Technology, Globalisation and Migration

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Interconnected Challenges for Inequality and Skills

Edited by

Steven Dhondt

Professor, Centre for Sociological Research (CeSO), Belgium; Senior Research Scientist, TNO, the Netherlands

Ulrich Zierahn-Weilage

Associate Professor, Utrecht University School of Economics, the Netherlands

Leire Aldaz Odriozola

Associate Professor, University of the Basque Country (UPV/ EHU), Spain

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Contributors

Ane Aizpurua Esnaola is a PhD student in Economic Integration and a researcher at the University of the Basque Country (UPV/EHU). Her PhD thesis mainly focuses on the analysis of occupational segregation by origin and gender in the EU labour market, as well as its determinants. Concurrently, it studies the impact of migration on the native workforce.

Mehtap Akgüç is a senior researcher in the research department of the European Trade Union Institute (ETUI) in Belgium and a research fellow at the Institute of Labor Economics (IZA) in Germany. Her work primarily explores labour market dynamics, with a particular focus on the impacts of the green and digital transitions, migration and mobility, work reintegration after long-term absence due to chronic health conditions, evolving jobs and skills trends, and development economics.

Cinzia Alcidi holds a PhD in Economics and is a senior research fellow at the Centre for European Policy Studies (CEPS) in Brussels. Her main research interests are EU economic policy, economic governance, and labour economics, with a significant focus on EU policies.

Leire Aldaz Odriozola holds a PhD in Economics and is an associate professor at the University of the Basque Country (UPV/EHU). Her research focuses on the impact of migration on the labour market. In particular, she investigates the causes and consequences of occupational segregation by origin, including a gender perspective.

Tore Bersvendsen is a senior economist at Drammen Municipality and a researcher at the University of Agder. His PhD in Economics focused on health economics and examined the effects of a rehabilitation intervention for older people. He has conducted numerous internal and external analyses of the municipality sector.

Terese Birkeland is a postdoctoral researcher at the University of Agder, Norway. Her background is in political science with a specialisation in

European integration. Her research focuses on how public administration and policymaking across sectors and levels shape policy outcomes, particularly climate and energy transition.

Steven Dhondt is a professor at KU Leuven (Belgium) and a senior researcher at TNO (Netherlands Organisation for Applied Research). In 2023, he co-edited the book *A Research Agenda of Workplace Innovation* (Edward Elgar Publishing) and, in Dutch, one on technology and work (*Robots in search of colleagues. Artificial intelligence and impact on work*, Lannoo, 2022). He is also the co-editor of a sociological analysis of the punishment of collaborators in Belgium (*Undigested Past*, Kritak, 2023). He writes about technological change and its impact on work and the sociology of law.

Begoña Eguía Peña holds a PhD in Economics and is an associate professor at the University of the Basque Country (UPV/EHU). Her main research interests are the distribution of population across territories and the interactions between demography and economy. Specifically, she investigates the immigrant population and its integration into the labour market.

Michael J. Handel studies the impact of technology on employment, skill requirements, wages, and inequality, including automation risk from AI and the future of work. He has held positions at the OECD and U.S. Bureau of Labor Statistics and served as faculty in the Sociology departments of the University of Wisconsin—Madison and Northeastern University in Boston, MA. He is currently a Research Professor at the George Washington Institute of Public Policy. Michael J. Handel received a Ph.D. in Sociology from Harvard University.

Gerben Hulsegge is a researcher at TNO (Netherlands Organisation for Applied Research), studying technology and digitalisation in relation to the labour market. His research primarily focuses on how technological advancements affect workforce employability, job quality, and company competitiveness. He also develops and evaluates innovative solutions to tackle challenges emerging in these areas. He has co-authored book chapters in publications such as *The Research Agenda for Workplace Innovation* (Edward Elgar Publishing) and contributed to journals like the *Journal of Innovation Management*.

Hans Christian Garmann Johnsen is a professor of working life research at the Department of Economics, University of Agder, Norway. He has a background in economics and political science and holds a doctorate from CBS, Copenhagen, Denmark. He has published extensively in the field of innovation

and working life research. He has taught philosophy of science at various European universities for many years. He is currently involved in two EU Horizon projects: GI-NI and BRIDGES 5.0. His latest book is *Science meets philosophy: What makes science divided but still significant?* (Routledge, 2023).

Pascal Kampert is a data scientist and labour market researcher at TNO (Netherlands Organisation for Applied Research). His work focuses on the effects of technology on work on an individual worker level (augmentation, human-centric technology) and labour market effects on a macro scale, such as skill demand changes, influence of AI on employment demand, and socio-economic inequalities.

Jon P. Knudsen is a professor of Human Geography at the University of Agder. He holds a PhD from Lund University. Knudsen has written extensively on culture, innovation, and regional policy. He has recently served as a member of the Norwegian Committee on Skill Needs and was also a member of the expert committee preparing the Norwegian 2020 Regional Reform.

Bart Los is a full professor of Economics at the University of Groningen. His research mainly revolves around the following themes: international trade; input-output analysis; innovation and technology diffusion; and productivity growth. He has (co-)authored articles in journals like the *American Economic Review*, *IMF Economic Review*, *Journal of Development Economics*, and *Journal of Economic Perspective*s, among others. In 2020 and 2022, he was identified as a Highly Cited Researcher by Clarivate.

Laura Nurski holds a PhD in Economics and is Head of the Future of Work Programme at the Centre for European Policy Studies (CEPS). Before joining CEPS, Laura worked as a data scientist and organisation design researcher. She investigates the interplay between people and technology in jobs, teams, organisations, markets, and societies. She specialises in the impact of artificial intelligence on the nature, quantity, and quality of work.

Victor Medina Pierluisi is a research assistant at Utrecht University School of Economics (The Netherlands). He is completing a MSc in Economics at the University of Amsterdam and a MSc in Econometrics and Data Science at the VU Amsterdam. His research interests involve technological progress and innovation, and the effect that these have on the labour market.

Emilie Rademakers is an assistant professor at the Utrecht School of Economics and an affiliated researcher on Boston University's Technology and Policy Research Initiative. She completed her PhD at KU Leuven with a PhD Fellowship from the Flemish Research Foundation (FWO). Her research interests include the implications of technological change for growth, inequality, individual worker careers, job search, and online platforms. In addition, she works on imperfect competition in the labour market.

Balázs Reizer is a senior research fellow at HUN-REN CERS (Hungary) and an associate professor at Corvinus University Budapest (Hungary). His research interests include the impact of technological advancement on firm growth, wage disparities, and employment opportunities at varying skill levels. Additionally, he contributes to the assessment of social security reforms.

Majda Seghir is a senior research fellow at the Conservatoire National des Arts et Métiers (France), contributing to research on labour market dynamics. Her work focuses on key areas such as job quality, the mismatch between workers' skills and job requirements, and the impact of migration on labour market outcomes.

Marcel Smolka has been a full professor of International Economics at the University of Flensburg since 2019. Before joining Flensburg, he was an assistant professor in the Economics Department at Aarhus University (Denmark). Since 2018, he has also been a member of the CESifo Research Network in Munich, and since 2024, he has been a member of the International Economics standing field committee of the Verein für Socialpolitik. His research interests lie within international economics, especially international trade, multinational firms, and migration. His research has been published in leading academic journals in economics, including the *Economic Journal*, the *Journal of International Economics*, and the *European Economic Review*. It has been awarded prizes from the Royal Economic Society (RES), the Nottingham Centre for Research on Globalisation and Economic Policy (GEP), and the Ruhr Graduate School of Economics (RGS Econ), among others.

Ulrich Zierahn-Weilage is associate professor of Economics and Data Analytics at Utrecht University School of Economics (The Netherlands) and Research Associate at the ZEW (Leibniz Centre for European Economic

Research) in Mannheim (Germany). His research focuses on the consequences of digitalisation and globalisation for the dynamics of individual labour market careers and for the economic performance of regional labour markets. Moreover, he investigates the effects of agglomeration of economic activities on the disparities between regional labour markets.

Preface

Michael J. Handel and Mehtap Akgüç

The past 35 years have witnessed the fall of communism in Europe, the expansion of the geographic and economic scope of the European Union (EU), tectonic shifts in the global division of labour, the growth of China to superpower status, increasing demographic diversity within advanced economies, and transformations in work and everyday life due to successive waves of information and communication technologies. These epochal shifts have also included rising inequality within and between many countries, uneven growth across them, and the visible decline of previously key regions as deindustrialisation has undermined the economic base, living standards, and cultural identities of once-thriving areas.

The first 25 years of the postwar period seemed to promise a degree of certainty and stability. Economic growth was relatively strong and steady, and a newfound prosperity was widely shared. The economic crises of the 1970s and 1980s were dividing lines. Most countries' experiences since that difficult period have been more positive, but the earlier sense of steady progress and widely shared gains did not return. The end of the golden age of capitalism ushered in an unsettled situation that never crystallised into a stable new model. Although neo-liberalism was widely promoted from around 1980, its limitations became apparent around 2000 and especially after 2010 with the rise of populism. Articulating a new model of growth and shared prosperity is the central task today, made even more urgent by recent political events in the United States and elsewhere that are dissolving many of the remaining institutional pillars of the postwar order.

The GI-NI project sought to address three of the most important long-run destabilising forces: the growth of automation and other computer technologies, globalisation, and migration. From an international perspective more broadly, the challenges of globalisation, technological disruption, and migration are deeply intertwined with broader issues of inequality. While many advanced economies have reaped the benefits of globalisation, the others – mainly the Global South – often face exploitation in the form of unequal trade relationships, limited access to technology, and a continued reliance on low-wage

labour, despite significant improvements in all these areas in some countries. These disparities contribute to regional inequalities, where certain countries and regions in the Global South remain dependent on resource extraction and low-value-added manufacturing, making it difficult for them to transition to more diversified and high-skilled economies.

Even after years of research, there continue to be fundamental questions regarding the implications of all three forces. Automation replaces human labour for certain jobs, but there is great uncertainty over the rate at which jobs are replaced and the degree to which they are offset by the spending freed up by the cost savings resulting from the new technology. Debates continue on the extent to which using information technology may increase or decrease job skill requirements. The degree to which automation or trade is responsible for the decline in blue-collar manufacturing jobs and industrial regions is debated, even as it is clear that manufacturing workers in less advanced countries in Europe, Asia, and elsewhere have benefited from free trade.

Likewise, international migration relieves labour scarcity, particularly in ageing societies, but language barriers and problems in receiving recognition of skills and foreign credentials often limit the full utilisation of migrants' capacities. Native workers sometimes fear wage standards will be undermined; there is a more general concern that migrants will have low upward mobility that will limit assimilation, and migrants may experience discrimination.

At the same time, existing migration patterns might lead to the phenomenon of 'brain drain', where skilled workers from lower-income regions or countries migrate to wealthier destinations in search of better opportunities, leaving their home regions with a shortage of talent, thereby further entrenching regional inequalities. In some cases, such population movements even result in depopulation in those regions, with the consequence of draining even basic public services and other amenities. This is not an unknown phenomenon in some peripheral regions of the EU, again with significant repercussions for the socioeconomic fabric and territorial cohesion.

On the upside, the reverse phenomenon of 'brain gain' is also prevalent, particularly in countries experiencing economic growth and a demand for skilled labour. Many developing countries, especially in Asia, have seen significant improvements in education and technology, leading to a brain gain as skilled workers return to their home countries or choose to work across borders within the Global South. Similar circular mobility is also observed in Europe, although often following some external shock, such as Brexit or the COVID-19 pandemic. However, these shifts are uneven and often limited to specific regions or sectors, meaning that inequalities within and between countries persist.

Coupled with these three major long-run and destabilising forces, the climate emergency and accompanying energy transition policies, while interacting

with the former three, have also been shifting the geopolitical, economic, and social context in their own ways. The interaction of energy transition, technological transformation, and globalisation has, on the one hand, tremendous potential to advance the green transition to remain within planetary boundaries and reach the emissions targets. However, existing climate-related injustices at a global scale, together with the 'new' trends of resource extraction among countries, remind us of the earlier infamous episodes of colonialism, again with significant concerns about their potential to exacerbate existing vulnerabilities, leading to further inequalities between and within countries. Last, but not least, the emerging phenomenon of climate-induced migration is ever more salient, creating both regional and international migration flows of people, who are often among the most vulnerable, with limited access to resources, social protections, or opportunities (e.g., to reskill) at the destination labour markets.

With such important questions remaining unsettled, there is an urgent need for clarification and for a reliable evidence base to use in the development of policy. The chapters in this book span the full range of issues associated with technology, globalisation, and migration, including skills, inequality, the transformation of work, regional convergence/divergence, and policy choices. They provide a solid foundation for the development of a new model of growth, shared prosperity, and social cohesion that is needed so urgently today.

PART I

Introduction

1. Inequality and skills: still the main social topics of our times

Steven Dhondt, Ulrich Zierahn-Weilage and Leire Aldaz Odriozola

INEQUALITY ON THE RISE; DETERIORATING SKILLS?

In an era marked by rapid technological advancements, intensifying globalisation, and shifting migration patterns, Europe faces major challenges in managing inequality and developing skills. This book delves into the intricate relationships between these forces, arguing that their combined impact necessitates a rethink of current policy frameworks. Recent years have seen significant technological breakthroughs, such as the rise of Large Language Models (LLMs), which act as major drivers of inequality, reducing opportunities for low-skilled workers while favouring high-skilled ones, and even threatening those with higher education. Geopolitical shifts have reshaped global trade dynamics, resulting in complex consequences for inequality and skill development. Their interactions with technology raise questions about mutual reinforcement or offsetting effects. Meanwhile, migration continues to be a contentious issue in European politics, with recent stringent legislation highlighting negative perceptions despite evidence of migration's overall benefits.

By integrating insights from economics, sociology, psychology, and political science, this book explores how these three forces interact within companies and labour markets and assesses policy responses from both European and global perspectives. It integrates research findings with the Green Deal (2019) and the new Clean Deal (2025) and addresses the implications of globalisation policies. Additionally, the book questions whether a new social contract is needed to address the consequences of these developments, examining global responses and the potential for a unified European approach. By investigating these themes, the book aims to provide a comprehensive understanding of the effects of technology, globalisation, and migration on businesses, labour markets, and policy, offering insights into future directions and necessary adjustments.

EUROPE'S PRESSING QUESTIONS

This book aims to confront one of the most pressing and provocative questions for Europe's future: How are technology, globalisation, and migration reshaping skills and deepening inequalities, and what does this mean for the very fabric of European society? It challenges the assumption that these forces, while transformative, can be easily managed through traditional policy approaches. While each of these factors – technology, globalisation, and migration – has distinct effects, their intertwined impact on Europe's labour markets, social structures, and political landscape remains dangerously underexplored.

The rise of technology has not just transformed industries; it has fractured labour markets, creating winners and losers in a highly polarised economic landscape. This polarisation is amplified by the intensification of globalisation, which pushes the boundaries of economic competition while deepening divisions within European societies. Migrants, in particular, often find themselves at the intersection of these forces, disproportionately facing the negative consequences of an increasingly divided labour market.

This book does not merely catalogue these challenges; it interrogates them. It dives into how the convergence driven by technology has led to fragile gains for European economies, while social outcomes lag far behind, failing to deliver on the promises of the European Pillar of Social Rights (EPSR). The analysis goes further to critique the assumption that Europe could maintain its competitive edge amidst these upheavals. In a stark warning to policymakers, it explores four divergent futures for Europe, each shaped by the uncertain trajectory of technology and globalisation.

By probing these dynamics, the book raises urgent questions: Will Europe continue to move towards social convergence, or will the inequalities within and between countries deepen further? Are current policy frameworks robust enough to tackle these seismic shifts, or do we need a radical rethink of how Europe addresses social and economic disparities? Ultimately, this book seeks to challenge policymakers, researchers, and society at large to confront the uncomfortable truth that Europe's future is not guaranteed – and that the time to act is now.

THE GI-NI PROJECT: AN INTERDISCIPLINARY ENDEAVOUR

This book integrates the findings from the GI-NI project. Launched in April 2021, GI-NI was conceived in December 2019 – a moment just before the COVID-19 pandemic, prior to the war in Ukraine, and at the inception of the European Green Deal. Since then, the world has undergone profound

transformations and, in 2025, the pace of change has only accelerated. These events are not just disruptions; they are part of broader, ongoing transformations that are reshaping economies, societies, and policy landscapes. Despite this rapidly shifting context, the GI-NI project was designed to move beyond the noise of daily events and instead focus on the deep structural forces shaping our time: technological change, globalisation, and migration. None of these forces has diminished in relevance. The rise of LLMs and artificial intelligence (AI) is redefining the future of work. Global trade dynamics are being rewritten amid escalating tariff wars and shifting geopolitical alliances. And, across Europe and beyond, migration has become a central issue in political debates, influencing electoral outcomes and policy directions. These three forces continue to shape economies and societies, making it more crucial than ever to understand their underlying drivers.

The GI-NI project is inherently interdisciplinary, bringing together economists, sociologists, psychologists, and political scientists to explore the intersections of these transformations. While much research has examined technological change, globalisation, and migration separately, little has been done to understand their combined impact on inequality and skills. The project has tackled this gap through an innovative mix of data analysis, scenario-building, foresight exercises, and expert engagement. Interdisciplinarity is not just a theoretical ambition; it is embedded in every stage of the research and policy process. The project has drawn on the expertise of an international scientific advisory board, fostering a continuous dialogue across disciplines. These experts, from diverse academic backgrounds and international contexts, have provided valuable perspectives that challenge conventional narratives and broaden our understanding of these transformations.

The research underpinning this book is based on rigorous economic, econometric, and sociological analyses across a diverse set of topics. The project has leveraged comparative cross-country studies, unique datasets combining surveys and administrative records, and even decades-old materials recombined for fresh insights. These efforts have allowed us to uncover patterns and dynamics that might otherwise remain hidden. But research alone is not enough. To ensure real-world impact, our findings have been tested and debated in engagements with national, European Union (EU), and international policymakers. The project has consistently sought to bridge the gap between academic research and actionable policy solutions through scenario-building, foresight studies, and direct collaboration with decision-makers.

This book presents cutting-edge insights that are deeply relevant not just to Europe but also to the global landscape. By linking rigorous academic research with policy innovation, it offers fresh perspectives that challenge existing approaches and inform future strategies.

The methodologies used range from advanced microeconomic techniques to macroeconomic modelling using input-output frameworks and sophisticated scenario simulations. This comprehensive approach ensures that our findings are not only robust but also relevant to policymakers navigating an era of rapid technological, economic, and social change. Most importantly, this work does not remain within the realm of academia. By integrating research findings into ongoing policy debates and stress-testing insights with real-world stakeholders, this book serves as more than a scholarly contribution – it is a roadmap for policy innovation in an age of transformation.

STRUCTURE OF THE BOOK AND APPROACH

This book is poised to set a new research agenda, compelling future studies to address the integration of multiple transformative forces – technology, globalisation, and migration – that are reshaping economies and societies. More than just an academic contribution, this book is designed to influence the shifting policy debate in Europe. The social dimension, long sidelined in EU policymaking, is now gaining critical attention. This book not only examines the European impacts of these transformations but also provides a bold roadmap for innovative policy approaches in the social domain. It challenges conventional thinking and offers a vision for the future of European social policy in the face of profound economic and technological change.

After this introduction (Part I), the book consists of three major parts: in Part II, we dive deeply into the three major challenges and their interactions. Part III develops policy responses to those challenges. The final Part reflects on the future agenda.

Part II – Three Transformations Reshaping Work and Inequality

This second part focuses on three powerful and interwoven forces – technological change, globalisation, and migration – that are reshaping economies, labour markets, and the distribution of skills in profound ways. Each of these transformations presents both opportunities and challenges, altering the nature of work, the demand for skills, and the structures of inequality within and across societies. This book delves into these transformations, exploring how technological advancements, global economic integration, and migration flows impact labour market outcomes and social inequalities. While each of these forces has long been studied in isolation, their cumulative and intersecting effects remain less understood. The chapters in this part offer a comprehensive analysis, drawing on cutting-edge research to examine how these forces evolve and interact in a rapidly changing world.

Technology: innovation or polarisation?

Technological advancements have always shaped the structure of labour markets, but the current wave of automation, AI, and digital platforms is redefining the very nature of work. This chapter investigates the evolving relationship between technology and inequality, tracing its historical patterns and examining contemporary disruptions. A key focus is on how emerging technologies – automation, robotics, AI, and the platform economy – transform job opportunities and challenge the traditional high-skill/low-skill divide. New skill requirements are emerging, job polarisation is deepening, and many occupations once considered stable are now at risk. The chapter critically assesses who benefits from technological change and who is left behind, addressing issues such as job security, skill mismatches, and economic mobility. While technology creates new avenues for productivity and innovation, it also risks exacerbating inequalities unless accompanied by proactive policies. The chapter concludes with a discussion on policy interventions, including education and training initiatives, labour market reforms, and technological governance, aimed at harnessing technological progress for inclusive economic growth.

Globalisation: a double-edged sword for skills and inequality

Globalisation has long been seen as a driver of economic growth and efficiency, facilitating trade, investment, and technological diffusion. However, its effects on labour markets and inequality are deeply uneven. While globalisation raises aggregate welfare, not everyone within a country benefits equally – some workers gain significantly, while others face displacement and declining job prospects. This chapter explores the winners and losers of globalisation, with a particular emphasis on how workers adjust (or fail to adjust) to changing trade patterns. The discussion centres on the role of trade in tasks, a defining feature of the modern global economy driven by internet-based information and communication technologies. As production processes become more fragmented across borders, workers face increasing pressure to adapt to a landscape where tasks, rather than entire jobs, are outsourced or automated. By examining who is most affected, how workers navigate these transitions, and what distinguishes those who successfully adapt from those who struggle, this chapter sheds light on the growing tensions surrounding globalisation. It also considers policy solutions – from workforce retraining programmes to social protections – that can mitigate the negative effects while preserving the benefits of economic integration.

Migration: the overlooked engine of economic growth

Migration is often framed as a challenge rather than an opportunity for our economies. Yet, as this chapter demonstrates, migration is a critical force in shaping labour markets, skills, and inequality. The economic integration of

migrants remains a high-stakes issue across Europe and beyond, influencing employment patterns, wage structures, and broader social dynamics. This chapter examines the labour market integration of migrants, focusing on their employment trajectories, occupational mobility, and interactions with native workers. A key concern is the recognition and transferability of skills – migrants often possess valuable human capital, yet structural barriers, credential recognition challenges, and discrimination prevent many from realising their full economic potential. The analysis also highlights the divergence in inequality patterns across Europe, showing that, while some economies successfully absorb and benefit from migrant labour, others struggle with growing disparities. The chapter further emphasises the importance of a gender-sensitive approach, recognising the distinct challenges faced by migrant women in labour markets. By reframing migration as a driver of economic dynamism, rather than merely a policy challenge, this chapter encourages a more nuanced and evidence-based perspective on migration's role in shaping the future of work.

The collision of technology, globalisation, and migration: a new economic order?

While each of these transformations – technological change, globalisation, and migration – has profound individual impacts, their combined effect is reshaping labour markets in ways that are both unpredictable and destabilising. This chapter moves beyond siloed analyses to explore how these forces interact and what their convergence means for the future of work, inequality, and skills. We are witnessing the emergence of a new industrial order where digital technologies are redefining production, trade barriers are restructuring global supply chains, and demographic shifts are influencing workforce composition. These interactions create complex feedback loops: automation and globalisation influence which tasks are offshored versus automated domestically; technological change and migration affect how skill shortages are filled and which jobs remain competitive; and global trade and migration shape the mobility of workers and the demand for diverse skill sets. The chapter challenges conventional assumptions about labour market resilience and economic stability, urging policymakers to reconsider how to navigate these converging transformations. Are we prepared for the structural upheavals they will bring, or are we clinging to outdated models of economic security? By understanding the synergies, tensions, and contradictions between these forces, we can better anticipate the challenges ahead and craft policies that foster resilience, adaptability, and inclusive growth.

Part III – Policy Responses: Reimagining the Rules of the Game

As the forces of technological change, globalisation, and migration reshape economies and labour markets, policymakers face urgent challenges in ensuring social cohesion, economic inclusion, and long-term resilience. This part explores key policy responses to these transformations, emphasising the EU's role in fostering social convergence, addressing regional inequalities, rethinking skills policies, and reasserting the importance of inequality on the policy agenda.

