THE EUROPEAN SOCIAL MODEL IN THE AGE OF AI

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Abstract:

The European social model (ESM) has been a pillar of the European Union, balancing economic growth with social justice. Yet, the emergence of digitalization and artificial intelligence (AI) is fundamentally transforming labourmarkets, welfare policies and social protection. This paper explores the impact of AI on the ESM, with particular attention to job creation and displacement, digital skill gaps, and changing welfare architecture. The methodology is based on a qualitative policy analysis and labour market data from the Eurostat and European Commission sources. The study analyses the ways in which AI-led changes will influence job losses, skills mismatches and the sustainability of the systems of social security. The results emphasizethe importance of proactive regulation, investments in digital literacy, and regulatory measures to enable AI to drive inclusive economic growth rather than increasing inequality. The recommendations include lifelong learning, adapting welfare systems to new forms of work and responsible governanceof AI.

Keywords: European Social Model, Artificial Intelligence, EU Labour Market, Social welfare, Digital Skills.

Introduction

The European Social Model (ESM), characterized by its commitment to social protection, strong labour rights, and inclusive growth, faces both challenges and opportunities in the age of Artificial Intelligence. With the rapid advancement and spread of AI technologies to the full range of economic activities and society, the foundations of ESM come under pressure and there is a need for an all-encompassing reorientation of the principles and policies (Essen & Ossewaarde, 2023). The advent of AI offers transformational possibilities to boost productivity, deliver better public services, and tackle societal challenges but it also poses potential threats, such as job displacement, growing inequality, and declining social cohesion (Hassan, 2022).

This paper's objective is to explore the impact of Artificial Intelligence on the key spheres of the European Social Model – namely onlabour markets, social welfare and social protection systems. It focuses on the transformation of the relationship between technological changes and social policy in the EU by evaluating the manner in which AI disrupts established welfare and labour models.

AI and job displacement and transformation

AI is expected to drive a significant transformation in the labour market with deep disruption of processes and skills demand. AI automation, which has the potential to enhance productivity and efficiency in almost all industries where labour is an input, however, also creates fear of mass unemployment, at least for routine skilled workers (Sun, 2025). The extentand distribution of these effects are likely to differ by sector and location, with some losing more jobs and others generating more new positions and opportunities (Patil, 2024). In addition, the jobs of the future increasingly demand an agile and digitally skilled workforce. In orderto deal with these challenges, pro-active measures, structured around investment in education and training, promotion of lifelong learning and development of social safety nets to assist workers in moving to new roles and adjusting to the changing needs of the labour market will be required (European Commission, 2024). Itis equally important to think about the ways in which AI might enhance human capabilities and open new opportunities for human - AI partnership in a more inclusive and beneficial work environment.

AI-driven automation is happening during a time of rising economic inequality and fears of mass technological unemployment, and it is prompting renewed calls for policy responses to the effects of technical change (Frank et al., 2019). One of the keyways in which AI is reshaping society is by re-mapping economic opportunities and income potential (Klinova and Korinek, 2021). The effects of AI are more than just job displacement but also include changes in the nature of work, job quality, work autonomy, and in the work relationship. The first era of globalization essentially hit manufacturing jobs, whereas today, AI, robotics and data processing will affect jobs in the entire skills spectrum (Arslan et al., 2018). Furthermore, the emergence of AI and automation has raised the issue of whether economic power will be mono-polised by a few tech giants and thus what that implies for a market competition and wealth distribution (European Commission, 2024). On the other hand, the application of AI in a range of sectors, such as automotive and advanced manufacturing via robotics, can reinforce the competitiveness of the EU if the AI development process is made a priority (European Commission, 2024).

The introduction of AI in the workplace can make human workers redundant as tasks can be automated more easily (European Commission, 2024).

But it also raises concerns about work skills. AI-based automation can replace workers in many industries. Nevertheless, it can open new job opportunities in the development of AI, data science and maintenance of AI (Arslan et al., 2018). The impact of automation is particularly stark in the retail sector, which has a high automation potential, but also has a large workforce.

Data shows that enterprises in the EU have been marking a growth in AI use year over year. This is in line with wider trends of digital transformation and increasingawareness of AI's potential for increasing efficiency, productivity and improvements in decision making. Larger firms are consistently more likely to use AI than small firms (Figure 1). The reason forthat is that they have more financial, technological and human capital at their disposal to implement AI.

