UNTANGLED POLICY BRIEF

TACKLING GROWING INEQUALITIES

Roberta Capello, Camilla Lenzi, Elisa Panzera and Andrea Caragliu
(Politecnico di Milano)

Key Messages

- Inequalities driven by factors including digitalisation and globalisation are increasing across modern economies and societies, demanding a robust response from policymakers
- Among initiatives at the company level, training in response to digitalisation tends to increase inequality, while incentive-based pay schemes can reduce it
- EU policymakers must ensure digital insfratructure is built that will guarantee the availability of digital services across the entire Union, including in remote areas, and for all population groups, including the most marginalised
- The rise of platform work requires a robust policy response to ensure job quality, worker protections and fair contributions to social safety nets
- Technological innovation is key to ensuring a steady supply of high-quality jobs

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UNTANGLED

Executive Summary

Growing inequalities are shaping modern economies and societies, driven by dramatic changes in the technological landscape, in the organisation of global transactions and value chains and in response to global challenges raised by the financial crisis, the pandemic and the energy crisis. The emerging inequalities are manifest in diverging trends in economic and employment growth between places, as well as the redistribution of wealth among population and worker groups (Chancel et al., 2022). **Increasing inequalities are therefore a dominant trait of the contemporary era**. Even if national tax and benefits systems can partly mitigate the effects of automation on income inequality (Doorley et al., 2023), digitalisation is expected to amplify inequalities across places (Capello et al., 2023), across firms (Jona-Lasinio and Venturini, 2022) and workers (Perugini and Pompei, 2022).

In the opinion of many commentators and scholars, this scenario calls for attention to possible policy actions to curb such multiple inequalities or at least to mitigate their most harmful effects. By analysing some of the factors pushing toward the upsurge of inequalities in the new millennium, Project UNTANGLED has contributed to understanding of which policy fields such interventions could target and the potential complementarities and synergies among EU, national and regional-level actions. Such multi-dimensional and multi-level policies may range from the creation and/or upgrading of digital infrastructure and uptake of cutting-edge technologies, to a renewed prominence of all those social policies aimed at upskilling the current and future labour force and to ensure quality jobs, all central themes in the EU Digital decade agenda.

Background & Methodology

The beginning of the new millennium has been characterised by rapid and dramatic changes. Disruptive technological transformations, together with deep reorganisation of trade exchanges and global value chains (GVCs), have significantly altered the world economy and affected society and territories, with effects magnified by global shocks such as the COVID-19 pandemic, the rise of geopolitical tensions and the related energy crisis.

In the opinion of many scholars and commentators from the academic, policy and business fields, the co-occurrence and interplay of these megatrends has produced a rather **unfavourable scenario for balanced growth and socio-economic and spatial resilience and cohesion**, leading to the most striking paradox of recent years: an unprecedented acceleration of technological change but stagnating median wages and increasing income gaps and regional disparities, frequently associated with a widespread sentiment of discontent, especially manifested at the ballot box (McAfee and Brynjolfsson, 2017; McCann, 2020; Dijkstra et al., 2020; Lenzi and Perucca, 2021).

The rise in income inequalities has been widely documented for the US case, where this trend started in the last century without reaching a halt, suggesting that the rise of prosperity in the past decades benefitted an increasing lower percentage of individuals and communities (Kemeny and Storper, 2022; Alvaredo et al., 2018; Chancel et al., 2022).

These trends have gradually become global and affected the European Union (EU) as well, though with nuances (OECD, 2022; McCann, 2020). The EU enlargement and integration process has in fact made member states and their regions particularly exposed to a series of shocks starting from the 2007-2008 financial crisis, amplified by the 2011 debt crisis, the COVID-19 pandemic, and finally the Ukraine conflict and the related energy and climate threat. All in all, this combination has exercised multiple pressures on economic, social and spatial cohesion in Europe, leading to an increase of socioeconomic disparities across and, especially, within EU countries. The highest burden was especially felt by those regions afflicted by a mix of adverse socioeconomic conditions, primarily stagnating and/or low productivity and limited economic growth prospects, and in which these disadvantages frequently translated into citizens' mounting political resentment and antisystem voting reaction (McCann, 2020; Dijkstra et al., 2020).

This secular trend has many concurrent explanations. There is converging evidence that **super-fast technological change of the past couple of decades, led by automation and digitalisation of production processes and consuming patterns, and the enhanced but unbalanced globalisation** played an influential part (Autor and Dorn, 2013). These two megatrends have progressively turned into the displacement of low– and middle-skilled workers being amplified by the offshoring of (primarily) manufacturing activities (Brynjolfsson and McAffe, 2014; Acemoglu and Restrepo, 2020). The shrinking of the middle-income class has progressively produced a polarisation of wages, the stagnation of the median wage and the widening of interpersonal and spatial inequalities in the US (Moretti, 2012) and, to a large extent, in Europe (Goos et al., 2014), i.e. the great divergence.