Social convergence and the transitions: which direction?
This chapter examines the EU's social policy trajectory towards 2030, considering the combined effects of technological change, globalisation, and migration on skills demand and socio-economic inequality. The EU has positioned social convergence and a just transition as central objectives, particularly through the EPSR. However, critical gaps remain in achieving these ambitions. Using two country case studies and a GI-NI scenario – which simulates stagnating digital transformation and reduced globalisation – the analysis highlights the risks of inaction: rising socio-economic inequalities, uneven growth, and increased labour market polarisation. The findings suggest that public resistance to globalisation and digitalisation may threaten long-term convergence. Yet, paradoxically, continued technological and economic integration remains essential for achieving a fair and sustainable social model. While the EPSR offers a policy framework, its effectiveness is limited by the absence of a cohesive European social model and a unified economic strategy. Furthermore, the lack of strong support from leading EU countries raises concerns about the feasibility of deep social convergence. The chapter concludes that while a unified European approach is crucial, it remains an uncertain and politically contested journey – especially as new technologies continue to reshape the labour market.

Regions in Europe: diverse paths, shared prosperity?
The chapter addresses persistent regional disparities across Europe, asking how diverse development paths can lead to shared prosperity. It applies the Varieties of Capitalism (VoC) framework as a theoretical lens to examine how different institutional configurations influence socio-economic convergence and divergence among regions. In doing so, the analysis adopts a historical-cultural approach while contrasting it with a structural perspective, acknowledging that both historical context and structural factors shape development trajectories. Empirical analysis of GDP, employment, and education data from 2000 to 2025 reveals mixed patterns: poorer regions (notably in Eastern Europe) have generally grown faster (catching up) and educational attainment

gaps have narrowed, but GDP and employment convergence remain uneven, with some advanced regions stagnating. These findings suggest that one-size-fits-all EU cohesion policies are inadequate, underscoring the need for tailored strategies at regional and national/EU levels that account for historical, cultural, and institutional contexts. The chapter concludes with policy recommendations to embrace regional diversity as a strength and foster institutional learning and cross-regional cooperation, aiming to promote inclusive and sustainable growth across the EU.

Skills: between reality and misconceptions

Upskilling and reskilling have become policy buzzwords, often presented as the solution to labour market challenges. However, what skills policies can actually achieve – and where their limitations lie – remains widely misunderstood. This chapter critically examines the role of skills in driving competitiveness, reducing inequalities, and shaping the future of work. Three key insights emerge: (1) skills are not just about individual workers; they are embedded in workplaces, industries, and innovation ecosystems. While skill development plays a role in boosting economic dynamism, it must be seen in conjunction with firms' investment in new technologies and business models; (2) while upskilling can improve social mobility, it cannot singlehandedly resolve structural inequalities. Policies that rely solely on skill development without addressing broader labour market imbalances risk perpetuating existing disparities; (3) skills should not be seen as static qualifications but as evolving capabilities. Formal education and training play a role, but on-the-job learning, workplace environments, and career progression pathways are just as critical. This chapter emphasises that effective skill policies require a systemic perspective, integrating education, labour market policies, and firm-level strategies. Simply increasing training opportunities is not enough – policymakers must also ensure that new skills translate into real economic opportunities.

Part IV – Rethinking Policy for an Uncertain Future

Despite its fundamental role in shaping economic and social outcomes, inequality and skills have been fading from the European policy agenda – a shift this chapter argues is a critical mistake. Using the Utility-Technology Possibilities Frontier model (Acemoglu, 2024), this chapter maps the findings of the GI-NI project onto broader debates about technological change, labour markets, and inequality. The model highlights why major technological advancements have not been fully adopted by firms – suggesting that new technologies are primarily labour-enhancing rather than labour-replacing, requiring complementary policies to support their diffusion. At the same time, labour markets are not homogeneous, meaning that policies must account for disparities in access to

training, job opportunities, and social protection. A key conclusion is that convergence in economic performance across the EU is not enough – political convergence must also be placed on the policy agenda. Without coordinated governance and investment in inclusive policies, inequality will continue to undermine social and economic stability.

Policy responses must evolve as Europe navigates the turbulent forces of technological change, globalisation, and migration. This Part underscores that while social convergence, regional policy, skills development, and inequality reduction remain core policy priorities, they cannot be addressed in isolation. A more integrated and adaptive approach is needed – one that recognises the interconnections between economic structures, labour market dynamics, and social policies. Ultimately, the findings of this book call for rethinking policy frameworks, ensuring that strategies are both forward-looking and resilient in the face of rapid transformation and uncertainty. The challenge for European policymakers is not just managing change, but shaping it in ways that promote shared prosperity, economic security, and social cohesion in the years to come.

OUTLOOK FOR THE FUTURE: MANAGING INEQUALITY IN AN ERA OF TRANSFORMATION

The economic and social transformations explored in this book will continue to reshape economies, labour markets, and policies. While these changes offer growth opportunities, they also risk deepening inequality. Addressing these challenges requires a shift in policy thinking – inequality must be seen not as an inevitable byproduct of change but as a key factor determining whether transformation leads to sustainable and inclusive development.

Inequality is not just a consequence of economic shifts but a structural issue that demands a comprehensive response. Automation, AI, and digital platforms are altering job markets, making some skills obsolete while increasing demand for others. Without proactive policies, job polarisation will deepen, benefiting highly skilled workers while others face declining security and wages. Globalisation has similarly produced unequal gains, rewarding those with skills and mobility, while migration – despite its economic potential – remains hindered by institutional barriers.

As integration accelerates, policymakers must rethink labour policies, social protections, and regional development. The EPSR offers a framework for social convergence, but its success depends on political commitment. The assumption that economic growth alone reduces disparities is no longer sufficient; policies must ensure that technological progress and globalisation benefit all. Governance should move beyond crisis management towards long-term strategies focused on resilience and inclusion.

Skill development must be reframed as more than just upskilling and reskilling. While education is crucial, it cannot alone resolve structural inequalities. Training must lead to real opportunities, not just qualifications. Regional policies should foster innovation and tailor strategies to local strengths rather than rely solely on financial redistribution.

Looking forward, policymakers must anticipate the systemic shifts driven by technological change, globalisation, and migration. These forces are reshaping labour markets, supply chains, and workforce demographics. Outdated policy frameworks risk economic fragmentation and social instability. Managing inequality will require a new social contract that aligns economic governance with social policy. Europe must recalibrate technological governance, view migration as an economic asset, and acknowledge that political convergence is as crucial as economic convergence.

This book provides key insights for researchers, policymakers, and industry leaders. It highlights the need for interdisciplinary research, adaptive policy design, and stronger collaboration between educators, businesses, and labour organisations. If unaddressed, inequality will destabilise economies and deepen social divisions. However, with the right policies, these transformations can foster a more inclusive and resilient future. The goal is not just to mitigate inequality but to restructure the systems that create it, ensuring Europe is prepared for the challenges ahead.

ACKNOWLEDGEMENTS

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PART II

Three transformations reshaping work and inequality

2. The consequences of technological advancements for labour markets

Victor Medina Pierluisi and Ulrich Zierahn-Weilage

INTRODUCTION

The rapid advancement of technology in recent decades has profoundly reshaped the global economy, transforming industries, revolutionising work processes, and altering the very nature of employment. This technological revolution, characterised by the rise of artificial intelligence (AI), automation, and digital platforms, has sparked intense debate about its implications for inequality and the future of work.

This chapter explores the multifaceted relationship between technology and inequality, examining how technological progress impacts labour markets, wage structures, and the distribution of economic opportunities. It focuses on wage inequality, leaving aside the question of income inequality. We begin by tracing the historical perspective on technology and inequality, highlighting the evolving dynamics from the Second Industrial Revolution to the present day. This historical context provides a crucial foundation for understanding the current technological trends and their potential consequences.

Our analysis then delves into three key areas of technological change that are reshaping the modern economy:

1. Automation and robotics: We examine how these technologies are transforming industries and altering the demand for different types of labour.
2. AI and machine learning: We explore the potential of AI to automate cognitive tasks and its implications for high-skill occupations.
3. Digital platforms and the gig economy: We investigate how these new forms of work organisation are changing employment relationships and income dynamics.

Building on these insights, we delve deeper into the shifting patterns of inequality that extend beyond the traditional low-skill/high-skill divide. We explore the emergence of new, high-demand skills and the erosion of job security in occupations previously considered 'safe'.

The chapter concludes by discussing policy implications and recommendations, focusing on education and training initiatives, labour market policies, and technological governance. These insights aim to guide policymakers, business leaders, and individuals in navigating the challenges and opportunities presented by technological change, with the ultimate goal of fostering inclusive economic growth and mitigating inequality.

By examining the complex interplay between technology and inequality, this chapter seeks to contribute to our understanding of one of the most pressing economic challenges of our time and to inform strategies for building a more equitable future in an increasingly digital world.

HISTORICAL PERSPECTIVE ON TECHNOLOGY AND INEQUALITY

Historically, the relationship between technological advancements and labour markets has been multifaceted, with varying impacts on the wage distribution and wage inequality. The impact of previous technological revolutions, particularly the Second Industrial Revolution (circa 1850–1980), can offer valuable insights into the potential consequences of current and future technological shifts.

The Second Industrial Revolution was marked by the spread of General Purpose Technologies (GPT), such as steam power, electricity, and the automobile. GPTs are technologies that are pervasive (i.e., they spread to most sectors), improve over time, and enhance possibilities to further invent and produce new products and processes (Jovanovic & Rousseau, 2005). They reduce production costs while enabling new products, which spur aggregate demand. This change led to a significant shift in manufacturing (Buyst et al., 2018). Large factories replaced smaller workshops, with economies of scale achieved through workers operating machinery. This initial phase often led to de-skilling as specialised tasks replaced skilled craftsmanship, particularly in the late nineteenth century (Buyst et al., 2018).

However, with the development of more complex production processes, such as batch and continuous-process methods, the demand for skilled labour increased (Buyst et al., 2018). This is known as skill-biased technological change (SBTC), as it raises the demand for skilled workers. Simultaneously, many countries experienced an expansion of education, increasing the supply of skilled workers. This race between technology and the supply of skills (Tinbergen, 1974, 1975) crucially affects the relative wages of high- and

low-skilled workers and, by that, inequality. SBTC raises wage inequality between skilled and unskilled workers. However, throughout the 1970s and 1980s, the wage premium for skilled workers remained relatively flat, despite a large educational expansion, indicating that the expansion of education was fast enough to cope with technology-induced rising demand for skilled workers during that time in the European Union (EU) and in the United States (US) (Acemoglu & Autor, 2011; Buyst et al., 2018).

The relationship between technology and inequality significantly changed with the rise of information and communication technology (ICT) in the 1980s. ICT technologies are particularly suitable for automating tasks that follow a set protocol, which makes them codifiable in software. These tasks, which can be both manual and cognitive, are called routine tasks and are specifically prone to substitution by computer-controlled machines. Simultaneously, ICT technologies complement human labour in problem-solving and complex communication tasks (Autor et al., 2003). This automation of routine tasks became a dominant feature of technological progress, known as routine-replacing technological change (RRTC). This process has led to job polarisation, as it is characterised by declining employment in middle-skill, routine-intensive occupations, while employment grows in both high-skill jobs which involve complementary problem-solving and communication tasks, and in low-skill service jobs (Acemoglu & Autor, 2011; Acemoglu & Restrepo, 2022; Autor & Dorn, 2013; Cortes et al., 2014; Goos et al., 2009, 2014).

RRTC has emerged as a central force behind rising inequality in recent decades in both the US and the EU (Acemoglu et al., 2022; Autor & Dorn, 2013). The task-based framework for analysing labour markets emphasises how technological advancements often automate specific tasks rather than entire jobs (Acemoglu et al., 2022; Autor & Dorn, 2013; Feng & Graetz, 2020). This automation can displace workers from tasks where they previously held a comparative advantage, leading to wage declines and potential job losses (Acemoglu et al., 2022). Notably, this displacement does not necessarily equate to overall job loss, as workers may be reallocated within firms or industries, but it can contribute to structural changes in the labour market (Acemoglu et al., 2022).

A crucial factor influencing the impact of technology on inequality is the relative supply of skills (Acemoglu & Restrepo, 2018b). When the supply of skilled labour keeps pace with the demand generated by technological change, the negative effects on inequality can be mitigated. Conversely, if the supply of skills lags behind, inequality is likely to increase (Acemoglu & Restrepo, 2018b). Previous technological revolutions highlight the dynamic and often unpredictable relationship between technology and inequality. Understanding these historical trends is essential for anticipating the potential consequences of more recent technologies, such as AI, and for developing policies that promote inclusive technological progress.

CURRENT TECHNOLOGICAL TRENDS AND THEIR IMPACT

Automation and Robotics

The rapid advancement of automation and robotics has sparked intense debate about their impact on the labour market. Some argue that these technologies will lead to widespread job displacement and worsen inequality, while others contend that they will boost productivity and create new employment opportunities.

To understand the relationship between automation and labour market outcomes, the task-based framework is crucial. This framework acknowledges that technological change often automates specific tasks instead of entire jobs, while simultaneously making workers more effective in other tasks. Automation can displace workers from tasks where they previously held a comparative advantage, potentially leading to wage declines and job losses. However, it can also generate new tasks and increase labour demand in other areas. First, we review the task framework before turning to empirical results on the consequences of automation and robotics for labour markets.

Displacement effects occur when automation directly displaces workers by taking over tasks previously performed by humans, especially routine tasks which can be easily codified and replicated by machines (see, e.g., Acemoglu & Autor, 2011; Autor et al., 2003). Routine tasks are particularly widespread in jobs in the middle of the wage distribution. Accordingly, studies show that automation has led to a decline in the share of middle-wage routine-intensive jobs while raising relative demand for both low-wage service jobs, which rely on hard-to-automate human interaction, and hard-to-automate high-wage abstract jobs. This has resulted in job polarisation with increasing shares of both high- and low-wage labour at the expense of middle-paid jobs (Autor & Dorn, 2013; Goos et al., 2009, 2014; Goos & Manning, 2007). For example, the increased use of industrial robots in manufacturing has been linked to job losses and wage declines for blue-collar workers (Acemoglu & Restrepo, 2020; Dauth et al., 2017).

Automation can also have indirect or 'ripple' effects on workers who are not directly displaced. For example, middle-skill automation may displace high-skill workers who then compete with low-skill workers for remaining jobs, potentially lowering wages for both groups (Acemoglu & Restrepo, 2018c).

While automation can displace workers, it also raises productivity by allowing firms to produce more output with fewer inputs (Acemoglu & Restrepo, 2018c; Autor & Dorn, 2013; Gregory et al., 2022). This can increase the demand for labour in other tasks that complement automation. For instance,

firms that adopt robots may need more workers to design, program, and maintain these machines. Furthermore, higher productivity can lower prices and increase demand for goods and services, creating new jobs in other industries.

The overall impact of automation on wages and inequality depends on the interplay between these countervailing forces. In particular, when the displacement effects dominate, automation can lead to wage declines and increased inequality. This is particularly true when automation primarily targets low-skill jobs, as it can widen the gap between high- and low-skill workers. Conversely, when productivity effects are strong, automation can raise wages for all workers, including those directly affected. The long-run impact of automation may be more positive, as capital accumulation and the creation of new tasks can amplify the productivity effects (Acemoglu & Restrepo, 2018c).

Due to these countervailing forces, the consequences of robotics and automation for labour markets remain an empirical question. The evidence of the impact of automation and robots on employment suggests a nuanced effect, possibly dependent on the nature of the technology and the country-specific institutional policies that are in place. In a cross-country study, Graetz and Michaels (2018) found no negative effects of robots on overall employment, but studies that have focused on the US have found that automation technologies tend to have a dominating displacement effect (Acemoglu & Restrepo, 2019), as does the adoption of industrial robots in this country (Acemoglu & Restrepo, 2020). However, as highlighted by Acemoglu and Restrepo (2018c), displacement effects that reduce demand for labour while increasing demand for capital push up the relative price of capital and incentivise the creation of new tasks for human labour. This counteracts the labour-saving effects in the long-run and may offset short- to medium-run negative employment effects.

Similar studies conducted in Europe have found that even though workers are displaced by technology in their own industries, these job losses are offset by employment gains in customer industries and have even induced increases in aggregate demand (Autor & Salomons, 2018; Gregory et al., 2022).

Looking at specific European countries, in France, robots are found to have positive employment effects for adopting firms but negative effects on overall industry employment as non-adopters struggle to compete (Acemoglu et al., 2020). In Germany, on the other hand, job losses due to robot adoption seem to have no effect on total employment as job gains in service jobs outweigh the job losses in manufacturing jobs (Dauth et al., 2017).

These results underscore the need to study the effects of technological disruption on countries and industries on a case-by-case basis, as the nature of the technology, the time-scale of the analysis, and the institutional framework surrounding its adoption could be important in determining the labour market outcomes. In particular, the distribution of gains from technological progress between labour and capital may play a key role in counteracting the

displacement effects (Gregory et al., 2022), highlighting the importance of mechanisms that help to preserve worker bargaining power in the face of automation.

Studies have also examined the impact of automation on firms. Firms that adopt automation technologies tend to be larger, more productive, and pay higher wages (Acemoglu et al., 2020; Koch et al., 2021). These firms often experience employment growth, but this may come at the expense of non-adopting competitors, leading to job losses in those firms. The benefits of automation may be unevenly distributed among firms, with larger, skill-intensive firms capturing a greater share of the gains.

The literature highlights the need for policies that promote inclusive technological progress and mitigate the potential negative consequences of automation on the labour market. Key policy areas include investment in education and skills development to prepare workers for the jobs of the future, support for displaced workers through retraining and job search assistance, and policies to ensure a fair distribution of the benefits of automation. Addressing competition policy and access to technology will also be crucial for fostering innovation and ensuring that the gains from automation are widely shared.

In conclusion, the labour market consequences of automation and robotics are complex and multifaceted. These technologies have the potential to both displace workers and create new opportunities. Their overall impact will depend on various factors, including the pace of technological change, the nature of tasks being automated, and the responses of firms, workers, and policymakers. A deeper understanding of the interplay between technological advancements and labour market dynamics is crucial for designing effective policies that can harness the benefits of automation while mitigating its potential negative consequences.

AI and Machine Learning

Current research on the impact of AI and machine learning on labour markets paints a complex picture, with potential for both disruption and opportunity. While AI can be considered an automation technology, its impact is thought to be different from that of previous automation cycles due to its general-purpose potential (Brynjolfsson et al., 2017; Trajtenberg, 2019). Earlier waves of automation have mainly focused on streamlining a limited scope of processes that primarily affected routine-intensive jobs. AI, on the other hand, is capable of mimicking human reasoning and interaction in ways that machines of the past have not, potentially challenging labour in tasks that require cognitive skills and adaptability and raising concerns about its likelihood to disrupt high-skilled professions.

Building on the idea that AI is increasingly able to perform tasks that previously seemed genuinely human, public alarmists have claimed that about half of all jobs are 'at risk' due to AI technologies (see, e.g., Frey & Osborne, 2017). The literature has shown that estimates from such feasibility studies are exaggerated due to methodological problems (see, e.g., Arntz et al., 2017; Nedelkoska & Quintini, 2018; Pouliakas, 2018). Studies on past technological revolutions have typically found little or no persistent declines in labour demand. This has led many economists to believe that there is little reason to believe that this time is different, which is in contrast with exaggerated public fears of AI-induced job losses. This contrast between neglect of potential negative employment effects in the economic debate, on the one hand, and excessive fears of a jobless future in the public debate, is what Acemoglu and Restrepo (2018a) call the 'false dichotomy'.

To resolve this dichotomy, we shed light on the emerging literature on the consequences of AI in the labour market. This literature acknowledges the potential negative employment effects of new technologies, studying their empirical relevance. A key theme emerging from the research is the potential for automation technologies such as AI to automate tasks rather than entire jobs (Acemoglu & Autor, 2011; Acemoglu & Restrepo, 2018c; Autor et al., 2003; Goos & Manning, 2007). This task-based framework suggests that AI will lead to significant skill shifts within occupations, as some tasks become automated while new ones emerge. Handa et al. (2025) show how Generative AI is being used increasingly to assist workers in performing various tasks spanning a broad range of occupations. Notably, AI's ability to automate cognitive, high-skilled tasks previously considered exclusive to humans challenges the traditional notion that high-skilled workers are immune to automation, potentially reducing wage inequality (e.g., Webb, 2020). Brynjolfsson et al. (2018), instead, find that jobs across all skill levels similarly require skills that are suitable for machine learning, a special form of AI. Compared to previous technologies, this suggests a shift from low- to medium-skill automation towards automation of tasks of all skill levels. This shift in skill demand highlights the growing importance of 'complementary skills' – human skills that are difficult for AI to replicate, such as critical thinking, problem-solving, creativity, and emotional intelligence (Brynjolfsson et al., 2018; Rademakers & Zierahn-Weilage, 2024; Trajtenberg, 2019; Webb, 2020). Teutloff et al. (2025) for example, find that the introduction of ChatGPT has resulted in a shift towards more specialised complementary tasks for freelancers on platform work. Equally important will be the need for human labour in tasks to develop the 'complementary innovations' that are needed to realise AI's potential productivity gains (Brynjolfsson et al., 2018).

Despite its fast growth and adoption, AI has only recently become more widespread (e.g., Furman & Seamans, 2019). So far, AI adoption is more

widespread among larger firms, which make more use of skilled workers (Acemoglu & Johnson, 2024; Arntz et al., 2024a; Zolas et al., 2020). The lack of long-term data on AI adoption hinders the analysis of its effects on the labour market. Recent results from Acemoglu et al. (2022) highlight that AI is being adopted rapidly at the firm level, with AI-adopting firms reducing hiring in non-AI related jobs and changing skill requirements for those jobs. However, they highlight that potential employment and wage effects at the occupation and industry level are "too small to be detectable" so far. AI-adopting firms highlight that they use these technologies, among others, to automate tasks previously performed by humans. These firms are also larger, have higher productivity, and lower labour shares compared to non-AI adopting firms. AI-adopting firms experience rising demand for complementary skilled workers (Acemoglu & Johnson, 2024). However, to date, the effects of AI on wages, employment, and inequality are also too small to be detectable (Acemoglu et al., 2022; Furman & Seamans, 2019) and no clear conclusion for the consequences of AI for high- and low-skilled workers can be drawn, so far.

Across a variety of sectors, AI applications are emerging that have the potential to significantly alter the nature of high-skill work:

- Healthcare: AI is being used to analyse medical images with accuracy surpassing human capabilities in some instances, diagnose diseases, and personalise treatment plans (Ernst et al., 2019). This has the potential to transform the roles of physicians, radiologists, and other healthcare professionals.
- Finance: Algorithmic trading platforms driven by AI are making investment decisions and executing trades at speeds unattainable by humans (Furman & Seamans, 2019). This has direct implications for the work of traders and financial analysts.
- Legal: AI tools are being developed to review contracts, conduct legal research, and predict case outcomes (Ernst et al., 2019). This has the potential to reshape the work of lawyers, paralegals, and legal researchers.
- Management consulting: AI is analysing vast datasets to identify patterns and generate strategic insights for businesses (Ernst et al., 2019). This may impact the role of consultants in data analysis, market research, and strategic planning.

These examples illustrate how AI is being integrated into high-skill industries, automating tasks that were previously considered the domain of highly trained professionals. This is not to say that AI will eliminate these jobs entirely. Instead, it suggests a shift towards tasks requiring a higher level of cognitive ability, creativity, and human interaction, as well as a greater need for professionals to work in tandem with AI systems.