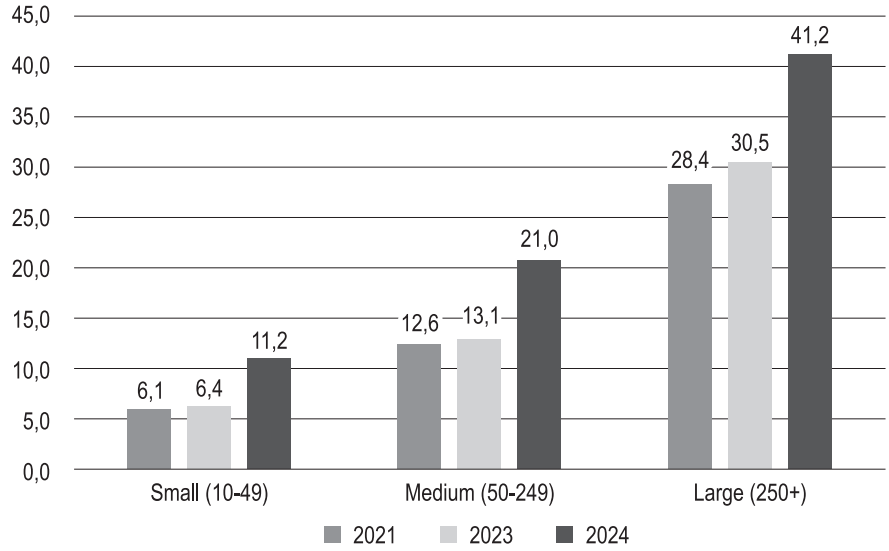

Figure 1. AI usage in the EU (by enterprise size, % of enterprises of each type) in 2021, 2023 and 2024*

Source: Author with data from Eurostat (2025a)

The adoption gap between the small and large enterprises indicates the need for a differentiated SME-focused public policy to develop digital and AI capabilities. It is also clear that sustained digital skills, training and infrastructure investment are necessary to sustain inclusive growth.

Therefore, re-skilling and upskilling programs are particularly important to prepare the workforce, supporting them in finding new positions in new sectors. The adoption of methods and approaches concerning the re/up-skilling of workers is one of the focuses of organisations that want to fit themselves in

* Data for 2022 is not available

the new work and organisational forms (Morandiniet al., 2023). Governments, schools, and businesses will need to invest in workforce development in order to bridge the gap in skills, and also to make workers more adaptable as AI continues to transform jobs (Patil, 2024). On the one hand, supporting firm innovation and productivity, along with investment in workers, are positive responses to the rapid technological change (Arslan et al., 2018). In that sense, digital skills are a prerequisite for building skills in digital technologies, but they are also facilitating their uptake (European Commission, 2024).

In an environment where AI landscape is evolving, emphasis will be placed on workplace learning and life-long learning, where workers will have access to the possibility of learning new skills or knowledge throughout their career. Even if the net effect on employment is positive, however, technology can create distributional risks including labour market polarization (Arslan etal., 2018). Wealth disparity, job polarization and quality of life are socio-economic aftermaths of implementing AI (Patil, 2024). Hence, the organizations have to address significant challenges like how to lead employees toward change, how to manage the cost of training or how to manage fairness and inclusion brought by age, gender and cultural diversity (Morandini et al.,2023).

To support suchtransformation, organizations must employ a proactive approach to navigate the AI-driven transformation at the workplace (Morandini et al., 2023). This includes labour market skills mapping against the skills that are required today to addressthe current skills gap, supporting workers to develop their skills to adopt AI and their training and skills development. Transversal skills, such as creativity, flexibility, emotional intelligence and critical thinking, are increasingly required to compensate for the fact that workers have to supplement the development of technical skills to manage an environment that is more and more dominated by technology (European Commission, 2024). These actionswill help to create a workforce equipped to face the opportunities and challenges of AI in the workplace. Governments can helpbusinesses by providing financial support and other support measures to help businesses adjust.

AI and social welfare systems

The European Social Model is characterized by comprehensive social security and welfare systems that provide a safety net for citizens, ensuring access to healthcare, education, unemployment benefits, and other essential services. These have been instrumental in the fight against poverty and inequality, as well as inbuilding social solidarity and citizens' confidence and security in a good life. In 2023, the highest share of general government expenditure across the EU member states was reported in social protection. The share of GDP spent onsocial protection was, however, widely different across countries. 6 EU member states (Finland, 25.7 %; France, 23.4 %; Austria, 21.4 %; Italy, 21.1 %; Luxembourg, 20.2 %; Belgium, 20.1 %) spent

over 20 % of their GDP on social protection. In comparison, in Ireland (8.1%), Malta (9.7%), Hungary (12.3%) and Romania (12.8%) less than 13 % of their GDP per inhabitant was used for this purpose (Eurostat, 2025b).