Differently from the post-WWII period, which was characterised by the reduction of inequalities (i.e. convergence), at least at the national level of analysis, the new millennium is marked by a novel spatial dimension (Kemeny and Storper, 2022), with an increasing divide between a small group of big, wealthy, resilient, and high-income superstar city-regions and the remaining ones, which instead show more similar patterns and an intra-group (i.e. club) convergence. These patterns are not US-specific but apply to the UK case as well (Overman and Xu, 2021) and many OECD countries (OECD, 2022).

With awareness of this complex scenario, the UNTANGLED project has addressed the interplay between these trends in technological transformations, globalisation and inequalities from a multilevel perspective by complementing analyses at the macro–, regional–, sectoral-and micro-level, based on both quantitative and qualitative research methods, and by developing comprehensive model-based scenarios of the impacts of these trends in the next decades.

Key findings from the UNTANGLED project

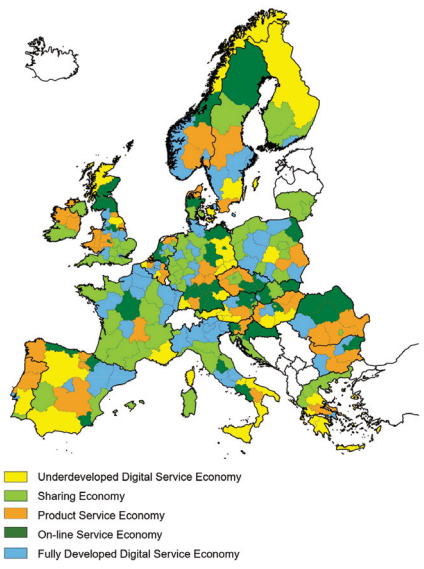
Digitalisation widens wage inequalities

Even if automation has a limited impact on wage inequalities, at least in the European context, there is large consensus about the impact of the diffusion of computerisation and ICTs for the upsurge of wage inequalities starting with the turn of millennium. Capello et al. (2023) enlarged this analysis to the case of advanced digital technologies enabling companies to switch their business models towards digital ones, largely dependent on digital platforms, and selling services, products or content on online markets.

In the case of 164 European regions in the period 2009-2016, findings indicate that regions show different mode and intensity of transition towards the digital service economy. While some regions are able to move some of their economic activities online, including business transactions but also consumer-to-consumer exchanges, others are still struggling with this transition.

Importantly, regions where the digital service economy is more advanced are more likely to experience a worsening of wage inequalities between top-wage and bottom-wage workers, for three main reasons:

- first, the shift towards new business models may require new competences and a re-orientation and/or upgrade of workers' profile towards jobs requiring higher educational attainment and skill level, various and more complex cognitive and abstract tasks, and, thus, higher wages (Dauth *et al.*, 2021). Possibly, these new tasks can lead to the creation of new high-skill, cognitive, elite jobs, mostly linked to intermediary platforms and not necessarily in the regions were platforms are used;
- second, new digital workers can produce competition effects on traditional offline workers becoming at risk of being displaced or at least suffering downward pressure on wages, especially in the areas where online services are consumed;
- third, platform-based digital services frequently rely on on-call contingent workers, using their own tools and equipment to perform the productive work associated with the supplied service (Stanford, 2017). Service providers (e.g. Uber drivers or Deliveroo riders) are often temporary or part-time workers, if not freelancers, who are willing to participate in the market to obtain some earnings by offering their spare time and skills since it is relatively fast, frictionless and cheap. These workers are commonly known in the literature and in the press as gig workers. Therefore, the digital service economy frequently comes with an expansion of local low-skill, low-paid and unsecure jobs.



Taken together, these effects lead to a worsening of intraregional wage inequalities in regions where the digital service economy is more advanced, confirming that popular fears about the possible consequences of the diffusion of the new technologies are not fully misplaced and wage inequalities do rise over time. While in some regions a deterioration of wage inequality conditions is already a reality and urgent policy actions are needed, other regions still have room to devise anticipatory policy interventions to avoid a widening of intraregional wage disparities once the new digital service economy becomes dominant.