A key question is how AI may affect the overall demand for labour. On the one hand, the labour-saving effects of AI raise productivity, which may trigger higher demand for labour in other sectors, ultimately raising growth and overall demand for labour and thus – at least in the long run – benefit all workers (see, e.g., Aghion et al., 2020). However, so far, productivity growth has remained sluggish despite fast developments in AI; this could be due to under-measurement of AI-induced growth, delayed responses of productivity to AI adoption, or discontinuities (Korinek & Stiglitz, 2019). On the other hand, some recent evidence suggests that automation reduces the share of labour and overall labour demand (e.g., Acemoglu & Restrepo, 2022). The overall labour demand effects of AI – and by that its consequences for employment and wages – likely depend on the direction of the further development of the technology (Acemoglu & Johnson, 2024). As highlighted by Acemoglu and Restrepo (2018c), 'so-so' technologies that automate human tasks without creating large productivity effects are likely to depress demand for labour. These potential negative effects of technological change are typically not internalised by innovators and technology adopters, which potentially results in socially excessive automation – i.e. automation beyond what is beneficial from a societal perspective (Acemoglu & Restrepo, 2018a; Korinek & Stiglitz, 2019). This may even reduce social welfare if redistribution to compensate the losers of technological change is too costly or not possible (Korinek & Stiglitz, 2019). Moreover, the degree to which workers can benefit from technological developments such as AI, or not, depends on the balance of power between workers and capital (Acemoglu & Johnson, 2024). The effects of AI on labour demand accordingly depend on policy choices regarding the direction and intensity of technological change, as well as the allocation of power.

The potential disruption of high-skill jobs by AI underscores the need for proactive policies that support worker adaptation and promote inclusive technological progress. We will review potential policy responses towards the end of this chapter, such as investment in education and training programmes, policies aimed at facilitating lifelong learning and reskilling opportunities and fostering a collaborative environment between humans and AI, where workers understand the capabilities and limitations of AI systems.

Digital Platforms and the Gig Economy

The technologies discussed so far – automation, robotics, AI, and machine learning – centre around the ability of technology to perform tasks that previously only humans could do. However, technology can also affect the way we organise work. In particular, the emergence of digital platforms and the gig economy may reorganise traditional employer–employee relationships. This development has spurred a significant amount of research examining their

consequences for labour markets. These platforms, connecting customers with workers for short-term or project-based work, have facilitated a notable shift in employment arrangements, moving away from traditional, full-time employment.

Several themes dominate current research on the gig economy:

- Flexibility and autonomy: Digital platforms offer workers greater flexibility in setting their own hours and choosing the type of work they perform. More than half of the participants work on these platforms for three months or fewer per year, generating additional earnings of about $750 per month of active work (Farrell et al., 2019). This autonomy can be particularly attractive to individuals seeking work–life balance or supplemental income (Cook et al., 2021).
- Income and inequality: A central debate in the research revolves around the implications of the gig economy for worker earnings and income inequality. Some studies suggest that gig work can provide supplementary income (Farrell et al., 2019; Koustas, 2019), or serve as a safety net during economic downturns (Cook et al., 2021). However, concerns remain about the potential for low wages, inconsistent income, and limited access to benefits and social protections for gig workers (Ernst et al., 2019; Schor, 2017). Digital economy opportunities are also more abundant in large cities where there is higher demand for the goods and services offered on these platforms (Glasner, 2023), potentially worsening regional inequalities.
- Skill development and career trajectories: The gig economy's impact on skill development and career trajectories is another area of active research. Gig work can offer opportunities for skill diversification and entrepreneurial experience. Simultaneously, gig work can trap workers in low-skill, low-wage jobs with limited opportunities for career advancement (see, e.g., Cook et al., 2021; Ernst et al., 2019; Schor, 2017). It could also erode the potential of incumbent full-time workers to earn a living in disrupted industries (Farrell et al., 2019).
- Labour market regulation and worker classification: The rise of the gig economy has challenged traditional labour market regulations and worker classification systems. The classification of gig workers as independent contractors rather than employees has implications for their access to benefits, social protections, and legal rights. This prompts discussions about the need to update existing labour laws and regulations to better address the unique characteristics of gig work (see Ernst et al., 2019).

The existing research suggests that low-income, less-educated workers may face specific challenges in benefiting from digital platforms. Factors such as access to capital, digital literacy, and competition from more experienced or

skilled workers can create barriers for low-income individuals seeking to prosper in the gig economy. This raises questions about the potential for digital platforms to exacerbate existing inequalities, potentially leading to a 'precariat' class of workers characterised by limited employment security and social mobility opportunities (Schor, 2017).

The rapid evolution of the gig economy and digital platforms necessitates ongoing research to better understand their long-term consequences for labour markets. Key areas for further focus include:

- Comprehensive data collection: The lack of comprehensive data on gig work poses a challenge for researchers (Abraham et al., 2019; Schor, 2017). More robust data collection efforts are needed to accurately measure the size, composition, and characteristics of the gig workforce.
- Longitudinal studies: Longitudinal studies tracking the experiences of gig workers over time are essential for understanding the long-term impacts on earnings, career trajectories, and well-being.
- Dynamic studies: A better understanding is needed of the relationship between the platform and the conventional economy. A tendency of conventional firms to offload tasks to gig platforms creates problems for workers on both sides. Traditional employees lose job opportunities as demand for their roles decreases, while gig workers face deteriorating conditions as the supply of available workers increases. (Vallas & Schor, 2020).
- Comparative analyses: Cross-country comparisons of the gig economy's impact on labour markets can provide insights into the role of institutional factors, regulations, and cultural norms.

The research findings have important implications for policymakers seeking to shape the future of work in the digital age. Key policy considerations include, among others, the need for modernising labour regulations to better address the unique characteristics of gig work, ensuring fair compensation, access to benefits, and worker protections. Given the geographically dispersed and diverse nature of the platform workforce and their limited collective action capabilities, particular attention must be paid to developing mechanisms for these workers to advocate for their labour market conditions (Vallas & Schor, 2020). Moreover, the gig economy requires expanding access to education and training programmes that equip workers with the skills needed to thrive in the evolving digital economy. In addition, policymakers should provide more support for workers transitioning to new forms of employment or who wish to take advantage of part-time work opportunities, including reskilling programmes, career counselling, and income support during periods of unemployment. Finally, policymakers should work with firms to ensure that their platforms do not exacerbate existing inequalities by using algorithms that favour the hiring

of some workers over others based on their age, gender, or ethnicity (Vallas & Schor, 2020).

SHIFTING PATTERNS OF INEQUALITY

Beyond the Low-skill/High-skill Divide

The expansion of AI into ever wider domains affects the distribution of wages, creating winners and losers. Those whose abilities are complementary can expect rising wages, while those whose tasks are replaced will face declining wages (see e.g., Korinek & Stiglitz, 2019). Traditionally, new technologies have often been viewed as raising demand for high-skilled, high-wage workers while reducing demand for low-skilled, low-wage workers, thus raising wage inequality. However, research on the consequences of AI and automation for labour markets is increasingly moving beyond the traditional dichotomy of low-skill versus high-skill jobs. This shift recognises that AI's capabilities are no longer confined to automating routine, manual tasks but are rapidly expanding into domains once considered the exclusive realm of highly skilled professionals (e.g., Arntz et al., 2020). This trend poses significant threats to occupations traditionally perceived as 'safe' from automation, while simultaneously driving the emergence of new, high-demand skills (see, e.g., Acemoglu & Restrepo, 2018c). By that, it may reshape how technology affects wage inequality. A key question that arises is to what degree AI will mainly assist humans to become more productive via 'intelligence-assisting innovation', versus substituting or even replacing human labour (Korinek & Stiglitz, 2019).

Erosion of high-skill job security: The growing capacity of AI to perform cognitive tasks, analyse complex data and even exhibit elements of creativity is blurring the lines between human and machine capabilities (see, e.g., Acemoglu, 2024; Arntz et al., 2020; Ernst et al., 2019). Occupations such as financial analysis, legal research, medical diagnostics, and even management consulting, once considered bastions of high-skilled employment, are now facing substantial disruption from AI-powered tools (Acemoglu & Restrepo, 2018a). The automation of specific tasks within these professions is forcing a re-evaluation of the skills and knowledge required for success in these fields. For instance, while AI can efficiently analyse vast quantities of financial data, human expertise remains critical in interpreting those insights, assessing risk, and making strategic decisions (Ernst et al., 2019; Qin et al., 2023).

Emergence of new, high-demand skills: The evolving nature of work in the face of AI is driving demand for a new set of skills that complement AI systems rather than compete with them. These 'complementary skills' encompass a range of cognitive, social, and emotional capabilities that are difficult for AI

to replicate, such as (see, e.g., Acemoglu, 2024; Ernst et al., 2019; Korinek & Stiglitz, 2019; Qin et al., 2023):

- Complex problem solving: The ability to break down complex problems, identify patterns, and develop creative solutions that go beyond the capabilities of current AI systems.
- Critical thinking and judgement: The capacity to evaluate information from diverse sources, weigh evidence, and make sound judgements in situations where AI may provide incomplete or biased insights.
- Creativity and innovation: The ability to generate novel ideas, develop new products and services, and adapt to rapidly changing technological landscapes.
- Social and emotional intelligence: Skills in communication, collaboration, empathy, and understanding human emotions, which are essential for effective teamwork and leadership in environments where AI plays a significant role.

The rapid pace of technological change and the emergence of new, high-demand skills underscore the need for adaptable and responsive education and training systems. Traditional models of education focused on imparting a fixed set of skills early in life are inadequate in preparing individuals for the dynamic demands of an AI-driven workforce. Instead, lifelong learning, continuous skills development, and the ability to adapt to changing technological landscapes are becoming increasingly crucial for success in the labour market (Ernst et al., 2019).

The evolving nature of work in the age of AI necessitates a shift in perspective, moving beyond the simplistic notion of a low-skill/high-skill divide. The impact of AI is not confined to a particular segment of the workforce, and thus its effects on wage inequality are more complex. Instead, it is reshaping the skills, knowledge, and capabilities required across a wide range of occupations along the wage distribution. Recognising this dynamic interplay between human and machine capabilities is essential for developing effective strategies to navigate the challenges and opportunities presented by AI and automation.

Skill Mismatch in the Modern Economy

The modern economy, characterised by swift technological advancements and changing work structures, experiences a persistent issue: skill mismatch. Understanding skill mismatch in the context of rapid technological change necessitates exploring its definition, causes, and consequences.

Skill mismatch encapsulates situations where workers' skills do not align with the needs of the job market. It can manifest as:

- Skill shortages: Where businesses struggle to fill vacancies despite high unemployment, indicating a lack of qualified candidates (McGuinness et al., 2018; Quintini, 2011).
- Skill gaps: Where employed individuals lack the skills to meet their job's requirements, potentially leading to underperformance and reduced productivity (McGuinness et al., 2018).
- Qualification mismatch: Where workers possess qualifications exceeding the job's demands, or where workers lack the necessary education or knowledge for their positions (McGuinness et al., 2018; Quintini, 2011). In either case, this potentially leads to job dissatisfaction and hinders career progression and earnings.
- Field of study (horizontal) mismatch: Where a worker's education is in a different field from their job, leading to a disconnect between acquired knowledge and practical application (McGuinness et al., 2018).
- Skill obsolescence: Where previously valuable skills become outdated due to technological advancements or changing industry demands, requiring retraining or upskilling (McGuinness et al., 2018).

Skill mismatch arises from a complex interplay of factors, including rapid technological change which constantly reshapes skill demands, making it difficult for workers and educational institutions to adapt. Another factor is inadequate education and training systems, which may not be sufficiently responsive to labour market needs or provide opportunities for lifelong learning and upskilling. Information asymmetries between employers and job seekers can lead to mismatches in expectations and skill requirements. Geographic mobility barriers prevent workers from relocating to areas with higher demand for their skills. Finally, demographic shifts, such as ageing populations, impact the supply of skilled workers in specific fields (Ernst et al., 2019).

The accelerating pace of technological change, particularly in relation to AI, automation, and digital platforms, is a significant driver of skill mismatch. This dynamic is creating a growing demand for workers with complementary skills such as complex problem solving, critical thinking, creativity, and social and emotional intelligence. Recent evidence suggests that educational programmes respond to technological change and that updating educational curricula helps workers cope with new technologies, as is indicated by rising wages (Lipowsi et al., 2024). However, the speed of adjustment is often slow. Education and training systems often struggle to keep pace with these evolving demands, leaving a gap between the skills workers possess and those sought by employers (Ernst et al., 2019). Simultaneously, workers require time to adapt, making adjustment sluggish, and resulting in skill mismatch and rising inequality. This also reduces the productivity gains from technological change, dampening its growth potential (Acemoglu & Restrepo, 2018a).

Skills mismatch has profound consequences on both individuals and the economy. Workers with outdated or mismatched skills find it difficult to secure employment, resulting in higher unemployment. Skills mismatch is associated with higher inequality since, within professions, individuals with the same qualifications can have vastly different earnings (Slonimczyk, 2013), and across professions, those with in-demand skills benefit disproportionately from technological advancements (Allen & Van der Velden, 2001). For firms, skills mismatch reduces productivity for businesses as they struggle to find qualified workers or contend with employees lacking necessary skills (Bennett & McGuinness, 2009; Fanti et al., 2021), resulting in even lower wages for workers in these firms (Guvenen et al., 2020). When firms struggle to fill R&D positions, a lack of skilled labour mismatch could hinder innovation and competitiveness as firms face a lower return on their investments (Igna & Venturini, 2019), leading to slower economic growth.

Against this background, mitigating skill mismatch requires multifaceted strategies, involving the modernisation of education and training systems to better align with evolving labour market needs, emphasising lifelong learning, and developing complementary skills; improving information flow between employers and job seekers, promoting transparency in skill requirements and job opportunities; supporting worker transitions through retraining programmes, career counselling, and financial assistance during periods of unemployment; encouraging investment in human capital through government initiatives and public–private partnerships; and adapting labour market regulations to address the changing nature of work and provide protections for workers in non-traditional employment arrangements.

POLICY IMPLICATIONS AND RECOMMENDATIONS

As technological change continues to reshape labour markets, creating both opportunities and challenges for workers and economies, policymakers face the critical task of crafting effective policy responses to navigate this transformation and ensure that its benefits are widely shared. This section explores key policy implications and recommendations across three interconnected domains: education and training initiatives, labour market policies, and technological governance. We provide an overview of general policy responses while leaving a detailed discussion of how EU policymakers could best respond to Part III of this book.

Education and Training Initiatives

To equip workers with the skills needed to thrive in a technologically driven economy, a fundamental shift in education and training systems is required.

This entails reforming education systems to meet new skill demands and promoting continuous learning and reskilling programmes.

Reforming education systems: Traditional education models, often focused on imparting knowledge and skills for specific occupations, must evolve to emphasise adaptability, creativity, and critical thinking – the core skills that complement AI and automation and are transferable across various fields. This requires integrating computational thinking and digital literacy into curricula from early education onwards, fostering problem-solving abilities, and nurturing collaboration and communication skills (Ernst et al., 2019; Trajtenberg, 2019).

Promoting continuous learning: Recognising that skills acquired early in life may become obsolete, policymakers should encourage a culture of lifelong learning. This includes providing accessible and affordable opportunities for workers to upskill and reskill throughout their careers, whether through vocational training programmes, online courses, or employer-sponsored initiatives. Policymakers can incentivise businesses to invest in employee training, offer tax breaks for individuals pursuing further education, and support the development of flexible and modular learning pathways that cater to diverse needs.

Labour Market Policies

Technological change is blurring the lines between traditional and non-traditional employment, creating new challenges for labour market policies. This calls for innovative approaches to addressing the challenges of the gig economy and non-traditional employment.

- Protecting workers in the gig economy: The rise of platform-based work has created opportunities for flexible employment but has also raised concerns about job security, benefits, and worker classification. Policymakers should consider adapting labour market regulations to provide adequate protections for gig workers, including minimum wage guarantees, access to social safety nets, and the right to collective bargaining (Ernst et al., 2019; Schor, 2017).
- Supporting worker transitions: As technology disrupts existing jobs, policymakers need to provide robust support for worker transitions. This includes enhancing unemployment insurance systems to provide income security during periods of job searching and retraining, facilitating access to career counselling services, and offering financial assistance for relocation to areas with higher demand for specific skills (Ernst et al., 2019; Rademakers & Zierahn-Weilage, 2024). By temporarily subsidising wages in industries that are particularly vulnerable to technological change, policymakers can increase the relative attractiveness of wage labour, thereby

slowing down the rate at which jobs in these industries disappear (Furman & Seamans, 2019). Workers in these industries would, therefore, have an extended timeframe to reskill.

- Redistribution: To the degree that new technologies depress the wages of low-earners, redistributive policies – such as wage subsidies and earned income tax credits – can alleviate the otherwise negative consequences of these technologies for income inequality. This could be accompanied by policies that aim to support aggregate demand so as to reduce unemployment – particularly of low-skill, low-wage workers – which raises workers' bargaining power, helping them to reap a larger share of the gains from technological change (Korinek & Stiglitz, 2019).

- Addressing wage stagnation: Despite its risks (Eckardt, 2022; Maarek & Moiteaux, 2021), minimum wage regulation remains a powerful tool to counteract any deepening of wage inequalities brought about by technological change. Modest increases in the minimum wage have been found to have little to no negative effect on aggregate employment (Doucouliagos & Stanley, 2009; Schmitt, 2013), and may even have a positive effect on participation and average earnings of uncovered workers, like those engaging in digital platforms (Glasner, 2023). Modest minimum wages may also be a useful way to counteract the erosion of worker bargaining power as the technological capabilities of AI expand (Korinek & Stiglitz, 2019). Promoting policies that encourage profit-sharing and employee ownership (Ernst et al., 2019; Vallas & Schor, 2020) should also be explored, as well as alternative models of income support such as universal basic income (Furman & Seamans, 2019; Han, 2022), to ensure a more equitable distribution of the benefits of technological progress.

CONCLUSION AND OUTLOOK

The rapid advancement of technology, particularly in the realms of AI, automation, and digital platforms, has profoundly reshaped the global economy and labour markets. This chapter has explored the multifaceted relationship between technology and inequality, examining how these technological trends impact employment, wages, and the distribution of economic opportunities.

This chapter provides five key insights: (1) The impact of technology on labour markets extends beyond the traditional low-skill/high-skill divide, with AI and automation now capable of performing tasks across various skill levels; (2) Job polarisation continues to be a significant trend, with employment growth concentrating in both low-skill and high-skill occupations while middle-skill jobs decline; (3) The emergence of new high-demand skills, particularly those that complement AI systems, is reshaping the nature of work and the skills required for success in the modern economy; (4) Digital platforms

and the gig economy offer increased flexibility but also raise concerns about job security, benefits, and worker protections; and (5) Skill mismatch has become a persistent issue, with rapid technological change often outpacing the ability of workers and educational systems to adapt.

Looking ahead, several key challenges and opportunities emerge:

1. Education and training: There is an urgent need to reform education systems to emphasise adaptability, creativity, and critical thinking. Promoting lifelong learning and continuous skill development will be crucial for workers to remain competitive in a rapidly evolving job market.
2. Labour market policies: Policymakers must adapt regulations to address the changing nature of work, including protections for gig workers and support for worker transitions in the face of technological disruption.
3. Technological governance: Ensuring that the benefits of technological progress are widely shared will require careful consideration of how new technologies are developed, deployed, and regulated.
4. Addressing inequality: As technology continues to reshape labour markets, proactive measures will be needed to mitigate the potential for increased wage inequality and ensure inclusive economic growth.
5. Future research: Ongoing research will be essential to understand the long-term impacts of emerging technologies on labour markets, skill demands, and economic structures.

In conclusion, while technological progress presents significant challenges for workers and policymakers, it also offers opportunities for increased productivity, innovation, and economic growth. By taking a proactive and adaptive approach to education, labour market policies, and technological governance, societies can work towards harnessing the benefits of technological advancement while mitigating its potential negative consequences. The future of work in the age of AI and automation remains uncertain, but with thoughtful policies and continued research, we can strive for a more equitable and prosperous future for all.

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3. Globalisation and labour market inequalities

Bart Los

INTRODUCTION

For a long time, international trade was a topic taught extensively in undergraduate economics programmes around the world, but not liked by many students. Now, this has changed. Knowledge about the causes and consequences of trade and foreign direct investment (FDI) has become essential to judge the merits of arguments put forward in newspapers, on TV and on social media on a daily basis. One of the most heavily debated issues is the implication of rapid globalisation for workers. Do they benefit from the opportunities of the firms they work for to sell more, due to the opening up of foreign markets? Or are the downsides of import competition larger than these gains from export opportunities? In addition, are these effects more or less uniform across segments of the labour market, or do some gain while others lose?

It is somewhat surprising that these questions only started to become really popular among academic economists after the wave of rapid globalisation had come to an end with the Global Financial Crisis in 2008. During that wave, most studies focused on quantifying the aggregated welfare gains associated with trade intensification and increased FDI activity. These gains emerge as a consequence of the channels that are taught extensively in the undergraduate classes mentioned: (i) countries specialise in the industries in which productivity differences relative to other industries are the most favourable (or production factors that are most abundantly available are used more intensively than in other industries); (ii) foreign suppliers increase the degree of competition in the home market; and (iii) intensive trade promotes international knowledge transfer. These mechanisms all lead to lower prices and, hence, welfare gains in all countries involved. The most influential theories argue that these aggregate gains tend to be unevenly distributed within countries (think of the famous Stolper-Samuelson theorem [1941]), but this was often seen as a side issue.

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The focus has changed, possibly as a consequence of the automation wave that happened largely in the same period. This transformation also had positive welfare effects for societies as a whole, but those workers in advanced countries who benefitted least (or actually lost, for example, by being displaced by a robot or computer) often belonged to the same segments of the labour market as those on the receiving end of the globalisation wave. These dissatisfied workers often became the targets of populist politicians (see the overview in Colantone et al., 2022), who managed to increase their influence. Coupled with increasing geopolitical tensions, this led to the launch of trade wars, undermining the multilateralism promoted by the World Trade Organization (WTO) and the return to explicitly protectionist policies.

The world is at risk of dispensing with substantial welfare gains due to trade. Eppinger et al. (2023) estimate that returning to full autarky would yield welfare losses amounting to about 20 per cent of current welfare for a large European country like Germany, while these losses would amount to as much as 60 per cent for small European countries like Ireland. Returning to full autarky is arguably an extreme scenario, but these percentages clearly illustrate what is at stake. Hence, a major question is whether policies can be devised that mitigate the negative effects of globalisation as experienced by some groups of workers, while avoiding the sizable aggregate welfare losses associated with protectionism. This chapter focuses on this question. The most important contributions to the literature will be discussed (it should be stressed that the coverage is far from exhaustive), and specific attention will be paid to studies done as part of the GI-NI project.

Section 2 addresses the question of which workers should actually be considered the 'losers from globalisation'. The changing nature of international trade, as implied by what is often called the 'Global Value Chain (GVC) revolution' or the 'second wave of global unbundling' (Baldwin, 2016), should be taken into account in doing so. Attention is also paid to similarities and differences between findings for advanced countries and emerging countries. Next, Section 3 is devoted to the question of whether workers belonging to the segments of the labour market adversely affected by globalisation tend to adjust (e.g., by moving to regions for which the outlook is less pessimistic or by switching to occupations that might be less vulnerable). Section 4 revolves around the question of how the 'adjusters' fare (in terms of labour market outcomes such as wage income) relative to 'non-adjusters'. Answers to this question lead to the concluding Section 5, which is about lessons for policymaking that can be drawn regarding ways to facilitate 'losers' from globalisation more, so they remain able to reap the overall benefits.

WHO ARE THE LOSERS FROM GLOBALISATION?

Textbook international trade theories argue that industry specialisation that comes with free trade yields winners and losers. The industries in which a country specialises are characterised by a surge in labour demand, while workers in the industries in which the country 'de-specialises' are laid off. The textbook models assume that production factors such as labour can move instantaneously and at no cost from one industry to another. Often, the reality is very different. However, even if this assumption were to reflect reality, the Stolper-Samuelson theorem (1941) states that the compensation for labour would decline in real terms in countries that specialise in capital-intensive industries. The Heckscher-Ohlin model (Ohlin, 1967) from which the Stolper-Samuelson (1941) theorem is derived, is very stylised and only considers capital and a homogenous type of labour as inputs. Still, the logic of a variant with high-skilled and low-skilled workers as production factors is clearly reflected in the results of empirical studies, in particular those for advanced countries. For emerging countries, much more mixed results have been found, suggesting that other mechanisms play an important role, instead of, or besides, trade-induced specialisation. The main results obtained for advanced countries are discussed in the next section, while the following section is devoted to results reported for emerging countries. We then focus on changes in the nature of international trade enabled by the fast diffusion of internet technology and discuss how research in the GI-NI project contributed to better identification of winners and (particularly) losers of globalisation.