The approaching AI revolution raises questions about the future of social security and welfare systems. AI could eliminate jobs,which mean higher unemployment and less payments to social security system (European Commission, 2024). At the same time, AI is likely to facilitate new revenue-generating possibilities, including taxes on AI-enabled activities, as well as new industries and services.

The European Social Model is based on the principle of providing its citizens with full social protection, including unemployment protection, health-care protection, and retirement protection. The increasing prevalence of AI technologies could place pressure on these social welfare systems, for instance in response to greater numbers of redundancy-based claims for unemployment benefits, or to changing healthcare costs as more diagnostic and treatment services are automated, or to the robustness of pension systems given the current demographic and employment trends. AI can also reinforce the existing inequalities in access to social services, because some people may encounter obstacles in using AI-enhancedplatforms or may not have such a good understanding of digital technologies. AI could exacerbate income and wealth inequality if proper policies are not put in place (Arslan etal., 2018).

Policies must address the risk of AI exacerbating inequalities. The intermediary of this is upskilling and re-skilling of workers for new-profile roles generated during the transitions (Rane et al., 2024). These mechanisms are beneficial in helping countries adapt to changes induced by trade and technological progress (Arslan et al). In order to avoid market concentration, the benefits of increased productivity should be distributed through profit sharing, capital taxation, and reduced working time, and new regulations of the digital economy will be required (Andrews et al., 2021). The private sector remains the critical source of demand, andgovernments need to ensure that jobs and higher productivity go together to foster more startup activity and competition (Sood and Khanna, 2024). There is the prospectthat AI-led creativity could drive productivity and economic growth but also create deeper the existing inequalities. The policy should be adjusted to overcome income and wealth gaps and employmentpolarization caused by AI adoption (OECD, 2024). In addition to those two measures, governments and policy makers have to take active steps to address the destructive effects of AI and automation on employment.

AI systems may also help to enhance the effectiveness and efficiency of social security and welfare programs, for instance bydecreasing the time needed for administrative processing, targeting benefits more accurately, and identifying fraud (Zajko, 2022). However, the use of AI-based systemsin social welfare administration is concerned from an ethical perspective regarding

privacy of data, algorithmic biases, and the risk of discriminatory decisions. It is important to develop strong regulatory frameworks and ethicalprinciples that govern the use of AI in social welfare to guarantee the transparency, responsibility, and rights-based principles in the designing of such systems. What is more, algorithmic welfare andhiring also raise the issue of having a means to contest the AI decisions in order to guarantee fair play. The integration of principles of social justice, equity and inclusivity into the development of AI is important to ensure that society does not perpetuate social biases and inequalities (Vargas, 2024).

AI's potential impact on social protection

The European Social Model traditionally has provided a robust system of social protection from various risks including unemployment, illness and old age. Yet, the emergence of AI has brought new challenges to these systems, such as job automation, inequality, and social exclusion. The nature ofwork is changing, and traditional forms of social protection are no longer sufficient and need to be reformed to remain relevant and effective. As a result, policy must consider the long-term impact of technological progress on the labour market and re-adjust social protection systems to deal with the new challenges.

One option is to extend social protection to embrace new forms of work, such as gig and platform-based work that are on the rise in the digital economy (Moraliyska, 2021). These novel types of work frequently escape from classical labour laws and social protection systems, leaving workers increasingly exposed to economic uncertainty. Another option is to explore radically new ways of social protection, like universal basic income or negative income tax that provide a buffer for all citizens, regardless of whether they arein work or not. These policies would help tospread the benefits of economic growth more fairly. In addition, the social protection systems need to be designedin an active way to enhance a high degree of labour market participation and to stimulate workers to upskill and reskill during their professional life (Bode and Gold, 2018).

Governments need to promote active labour market policies, such as job search assistance, training, and employment-support, to facilitate the transition of workers to new jobs and to adapt to the new demands of the labour market. Wage insurance could help workers adjust to job loss, in combination with unemployment benefits and workforce support services (Holzer, 2019). They can also consider options like unemployment insurance, job search assistance, and retraining to ensure workers have the tools to transition to other jobs. These should be policies targeted at working people across their working lives, enabling workers to gain, retainand regain the skills necessary in an age of digital-economy change. Competition policy should also deal with practices impeding labour mobility across firms, such as the non-compete and no-poach agreements (European Commission, 2024).