Company-provided training in response to digitalisation enlarges wage inequality

Jona-Lasinio and Venturini (2022) studied the impact of digitalisation on wage inequalities in a sample of more than 100,000 European companies, surveyed in three different periods, i.e., 2005, 2010, 2015, with the goal of describing companies' wage and employment performance in relation to the digital content of their production and training activities.

As digitalisation deepens, in fact, the need for new competences and skills is expanding. Cedefop (2016) indicates that 71% of European workers self-report the need for some ICT skills to perform their usual tasks, and 14% need very advanced ones. There are, however, variations across sectors, involving anywhere from about 5% of workers in the Accommodation sector up to 51% of workers in the ICT sector. The European Investment Bank (EIB, 2022), in fact, indicates that training and digitalisation are closely related to one another; the provision of (vocational) training is typically highest in firms with a high adoption of digital technologies and increases with the complexity of the digital technologies adopted.

Companies usually provide training to regenerate and upgrade workers' competences; these intangible investments should enable firms to pay higher average wages compared to firms without training, thus fuelling wage dispersion across companies. This conjecture is confirmed by data, proving the role of training as a tool and booster for higher wages. The greater the exposure to digitalisation across industries, the greater the wage gaps across companies. This gap is due to two main effects:

- companies offering training targeting general skills in response to digitalisation are able to pay 8% higher wages than firms not engaging in this type of investments;
- companies implementing training targeting IT-intensive skill are able to increase wages an additional 8%.

In conclusion, digitalisation has an important role for the widening of wage inequalities across companies.

Firm-level incentive payment schemes can attenuate wage inequalities and discrimination

In a study of five major European countries (Germany, France, Italy, Spain and the UK) in the years 2006, 2010, 2014 and 2018, Perugini and Pompei (2022) highlight the importance of firm-level managerial practices, beyond general training policies, to mitigate wage inequalities across workers and especially discrimination against the most vulnerable and fragile categories, including the traditional and undesirable gender wage gap.

According to OECD (2021), in fact, women, on average, earn 22% less than men for similarly qualified occupations. Three-quarters of this gap is due to differences in pay within firms and is due to discrimination and asymmetries in bargaining power as opposed to women concentrating in lower-paid functions or having lower or differently paid skills.

However, wage discrimination and inequality could attenuate in the presence of incentive payment schemes (IPSs). These schemes posit a clear link between fulfilment of targets and achievements of goals to high remuneration. Therefore, job positions offering these arrangements could equally attract men and women who are most productive and less constrained by household workloads; moreover, in principle, clearer screening and monitoring practices implemented in the frame of IPP could mitigate arbitrary and gender discrimination.

This attenuation effect on the gender wage gap driven by the introduction of IPSs, however, is subject to variations, depending on the organisational context in which they are arranged. Firms with a very flexible and unpredictable working time might be unfavourable for women looking for a reconciliation between work and household responsibilities, depressing their propensity to bargain on monetary incentives. Moreover, in these workplaces, discrimination is likely to self-propel as employers may anticipate lower performance by women in jobs with low possibility of reconciliation with family needs. This situation may be particularly evident in firms with strong digital and ICT-related investments, in which women are largely under-represented and jobs are characterised by volatile and changing working hour arrangements. Differently, contexts open to investments in competences and training, and more generally to investments in organisational capital, which includes for example expenditures in management consulting and human resource management practices, might favour a narrowing of gender pay gaps through IPSs and limit discrimination practices.

In conclusion, **IPSs can influence gender pay gaps depending on their technological intensity and digitalisation propensity**, highlighting the need for arrangements to improve the allocation across genders of unpaid work, as suggested by the Work-Life Balance Directive (European Commission, 2022) and the role of training as an anticipatory tool to mitigate the potential negative effects the disruptive technologies may have on gender wage inequalities.

National tax and benefits systems mitigate the effects of automation on income inequality

Doorley et al. (2023) studied the impact of robot penetration on income inequality in 14 European countries between 2006-2018, a period of rapid robot diffusion especially in main manufacturing countries. They results align with existing evidence suggesting that, similarly to the US case (Acemoglu and Restrepo, 2020), automation reduced hourly wages and employment. This effect, however, is heterogeneous across European countries and particularly concentrated in Western Europe, while the effect seems non-existent in Eastern Europe. Lower labour costs can in fact make the opportunity costs of robot adoption significantly higher in Eastern European countries, thus discouraging their diffusion. Importantly, automation may not only depress the number of jobs, and of the related wages, but also the way in which income is distributed in the society, i.e. household income inequality. This inequality effect of automation was detected in the European countries analysed, but, fortunately, small in magnitude. This relatively positive result has two main explanations:

- first, **the job displacement and wage compression effects due to automation are small in magnitude.** Especially in Western Europe, where labour market effects are found more sizeable, automation hit least educated workers, and coupled with considerable compositional effects, i.e. the decrease in earnings for some sociodemographic groups were partly offset by the increase in earnings of others;

- second, and most relevantly, **the role of welfare states proved to be effective to cushion wage and employment shocks, through the tax and benefit systems.** Especially in Germany, Belgium, and Sweden, benefits (more than taxes) absorbed wage and employment shocks caused by automation. In Eastern Europe instead, welfare states were not similarly effective in mitigating automation-driven shocks; in fact, the demographic groups that benefited from automation-driven shocks received more transfers than those groups that suffered from these shocks, thus amplifying inequalities. Yet the small economic size of the automation shocks in these countries made this household income inequality effect negligible.

In conclusion, the observed increase in inequality documented in many European countries between 2006 and 2018 is mainly **due to other market income changes or shifts in tax-benefit systems unrelated to automation rather than to automation itself.**

Recommendations

The technological transformations taking place in modern economies and society are deemed to play a role in widening existing (and emerging) inequalities. Until now automation had, in terms of magnitude, modest effects; however, it is hard to exclude more sizeable effects in the future when automation will be more intense, also in Eastern European countries, thus calling for ambitious preventive policies. Digitalisation, in particular, has already started unfolding its unbalanced effects across different regions and population groups, with especially adverse effects for the most vulnerable workers. The complexity of this scenario requires then multiple types of interventions at different policy levels to curb the rise in inequalities.

Infrastructure

The strong network nature of the technologies at the base of the present transformation requires an alignment of national initiatives, especially within the EU, in order to improve its positioning in the technological global competition, to speed the progress towards the completion of the Digital Single Market, but without threatening further the internal social and territorial cohesion.

A capillary digital infrastructure across the whole EU is a prerequisite for the diffusion of digital services also in remote areas and for their accessibility to all population groups, including the most fragile and marginalised ones as much as to the (expanding) elder population. In this respect, the EU has taken a virtuous path. In fact, both the NRRPs (National Resilience and Recovery Plan) in the frame of the NextGenerationEU funding scheme and ESIF (European Structural Investment Funds) are earmarked to the development of digital networks, technology and skills and the completion of the Digital Single Market. These actions are crucial to the implementation of the EU Digital Strategy and the achievement of the targets set for the upcoming years in the Digital Decade for the EU as whole and for each single Member State, according to national Digital Decade strategic roadmaps due by October 2023.

Skills

The digitalisation transition, however, requires complementary interventions that are not limited to the provision of infrastructure. The widely documented rise of inequalities suggests that there might be necessary actions to offer some safety net to those workers and individuals most hit by the diffusion of the new technologies. Given the complexity of the emerging scenario, a mix of actions will probably be most appropriate, targeting **education and training** on the one hand, **securing quality jobs** on the other, while ensuring the equitable distribution **of the benefits stemming from innovation** (Autor et al., 2021). While "this is more easily written than done effectively" (Johnson, 1997, p. 53), the EU has already set up a policy framework to proceed in this direction through the NRRPs and ESIF, requiring dedicated efforts for their effective implementation.

Adapting educational programs, at all school levels, is certainly key to equip new generations of workers with skills, competences and attitudes that will become dominant in the near future. The digital and automation waves will possibly make those competences necessary to accomplish routine tasks, both cognitive and manual, somewhat unfit. Differently, the new technologies will value those skills and competences necessary for accomplishing non-routine tasks, requiring **creative thinking, relational intelligence and negotiation**, in which humans still maintain a competitive advantage over machines (and will for the foreseeable future).

Retraining and upskilling will likely be the areas in which most efforts are needed to adapt the existing labour force. It is in fact necessary not only to prepare the future working generation but also to make the current ones adapt to the rapidly evolving business needs and use the evolving technologies effectively.

Educational systems are predominantly public in most European countries. Their adaptation therefore requires a **strong national public commitment in terms of funding** and, hopefully, some basic alignment at the EU level. NRRPs, now in the early stages of implementation, represent a unique occasion to achieve this goal and deserve, therefore, tight monitoring of their progress in this direction. Training, retraining and upskilling, however, remain crucial to ensure that everyone can exploit digital opportunities and no one is left behind, as posited by the Digital Decade policy programme. The high heterogeneity of national contexts and of the emerging needs of the different economic sectors in response to digitalisation will require a mix of options, from **sectoral training programmes** (Katz et al., 2020), **to vocational training and education (VET) programs, building on strong partnerships between government, unions, employer associations and other social partners** (Thelen and Ibsen, 2020), educational and training institutions and purely **private actors' investments**, not least to develop new and flexible offers of further education and training. The definition of national Digital Decade strategic roadmaps, due by October 2023, setting clear targets and key performance indicators to monitor the progress towards the achievement of the overarching goals of the Digital Decade, can offer an opportunity in this regard.