Heterogeneous Effects on Workers in Advanced Countries

The empirical literature focusing on the heterogeneity of the effects of globalisation on workers most probably got the strongest impetus from Autor et al. (2013). The study analysed the effects of imports from China on local labour markets in the United States (US) in the period 1990–2007. It did not focus on the effects on individual workers but on average wages in these local labour markets and regional unemployment and labour force participation rates. Heterogeneity featured prominently as a consequence of the variation in industry compositions of these regions before the import shock took place: in some US regions, the industries in which Chinese exporters started to excel were much more prominent than in other regions. One of the main results obtained by the authors was that about a quarter of the reduction in American employment in manufacturing could be attributed to growing import competition from China. They also found, though, that labour market outcomes in industries that were not directly affected by import competition (e.g., service

industries) tended to be affected negatively. In a follow-up study, Autor et al. (2014) focused on similar questions but used worker-level data rather than data at the level of local labour markets. This allowed them to focus on heterogeneity across workers. One of their main findings was that reductions in earnings due to the rapid increases in Chinese imports were the largest for workers who initially already had low incomes and/or did not have much tenure.

The findings of this 'China Shock' literature (see Autor et al., 2016, for a summary of the early contributions) were considered very policy-relevant. However, given geographical differences and differences in labour market regulations, results for the US do not automatically carry over to other countries. Hence, it is no surprise that very similar questions were addressed in studies for other advanced countries. Dauth et al. (2014), for example, studied the case of Germany for roughly the same period (1988–2008), using the local labour market approach. This study also found that workers facing strong import competition were affected negatively, but that globalisation also led to increased options for exporting, yielding more employment and more stable employee–employer relations. The negative part of the implications of globalisation for German workers was much more due to the economic integration of Eastern Europe than to the rise of China. Existing specialisation patterns played an important role in this because China mainly replaced other European countries as suppliers of 'low-tech' products, like textiles, to German customers. In a more recent paper (Dauth et al., 2021), the same authors used data for individual workers and found that the negative effects of import competition were mainly absorbed by low-skilled workers. However, the negative effects turned out to be relatively small if compared to the positive effects of earnings on high-skilled workers, who benefitted from increasing opportunities to export. This additional effect implies that globalisation added to inequality between workers, despite the relatively minor effects of import competition. In their conclusions, the authors highlighted that the trade balance of Germany vis-à-vis China and Eastern Europe was much more even, while the US had a large trade deficit with China. This could well be a major reason for the differences in outcomes for these two countries.

Heterogeneous Effects on Workers in Emerging Countries

Increased globalisation implies increasing import competition for workers in advanced countries but also increasing opportunities to export for emerging countries. If firms in emerging countries start to outcompete firms in advanced countries in industries that are intensive in low-skilled labour, one would expect that demand for low-skilled labour and its remuneration would go up, at least in comparison to high-skilled labour. Hence, globalisation would reduce labour market inequality in these countries. The literature generally does not

find this type of effect, though. This may be due to the fact that the location of production does not necessarily say much about the location of the firm governing these production activities. This governance can be either at arm's length or by acquisition (FDI), but in both cases, the technologies in use by the governing firm are likely to affect the technologies to be adopted in the plants substituting for labour in advanced countries.

Almeida (2007) was among the first to study the empirical fact that foreign-owned firms tend to pay higher wages than domestically owned firms. In her study of Portugal in the 1990s, she did not find results hinting at changes in labour market outcomes due to foreign acquisitions. Her results pointed to a mechanism in which parent firms select firms in emerging countries that are already paying higher wages than other firms as targets for takeovers. Using macroeconomic data for a broad set of countries from the period 1980–2002, Figini and Görg (2011) found that inward FDI tended to have a wage inequal-ity-increasing effect on FDI for the less advanced countries in their sample. A similar finding was reported by Bhandari (2007), for a sample of Eastern European countries and former Soviet states in the first decade after the fall of the Iron Curtain. These are the first indications that technologies transferred from advanced countries through the FDI channel might complement high-skilled workers and/or substitute low-skilled workers.

Koch and Smolka (2019) used detailed, firm-level data for Spain in the period 1998–2013 to analyse the importance of these mechanisms empirically. They found that the skill level (measured by the educational attainment of workers) in firms acquired by foreign firms increased. First, these foreign-owned firms tended to hire more high-skilled workers and, second, workers already employed received more training to enhance their skills. The data did not allow for a study into the wage distribution effects of these mechanisms, but intuition suggests increased wage inequality due to FDI.

A New Type of Trade Specialisation

So far, the discussion of the impacts of globalisation on labour market inequal-ities has been related to the increased specialisation of countries in industries. As explained above, differences in the pre-China Shock industry composition of local labour markets were used by Autor et al. (2013) to establish which workers were facing the negative effects of import competition. However, it is essential to note that it is not just the intensity of international trade (for exam-ple, as illustrated by the global trade to global GDP ratio) that has increased, but also that its nature has changed significantly. As Baldwin (2016) argues, this is mainly due to the rapid improvements in internet-based communication technologies, which considerably reduced the coordination costs associated with spreading the location of tasks involved in producing a firm's output.

Reinforced by further trade liberalisation and continued efficiency gains in international shipping (e.g., containerisation), multinational firms could benefit to a much larger extent from differences in comparative advantage across countries. In times in which coordination costs were very high, firms basically had to choose between relocating all the tasks involved in the production of their output to one location elsewhere or not relocating at all. With strongly reduced coordination costs, however, they can relocate much smaller sets of tasks to several different places, while continuing to perform others in the home country. Consequently, countries have increasingly specialised in performing certain sets of tasks, while other countries specialise in different task sets (see Grossman & Rossi-Hansberg, 2008, for a theoretical exposition; Timmer et al., 2019, offer empirical evidence in an international comparative context).

An implication of this new type of specialisation is that offshoring by firms in an advanced country does not affect all workers in a given industry to the same extent. If a German car manufacturer decides to relocate its assembly tasks to Slovakia and import semi-finished cars from there, German assembly workers may well face negative impacts on their labour market outcomes. German sales workers in that industry, however, may even experience beneficial effects because the offshoring of assembly tasks to Slovakia will make the products they intend to sell cheaper and, hence, more attractive to their customers.

The focus on trade in tasks has been characteristic of the studies into the labour market effects of globalisation in the GI-NI project but was inspired by earlier contributions to the literature. For example, Ebenstein et al. (2014) already pioneered research in which the occupations of US workers were considered a more important determinant of the degree to which they were exposed to imports than their industries of employment. They argued that the main reason for this was that occupation-specific knowledge and experience is much more of a barrier to switch into other employment than industry-specific human capital. Using data for the period 1984–2002, Ebenstein et al. (2014) found that, in particular, in the second half of this period, the wages of workers in occupations with many routine tasks had taken a blow, while other wages had not been affected negatively by rapid globalisation. Traiberman (2019), using a much more sophisticated empirical model and longitudinal data for workers in Denmark (1996–2008), found qualitatively similar results, indicating that close to 5 per cent of the workers would lose real lifetime earnings because of globalisation. A major downside of the occupation-level import exposure indicator used in both studies is that it assumes that the tasks performed in a given industry in (emerging) exporting countries are identical to those in the (advanced) country studied. This obviously denies the notion of within-industry task specialisation discussed above.

In GI-NI work (Los et al., 2023), a novel measure for task-specific import exposure was developed. Broad sets of tasks were proxied by business functions. Using the global inter-country input-output tables from the World Input-Output Database (WIOD; Timmer et al., 2015) along with an update of the dataset developed by Timmer et al. (2019), splitting labour income for 55 industries in 43 countries into income earned by (i) R&D workers, (ii) fabrication workers, (iii) managers and (iv) marketing workers, a new import exposure indicator was developed. Its analytical derivation is an application of the input-output-based methods developed by Los and Timmer (2023). It quantitatively conveys the notion that, for example, the electronics manufacturing industry mainly carried out tasks associated with the business function fabrication. These tasks are complementary to the tasks carried out by R&D and marketing workers in the German and Dutch electronics industries, so these workers are not exposed to competition from workers in factories in China. This is also reflected in the empirical values obtained. For German fabrication workers in 2011, for example, an import exposure indicator value of close to 0.1 was found (for imports from China and Eastern Europe together), while the indicator for German R&D workers in the same year appeared to be slightly smaller than 0.02. In an update to the part about Germany by Los et al. (2023), a clearly negative relationship between import exposure and labour earnings was reported, indicating that fabrication workers were generally hit much harder by these imports than workers involved in other sets of tasks. This holds true across the entire spectrum of manufacturing industries.

Other work in GI-NI (Reizer et al., 2024) was aimed at finding evidence about labour market inequality effects in Eastern European countries, specifically Hungary and Bulgaria, also adopting a task perspective. This line of work provided deeper insights into the economy-wide studies of tasks performed in Eastern European countries, like Hardy et al. (2018). The study regarding Hungary considered the consequences of domestic firms being acquired by foreign companies, using employer–employee data and an event study setup that resembles the study done by Nilsson Hakkala et al. (2014) for Sweden. Moreover, Koerner et al. (2023) used this type of data and analytical framework to analyse the effects on within-firm wage inequality due to outward FDI by German companies. Foreign acquisition of a firm usually causes an intensification of its imports and exports. Given comparative advantages, one might expect that within-firm inequality would become smaller as a result of such an event: the demand for fabrication workers would increase, and hence, their wages would go up faster than for workers performing other tasks. However, the study finds the opposite. The fabrication workers lose from FDI, most probably because the foreign parent firm transfers its advanced technologies to the newly acquired firm. This new technology requires more input from workers performing more abstract tasks. Demand for these workers increases, resulting

in an upward pressure on their wages. Workers with abstract tasks generally have higher wages already, so inequality increases.

The study on Bulgaria deals with 'processing trade', another phenomenon that started to feature prominently after the diffusion of internet technology enabled firms to relocate specific sets of tasks. Processing trade is often defined as 'production on behalf of another firm'. Firms in advanced countries increasingly offshored routine-intensive tasks to processing trade firms in emerging countries, like Bulgaria. Slightly more than 20 per cent of manufacturing firms observed in the sample (which covers the period 2008–2015 and was constructed by combining data from three different sources) were involved in processing trade activities. In the textiles and apparel industry, though, as much as 84 per cent of the observations involved processing trade. Among many other results regarding firm growth and increased export performance, the study finds that firms that switched from producing exclusively on their own account to (partially or entirely) producing on behalf of others started to hire more workers doing fabrication tasks. Hence, this feature of globalisation, considered in isolation, has an inequality-reducing effect on labour markets in emerging countries. The studies for Hungary and Bulgaria thus uncovered mechanisms that have clearly different implications for labour market inequalities in emerging countries, which might explain the mixed results regarding the winners and losers of increased globalisation in emerging countries reported by studies with a macroeconomic orientation.

DO THE LOSERS FROM GLOBALISATION ADJUST?

In textbook models of international trade, workers can seamlessly switch from an industry that shrinks due to trade-induced specialisation to an industry that grows. In reality, this might be much more difficult, for example, because working in one industry requires different capabilities to working in another industry. As Traiberman (2019) finds, capabilities tend to be even more occupation-specific than industry-specific, which means that the emergence of trade in tasks has made it harder for losers from globalisation to adjust to this transformation by switching to occupations that are less vulnerable to import competition.

The first influential studies analysing the adjustment to import competition focused on adjustment by switching to employment in other industries. In many of these studies, distinctions could be made between results for workers who earned relatively high wages before the wave of rapid globalisation and those who earned lower wages. Autor et al. (2014), for example, studied manufacturing workers in the US between 1992 and 2007, and found that workers with high wages often switched to jobs in services industries, which were less exposed to import competition. Low-wage workers, however, often switched

from a job in one manufacturing industry to another, at the risk of being exposed to further import shocks. As discussed above, Dauth et al. (2021) considered both sides of exposure to globalisation, i.e. increased opportunities to export and increased import exposure. They found that workers in German industries with increased opportunities to export relatively frequently switched jobs, but mainly within the same industry with the aim to earn a higher wage. Workers in industries facing increased import competition relatively often adjusted (forced by layoffs or not) by switching to services industries. High-skilled workers were generally better at adjusting in this way without losing earnings than low-skilled workers, arguably because they had accumulated less human capital relevant for employment in services industries.

Utar's (2018) was one of the best-known studies focusing on the importance of occupational differences between workers in an industry affected by an import shock. She examined the effects on workers in the Danish textiles industry of the removal of quotas on textiles and clothing imports from China, at the time when the so-called Multifibre Arrangement was discontinued. Utar (2018) found that the initial adjustment of workers in a given firm was very similar across workers, irrespective of their occupation or educational attainment. They tended to switch to jobs in service industries. In the longer run, though, this adjustment channel appeared to yield very different outcomes, along both the occupational and skill-level dimensions. High-skilled workers generally managed to attain higher wages than before, making up for the initial losses, while low-skilled workers often lost earnings accumulating to about 1.5 times their annual earnings before the import shock. Similar findings were reported for the differences between secretaries and machine operators, for example, the latter being considerably worse off in the longer run, despite having adjusted in a similar vein.

Workers facing high import competition might also adjust by means of moving to a region that is less exposed to imports. Greenland et al. (2019), for example, studied the mobility of workers across local labour markets in the US after the accession of China to the WTO in 2001. Using both aggregate data for these local labour markets and worker-level data, they concluded that labour mobility away from highly exposed regions had indeed increased. These adjustments were often not instantaneous, though. Generally speaking, a lag of seven to ten years between shock and adjustment was observed. Greenland et al. also reported that not all types of workers adjusted in this way. Young workers, male workers and workers with low educational attainment were strongly overrepresented in the group of workers moving in response to the import shock. In a recent paper, Autor et al. (2025) focused specifically on the changes in the labour force of US local labour markets after import shocks due to differences in adjustment behaviour between native workers and foreign-born workers. They found that foreign-born workers were much more

tempted to move (either to other US regions or to other countries) than native workers in local labour markets facing the same exposure to imports and having similar, generally low, skill levels.

Until now, this section has mainly discussed studies into the effects on advanced countries. Dix-Carneiro and Kovak's study (2019) is probably the most influential regarding labour market adjustments to trade shocks in emerging markets. It investigated adjustment to large trade liberalisations in Brazil in the early 1990s when many import tariffs were substantially reduced or removed altogether. The authors did not find evidence for interregional labour mobility as an adjustment mechanism. Switching to employment in services was observed at a relatively large scale, prompting the authors to argue that workers in non-exposed industries might well experience negative labour market outcomes as well: labour supply in these industries increases due to industry-switchers, causing downward pressure on wages. The study also considered switching from the formal to the informal part of the economy as a channel for trade-induced adjustment. Given their relatively large informal sectors, this type of adjustment might be relevant for Eastern European countries as well. In view of the Brazilians' strong specialisation in natural resources-intensive industries, generalising the results obtained by Dix-Carneiro and Kovak (2019) seemed too much of a stretch.

The GI-NI project also paid attention to the question of how workers who face import competition adjust. In the updated part of Los et al. (2023) on Germany (Konietzny et al., 2024), two channels of adjustment are considered: moving to a different region and switching to a job related to a different business function. Both types of adjustment are identified. Like Greenland et al. (2019), the study found that low-skilled workers are more tempted to move. Unlike Autor et al. (2025), however, workers with German nationality opt for this adjustment more than foreign workers who are identical according to all other observable characteristics included in the analysis. The difference with Autor et al.'s findings might be caused by the fact that Konietzny et al. only consider labour mobility within Germany, without taking international mobility into account. The study also reported a positive relationship between import exposure and functional switching. The effects are roughly similar across the educational attainment levels of workers, but non-German workers generally do not follow this path.

IS ADJUSTMENT TO GLOBALISATION WORTHWHILE?

From a policy perspective, it seems worthwhile to promote increased adjustment by workers who face competition from workers in other countries through increased import penetration. At least in theory, it would enable society to benefit from the economy-wide gains from trade, while mitigating the negative

consequences for subgroups of workers. It is important, though, that those who adjust do not experience welfare-reducing effects. This issue has not been addressed often in the literature so far. The literature discussed in the previous section mainly aimed at comparing labour market outcomes after adjustment to labour market outcomes before the import shock. In the GI-NI project, two studies were conducted that tried to shed more light on the comparison of labour market outcomes for adjusters to those for non-adjusters at the same point in time (Los et al., 2023). One study focuses on German workers, and the other focuses on workers in the Netherlands. Because the availability of data is different for the two cases, the research questions that could be asked are slightly different. However, both studies focus on the period in which globalisation proceeded very rapidly: the first decade of the twenty-first century.

In a recently revised version of the study for Germany (based on a more extensive database, see Konietzny et al., 2024), a so-called triple difference-in-differences set-up was employed to address the question of whether workers who experience import shocks (for the business function they perform, in the region in which they are employed), and adjust to such a shock, experience labour market outcomes that are different from otherwise similar workers who do not. Two types of adjustment are considered: moving to a different region and switching to a job with tasks pertaining to a different business function.

For workers who moved to a different region after the shock, the wage effects turned out to be clearly positive and significant. This significance is not only high in a statistical sense but also from an economic viewpoint. If an import shock is defined as an import exposure level higher than the median exposure computed over all functions in all regions in all years, the wage of a worker who moved is, on average, about 9 per cent higher than the wage of a similar worker experiencing the same type of shock but not moving. If import shocks are defined in a narrower way (as situations in which a worker faces import exposure above the 95th percentile of the exposure distribution rather than above the 50th percentile), the estimated 'premium' for moving after the shock is even larger, at close to 34 per cent.

For workers who adjusted to an import shock by switching to a different business function, the study also finds higher wages than for similar workers who decided to stay put. The differences are smaller than in the case of moving to a different region, at 2–8 per cent, depending again on how rare an import exposure level must be to be labelled as an import shock. The authors also consider the effects on wages of jointly moving to a different region and switching from one function to another following an import shock and find positive differences of 22–42 per cent between 'adjusters' and workers who do not adjust. These high estimates are less precise, though, because only a few workers adjust in both ways.

The study for the Netherlands employed the same data regarding the exposure of workers to imports but used a more fine-grained measure of task sets. Rather than focusing on which of four business functions is performed by a worker, import competition was measured for ten occupational categories (using data from Reijnders & de Vries, 2018). The worker-level data does not contain information about the location of work or residence in times before participation in a questionnaire, which implies that moving as a way to adjust could not be analysed. However, more information is available about the stated motives for workers to switch occupations. Although none of these can be matched with certainty to import competition, some might well be related to this issue. Examples are 'to have a more secure job', and 'reorganisation/business closure'. In a difference-in-differences approach with propensity score matching, the effects of changes in import exposure on wages were compared between workers who switched occupations and those who did not. Moreover, unlike in the study for Germany, the data allowed for an analysis of the effects on non-monetary aspects of import competition for workers. The differences between stated feelings regarding job security between adjusters and non-adjusters could be estimated. Another extension as compared to the study for Germany is that a distinction between short-run and long-run differences could be made (the data for the German workers only allowed for analyses of short-run effects).

The analysis focusing on the short-run effects did not yield any significant differences regarding the wages of workers. The relatively small sample did not allow for deep heterogeneity analysis, but some indications that workers with medium-level education would be better off after switching occupations were obtained. Job satisfaction among workers was higher for workers who had switched than for similar workers who had not. The analysis of the long-term impacts (up to six years after the occupational switch) yielded non-significant differences between adjusters and non-adjusters, irrespective of whether wages or job satisfaction levels were considered.

The differences between the findings for Germany and the Netherlands might be attributable to differences in the industry and occupational structures of the two countries. Manufacturing industries and tasks related to factory work have been more prominent in the German economy than in the Netherlands, the economy of which already relied on services output and employment before the second global unbundling started. Hence, import exposure levels have been lower, and changes in these might have had less of an impact on the decisions of workers and the outcomes of these. Furthermore, it is important to note that the data used in the study for Germany did not allow for comparisons of labour market outcomes for the adjusters and the non-adjusters in the medium to long run. The study by Utar (2018) discussed

in the previous section suggests that an explicit consideration of longer-term effects might reveal different outcomes.

CONCLUSIONS

This chapter provided an overview of the unequal effects of rapid globalisation on workers. While many studies have shown that the effects on the welfare of entire countries have been positive (mainly via lower prices), the relatively new strand of literature on which this chapter focused has revealed that some types of workers have been affected negatively. Initially, in identifying these workers, most studies considered the industries in which they were working, (implicitly) assuming that the specific tasks performed by a worker did not really matter. Industries in which advanced countries (like the US and Germany) had a comparative disadvantage tended to be relocated to emerging countries (like China and countries in Eastern Europe). In the more recent literature, the notion of trade in tasks has become prominent. Improved internet-based information and communication technologies have allowed firms to relocate the execution of specific sets of tasks to (often distant) countries, while continuing to perform other tasks in the home country, depending on where these tasks can be done at low cost. Consequently, workers in specific occupations, rather than in specific industries, tend to be affected most.

The literature overview and the discussion of the work done on this theme in the GI-NI project showed clearly that adjustment to trade shocks happens, but not immediately. Adjustment costs are substantial, especially for workers with very occupation-specific knowledge. Often, this group of workers overlaps considerably with the group of workers with relatively low earnings, implying that trade shocks generally lead to more labour market inequality (particularly in advanced countries; in emerging countries, several mechanisms yield opposite effects, implying that the aggregate outcomes can vary). The extensive overview by Colantone et al. (2022) on the wider implications of the inequality-enhancing effects of globalisation might suggest that it would be better to erect high barriers to globalisation again. Over the past few years, this 'backlash of globalisation' has already had such effects, reinforced by geopolitical tensions. It remains to be seen whether the tendency towards deglobalisation has the opposite effects to those that the earlier waves of globalisation had. Within the constraints set by national and supranational policies (as proposed by, for example, national governments and the European Commission), firms will continue to seek ways to produce at lower costs than their competitors. Rather than using expensive domestic labour to perform tasks that were previously performed abroad, they might opt for investing in robots and other types of capital that could replace workers. Hence, it remains to be seen whether deglobalisation will reduce inequality.

Given the incentives to firms to reduce costs and the ongoing technological progress with respect to digital technologies, it is likely that, sooner or later, globalisation will pick up again. The last section of this chapter devoted attention to how workers who adjust to high levels of import exposure (the 'losers from globalisation') fare in comparison to workers in the same situation who do not adjust. The adjusters appear to do better, which suggests that governments should try to adopt policies to enhance adjustment. Switching to different occupations could be promoted by designing lifelong learning policies that go beyond the provision of training in capabilities that are required to perform the current job in more productive ways. Workers should become more versatile instead, which could be stimulated by offering training that might not be directly relevant to the current job. This will not be easy, of course, because the current employers of workers will probably not benefit themselves. Another way in which switching could be stimulated is by designing pension systems that do not complicate things too much for workers who switch from one employer to another. Facilitation of adjustment might also relate to finding employment in regions that are less exposed to import competition. Workers facing such a shock might be more tempted to adjust in this way if housing markets are flexible. Investing in affordable and sustainable long-distance infrastructure might also help because it might reduce the (largely non-monetary) costs of moving from one place of residence to another. The literature has so far not addressed the question of which workers decided to adjust (and why) and which ones decided to stay put. Getting deeper insights into questions like these might allow the development of targeted policies.

The benefits of globalisation are too significant to be discarded. Domestic policies can go a long way in facilitating those workers who are affected negatively. A lot of policy-relevant research has been done, but much more is needed in this respect to support sound policymaking.

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4. Migration, inequality, and skills

Leire Aldaz Odriozola, Majda Seghir, Begoña Eguía Peña and Ane Aizpurua Esnaola

INTRODUCTION

Migration is a current prominent issue in the political discourse of the European Union (EU) and poses a major challenge to policymakers. As stated by Eurostat[1], the EU hosts nearly 60 million individuals who were born in other countries, representing 13.4 per cent of the total population. The presence of these foreign-born citizens has a significant effect on the labour market, and its economic impact is influenced not only by the profile of the migrant population but also by the public policies that are implemented. The recent influx of migrants into Europe has led to a vigorous debate about the introduction or tightening of immigration restrictions. The European migration policy is characterised by inconsistencies in its actions, values, and proposed solutions. Despite the EU's longstanding recognition of migration as a pivotal aspect of its demographic, economic, and social landscapes, its current policy frameworks reflect a predominantly defensive posture.