The integration of AI into the workplace also raises concerns about algorithmic bias and discrimination. Biases present in data can be perpetuated and even amplified by AI systems, producing biased hiring, promotion andperformance review decisions. To guard against these risks, it is necessary to ensurethat engineering with AI is transparent, accountable, and discrimination-free. Businesses would do well to adopt methods for the fair development of AI,regularly checking to ensure their systems are free from bias. Furthermore, governments should establish clear legal and ethical guidelines for the use of AI in the workplace to protect workers from discrimination and ensure fair treatment (Bernhardt et al., 2022).

The EuropeanUnion has tackled these challenges through, inter alia, the promotion of the Artificial Intelligence Act, designed to provide a legal framework for the development and use of AI in Europe. Moreover, policymakers need to guarantee thatthe social partners – trade unions and employer organisations – are included in the processes of the formulation and implementation of AI policies to safeguard workers' rights and foster social dialogue (Stefano & Taes, 2022).

Ethical considerations of AI application

The growing dependence on AI technologies provokes serious ethical and societal issues that need to be resolved to ensure the responsible construction and deployment of AI. As mentioned above, algorithmic bias, originating from prejudiced data or algorithm development, can lead to prejudiced outcomes in social-sensitive applications like hiring, financial gadgets, and justice. This can exacerbate the disparities in the society. In addition, the opacity running through many AIsystems – commonly known as the „black box" problem – works against transparency and accountability thus hampering efforts to retrace the decision-making issues or identify potential errors and biases.

In addition to that, the power of AI to process personal data raises concerns for data privacy and personal rights. It is vital to guarantee the privacy and security ofdata in data collection, storage and application, in accordance with regulations and ethical standards. Focusing on algorithmic discrimination, data collection andpreparation as well as algorithm design and iterative monitoring and evaluation, are critical to ensure the fairness and accuracy of a system (Chu et al., 2023). Explainable AI and algorithmic audits are crucial for enhancing understanding and monitoring AI systems (Cheong, 2024). The convergence of ethical guidelines emphasizes the importance of transparency, justice and fairness, non-maleficence, responsibility, and privacy (Curto and Comim, 2023).

It is necessary to develop clear accountability frameworks that assign responsibility for the decisions and actions of AI. This ranges from legal and regulatory frameworks addressing liability in case of AI harm, as well as ethical

guidelines for design, developmentand deployment of AI systems (Dhopte and Bagde, 2023; Elendu et al., 2023). Ensuring thatthe public may trust AI would involve transparency and interpretability of AI systems to citizens, so that people can understand how AI decisions are taken and challenge them (or request accountability) when necessary (Choung et al., 2022). Interdisciplinary collaboration will be key to providing for transparency and accountability by redefining legal accountability andmaking AI-based decision-making consistent with stakeholder values (Mukherjee and Chang, 2025).

In addition, joint initiatives involving governments, industry, academia, and civil society are needed to define common ethical principles and best practices for the development and use of AI (European Commission, 2024). The development and deployment of AI systems must prioritize fairness, equity, and inclusivity, ensuring that AI benefits all members of society and does not exacerbate existing inequalities (Radanliev, 2024). Regulations are needed to ensure AI systems are equitable to all members of society (Sun et al., 2024). Continuous review and assessment are necessary toidentify and correct such biases (Sun et al., 2024).

In general, the potential for AI in solving longer-term issues like climate change, food security etc., depends on political solutions and global coordination (Loeff et al., 2019). Governments and businessesneed to invest in education and skills training to give people the tools they need in the AI age to be a digitally literate society.

Conclusion

The European Social Model faces significant challenges in the age ofAI, yet it is also well placed to evolve and prosper. Through the adaption of new technologies (such as algorithms that do not allow discrimination), fostering social dialogue, investing into skill and vocational education and further initiatives like education and social policy, Europe can ensure that AI benefits everyone equally, so thatno one is left behind (Cabral, 2020).

To ensure that social welfare programs remain effective and sustainable in the era of AI, policy makers should consider reforms that adjust to the changing conditions for the population (e.g. access to retraining programs), new ways of financing social security initiatives, and respond to the digital divide that results from the unequal distribution of digital technology and its benefits.

Governments should develop social protection policies that are responsive to the nature of work, which now includes gig work, and more temporary or non-standard forms of employment. They could include the provision of portable benefits, the extension of social security coverage to independent contractors and the generation of new kindsof social insurance that are more adapted to the 21st century's labour force.

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