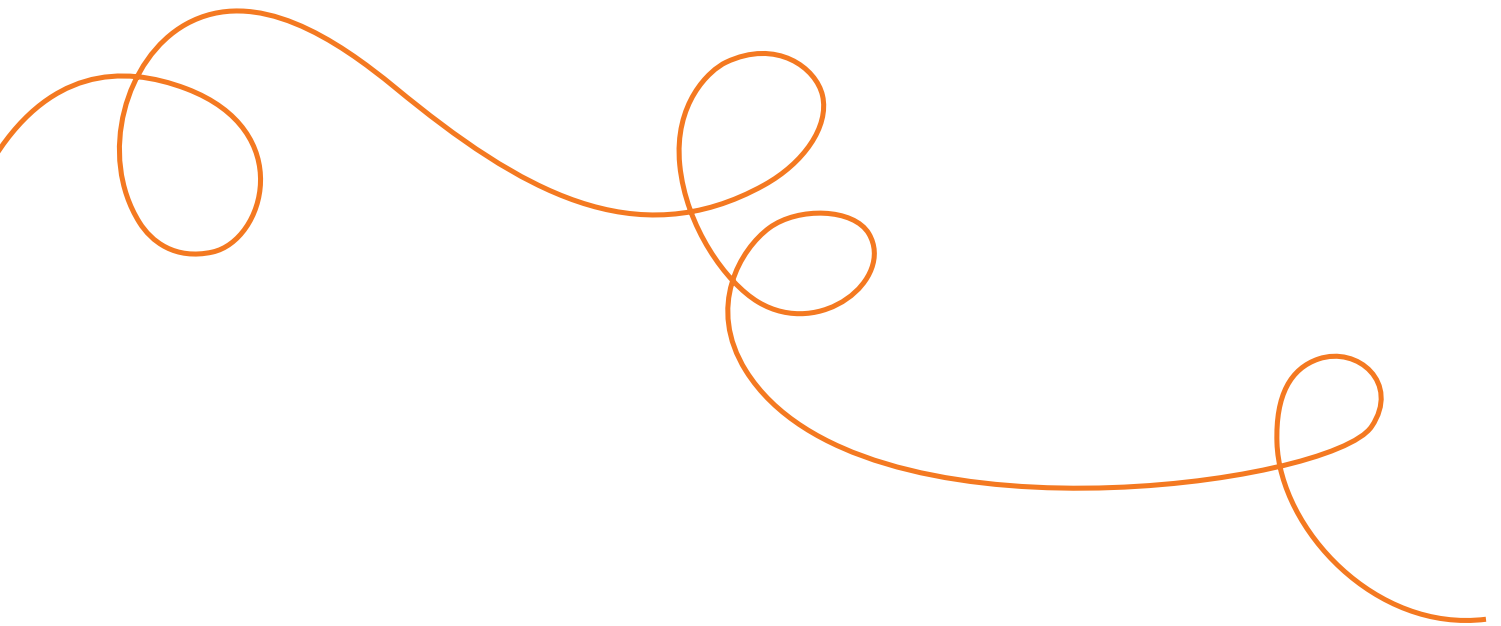
Roberta Capello, Camilla Lenzi and Elisa Panzera from Politecnico di Milano presented their collaborative work within the framework of Project UNTANGLED, “**The nexus between the digital service economy and intraregional wage inequalities**”.

Additionally, Roberta Capello and Andrea Caragliu discussed their most recent UNTANGLED paper, “*European integration and global cooperation: Long-run scenarios assessed with the MASST5*”.

UNTANGLED RESEARCH PUBLISHED IN SCIENTIFIC JOURNALS

Albinowski, M and Lewandowski, P. The impact of ICT and robots on labour market outcomes of demographic groups in Europe, *Labour Economics*, Volume 87,2024, 102481.

Robert Stehrer, “The impact of ICT and intangible capital accumulation on employment growth and labour income shares”, *Structural Change and Economic Dynamics*, Volume 70, 2024, Pages 211-220.



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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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