The phenomenon of migration is inherently complex. Historically, migration in Europe was primarily driven by economic considerations and the reunification of families. However, in recent years, the continent has witnessed a surge in asylum seekers, particularly from war-torn countries. The EU Member States are confronted with the dual challenge of integrating these migrants and managing public perceptions of migration, which are often misinformed. To effectively address these challenges and implement appropriate integration policies, it is essential to have an evidence-based understanding of the scale of the challenge and the impact of migration on the labour market and public finances, among others.

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[1] https://doi.org/10.2908/TPS00178

The EU labour force is undergoing a demographic shift, with an increasing proportion of immigrant workers: according to Eurostat[2] the foreign-born constitute nearly 15 per cent of the labour force, a notable increase from 8 per cent at the beginning of the century.

A significant number of politicians in Europe have adopted an anti-immigration stance, attributing the deterioration in labour market conditions to immigration. It is pertinent to enquire whether economic factors are the underlying cause of these sentiments, or whether cultural diversity presents an obstacle to social cohesion. It can be assumed that immigrants will intensify competition for employment in the host country, resulting in lower wages and higher unemployment rates among natives. Nevertheless, what is the actual impact of immigration on the employment and remuneration of the native population?

The existing literature on the economic effects of immigration presents a contradictory picture (Dustmann et al., 2016). With regard to the effect on wages, the findings of Borjas (2003), Borjas and Katz (2007), Dustmann et al. (2017) and Monras (2020), among others, indicate a moderate negative effect of immigration on natives' wages. However, Card (2001, 2005), Foged and Peri (2016), and Ottaviano and Peri (2012) estimate a zero or positive effect on natives' earnings. In a recent study, Tabellini (2020) reinforces previous findings and concludes that the results are inconsistent with the notion that immigrants exert downward pressure on wages or reduce employment even for workers in the most exposed sector, or whose skills are highly similar to those of immigrants.

Moreover, diversity can be economically beneficial on account of the advantages of specialisation and complementarity (Alesina & La Ferrara, 2005). Peri and Sparber (2009) demonstrate that immigration facilitates occupational upgrading among the native population. Due to complementarity, the native workforce tends to transition away from occupations that are more exposed to competition from immigrants and instead specialise in jobs where they hold a comparative advantage.

The economic integration of migrants is a critical issue for policymakers, as its consequences depend on the policies implemented. In the absence of effective integration measures, migration can result in an increase in inequality, with foreign-born workers being confined to specific labour niches, usually at the lower end of the occupational ladder. In a polarised society with a segmented labour market, equal opportunities for all citizens cannot be guaranteed. Conversely, migration can contribute to the resolution of certain problems. The demographic shift towards an ageing population in Europe is associated with a number of challenges, including labour shortages. In this

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[2]   https://doi.org/10.2908/LFSQ_EGACOB

context, migration flows can be conceptualised as a potential solution to address this shortage issue.

This chapter focuses on the challenges and opportunities afforded by the economic integration of foreign-born workers. Adequate understanding of these issues is crucial for the development of effective policies.

ECONOMIC INTEGRATION OF FOREIGN-BORN WORKERS IN THE LABOUR MARKET

Labour Niches by Origin and Gender

The EU labour market comprises workers who differ in their level of qualification, wages, and type of occupation. International migration and mobility, whether from outside the EU or in the form of free movement of EU citizens, are controversial issues that are high on its political agenda. Both migration and mobility are necessary to address skills imbalances and respond to labour market demands.

Western societies have undergone three major changes that transformed their labour markets and migrants' labour situation (De Haas, 2023). First, younger generations are more likely to pursue higher education, leaving vacancies in manual sectors that are currently filled by migrants. Second, the enhancement of the educational attainment of women and their massive incorporation into the formal labour market in occupations commensurate with their level of education has led to a high demand for domestic work. Hence, the tasks formerly assumed by mothers are currently fulfilled by female immigrants (De Haas, 2023). Additionally, there has been a considerable decline in birth rates, accompanied by an ageing population. This has resulted in an increase in the presence of foreign-born workers in activities where there is a shortage of labour.

The different demographic groups participating in the labour market are not on an equal footing; namely, the migrant population experiences disadvantages based mainly on the country of origin. That is, labour outcomes vary depending on the profile of the foreign-born workers, since third-country nationals behave differently to movers (EU citizens). Third-country nationals are predominantly employed in low- and medium-skilled occupations, whereas EU citizens encounter fewer barriers to entering the high-skilled levels. Furthermore, gender plays a major role in this process, given the notable presence of third-country women on the lower rungs of the occupational ladder. This demographic group constitutes the most vulnerable segment of the labour force and faces additional barriers, both as immigrants and as women. In addition, the foreign-born workforce is over-represented in specific sectors such as construction, transportation, hospitality, and household activities. This

situation is a consequence of labour shortages caused by a decline in local workers willing to undertake a range of manual tasks across diverse sectors. In fact, the underlying cause of migration is the persistent demand for particular occupations. Despite the automation or offshoring of some jobs, certain low-skilled services require the physical presence of workers (De Haas, 2023).

Occupational segregation, the systematic concentration of a group of workers in particular jobs, is a feature of the labour market in numerous geographical areas. Labour markets are strongly segmented, with highly specialised jobs where the transfer of skills between sectors is challenging (De Haas, 2023). Thus, foreign-born people in the EU suffer higher levels of segregation than natives, but movers fare better than third-country nationals in the labour market. Gender and country of origin are the two main motivating factors and, therefore, third-country women constitute the most vulnerable group, having to meet the specific challenges of immigrants and women simultaneously.

Research on occupational segregation concludes that the unequal distribution of men and women across and within job types is often at the heart of gender disparities in labour market outcomes (Carranza et al., 2023). In turn, the literature shows that immigrants are mostly concentrated in low-skilled and low-paying occupations (Alonso-Villar et al., 2012; Catanzarite, 2000; Hellerstein & Neumark, 2008). This occupational segregation is a significant contributing factor to the wage gap, job quality and employment trajectories of foreign-born workers.

There are several explanations for the occupational segregation of foreign-born workers. According to the human capital theory, occupational differences among groups are attributable to workers' education and skills (Cotter et al., 2003). Both women and immigrants are regarded as disadvantaged in the labour markets due to their lower levels of human capital (Schrover et al., 2007). The sources of this disadvantage vary by group: while gender differences are based on skill investment, immigrants' disadvantage is related to foreign credentials. However, several pieces of research conclude that after controlling for human capital, occupational segregation based on race (Hellerstein & Neumark, 2008), gender (Gradín, 2013) and nativity (Chiswick & Miller, 2009) persists.

Consequently, two further explanations for occupational segregation can be posited: social networking and discrimination. The social networking model refers to the process by which individuals are directed towards certain jobs through the influence of their social networks, including friends, family, and acquaintances. Individuals recommend only co-ethnic group members who are perceived to be hardworking and reliable (Waldinger & Lichter, 2003) and, as a result, immigrants concentrate in particular sectors of the labour market (Ellis & Wright, 1999). Additionally, the social networks providing immigrant men and women with job information are not closely related.

Therefore, immigrant women are more likely to enter occupations with immigrant women, regardless of place of birth, than into jobs with co-ethnic men (Wright & Ellis, 2000). As a result, foreign-born men and women are clustered in different occupations (Hamilton et al., 2018). On the other hand, statistical discrimination, defined as the practice of hiring based on stereotypes of groups, represents a key mechanism through which stereotypes create segregation (Kaufman, 2002).

The majority of studies on foreign-born workers have focused on the United States (US), but the findings can be extended to the EU. In this context, Aldaz et al. (2025) reveal that significant internal differences exist within the EU, with heterogeneity emerging as a key characteristic of segregation, based on the diverse historical migration flows experienced in Europe.

The lowest levels of overall segregation, that is, the smallest differences by origin and gender, are observed in the countries of Western Europe (Austria, Belgium, Germany, etc.), where movers access high-skilled occupations and behave similarly to natives, but third-country nationals are distributed unevenly across the occupational ladder. Similarly, North-Western European countries (Sweden, the Netherlands, France, etc.) exhibit low segregation levels, with no major gender disparities and a more equal distribution of third-country nationals. Conversely, countries in Eastern Europe (Estonia, Latvia, Lithuania, etc.) present higher differences by origin and gender, particularly in the case of movers. However, third-country nationals have a greater presence in high and medium-skilled occupations. Southern European countries (Greece, Italy, Spain, etc.) also tend to have unequal distributions of workers by origin and greater gender differences in the labour market, with a notable pattern of confinement of third-country national women in domestic activities (Aldaz et al., 2025).

Moreover, the first two groups of countries, with lower differences by origin and gender in the occupational distribution of workers (North and West), also exhibit lower income inequality indices (Gini index is below the European Union average). The most segregated countries (East and South) have higher income inequalities.

Therefore, cross-country differences highlight diverse patterns of inequality across the EU. In comparison with northern and western countries, which have longer experiences with immigration, recent destinations, such as the south of Europe, still show much more segmented labour markets.

It is essential to understand the segregation patterns of migration and its consequences in order to implement appropriate measures.

Consequences of Occupational Segregation

Occupational segregation is a major source of inequality inside and outside the labour market. Its consequences can be categorised into three domains.

First are consequences related to the welfare of the affected groups. Is the immigrant population the most segregated and the worst off? In all EU countries, immigrants are more segregated than natives, but segregation in itself does not necessarily reflect the advantaged or disadvantaged status of a group. In order to assess a group's position in the labour market, it is necessary to complement the measure of segregation with an indicator of the quality of the occupations in which the group is over- or under-represented. In this regard, Palencia and Del Río (2024) quantify the economic and welfare consequences of gender and origin-based job segregation in 12 European countries and conclude that, in general, countries with the highest segregation levels experience greater losses. The majority of foreign-born workers suffer negative consequences, especially immigrant women. The effects vary across countries. Italy, Spain, Slovenia, and Germany show the greatest wage and welfare losses, with women bearing the largest losses. Conversely, Portugal, the Czech Republic and the United Kingdom show positive wage outcomes for male immigrants, but slightly negative ones for women.

Second are consequences related to immigrants' skills utilisation. Immigrants' jobs often do not match their level of education, creating an underutilisation of skills in the EU. Some university-educated immigrants work in low-skilled jobs, resulting in an overqualification of this workforce. This fact has several costs. On the one hand, brain waste produces costs for immigrants and their families, with implications for their integration. Skills and education degrade over time if they are not put to productive use, making occupational mobility difficult and confining foreign-born workers to low- and medium-skilled jobs. Moreover, this has an impact on their salaries, increasing the risk of poverty. On the other hand, skill underutilisation also has costs to the economy. Workers employed below their skill level and on lower wages are less productive and generate lower levels of output and demand for goods and services. In turn, lower incomes also have a negative impact on tax revenues and increase the use of public benefits.

Last are the consequences on gender disparities. Occupational segregation perpetuates gender gaps among occupations. Despite a higher level of education than men, women in all EU Member States continue to experience gender-based disadvantages. Female immigrants face higher inequality, not only due to their lower concentration in the highest-paying occupations but also because the share of educated females in low-paying jobs is higher than that of men.

It is important to be aware of the several consequences of occupational segregation by origin and gender, some of which are evident in the labour market.

The human-capital losses should be of special concern for policymakers. The most sensible course of action would be to improve the accessibility of educated immigrants to the labour market, enhance their attractiveness to global talent and mitigate brain waste by eliminating barriers to their education–skill alignment. In turn, it is essential that migration and integration policies incorporate a gender perspective. Ultimately, it will be crucial to remove the barriers faced by foreign-born workers in order to diminish occupational segregation and thus be able to reduce or even eradicate these inequalities in the labour market, thereby fostering more inclusive and balanced economic development.

Effectiveness of Current Integration Policies

Focusing on the policy measures implemented in the EU, are current integration policies effective? There is no single answer, but it depends on the specific policy measures in place in each country.

The Migrant Integration Policy Index (MIPEX) measures immigrant integration policies in several countries across five continents, including all EU Member States (Solano & Huddleston, 2020). It is based on a set of indicators covering eight policy areas related to integration: labour market mobility; family reunification; education; political participation; permanent residence; access to nationality; anti-discrimination; and health. The index enables the assessment and comparison of governmental initiatives aimed at facilitating the integration of immigrants. As demonstrated by this index, Portugal's integration policies have been found to facilitate migrants' access to both the economy and wider society. Along with the Nordics and other traditional destinations, this southern European country ranks at the top of the MIPEX, with a score of 81 out of 100 (Sweden, 86; Finland, 85). Other new destinations like Italy (58) and Spain (60) score much lower (as do Eastern European countries like Lithuania and Latvia, 37).

The maps (Figure 4.1a-c) illustrate, for each EU Member State, the extent to which integration policies have been implemented specifically in the labour market area, as well as the degree of segregation experienced by third-country nationals, men and women (darker shades represent higher intensity, while lighter shades reflect lower levels.). Although the correlation is not strong, countries with more inclusive labour market policies experience lower levels of segregation. Portugal has the highest MIPEX index in the area of labour market (94 points). The Nordic countries, Sweden and Finland, are close behind.

The economic and social context of each Member State, in conjunction with the skills and qualifications of the workforce, determine access to different jobs. Nevertheless, it seems that integration policies are effectively contributing to a more equal distribution of groups across occupations, thereby facilitating

Figure 4.1a   *Map of EU Member States according to MIPEX labour market mobility (darker = more integration policies)*

Figure 4.1b   *Map of EU Member States according to occupational segregation – Male immigrants (darker = more segregation)*

Source: Authors' own calculations.

Figure 4.1c   *Map of EU Member States according to occupational segregation – Female immigrants (darker = more segregation)*

immigrant wage and welfare integration in countries such as Portugal, Sweden and Finland, as found in Palencia and Del Río (2024).

In contrast, in other Southern European countries, such as Spain and Italy, foreign-born workers are highly segregated, wage and welfare losses from access to certain jobs are significant, and immigrant integration policies have been scarce. However, it is hoped that the recently implemented policy of framing migration as a solution to its demographic challenges in Spain will facilitate labour market integration of this group and will help to achieve the promotion of equal quality employment in the short to medium term.

MAXIMISING THE POTENTIAL OF IMMIGRANTS: FOSTERING ECONOMIC INTEGRATION THROUGH RECOGNITION AND TRANSFERABILITY OF HUMAN CAPITAL

Immigration is also increasingly being used as a cost-effective strategy to address labour shortages in many European countries, with initiatives also being actioned at the EU level. Demographic decline and ageing populations in several EU countries are likely to intensify efforts to attract foreign workers to fill domestic labour shortages. While this approach appears to be a

mutually beneficial solution – with adverse economic and social conditions in many countries of origin driving individuals to seek opportunities abroad and European host countries in need of an influx of foreign labour – the key challenge is to make effective use of immigrants' skills to meet domestic labour needs. At the heart of this issue is the integration and assimilation of immigrants into the labour market, which requires a thorough assessment of how their educational qualifications and skills are perceived by employers and how these qualifications translate into the labour markets of host countries. The following sections address two key issues that are central to the successful integration of immigrants into EU labour markets. The first question concerns how labour shortages are identified within EU economies, as this is key to proposing effective solutions. The second question examines how labour migration – as distinct from other forms of immigration such as refugees and irregular migration – can effectively address labour shortages in European countries by removing barriers to immigrants' successful labour market integration.

Efficient Identification of Labour Shortages: a Prerequisite for Effective Solutions

Labour shortages lack a commonly agreed definition and a well-defined measurement. Departing from the traditional supply–demand framework, labour shortages refer to a market disequilibrium where the quantity of labour demanded exceeds the quantity of labour supplied at prevailing wages. This definition emphasises the role of wage adjustments as a market-clearing mechanism, i.e. rising wages will attract more workers, thereby alleviating the shortage. Arrow and Capron (1959) add to this definition by considering shortages as a disequilibrium phenomenon during the transition of the labour market to a new equilibrium, driven primarily by wage stickiness. They argue that the faster wages rise to meet excess demand, the faster shortages will disappear. Similarly, Barnow et al. (2013) define labour shortages as situations where the demand for workers exceeds the available supply willing to work under prevailing conditions in a given place and time.

Labour shortages are often identified by a persistent increase in vacancies for specific occupations, but high vacancy rates may also indicate inefficiencies in recruitment processes or unattractive employment conditions. Employer surveys are another common tool, measuring the proportion of firms reporting recruitment difficulties. However, these surveys may reflect factors such as unrealistic job requirements, low wages, or poor working conditions rather than genuine labour shortages. For example, geographical immobility, particularly in rural or remote areas, may exacerbate recruitment difficulties. Despite these limitations, vacancy data and employer surveys remain key indicators for the design of policies at the national and European levels. For example, the

European Labour Authority's annual report on labour shortages and surpluses relies heavily on these indicators.

Multidimensional indicators that take into account both the quantity and quality of the available labour force are more appropriate for improving identification. These indicators capture situations where shortages result either from insufficient supply in terms of numbers or from skill mismatches. Forecasting techniques that integrate historical data, demographic trends and economic projections also provide valuable insights. For instance, models that take into account ageing populations can predict future shortages in professions such as teaching and healthcare.

A clear framework for identifying and analysing labour shortages is essential for understanding their causes and designing effective solutions. Without such a framework, it becomes difficult to evaluate the success of implemented solutions, leading to inefficiencies. Despite the availability of tools, there are significant differences between EU Member States in the ways labour shortages are assessed. While some countries rely heavily on employer-reported data, which are influenced by short-term business cycles, others use predictive models based on macroeconomic trends. This inconsistency limits the effectiveness of cross-border and national policies and underlines the need for standardised methodologies to identify skills shortages, understand their causes, propose solutions, and evaluate their impact.

Immigration as an Effective Solution to Alleviate Labour Shortages

Immigration is a pragmatic and increasingly used strategy to address labour shortages. In the EU, initiatives such as the EU Talent Pool[3] – a platform linking employers with jobseekers from non-EU countries – have been set up to facilitate international recruitment. This tool makes it possible to identify skilled workers while simplifying migration procedures and ensuring legal channels for employment. These efforts complement other EU policies aimed at improving labour mobility, retraining, and up-skilling to meet evolving labour market needs.

National policies also illustrate how immigration can alleviate labour shortages. For example, Germany's Skilled Labour Immigration Act[4] (implemented in March 2024) simplifies visa requirements and speeds up the recognition of

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[3]   https://home-affairs.ec.europa.eu/news/commission-proposes-eu-talent -pool-help-address-labour-shortages-across-europe-2023-11-15_en?utm_source =chatgpt.com

[4]   https://www.bundesregierung.de/breg-en/news/skilled-immigration -2264340#:~:text=Stage%202%20of%20the%20Skilled,bureaucracy%20and %20more%20streamlined%20procedures

foreign qualifications, particularly in high-demand sectors such as healthcare and information technology. Similarly, Ireland's Critical Skills Employment Permit[5] targets skills gaps by offering fast-track immigration pathways and direct routes to permanent residency for skilled professionals. However, the successful implementation of such policies requires addressing structural and operational challenges to maximise the potential of foreign workers.

The effectiveness of immigration in addressing labour shortages depends on the integration of foreign workers into domestic labour markets. Research consistently shows that immigrants face poorer employment outcomes than native workers due to systemic barriers to skills recognition and integration (Algan et al., 2010; Borjas, 2015). Limited recognition of foreign qualifications significantly hampers immigrants' ability to access jobs that match their skill levels, reducing opportunities for upward mobility. Recognition frameworks have been shown to improve immigrants' employment prospects by validating their skills (Brücker et al., 2021). However, barriers such as high costs, procedural delays and non-standardised requirements persist (OECD, 2017).

In Europe, the experience of Ukrainian refugees highlights these challenges. Despite being highly qualified, many faced lengthy recognition processes that delayed their entry into the labour market (Eurofound, 2024). Policymakers need to streamline the recognition of qualifications by reducing costs, standardising procedures and targeting support to occupations in high demand. Within the EU, the recognition of professional qualifications is governed by Directive 2005/36/EC, which facilitates mobility for regulated professions such as doctors, nurses, architects, and pharmacists. However, the recognition of third-country qualifications remains largely at the discretion of employers and there is no comprehensive system for regulated professions[6]. This gap underlines the need for harmonised frameworks, mutual recognition agreements and standardised assessment of qualifications to make better use of the skills of third-country nationals.

Effective use of migrant workers also requires targeted integration initiatives, including language training and skills upgrading programmes. Language skills are crucial for navigating professional environments and job-specific language training should be prioritised. Bridging programmes that bring immigrants' skills up to local standards can reduce skills mismatches. For example, Germany's sector-specific training programmes for healthcare professionals have accelerated integration into critical roles.

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[5]   https://enterprise.gov.ie/en/what-we-do/workplace-and-skills/employment-permits/permit-types/critical-skills-employment-permit/

[6]   https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM:2023:715:FIN

Discriminatory practices and systemic inequalities further exacerbate the underutilisation of immigrants' skills. Anti-discrimination legislation, diversity initiatives and public awareness campaigns are essential to promote inclusive labour markets. Engaging employers through mentoring programmes, on-the-job training and hiring subsidies can also reduce bias and promote workforce integration. Robust data collection systems are needed to assess the effectiveness of policies. Disaggregated data on job vacancies, skill requirements and labour market performance of immigrants provide the evidence base for designing targeted interventions.

In conclusion, while immigration offers a viable solution to labour shortages, its success depends on the implementation of comprehensive policies that address structural barriers, facilitate the transferability of skills, and promote equity. By investing in these areas, governments can ensure that immigration serves not only as a short-term remedy but also as a sustainable strategy to meet evolving labour market needs.

DISCUSSION AND POLICY IMPLICATIONS

Migration is a complex and multifaceted phenomenon, as the labour behaviour of foreign-born workers varies according to their country of origin but also according to the economic structure and culture of the host country.

The existence and persistence of gender and origin-based labour niches can reduce society's economic potential, as human resources are often not optimally distributed according to their skills and qualifications. This underutilisation of talent not only leads to economic inefficiency but also contributes to the entrenchment of social inequalities.

Adopting a holistic approach seems to be a critical issue, where employment constitutes the most important pathway to integration (De Haas, 2023). Policies addressing anti-immigrant attitudes, streamlining recognition of foreign qualifications, and ensuring equal access to training opportunities may have positive aspects, as long as they provide means for migrants to learn the language and receive academic training.

Simplifying and expediting the bureaucratic processes and establishing clear guidelines would prevent overqualification and underutilisation of migrant skills in the labour market. Furthermore, engaging employers to invest in training programmes and providing pathways to upward mobility would support migrants in developing their skills and advancing in their chosen professions, shifting from short-term to long-term employment prospects.

In the absence of comprehensive policies at the EU level, it is essential to recognise the importance of the context of each Member State in migrant integration and tailor integration policies accordingly. The gender perspective should be included in all actions related to migration, as immigrant women

are the most vulnerable group. In addition, multilevel governance should be fostered, so that local and regional governments are involved in policy design, leveraging their understanding of migrants' day-to-day realities and enhancing pragmatic problem-solving.

Consequently, integration policies emerge as one of the strongest factors that can help to achieve equal opportunities for immigrants, one of the principles of the European Pillar of Social Rights for a fair, inclusive and opportunity-filled Europe. The EU's capacity to effectively address labour shortages would be enhanced by the proper economic integration of foreign-born individuals.

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5. The interaction of the three shocks: technological change, globalisation, and migration

Marcel Smolka

INTRODUCTION

Until recently, there was a widespread perception that groundbreaking technological developments in the fields of information, communication, and transportation had led to humanity living in a 'global village'[1]. Now we are painfully realising that this notion has blatantly ignored the role of national policies, especially in the context of geopolitical conflicts. The US, under the leadership of Donald Trump, and China are engaged in a serious tariff war that threatens global prosperity. Russia has been trying to move borders through military power not only since the attack on Ukraine in February 2022. European interests, both economic and security-related, are directly affected by both developments.