Jobs

The digital transition might imply an adjustment phase, possibly generating opportunities, but might also (probably) degrade the conditions of many, in absence of policies preventing the negative impacts, with further risks to democracy and European cohesion. According to OECD (2019), **the growth of unusual forms of works and contract types**, different from the standard full-time employment contract of indefinite duration, has been particularly sustained in the last couple of years. Temporary and casual contracts, i.e. gig jobs, are frequently associated with the emergence of platform works. Flexibility of contracts can show some advantages for both employees and employers. However, serious concerns about the **quality of jobs, fair competition on markets and across places, challenges to the social protection systems** have been frequently expressed (Eurofund, 2016), warning about the implications and responsibilities of the digital economy to workers and society, e.g. by turning undeclared work into declared work. In particular, the digital economy should not become a fast route to go back to 100-year-old labour relations problems with the effect of facilitating avoidance of social security and tax obligations. **Good pay, labour market security and a decent working environment** are according to OECD basic principles to ensure jobs of acceptable quality that further support skill upgrading, creativity and voice in the workplace. **Minimum wage regulations, unemployment insurance schemes, unionisation, active and training-oriented labour market policies** represent all possible and complementary directions for action (Autor et al., 2021). These policy areas are direct member states competences. Yet the EU can devise and provide some guidelines and framework with the goal of promoting harmonisation and of preserving fair competition as much as the mobility of people and capitals in the Single Market. The proposal for the minimum wage directive, adopted in October 2022, moved in this direction, consistent with Principle 6 of the European Pillar of Social Rights.

Institutions for innovation

The future of jobs will reside in the new occupations and industries, mainly being created by the new technologies. Most of today's jobs did not exist 50 if not 40 years ago (Autor et al., 2022). How and where the new technologies and innovation flourish will significantly affect the amount and the geography of future jobs. **The pace of technological progress will affect the pace of job creation and will increase the chance that job creation will outweigh the job losses due to automation.** Where the new technologies will be created and finally adopted will shape the fortunes of places (Capello and Lenzi, 2021), opening opportunities also for technologically less advanced areas. **Funding for research and innovation**, therefore, will play a critical role not simply to maintain a technological and scientific edge, but also to seize the opportunities for new businesses and jobs creation. The enlarged and enriched Horizon Europe Programme is the EU innovation policy flagship initiative with a strong focus on basic and applied science, especially aimed at targeting societal needs. In synergy with other programs, and particularly with the NRRPs and ESIF, through the development and the implementation of regional Smart Specialisation Strategy, it aims at strengthening the European Research Area, boosting productivity and closing territorial gaps. The complementarity with national research policies will remain crucial to maximise the returns from the investments undertaken at the EU level. Importantly, **research and innovation policies should become complementary to adoption policies, without one crowing out the other.** Especially for some less-developed regions, in fact, smart adoption policies could facilitate the digital transition more that investment in basic technology development (Camagni and Capello, 2013).

Conclusion

Growing inequalities are a reality in the European context. Project UNTANGLED has contributed to raising awareness about some of their potential causes and their potential mitigating conditions, and to highlighting the places and societal groups most likely affected by the rise of different types of disparities. **The results of Project UNTANGLED clearly emphasise the important and renewed role of policies and business practices** to mitigate, and hopefully to prevent, the most harmful inequality consequences of the major contemporary trends in order to avoid further marginalisation of people and places and transforming them into people and places that do not matter (Lenzi and Perucca, 2021). The EU has set up a broad policy framework to fight inequalities and a far-reaching set of initiatives in multiple domains, including (technology) infrastructure, education, social and innovation policies. Through NRRPs, the NextGenerationEU program and ESIF, the EU has also undertaken an unprecedented financial effort to make the Union, its countries, regions and people better equipped to face the multiple challenges it is confronted with. The capacity of national and regional governments to boost the alignment and synergies with this policy approach will remain fundamental to unlock the potential for equitable growth throughout the Union and to reverse the expanding geography of (political) discontent emerging in response to diffused inequalities and under-development traps (Rodriguez-Pose et al., 2023).

Further Reading

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About UNTANGLED

UNTANGLED is a three-year interdisciplinary Horizon 2020 research project that seeks to examine the inter-connected 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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