However, this does not necessarily mean that globalisation is turning back. Even after the global financial crisis of 2008/09 and the subsequent so-called European sovereign debt crisis, there were great fears that globalisation had come to an end. Similar prophecies of doom were voiced during the COVID-19 pandemic. However, these fears were definitely premature. If anything, globalisation has slowed down. *The Economist* judged that the world had moved from a phase of hyper-globalisation in the 1990s and early 2000s to

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[1]   The term was introduced as early as 1962 by Canadian philosopher Marshall McLuhan; see p. 31 in McLuhan (1962), *The Gutenberg galaxy: The making of typographic man*. Toronto: University of Toronto Press. Journalist Thomas Friedman took it up again and described the world as being "tied together into a single globalized marketplace and village"; see page xvii in Friedman (2000), *The lexus and the olive tree: Understanding globalization*. New York: Farrar, Straus and Giroux.

a phase of 'slowbalisation'[2]. Admittedly, the current geopolitical challenges are of a different nature. But, rather than marking the end of globalisation, it is more likely that international economic interdependencies will change and shift. Technological change does not necessarily have to be slowed down by geopolitical tensions either. On the contrary, national rivalries can encourage investment in technological capital and thus spur technological progress[3]. The digitalisation of the economy and the use of artificial intelligence (AI) in production appear to be progressing at a breathtaking pace. Similar things can be said about migration. Sometimes described as the 'missing piece' of globalisation (highlighting the limited focus on labour mobility compared to trade and capital flows[4]), the issues about migration have moved to the forefront of political debates, with massive influence on election campaigns and outcomes[5]. In the future, we can expect more, rather than less, people to migrate, not just because of persistent economic inequalities, but also because of climate change, demographic change, and geopolitical conflicts.

These three profound transformations – globalisation, technological change and migration – raise important questions. On the one hand, there is the question of their reciprocal effects. Does international trade accelerate technological progress? Does it lead to more migration? And vice versa: Does technological progress lead to more trade? Do recent trends such as automation and digitalisation increase or reduce the incentives for migration? And how can migration spur innovation and economic growth? On the other hand, there is the question of the impact of the three transformations on incomes, inequalities, and labour markets. Do they lead to social division and international divergence? Who benefits and who loses? What can policymakers do?

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[2] The term 'slowbalisation' was coined to describe the slowdown of globalisation. It highlights how global trade, foreign direct investment, and supply chain expansion have decelerated after decades of rapid globalisation amid rising protectionism, geopolitical tensions, and shifts in economic policy. See the article 'The steam has gone out of globalisation' in the 26 January 2019 issue of *The Economist*.

[3] For empirical evidence, see Alptekin and Levine (2012). For a general equilibrium analysis of the trade, technology, and growth effects of a geopolitical decoupling of the West from the East, see Goés and Bekkers (2022).

[4] Clemens (2011) discusses the economic losses caused by barriers to migration.

[5] See the recent elections in the US or Germany, where the issues of immigration and border security played pivotal roles, and where polls and election outcomes indicate a desire among the electorate to move to more restrictive immigration regimes.

In this chapter, we approach some of these questions in three ways. First, we take a descriptive look at the latest data for the EU member states on inequality, convergence, and the three transformations. In doing so, we look at the long-term trends, i.e., we cover the period from 1990 until the present. We find that the three transformations are increasingly evident in the data, but that it is difficult to establish clear, empirical relationships about their mutual effects and their impact on inequalities at the country level. Second, we highlight – without claiming to be exhaustive – several important ways in which we can expect the three transformations – technological change, globalisation, and migration – to be related to one another, and to impact inequalities. The interdependencies are complex, and the effects sometimes go in opposite directions. We should, therefore, not be surprised that we will not be able to identify clear empirical relationships in the aggregate data that we use. Finally, to exemplify one way in which modern economic research tackles the aforementioned issues, we summarise a particular and very recent piece of economic research from the GI-NI project that employs an instrumental variables approach to tease out some of the causal effects of the transformations on labour market inequalities, focusing on educational mismatch (or skills mismatch) across Western European countries (Seghir & Smolka, 2024a).

The rest of this chapter is organised as follows. In Section 2, we provide a first look into the data on inequalities and the three transformations in the European Union (EU). Section 3 provides a discussion of important interdependencies between the three transformations, and illustrates data on their mutual relationships. Section 4 emphasises the link between the three transformations and labour market inequalities, and explores data on how recent changes in income inequalities across EU countries are related to their exposure to the three transformations. Section 5 summarises recent research from the GI-NI project by Seghir & Smolka (2024a) on the relationship between globalisation and automation on the one hand, and labour market inequalities on the other hand, focusing on the research question, the empirical strategy and the results. Section 6 concludes and highlights a few policy aspects.

A CURSORY LOOK AT THE DATA ON INEQUALITY AND THE THREE TRANSFORMATIONS

We begin with a cursory look at the data on inequality and the three transformations. To do this, we focus on EU countries and take a long-term perspective. By that, we mean the period of more than 30 years from the collapse of the Soviet Union to the present day. We do this with an understanding that looking

back into the past can be helpful in identifying and understanding the possible determinants of inequality and connections with the three transformations[6].

When it comes to inequality, it is often unclear in the public debate what kind of inequality we are actually talking about. We will limit ourselves here to looking at income inequality and completely ignore wealth inequality. This makes sense because the data on income is of a high quality, especially in comparison to the data on wealth. However, it is also important to ask whether we are looking at income inequality between or within countries. We will do both in the following, noting that increasing inequality between countries implies a lack of convergence in terms of per capita incomes and that increasing inequality within a country means a drifting apart of living conditions within the country's borders. We will very quickly see from the data that, although we are dealing with a significant degree of inequality in the EU (both between and within countries), there have been no significant increases in this inequality over time.

Figure 5.1 highlights income inequality between EU countries in 1990 and 2023. We choose GDP per capita as the measure of a country's income, and we measure the deviations from the EU average on each of the two axes. To ensure comparability of income over time and between countries, we measure GDP per capita in constant prices and adjust it for price differences between countries. The underlying data comes from the World Bank. If the data points in the scatter plot in Figure 5.1 are far apart horizontally and vertically, this is an indication of high inequality in the original year, 1990, or in the most recent year, 2023. If the gap between a country and the EU average has not changed between the two points in time, the data point of the country in question lies on the (solid) 45-degree line. Based on Figure 5.1, we can conclude the following: first, there were, and are, significant income differences between countries; second, there is hardly any empirical evidence of a macroeconomic convergence of incomes after the fall of the Iron Curtain to the present day, but there is also no indication of a drifting apart of the countries[7].

Figure 5.2 looks at income inequality within the countries of the EU, and then makes an international comparison in terms of the degree of inequality[8].

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[6]   Wherever possible, we therefore include the period since the beginning of Russia's military attack on Ukraine in Spring 2022 in our analysis. However, the World Bank inequality data that we use are typically only available up to 2021.

[7]   For some more evidence on convergence and inequalities in Europe, see ECB (2015) and Ridao-Cano and Bodewig (2018).

[8]   The data source is the World Bank Poverty and Inequality Platform. The data usually refer to income measured after taxes and benefits (not consumption) per capita. They are elicited from primary household survey data obtained from national statistical offices; see https://pip.worldbank.org/.
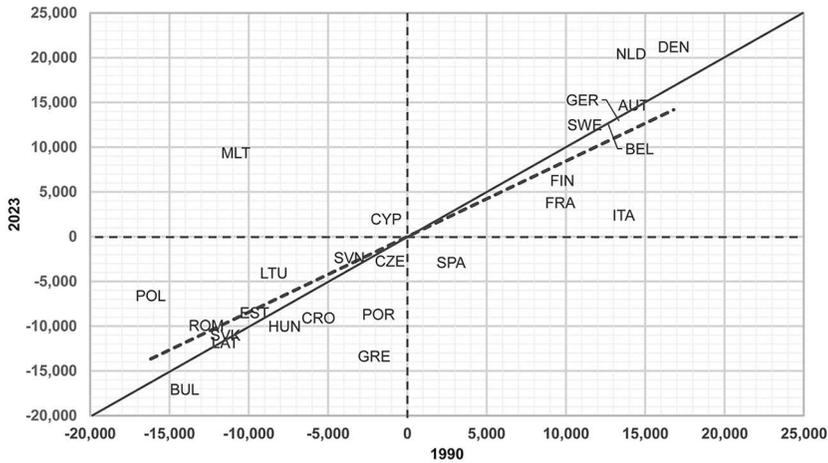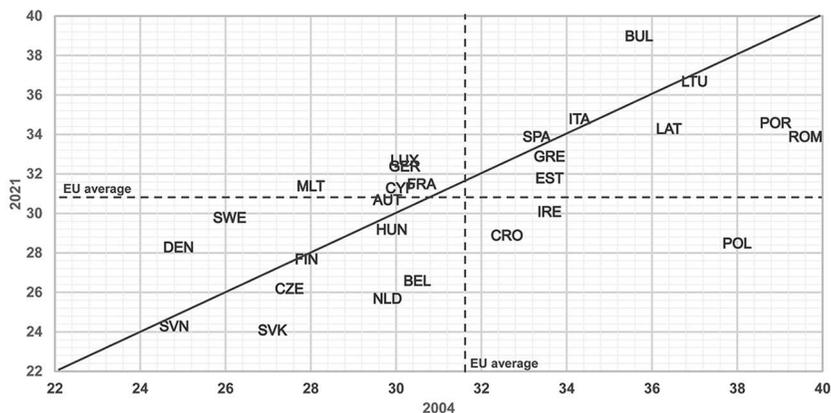
Notes: The figure uses country-level GDP per capita data from the World Bank and includes 25 EU countries (Ireland and Luxembourg are outliers and therefore not included). The upward-sloping solid line is the 45-degree line, while the upward-sloping dashed line is the linear best fit. The two short black lines indicate the positioning of GER (Germany) and BEL (Belgium) for better readability.
Source: Author's own work.

Figure 5.1   *EU between-country income inequality (2023 vs. 1990)*

Due to data limitations, we compare the years 2021 and 2004. We use the so-called Gini index as a measure of inequality. A Gini index equal to 0 means perfect income equality (all households earn the same income), and a Gini index equal to 100 means perfect income inequality (one household earns the entire national income, while all other households earn no income). Figure 5.2 allows the following observations. First, the degree of inequality differs significantly between countries. In lower-income countries such as Bulgaria, Romania and Lithuania, the Gini index value in 2021 was between about 34 and 39. In other countries, including high-income countries such as Denmark, Finland and the Netherlands, but perhaps surprisingly also Slovenia and Slovakia, the index value in 2021 was between 24 and 29. Second, in some countries, especially Denmark, Sweden and Bulgaria, inequality has increased significantly over time, while in other countries, especially Poland, Romania and Portugal, it has decreased significantly. A correlation with the income level of a country is not readily apparent. Third, on average in the EU, income inequality did not increase between 2004 and 2021, but actually fell slightly, from an index value of 31.6 to 30.8. This squares well with a relative stability in average EU

Notes: The figure uses country-level data on income inequality from the World Bank and includes the 27 current EU member countries. The upward-sloping solid line is the 45-degree line, while the dashed lines indicate the EU averages in the respective years. For a few countries, the data are missing for the respective years. We then use data for the closest available year.
*Source:* Author's own work.

Figure 5.2   *EU within-country income inequality (2021 vs. 2004)*

inequality observed in earlier periods, although some periods and countries have seen rising income inequality (see Ridao-Cano and Bodewig [2018]).

Turning to the three transformations, first, let us gain an overview of the aggregate trends in technological change, globalisation (in the form of international trade), and migration in the EU. Figure 5.3 shows the trends since the early 1990s. To get straight to the point: we find that all three transformations are clearly evident in the data, almost in parallel and continuously. At an aggregated level, we can therefore speak of a simultaneity of the three transformations.

To capture technological change, we focus on the automation of production processes. Specifically, as is common in the literature, we look at robot density (measured as the number of industrial robots per 10,000 workers). Measured in this way, three factors can explain increasing robot density: first, advances in robot technology that expand the range of production activities that could previously be performed solely by labour as a factor of production and can now, in principle, be automated; second, factor price changes (in the form of a relative price increase of the factor labour), which make automation appear more attractive in the existing industrial structure; and third, changes in the
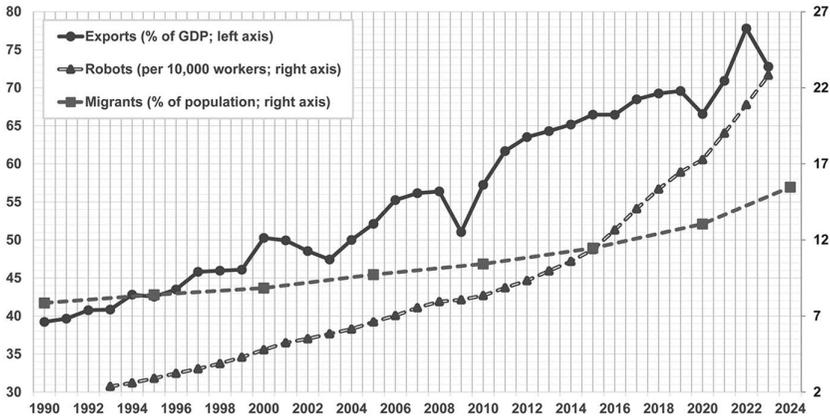
Notes: The data on exports (% of GDP; left axis) come from the World Bank. The data on the stock of robots (per 10,000 workers; right axis) come from the International Federation of Robotics (IFR) and are scaled using labour force data from the World Bank. The data on migrants (foreign-born individuals over total population; right axis) come from the World Bank. All series use unweighted EU27 country averages. The data on robots are not available for Luxembourg and Cyprus. The data on migrants are not available for Cyprus.
Source: Author's own work.

Figure 5.3   *EU countries are subject to three transformations: technological change, globalisation, and migration*

industrial structure of a country (with an expansion of robot-intensive industries at the expense of less robot-intensive industries). The sharp increase in the average robot density in the EU in Figure 5.3, especially after 2014, is therefore not necessarily explained by technological progress alone.

The development of international trade over time is also impressive. Average exports (measured as a share of GDP) have risen sharply, from less than 40 percent in 1990 to almost 80 percent in 2022. This positive development has been almost continuous and has only been set back by some major events: the bursting of the so-called 'dot-com bubble' in the early 2000s, the global financial crisis in 2009, the COVID-19 pandemic in 2020 and the Russian war against Ukraine. How can we explain the increased importance of international trade? It is clear that technological advances in logistics and communication have greatly expanded the opportunities for trade. Politics has also contributed significantly to the reduction of tariff barriers to trade through trade liberalisation (e.g. China's accession to the World Trade Organization and the expansion and deepening of the EU). Accordingly, the average trade

data show no signs of a decline in the importance of international trade for the EU economies. On the contrary, the EU economies have opened up to trade during the period under review in a similar way to how they have been affected by increasing automation[9].

The importance of migration has also increased significantly over time. Figure 5.3 uses data from the World Bank to show that the average share of migrants in the total population in the EU member states increased continuously between 1990 and 2024, from less than 8 percent in 1990 to over 15 percent in 2024. The increase has even accelerated in recent years, not least due to political crises and military conflicts. Between 2015 and 2024 alone, the average share of migrants in the total population rose by more than three percentage points. It should be emphasised that the aggregated migration data completely obscures the heterogeneity of migrants (age, gender, professional background, level of education, etc.). This also includes the various motives for migration. In particular, the data includes refugees from crisis areas as well as migrants who migrate for purely economic reasons (labour migration). These two types of migration differ considerably in some cases and require precise, separate consideration in more in-depth analyses[10].

After looking into the empirical facts, we find that the three transformations – globalisation, technological change and migration – have been taking place simultaneously, continuously and, in some cases, intensifying over time since the early 1990s. An end to these trends is not evident in the data. At the same time, there is no empirical evidence of a general divergence of incomes, either between or within EU member states. The data, therefore, do not suggest any obvious correlation between the three transformations and the degree of inequality in the EU. We will come back to this later on when we explicitly relate the three transformations to changes in within-country income inequality over time.

THE RELATIONSHIP BETWEEN TECHNOLOGICAL CHANGE, GLOBALISATION, AND MIGRATION

In the next step, we want to take a closer look at the connection between technological change, globalisation and migration. It is clear that the three transformations are closely intertwined. But how, exactly? The interrelationships are complex and reciprocal and are widely discussed in the literature. In the

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[9] It should be explicitly pointed out that we are looking at gross exports here when considering trade, not exports of domestic value added. This explains the relatively high export ratios in Figure 5.3.

[10] For an analysis of migration of refugees and their labour market integration, see Brell et al. (2020).

following – without claiming to be exhaustive – we want to roughly outline some of the key relationships and then take another look at the data.

Technological Change and Globalisation

First of all, we have known, at least since David Ricardo's classic theory of comparative cost advantages, that technological differences between countries are an important motive for international trade (Ricardo, 1817). Technological progress that increases the efficiency of certain production processes will almost inevitably have an impact on trade in open economies. Regardless of this, technological advances in the areas of logistics (e.g., through containerisation) and communication have reduced trade costs and frictions enormously in recent decades[11]. More recently, trade in services, in particular, has benefited greatly from a reduction in communication and information costs (Nath & Liu, 2017). However, technological progress has also made it possible to separate out individual intermediate products and production steps ('tasks') along the value chain of a product and relocate them geographically to other countries. This is known as offshoring and is often measured in the literature via trade in intermediate products (Hummels et al., 2001)[12]. If offshoring is used to relocate parts of production abroad for cost reasons and to import the intermediate products manufactured there (or to export them to third countries), increased offshoring is reflected in an increase in the volume of international trade[13]. Another channel through which technological change can lead to more trade lies in increased product differentiation and the possibility of achieving increasing returns to scale in areas of production that were previously characterised by constant returns to scale. Neoclassical trade theories, which assume perfect competition and constant returns to scale, cannot explain trade between perfectly identical countries. However, if technological change allows products to be more differentiated and unit costs to be reduced through mass production, we move towards a world of monopolistic competition and the so-called new trade theory, according to which even perfectly identical countries trade with each other to unlock gains from trade (Helpman, 1981; Helpman & Krugman, 1985; Krugman, 1979).

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[11]　For recent research on how digitisation has reduced trade costs over the period 2014–2018, see Bellucci et al. (2023).

[12]　See Antràs (2020) and Antràs and Chor (2022) for overviews of research into global value chains (GVCs), which are crucial in the understanding of trade in intermediate inputs. See in this context also Bernard et al. (2020).

[13]　See Grossman and Rossi-Hansberg (2008) for the seminal task-based model of offshoring.

On the other hand, international trade in goods and services promotes the spread of technology and technological knowledge. Imitation and learning are made possible, in particular through the offshoring and trade in intermediate products mentioned above, which, to a large extent, take place within the boundaries of multinational companies[14]. Open economies characterised by trade encourage investment in research and development and the application of new, more efficient technologies; see Akcigit and Melitz (2021) and Melitz and Redding (2023) for surveys of the literature on how trade fosters innovation[15]. But does trade lead to a levelling out of technological differences between countries? The assumption is obvious, but the overall lack of macroeconomic convergence in terms of productivity (measured by GDP per capita) seems to suggest otherwise (Johnson & Papageorgiou, 2020). Nevertheless, China is an interesting example in this context. With its opening up to the global economy and its former role as the 'workbench of the world', the country has made impressive progress in terms of productivity[16]. The country is becoming a dominant factor in the field of digitalisation and AI (Zhang & Khanal, 2024).

Technological Change and Migration

Technological progress is the main reason for economic growth with steadily rising per capita incomes; see Solow (1956) for a classical model. If productivity gains are concentrated in the richer countries, per capita incomes between poorer and richer countries will drift apart. However, growing international income differences in connection with better working conditions, higher wages and better development opportunities are a major incentive for international migration; see Lewis (1954), Ranis and Fei (1961), Harris and Todaro (1970), and Todaro (1976) for classical references. Conversely, poorer

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[14] Antràs et al. (2023) develop a theoretical framework to explore the interplay between exporting, global sourcing, and multinational activity. In a related strand of the literature, Kohler & Smolka (2021) bring the class of global sourcing models explaining trade in intermediate inputs and pioneered by Antràs (2003) and Antràs and Helpman (2004) to firm-level data from Spain.

[15] Melitz and Redding (2023) highlight four mechanisms through which trade creates dynamic welfare gains from innovation: (1) increased market size; (2) increased competition in the goods market; (3) specialisation according to comparative advantage; and (4) international knowledge spillovers. See Koch and Smolka (2019) for evidence in the spirit of (1), visualised on technology and skill upgrading in firms accessing export markets through their foreign parents.

[16] See Brandt et al. (2022) for a study on China's current and future productivity development.

countries catching up technologically with richer countries reduces the incentive to migrate[17]. In a broader historical context, transportation technologies are, of course, a prerequisite for migration on a larger scale. European migration to America since the fifteenth century, for example, took place by sea. The prerequisite for this was the development of appropriate sailing boats and, later, steamers[18]. In the more recent past, since the mid-1990s, millions of immigrants from Latin America were able to travel to Spain much more quickly by air. Apart from this, modern information and communication technologies make it possible today to maintain contact with the home country and those who stayed at home, even over great distances, and to process money transfers easily. This is important for remittances to the home countries, for example, and must be seen as a relevant reduction in the (overall very high) migration costs[19].

Can migration also promote technological progress? The answer is clearly yes, but it depends very much on the type of migration. Highly qualified migrants bring their knowledge, skills and experience with them from their home countries. Especially in the fields of science and technology, they can improve existing processes and products and establish new ones This applies in particular to migrants who have a professional background in the STEM fields (science, technology, engineering, and mathematics) or who acquire it in the destination country and frequently set up their own companies, often in technology-driven sectors. These start-ups can create new products and services and thus drive technological progress in the destination country; see Hunt and Gauthier-Loiselle (2010), Kerr and Lincoln (2010), Stuen et al. (2012), Akcigit et al. (2017), and Lissoni and Miguelez (2024) for empirical evidence on the relationship between immigration and innovation[20]. Migration also promotes

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[17]   This also applies to better technology-driven adaptability to climate change, which can reduce climate-induced migration.

[18]   See Neubecker et al. (2017) for a study on the determinants of the Spanish immigration boom in the 1990s and 2000s.

[19]   The digitisation of borders and migration controls that is taking place in some cases can also lead to a reduction in migration costs for legal migration and at the same time increase the costs of illegal migration. Kennan and Walker (2011) estimate migration costs empirically using a structural econometric model.

[20]   It is no coincidence that there is a newly emerging hope in the EU that the political developments in the US could attract highly qualified migrants from there; see also the commentary by Louisa Clarenze-Smith: "This is the perfect moment for Europe to attract US scientists: As America faces a brain drain due to Donald Trump's funding cuts, Europe could become a global leader in AI, green tech and advanced materials", published in *The Times* on 25 February 2025. The EU and the US have created easier immigration opportunities for highly qualified migrants via the Blue Card and the H-1B visa with paths to permanent residency.

international networks between scientists, engineers and companies. These connections facilitate the exchange of ideas and technologies across national borders[21]. Silicon Valley is a prime example of how migration drives technological progress. Without international talent and founders, the region would hardly be the global centre for innovation that it is today[22]. Migration of low-skilled workers, which has particularly affected the EU in recent times due to conflict situations in other countries, has a different effect. However, it can also promote technological progress, namely when a reduction in production costs frees up resources that can be invested in research and development or when native workers specialise in other, technology-intensive activities following increased competition in the labour market (Peri & Sparber, 2009).

Globalisation and Migration

A key finding of neoclassical trade theory is that international trade and migration are substitutes. This is because, under certain conditions, the opening of goods markets leads to factor price equalisation between countries. The integration of a country richly endowed with the factor labour into world trade (e.g. China or Mexico) leads to a higher demand for labour and causes the equilibrium wage rate there to rise. This removes the incentive for labour migration. Of course, this prediction depends on strong neoclassical assumptions (perfect competition, constant returns to scale, perfect factor mobility within a country). More generally, international trade leads to shifts in the industrial structure of the countries involved, and to specialisation in those industries in which countries have a comparative advantage. In the classical Ricardo model with technological differences between countries, trade liberalisation leads to higher wage gains in less productive countries and thus reduces the incentive to migrate from poorer to richer countries. On the other hand, trade liberalisation can also be conducive to migration. If sectoral shifts take place within a country to the detriment of (certain groups of) workers (in the form of wage losses and increased unemployment), the incentive for them to migrate increases. Apart from this, migration costs for poorer households are sometimes prohibitively high. The opening of a poorer country to the world market leads to income gains there, allowing people to migrate once they overcome a certain threshold level of income; see Clemens (2011) for a thorough discussion of obstacles to migration for poor households in the context of the development-migration nexus.

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[21]   Technology transfer can create so-called brain circulation effects when skilled workers later return to their home countries and promote innovation there (Docquier & Rapoport, 2012).

[22]   See Kerr (2020).

Migration has a trade-creating effect, as has been widely discussed and empirically investigated in the literature starting with Gould (1994) and Head and Ries (1998)[23]. This effect can be attributed to at least two channels, a trade cost channel (sometimes called 'business and network channel' or the like) and a demand channel (sometimes called 'preference channel'). First, migrants reduce trade costs (related to information, communication, and set-up costs) between the country of origin and the country of destination. This enhances bilateral trade. Second, migrants have stronger preferences for goods produced in their countries of origin (e.g. certain types of food). This raises the import demand for goods produced in immigrants' countries of origin.

Some Macro Evidence on the Relationship Among the Three Transformations in EU Member States

Figures 5.4, 5.5 and 5.6 use cross-sectional data from the EU member states to examine whether there is an obvious empirical pairwise correlation between the three transformations. The above considerations could, indeed, lead us to expect this. In Figure 5.4, first we look at the relationship between globalisation and migration. For each EU country, we compare the absolute change in exports (in percent of GDP) with the absolute change in the share of migrants in the total population (in each case over five-year periods). In the left panel, we do this in relation to the change in migration five years in the past, and in the right panel in relation to the change in exports five years in the past. If migration causally leads to higher aggregate exports, and exports causally lead to a higher share of migrants, then we could expect a positive correlation between the variables mentioned. The data do not speak a clear language here. As expected based on Figure 5.3, most of the data points are found in the upper right quarters of the two charts. This shows that most countries have seen an increase in migration and exports over time. However, there is no evidence of a strong positive correlation between globalisation and migration at the country level. We arrive at very similar results when we look at the relationships between globalisation and technological change (Figure 5.5) and between technological change and migration (Figure 5.6). Obvious empirical correlations cannot be identified with the help of the aggregate data that we use, and a more fine-grained empirical analysis is needed to clearly establish an empirical relationship among the three transformations.
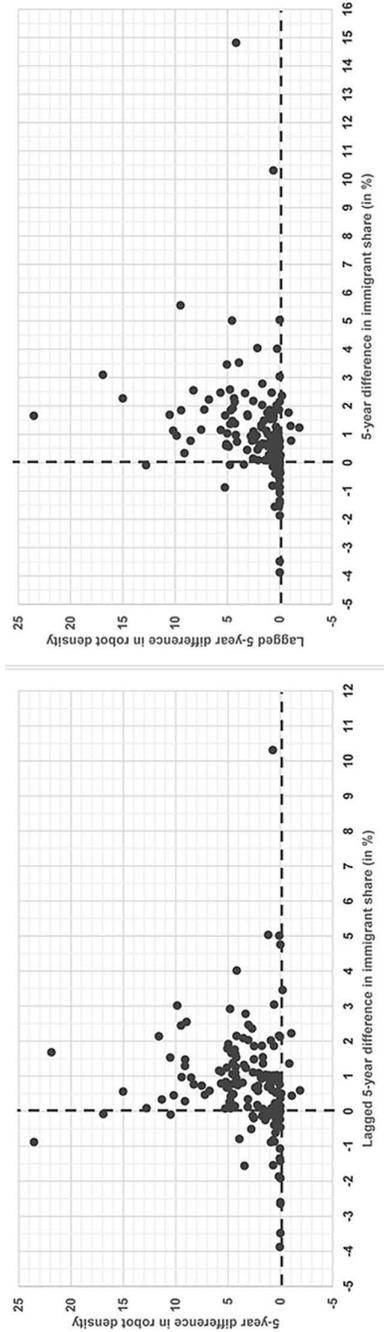
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[23]   See Kerr (2020).
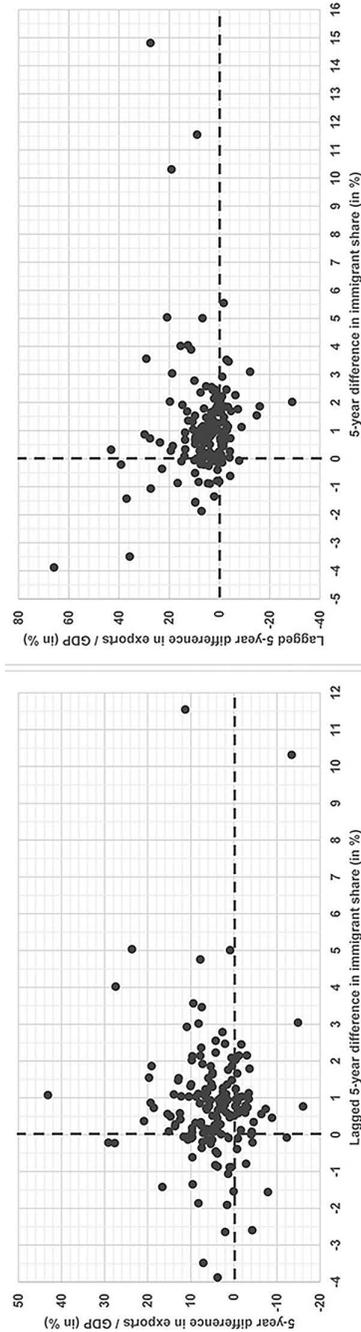
Notes: All data start in 1990 and come from the World Bank. The data cover all EU-27 countries except Cyprus, for which data are missing.
Source: Author's own work.

Figure 5.4   Globalisation and migration
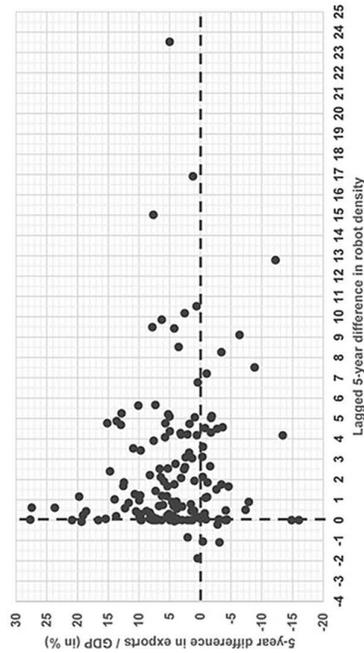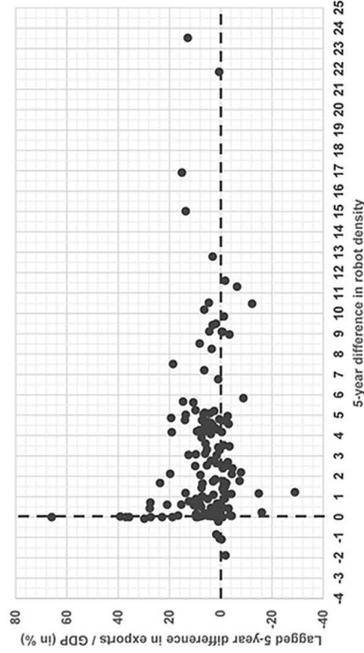
Notes: The export data start in 1990 and come from the World Bank, while the robots data start in 1993 and come from the IFR. Robot density is the operational stock of robots per 10,000 workers in the labour force. The data cover all EU-27 countries except for Luxembourg and Cyprus, for which data are missing.
Source: Author's own work.

Figure 5.5   *Globalisation and technological change*

Figure 5.6   Technological change and migration

INEQUALITIES IN THE LABOUR MARKET AND THE THREE TRANSFORMATIONS

Is there a connection between increasing (or decreasing) inequality in the labour market and the three transformations? In the following, we selectively outline some of the important connections frequently discussed in the literature.

Technological Change and Globalisation

In neoclassical trade models, international trade leads to an increase in wage inequality in richer countries, which are richly endowed with highly qualified workers, and to a reduction in wage inequality in poorer countries, which are richly endowed with low-skilled workers (Stolper-Samuelson theorem)[24]. In richer countries, however, wage inequality increases even more if technological progress is taken into account that favours highly qualified labour and thus has a positive effect on the relative demand for highly qualified workers (so-called skill-biased technological change [SBTC]); see Katz and Murphy (1992), Autor et al. (2003), Autor et al. (2006) and Akerman et al. (2015) for empirical evidence. Offshoring has a similar effect through the relocation of labour-intensive parts of production from richer countries to poorer countries (Feenstra & Hanson, 1996, 1999)[25]. More recent models that explicitly model the labour-displacing effect of technological progress in the form of automation (Acemoglu & Restrepo, 2018, 2019) arrive at theoretically nuanced results. Autor & Dorn (2013) show how technological progress in the US has led to job polarisation through a reduction in automation costs, with growth

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[24]   See the classical paper by Stolper and Samuelson (1941). Burstein and Vogel (2017) revisit this prediction in a fully-fledged Ricardian multi-country model of international trade with skill intensity differences across firms and sectors, and factor endowment differences across countries. Epifani and Gancia (2008) show how economies of scale along the lines of Krugman's new trade theory can explain how trade raises wage inequality, abstracting from the effects operating through different factor endowments across countries. Autor et al. (2013) use a local labour markets approach coming from a Krugman-style trade model to provide evidence on how rising imports from China into the US have harmed workers employed in regions most heavily affected.

[25]   Goos et al. (2014) show how technological advancements biased towards routine tasks (so-called routine-biased technological change [RBTC]) and offshoring have jointly contributed to job polarisation across Western Europe, affecting wage structures and inequality. See Hummels et al. (2018) for a survey of the labour market effects of offshoring.

of low-skill service occupations and a hollowing out of the middle class. In a similar vein, Acemoglu and Restrepo (2022) show that US workers specialised in routine tasks in industries experiencing rapid automation have suffered from relative wage declines. Seghir and Smolka (2024b) show, for a number of Western European countries, that the same occupations that were heavily exposed to automation between 1998 and 2018 were also heavily exposed to rising import competition. Overall, we conclude that the recent waves of technological change and globalisation have affected some of the same workers in similar ways, especially in richer parts of the world[26].

Technological Change and Migration

Technological progress in the form of automation reduces the demand for labour in routine-intensive activities and increases the demand for labour in activities that require complex and cognitive performance. This leads to higher wage inequality; see above. The interaction of automation and simultaneous immigration, in turn, depends on the type of migration. Immigration of workers with low and medium skill levels increases the supply of workers who are largely deployed in routine-intensive activities (D'Amuri & Peri, 2014; Peri & Sparber, 2009). This also leads to increasing inequality between native workers and migrants. Dustmann et al. (2005) and Edo (2019) provide surveys of the extensive literature studying the labour market effects of immigration[27]. At any rate, it should be noted that the latest technological developments in the field of AI can have very differentiated effects on the relative demand for different types of workers (Hampole et al., 2025; Webb, 2020). If they are complementary to highly skilled labour in production, this would lead to higher wage inequality, like SBTC; if they are substitutive, the effect is weakened or reversed.

Globalisation and Migration

As we have already described above, the welfare gains from international trade are unevenly distributed. In richer countries, the demand for highly skilled labour increases following trade liberalisation, giving rise to higher wage inequality. If there is also a higher supply of low-skilled labour due to immigration, this effect tends to be amplified. Conversely, an increase in the

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[26]   In poorer countries, the effects of SBTC (or RBTC) can overturn the results of international trade and thus lead to higher wage inequality as well; see Esquivel and Rodríguez-López (2003) for evidence from Mexico. See also Waddle (2021).

[27]   Smolka (2024) finds that immigration can impact within-country income inequality through the effects it has on different domestic consumer prices.

supply of highly skilled labour through immigration tends to counteract this effect. As for offshoring and trade in intermediate inputs, Ottaviano et al. (2013) study the joint effects of offshoring and migration in a task-based model à la Grossman and Rossi-Hansberg (2008). With migrants suffering from a comparative disadvantage in performing complex tasks (e.g., due to lower communication skills in the host country's language and culture), the model generates novel insights into changes in labour demand and efficient task specialisation following immigration and offshoring. In a somewhat similar spirit, it should be noted that the data show that when migrants arrive in their destination country, they often initially find employment below their actual level of education and qualification acquired in their countries of origin; see Lebow (2024) for recent evidence from Venezuelan migrants in the Colombian labour market. It is only over time, over several years, that migrants make up for this occupational downgrading (Seghir & Smolka, 2024a). However, we should also like to point out that neoclassical trade theory teaches us that immigration (whether low- or high-skilled) can also leave relative wages unchanged under standard assumptions of neoclassical theory, namely when the home country is 'small', and international goods prices are not affected by migration.

Some Macro Evidence on Inequality and the Three Transformations in EU Member States

Let us now take another look at the data.

Figure 5.7 uses cross-sectional data for the EU countries and compares the change in inequality between 2010 and 2020 within a country with the three transformations in a scatter diagram. The period chosen sensibly begins directly after the global financial crisis in 2009 and ends with the start of the COVID-19 pandemic. As a measure of (the change in) inequality, we use the change in the Gini index (see Figure 5.2). In order to capture the three transformations quantitatively, we construct an index with values ranging between 0 and 100, which measures the degree of transformation over the same period (i.e., between 2010 and 2020). Specifically, first we construct an index measure for each transformation (globalisation, automation and migration) based on the data underlying Figure 5.3, with the country with the highest rate of change receiving a value of 100 and the country with the lowest rate of change receiving a value of 0. The other countries receive an index value according to their distance from these two countries. Finally, we average all three transformations for each country and normalise the resulting values to index values between 0 and 100. Countries with higher rates of change (related to globalisation, automation and migration) thus tend to have higher index values for our measure of transformation.
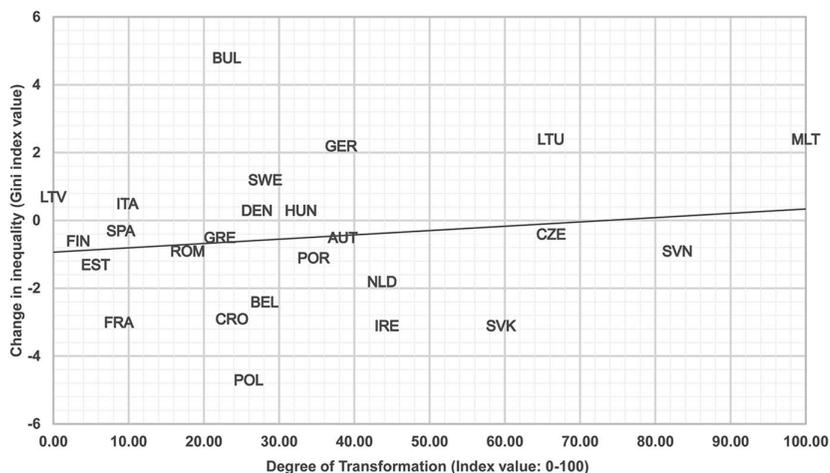
Notes: The figure uses country-level data on changes in the Gini index from the World Bank along with data on the three transformations from the World Bank and the IFR. We include all 27 EU member countries except Cyprus and Luxembourg, due to missing data. The vertical axis measures the change in the Gini index between 2010 and 2020. The horizontal axis measures the degree of transformation, with higher index values indicating stronger degrees of transformation. See the text for details.
Source: Author's own work.

Figure 5.7   Inequality and the three transformations

Figure 5.7 suggests, perhaps surprisingly, only a very weak positive correlation between the three transformations and income inequality within a country.

RECENT RESEARCH ON THE IMPACT OF THE THREE TRANSFORMATIONS ON LABOUR MARKET INEQUALITIES IN WESTERN EUROPE

Let us now take a brief look into a very recent piece of empirical research on the question of how major transformations affect inequalities in the labour market. In what follows, we summarise the methodology and results of Seghir and Smolka (2024b), but leave the details to the original source. Specifically, we investigate the impact of globalisation and technological progress, particularly automation, on the labour market[28]. However, rather than looking into the

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28   In our empirical investigation, we do not estimate the effect of rising immigration in the same way as we estimate the effects of technological change and

effects on wage or income inequalities, we focus on a very particular aspect of the labour market which can give rise to inefficiencies that can negatively affect both individual productivity and macroeconomic performance: educational mismatch. By educational mismatch we mean a situation in which a worker is overeducated for the work that he or she does, that is, the worker's educational background (measured through the highest level of education obtained) exceeds the level of education that is typically required for the job in which he or she is employed[29]. An example would be a worker with a university degree in engineering employed in an occupation that requires no university degree. We use data from the European Labour Force Survey (EU-LFS) covering 11 Western European countries over a 16-year period (2002–2018) to analyse how the observed structural changes (transformations) in terms of globalisation and automation influence the alignment between workers' educational qualifications and job requirements.

We focus on two major economic shifts that define the period of our study: the expansion of trade between Western and Eastern Europe and the rapid rise of automation. The fall of the Iron Curtain facilitated economic integration, leading to a 185 percent increase in real trade between the two regions from 2002 to 2018. Simultaneously, Western Europe experienced a surge in the operational stock of robots, more than tripling between 1996 and 2018, with annual sales reaching more than 56,000 robots by 2018 according to IFR data. These transformations significantly altered job structures and skill requirements, raising concerns about potential mismatches between workers' educational levels and job demands and resulting labour market inequalities.

To gauge the effects of both globalisation and automation on educational mismatch, we propose and apply a fixed-effects econometric framework that relates the share of mismatched workers to the exposure of rising trade and automation. Importantly, we measure the share of mismatched workers at the country-occupation level, which is made possible through detailed data on workers' educational backgrounds, international trade, and robot use. Specifically, we leverage differences in occupational shares in industries and countries, to capture differential exposure to rising trade and automation. To tackle endogeneity issues, we follow the established literature and rely on an instrumental variables approach using third-country trade and automation as instruments. This allows for a causal interpretation of the results that we obtain. The novelty of the study lies in its focus on the impact on occupations rather than regions (as is common in the literature), as well as its use of

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globalisation, but we do account for initial levels of immigration.

[29]   We do so based on the realised-matches method, that is, we compute the benchmark level of education based on typical levels of education observed for a certain job.

a long-term dataset across multiple Western European countries, providing a broader perspective on structural labour market changes across countries and occupations triggered by globalisation and automation.

Overall, we find that the share of mismatched workers has doubled from 5 percent to 10 percent over the period of our analysis. This suggests rising labour market inefficiencies which could be due to a growing workforce and job heterogeneity and complexity. However, we do not find globalisation and automation trends to be the dominant factors in explaining the broad increase in educational mismatch. We identify several other key findings: while international trade does not appear to have a uniform effect on mismatch levels, there is some evidence that imports and exports influence mismatch differently. This aligns with previous findings that import competition can lead to job displacement and skill redundancy, whereas export growth can generate new, skill-aligned job opportunities. Additionally, we find strong evidence that automation has increased the share of overeducated workers, contributing to labour market imbalances. The introduction of advanced technology has led to shifts in skill requirements, sometimes leaving workers with higher qualifications in jobs that do not fully utilise their skills.

We also find that some of the same occupations that are heavily exposed to globalisation are also exposed to accelerating automation. This is particularly true for occupations with relatively low skill requirements, such as plant and machine operators and (elementary) trade workers, and aligns well with our discussion on the interaction between globalisation and technological progress in affecting certain types of labour similarly, and more than other types of workers. Overall, our study adds to the ongoing debate on the consequences of globalisation and automation, emphasising the importance of labour market adaptability in mitigating the adverse effects of these transformations.

CONCLUSION AND POLICY IMPLICATIONS

What have we learned from this chapter? First, the current EU member states have been subject to rising trends in globalisation (in the form of international trade), automation, and immigration since the beginning of the 1990s. Second, there is a variety of channels that suggest that these three trends have been reinforcing each other. Third, there are reasons to believe that all three trends (and their interactions) have raised inequalities in EU labour markets by putting pressure on wages at the lower end of the wage distribution, visualised through changes in relative labour demands and supplies along the lines of skills needed to perform cognitive non-routine tasks vs. manual routine tasks. Fourth, and perhaps surprisingly, the data show no clear signs of rising income inequalities, neither between nor within EU member states; the correlation between rising within-country income inequality and the three transformations

is positive but weak. And fifth, recent research from the GI-NI project suggests that educational mismatch across Western European labour markets has intensified in recent times, the reasons for which are not yet fully understood.

We conclude with a few observations on policy. First, while all three transformations can be influenced by policy, it is evident that the scope for policy is largest in restricting trade and migration flows, as is the willingness among policymakers to do so – this holds true in Europe and beyond. However, given the interactions between all three transformations emphasised above, doing so jeopardises not just the static welfare gains from economic integration but also future productivity gains through a slowdown in technological progress. This creates a timing mismatch: while the present-day electorate and policymakers determine policies, the full cost of protectionism and closed borders are felt much later by future generations. This leads to too much protectionism and too high restrictions on labour mobility in equilibrium. Disclosing and articulating this trade-off, therefore, seems important.

Second, if the policy goal is to maximise the economic gains from the three transformations, it is crucial to ensure smooth and well-functioning labour markets, so that workers are able to perform those jobs and specialise in those activities in which their skills are rewarded the most (that is, in which they have a comparative advantage). Shocks from both newly emerging technologies and globalisation (including reconfigurations of global value chains in the face of geopolitical issues) can lead to potentially rapid shifts in labour demand schedules; migration, on the other hand, can lead to equally rapid shifts in the supply of labour with different skills. This commands policymakers to aim for a high degree of flexibility in terms of labour mobility both location-wise (within and across EU member states) and occupation-wise (supporting workers in switching occupations). This could happen, for instance, through investments in housing infrastructure and mobility assistance programmes to reduce housing and moving costs, as well as through active labour market policies aimed at efficient information sharing and tailored skills training. In addition, a policy priority must be to ensure a smooth integration of immigrants into the domestic economy. Relevant policy domains include, but are not limited to, policies on citizenship, language acquisition, and employment access. Another focus area for governments in this context is education. Educational institutions must be upgraded in terms of pedagogical approaches, efficient funding models, and effective use of digital technologies, not just to raise the overall level of skills and education, but also to promote equity in access to educational resources, skill upgrading and retraining.

Finally, if policymakers want to fight a further backlash against globalisation, technological progress, and immigration, they must make sure that the economic fruits of these transformations are shared, and not concentrated in a few hands. The shift of political power to the right and the far right of the

political spectrum across Europe and the US, fuelled by anti-globalisation and anti-immigration rhetoric, have made this abundantly clear. What is more, parts of the tech industry in the US have been subject to rising market concentration; they have also proven to have a strong will, as well as the means, to shape public opinion and national policies. This has given rise to fears of a newly developing tech oligarchy and demonstrates the need for policy to play an important and active role in maintaining or developing strong (welfare) states and constraining economic and political power through smart regulation and taxation that minimises inefficiencies due to price distortions.

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PART III

Policy responses: reimagining the rules of the game

6. Regions in Europe: diverse paths to shared prosperity?

Hans Christian Garmann Johnsen, Jon P. Knudsen, Terese Birkeland and Tore Bersvendsen

INTRODUCTION: FRAMING REGIONAL DISPARITIES

Regional disparities remain a pressing challenge for the European Union (EU), as evidenced by persistent gaps in economic growth, employment, and quality of life among its regions (Iammarino et al., 2019). While poorer regions, particularly in Eastern Europe, have shown signs of economic catch-up and convergence, wealthier regions in Western Europe exhibit relative stagnation or divergence (Marrocu et al., 2013). This dual trend reflects aspects of the complex interplay of historical, structural, and institutional factors shaping regional development.

This chapter presents two mutually exclusive theoretical approaches, as articulated in the GI-NI project: a structural and a historical-cultural approach for enhancing our understanding of regional differences. Even if this chapter adopts a historical-cultural approach, it recognises that both perspectives can offer valuable insights into European regional inequality and the diverse challenges European regions face today.

The chapter explores these dynamics through the lens of the Varieties of Capitalism (VoC) framework, which provides a theoretical foundation for understanding how institutional configurations influence socio-economic performance. By examining empirical data from the GI-NI project and related studies, we aim to uncover patterns of convergence and divergence and propose tailored policy strategies to address regional disparities.

We argue that both acknowledging and at the same time leveraging regional diversity by fostering institutional learning and adaptation are essential for achieving shared prosperity. The chapter begins by providing a background on the current EU debate related to cohesion policy and then outlines key

theoretical insights. It presents empirical findings and concludes with policy recommendations to inform the future of EU cohesion policy.

BACKGROUND: THE CURRENT EU DEBATE

A recent report by the European Commission's high-level group on the future of cohesion policy, 'Forging a Sustainable Future Together: Cohesion for a Competitive and Inclusive Europe', highlights the growing regional disparities in Europe and calls for more tailored policies. The report emphasises that, in the future, "Cohesion Policy will have to pay more attention to the nature of challenges and the responses needed in every region" (European Commission. DG Regional and Urban Policy, 2024, p. 39). This perspective is largely shared by Enrico Letta (2024) in his recent report, 'Much More Than a Market'. Letta emphasises the importance of the "freedom to stay", advocating that the European Single Market should benefit all citizens, including those who choose to remain in their home regions. He highlights that the Single Market is often perceived as favouring individuals and sectors with the means and skills to capitalise on cross-border opportunities, which can undermine public and political support.

These ambitions, however, are challenged by the development of convergence and divergence within the context of the Single Market. On convergence, the report argues that the European Single Market has historically acted as a catalyst for convergence among Member States, driving economic growth, social progress, and enhanced living standards. It references the International Monetary Fund, which has acknowledged the role of the European growth model as a "powerful engine for economic convergence over the last decades". Gross domestic product (GDP) per capita in the Member States that joined the EU in 2004 has risen significantly, from approximately 52 per cent of the EU's average in 2004 to nearly 80 per cent by 2023. This reflects a considerable catch-up process between newer and older Member States.

However, divergence is also highlighted in terms of territorial disparities within the EU. Although newer Member States have experienced significant economic catch-up, many regions, particularly in Western Europe, have faced long-term economic growth, stagnation, or decline. Approximately one-third of the EU's population lives in regions where GDP per capita has grown less than 0.5 per cent yearly since the early 2000s.

Additionally, the concept of 'development traps' is discussed in the Letta report, referring to regions experiencing prolonged periods of low or negative growth, limited productivity increases, and low employment creation. These regions often cannot reap the benefits of the Single Market, mainly as many of them are located in middle- or high-income Member States and are thus not eligible for substantial EU cohesion funding.

The Letta report observes that the advantages of the Single Market are perceived to primarily benefit individuals with the means and skills to take advantage of cross-border opportunities, as well as large enterprises capable of expanding operations across Member States. Highly skilled individuals and large corporations are better positioned to leverage the benefits of the Single Market, particularly in areas like research and development (R&D), foreign language skills, and cross-border trade. Nevertheless, significant disparities exist between regions within the EU, particularly those that have fallen into development traps. These regions experience low or negative growth, weak productivity, and limited job creation, and their residents often feel compelled to relocate to find better opportunities. This exacerbates inequality between thriving and stagnating regions. Still, it is important to observe that the group of poor regions and the group of stagnating regions do not overlap.

In this chapter, we used these observations as a starting point to examine regional performance in recent years, focusing on trends of convergence and divergence between regions. More importantly, we aim to identify underlying historical and cultural patterns in terms of social models that might explain some of the empirical observations. We argue that understanding the historical and institutional patterns underpinning regional disparities is crucial for formulating effective and context-sensitive cohesion policies in Europe. The theoretical part of this chapter uses the ideas from our previous work (Johnsen et al., 2024). It explores these dynamics through the lens of the VoC framework. This framework provides a theoretical foundation for understanding how institutional configurations influence socio-economic performance.

THEORETICAL FOUNDATIONS

Varieties of Regionalisation Theories

Regions are critical drivers of economic and social development, but their trajectories differ widely due to variations in governance systems, institutional quality, and socio-economic structures. Theories of regionalisation have evolved to address these complexities. Early approaches, such as Krugman's (1991) work on economic spillovers, emphasised the spatial concentration of industries. Later, concepts like regional innovation systems (Cooke, 1992) and learning regions (Florida, 1995) highlighted the role of knowledge, innovation, and institutional capacity.

The VoC framework (Hall & Soskice, 2001) adds a comparative institutional perspective, categorising economies into Liberal Market Economies (LMEs) and Coordinated Market Economies (CMEs). This framework has since been expanded to include sub-national and regional dynamics, offering

valuable insights into the diverse responses of European regions to economic and social challenges.

More broadly, the 1990s and 2000s saw increasing attention to the endogenous economic growth potential at the regional level (Johnsen & Ennals, 2012; Storper, 1997) as well as the challenges and opportunities stemming from different VoC (Hall & Soskice, 2001; Hancké et al., 2007). As discussed by Johnsen et al. (2024), this shift may have contributed to the emphasis on regional policy in the Treaty of Lisbon, which laid the foundation for reshaping the regional funds, first introduced in 1975, and later the smart specialisation strategy (S3) as part of the EU's efforts to promote social and economic development and cohesion.

The literature on European regional development, specifically on regional convergence and divergence, has evolved over time, addressing various factors influencing regional growth, such as economic development, labour market structures, institutional factors, innovation, and resilience across regions. Initially, according to Johnsen et al. (2024), the focus was on Western Europe, but with the accession of Eastern European countries to the EU in the early 2000s, attention shifted towards examining the role of EU policies in reducing regional disparities across Europe. Prior to the financial crisis, scholars primarily focused on European social models and measuring economic growth. In the aftermath of the crisis, discussions increasingly centred on the explanatory power of institutional factors and regional clustering.

Numerous scholars have explored regional convergence and divergence within specific European countries, investigating factors such as regional migration and standards of living (Kosfeld et al., 2006; Kubis & Schneider, 2016; O'Leary, 2001). Additionally, regional convergence and divergence studies extend beyond individual nations to include the context of the EU. Nevertheless, we argue that empirical studies alone cannot fully explain the differences in regional performance. Acknowledging the diverse theoretical contributions to this field, we present two alternative explanations, a structural and a historical-cultural perspective, that we define in more detail below. Our argument is that these give slightly different guidance to dealing with the differences in terms of policy. These arguments have already been scrutinised in the report of Astarita & Alcidi (2024). While these authors calculate club-convergence across Nuts-2 regions, Johnson et al. (2024) take as point of departure the historical varieties of capitalism when classifying Nuts-2 regions.

CEPS's analysis confirms an urban–rural divide. Basically, this finding aligns with the studies made by Rodríguez-Pose and others that we present below that support the structural argument. However, as we shall argue further below, there is an alternative way of approaching these differences.

Structural Perspectives

There is broad agreement in the regional economic literature that specific institutional features of regions help explain differences in regional development, though explanations vary. Rodríguez-Pose (1998) highlighted the relationship between economic growth and local social forces, noting that economic activity has become more mobile due to socio-economic restructuring and structural changes. He argued that no single social mix is uniquely associated with either low or high growth, showing that economic activity can thrive even in areas where growth was previously unlikely during the era of mass production. The study aimed to illuminate the complex connection between social forces and regional growth during the transition from mass production to a more flexible system in Western Europe. In 1999, Rodríguez-Pose (1999) demonstrated that the method of measuring growth and the influence of national growth on regional patterns reveal a complex and varied picture of regional growth linked to socio-economic restructuring. His analysis revisited convergence trends in Western Europe, stressing the importance of national factors in determining growth and identifying key regional growth patterns. Using the standard deviation at the NUTS-2 level, he classified regions into five clusters: capital regions and main financial centres, declining industrial regions, intermediate dynamic regions, intermediate less dynamic regions, and peripheral dynamic regions.

Johnsen et al. (2024) see the significance of institutional quality in shaping regional economic performance tie into broader discussions on the need for coordinated policy responses, especially within the EU framework. Scharpf (2002) explored the constitutional imbalance between policies promoting market efficiencies and those prioritising social protection and equality in the context of European integration. Similarly, Pasimeni and Pasimeni (2016) examined the influence of institutional factors compared to economic growth and public finance indicators, using the Europe 2020 index. Their analysis reaffirmed the pivotal role of institutions, especially good governance and social capital, in shaping outcomes and emphasised that these institutional factors exert a greater impact than GDP-based economic variables in determining European countries' success in implementing the Europe 2020 strategy. This aligns with a study undertaken by Duranton et al. (2009), showing historical patterns of institutional variety to be the strongest factor explaining present-day socio-economic performance at the NUTS-3 level in Europe.

More recently, Rodríguez-Pose (2013), building on the study of Duranton et al. (2009), explored the critical role of institutions in regional development, challenging traditional, top-down approaches to regional policy. He questioned the common belief that replicating policies on infrastructure, education, and industrialisation drives growth and regional convergence. Instead, he

emphasised the importance of property rights and the rule of law. In a subsequent study, Rodríguez-Pose (2020) measured the impact of institutional quality on regional economic development, finding that conventional strategies focused on capital and technology failed to address rising territorial inequality. Additionally, he noted mixed results from European investments in cohesion and stressed the importance of integrating institutional quality into development policy frameworks. Furthermore, Rodríguez-Pose and Ketterer (2020) examined how government quality impacts regional economic performance, focusing on lagging EU regions.

The Historical-Cultural Approach

Scholars have emphasised the intricate interplay of historical, cultural, and socio-economic factors in shaping local development and innovation policies (Duranton et al., 2009) while addressing regional clustering dynamics. Garofoli (2002) illustrated that successful local development relies on the collaborative generation of specialised knowledge and resources, which are essential for cultivating dynamic competitive advantages for sustainable growth. Garofoli (2002) highlighted the importance of capacities, network relations, and the interaction between path dependency and best practices, focusing on the diffusion of firm culture. Building on this, Nahtigal (2013) addressed the widening gap between advanced and less developed regions in Europe, criticising the one-size-fits-all approach of EU policies. He advocated for decentralised strategies that empower European regions to craft tailored solutions, stressing the need for grassroots initiatives and close collaboration at the local and regional levels. Thus, underscoring the importance of economic, social, legal, and political reconstruction from the ground up for the EU's future trajectory.

Reflecting the widening gap between advanced and less developed regions in Europe, Pinto et al. (2019) identified diverse patterns of socio-economic resilience across European regions, linked to the effectiveness of regional institutions in navigating socio-economic restructuring. They examined the relationship between these patterns and the VoC, acknowledging the influence of national macroeconomic conditions on different resilience outcomes. Regional socio-economic resilience was measured by variations in GDP and unemployment. At the same time, innovation efforts were assessed by R&D variations in response to the financial crisis. Through cluster analysis, they identified types of resilient regions and suggested a connection between the cluster types, resilience levels, and VoC.

Initially, the analysis of VoC focused on the division between the Anglo-American liberalist sphere and the more blended continental European model (Hall & Soskice, 2001). Over time, however, the literature expanded to encompass diverse models and sub-models addressing different regions and

time periods (Mahoney & Thelen, 2015), ranging from the studies of smaller regions (NUTS-3) (Duranton et al., 2009) to broader macro-regional analyses (Todd, 2019). These regional models fall under the VoC framework, which draws on insights from economics, political science, sociology, and cultural studies to provide typologies of institutional configurations across different geographical scales and explain varied societal responses to similar external trends and challenges.

Between Structural and Historical-Cultural Approaches

Without going deep into the discussion, we want to emphasise that the structural and historical-cultural perspectives on regional disparities are theoretically mutually exclusive. They are based on different assumptions related to how to explain social and economic development.

Structural approaches emphasise factors like labour market dynamics, urban–rural divides, and industrial composition. For instance, the urban–rural polarisation observed in high-income regions underscores the role of agglomeration effects and economic spillovers. In contrast, historical-cultural perspectives focus on the path-dependent nature of regional development (North, 1994, 2012), highlighting the influence of governance quality, social capital, and cultural norms. Though both distinct and interwoven, these perspectives are complementary in understanding the persistent disparities across European regions.

Building on the literature review, we adopted the VoC framework as a foundational point of departure. Hall & Soskice (2001, p. 7) identify five key dimensions that determine the type of capitalism present in each society at the national level: industrial relations, vocational training and education, corporate governance, inter-firm relations, and employer–employee relations.

Using these dimensions, we identify five distinct groups of economies, primarily within the Organisation for Economic Co-operation and Development following Pinto et al. (2019): Continental European Capitalism (CEC), Liberal Market Economics (LME), Social-Democrat Economics (SDE), Mediterranean Capitalism (MED), and Eastern and Central European Capitalism (EAST). The aim is to explain observed changes by applying the Pinto et al. (2019) model, supplemented by relevant VoC-related literature, particularly the socio-cultural typologies proposed by Todd (1990, 2019). The rationale for this choice lies in its utility for analysing the relationships between institutional factors, particularly social models, and regional economic performance. While our study does not explicitly engage in a regression-based analysis, we argue that the VoC framework offers a robust context for interpreting the findings of our empirical analysis. By utilising this theoretical lens, we are better equipped to understand how institutional configurations influence economic

outcomes across different regions. The main findings presented here have already been published in the GI-NI report by Astarita and Alcidi (2024) on patterns of divergence and convergence, distribution and institutional capacity. Below, we present some of these findings and, more importantly, reflect on their implications.

PERSISTENT HISTORICAL-CULTURAL PATTERNS

The Convergence Challenge

We observe that historical and cultural development has uniquely shaped each region. However, as articulated by the EU, these differences do not necessarily lead to disparities in overall socio-economic outcomes. This implies acknowledging a pluralism in how regions respond to challenges, while also expecting regions to converge in certain respects. What has actually occurred in terms of regional development over the last two decades? In order to discuss this, we have tried to calculate convergence and divergence between regions in Europe in the period from the year 2000 up to the present.

Convergence and divergence can be measured in different ways. Eurofound (2009, p. 7) uses the following definitions:

- 'Beta convergence' measures whether countries starting from lower performance levels grow faster than better-performing countries, a process referred to as 'catching up'.
- 'Sigma convergence' refers to the overall reduction in disparities among countries over time and is measured by the evolution of statistical dispersion metrics, such as standard deviation or the coefficient of variation. A decrease in these measures over time indicates convergence.
- 'Delta convergence' analyses the distance between countries from the best-performing country, typically measured by the sum of the distances between the Member States and the top performer.

Nevertheless, analysing social development, particularly inequality, is a complex task (Heichel et al., 2005). For example, Thomas Piketty writes in the introduction to *Capital in the Twenty-First Century* (2014):

> If we are to progress in our understanding of the historical dynamics of wealth distribution and the structure of social classes, we must obviously take a pragmatic approach and avail ourselves of the methods of historians, sociologists, and political scientists as well as economists. (Piketty, 2014, p. 34)

Adding to this complexity is the philosophical challenge of defining equality. No two lives are equal and, at a philosophical level, equality often becomes more of an abstract concept than a measurable reality. This necessitates a pragmatic approach to equality, linking it to factors or indicators that provide a representative understanding of equality.

Our analysis adopted this pragmatic approach. By leveraging the VoC model, we describe how regions in Europe (at the NUTS-2 level) have performed in terms of socio-economic indicators. We reflect on development patterns by comparing NUTS-2 regions across key socio-economic indicators across different VoC categories. To achieve this, we have calculated sigma and beta convergence for NUTS-2 regions on selected socio-economic indicators. The Appendix presents the technical details of our analysis.

Diverse Regional Paths

Our data offers mixed results when looking at each VoC group in relation to the three indicators we have selected; the picture is as follows. Regarding GDP, one can clearly see that the average GDP across all EU and VoC regions has increased since 2000. However, the same holds for the standard deviation. Still, the Coefficient of Variance (CV) is flatter, indicating that there is no big divergence in relative terms. Europe has a slight tendency towards a downward trend in GDP, indicating signs of sigma convergence, which means minor reduced disparities in GDP. However, the CV is still high, indicating a large variation across European regions. CEC and EAST show a downward trend and signs of sigma convergence within these groups. MED had a large dip before 2010 but is now at the same level as it was in 2000. SDE has a low CV, indicating little variation over time, and stays low. However, there is a slight tendency to an upward trend, meaning some increased disparities in GDP. LME has clearly increased in CV, which translates into increased disparities in GDP.

Regarding employment per capita, trends are a bit different. There is an increased average, but not all standard deviations are increasing. This yields some interesting observations. Europe had an upward trend in employment per capita before ca. 2013 and thereafter a downward one. If these trends continue in the future, there will be sigma convergence. This implies fewer disparities in employment, but, as for now, we are not far from the levels in 2000. If we look at each VoC group, the picture is this: CEC follows the EU and has no clear tendency. For EAST, the trend shifted to the opposite right before 2015, implying that the trend is increased disparities. However, these are not at the same level as in 2000. MED and SDS are showing signs of sigma convergence. The LME, when including Inner West London, has a clear tendency for increased disparities.

Regarding educational attainment, the data indicates a general increase in tertiary education rates (ages 25–64) across all regions from 2007 to 2019. Furthermore, there is a clear tendency for sigma convergence in educational attainment for EU and MED, CEC, and EAST.

To summarise, our analysis has revealed a mixed picture of how European regions have developed. Our analysis provides strong evidence that poorer regions are growing faster than wealthier ones in terms of GDP, employment, and education. Evidence of narrowing disparities is mixed: GDP differences are not uniformly shrinking across regions. Employment gaps show signs of narrowing in the latter part of the period when excluding the outlier impact of Inner London West. Educational disparities are clearly decreasing, primarily due to improvements in the CEC, MED, and EAST groups.

Thus, looking at each VOC group, there are still clear differences in performance:

- CEC: Fairly consistent evidence of convergence and narrowing disparities, but some uncertainties regarding employment.
- LME: Divergence observed, particularly due to the impact of Inner London West.
- SDE: Evidence of convergence in employment and minor evidence regarding education. There are more mixed results for GDP, but the tendency is to increase, albeit from a low variation level.
- MED: Slight convergence in GDP, particularly in the latter time period. Strong convergence in education, and less pronounced convergence for employment.
- EAST: Strong evidence of convergence, particularly in GDP and employment.

If we look at beta convergence, that is, to what extent the least-performing regions are catching up, the patterns are still mixed. Regarding GDP at fixed prices, CEC, MED, and EAST all show clear signs of beta convergence. This also relates to a significant coefficient, where these three regions were also highlighted. SDE and LME showed no signs of beta convergence.

For employment per capita, the trends are similar. The same three regions show a sign of beta convergence at the 5 per cent significance level, but the SDE trend is also notable. Again, this is closely related to the findings regarding sigma convergence. LME shows no signs of beta convergence.

For tertiary education for ages 25–64, only CEC and MED have significant negative coefficients. These are also the two VoC regions showing convincing trends of sigma convergence. The others are not significant, even if the

tendency is towards convergence. The result for LME still holds when removing Inner West London.

All in all, this does not present a gloomy picture of regional development in Europe; rather, we see many positive trends in our data. Thus, we think the results indicate that there are many interesting and positive tendencies in regional development, even if there are challenges and the regional landscape is diverse.

CONCLUSION AND POLICY IMPLICATIONS

Tailored Strategies for Shared Prosperity

In this chapter, we have argued that the theoretical approaches to the study of regional development can meaningfully be grouped into two distinct positions: the structural approach and the historical-cultural approach. Even if we argue that these two are theoretically mutually exclusive, they can both help us understand the underlying mechanisms that are forming the regional responses to socio-economic change.

The Letta report emphasises the principle of balancing 'freedom to move' with 'freedom to stay' within the EU. The success of the Single Market relies not only on its economic integration but also on its social inclusivity. While the right to move and work anywhere in the EU has significantly contributed to economic growth and personal opportunities, there is increasing recognition that the benefits of this freedom should not come at the cost of creating areas where people feel compelled to leave due to a lack of local opportunities.

Labour and skills shortages, exacerbated by these transformations, require robust upskilling and reskilling initiatives. The mismatch between available jobs and the skillset of the workforce underlines the necessity for ongoing education and training programmes that are responsive to emerging labour market demands. The integration of migrants and their skills is also crucial in addressing these shortages but must be managed to prevent occupational segregation and deskilling. We take these observations as a point of departure in examining the regional dynamics in Europe and how regions respond to social and economic change and disruption.

The findings suggest that a one-size-fits-all approach to EU cohesion policy is inadequate. Instead, both top-down and bottom-up strategies tailored to regional specificities and enhancing institutional quality are essential. Policy instruments must address the complex interplay of historical, structural, and institutional factors shaping regional development, as there is no universal solution. Different regions present unique challenges and conditions for regional prosperity, requiring diverse policy responses. The smart regulation literature argues that combining multiple policy instruments with the collaboration of

various regulatory actors leads to better regulation (Gunningham & Sinclair, 2017). However, the plurality of policy instruments must be designed to complement each other rather than become counterproductive, and governments should focus on enabling second and third parties to share regulatory responsibilities instead of relying on direct intervention. Therefore, enhanced coordination and collaboration across regional, national and EU levels is essential. This approach, though focused on environmental challenges in the literature, is also applicable to social regulation.

One main argument following our discussion is that understanding the underlying differences that are shaping the current regional patterns is an important prerequisite for suggesting cohesion policies. The VoC framework provides a useful lens for interpreting regional disparities. For example, CEC regions, characterised by strong coordinated market economies, demonstrate consistent convergence trends, whereas LME regions, with their liberalised markets, show increasing divergence due to their institutional setups, disposing them of structural inequalities (Hall & Soskice, 2001). This divergence underscores the need for differentiated policy approaches that align with the institutional configuration of each VoC category. The findings point to the need for a differentiated approach to regional policy, moving away from a one-size-fits-all model. Key principles include:

- Promoting institutional learning: Encourage regions to learn from best practices by fostering knowledge exchange and collaboration. For instance, successful initiatives in CEC regions, such as vocational training programmes, could be adapted for underperforming areas.
- Leveraging regional strengths: Design policies that build on the unique institutional and cultural assets of each region. For example, rural regions in the EAST group could capitalise on emerging industries like renewable energy, supported by EU funding and private-sector partnerships.
- Addressing 'freedom to stay': Emphasise policies that create local opportunities, reducing the need for out-migration. This could include investments in infrastructure, education, and digital connectivity, particularly in regions experiencing 'brain drain'.
- Fostering innovation ecosystems: Support the development of regional innovation systems by strengthening ties between universities, businesses, and government agencies. Tailored strategies, such as smart specialisation, can help lagging regions integrate into global value chains.
- Bridging urban-rural divides: Address the growing polarisation between metropolitan and rural areas through targeted support for rural entrepreneurship, digital transformation, and sustainable developement initiatives.

Conclusion

The persistent disparities among European regions highlight the need for tailored and context-sensitive cohesion policies. By integrating structural and historical-cultural perspectives, policymakers can better understand the complex factors shaping regional development and design interventions that promote inclusive growth.

While the VoC framework provides a valuable lens for analysing regional dynamics, it also underscores the importance of institutional learning and adaptation. The EU's challenge lies in balancing regional diversity with shared prosperity, fostering policies that empower regions to leverage their unique strengths while addressing systemic inequalities.

Future research should explore innovative policy mechanisms that align with these principles, ensuring that the benefits of economic growth and social development are equitably distributed across Europe.

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APPENDIX: OUR DATA

We focus on three key indicators to examine the evolution of economic disparities among European regions over time within the various VoC categories: GDP per capita at current prices (PPS), GDP per capita at constant 2015 prices (EUR2015), and employment rates. The data, derived from the Annual Regional Database of the European Commission (ARDECO) database, covers 291 regions from 2000 to 2025. These regions are categorised into five economic models: CEC, LME, SDE, MED, and EAST. Thus, it includes non-EU countries, providing a more comprehensive representation of LME countries, such as the United Kingdom (UK) and Ireland. All data were obtained from ARDECO using the 2021 NUTS-2 level version. ARDECO relies on several data sources, primarily Eurostat and national or regional statistical offices, supplemented by short-term projections based on the annual macroeconomic database of the European Commission's Directorate General for Economic and Financial Affairs.

The following three variables were downloaded and included in this study (ARDECO codes in parentheses): GDP per capita at current prices expressed in purchasing power standard (SUVGDP), GDP per capita at constant prices expressed in EUR2015 (SOVGDP), and employment per capita (SNETDP). Countries included in the VoC classification (see Table 6A.1) are incorporated, with only two regions excluded due to missing data on observations prior to 2008. These regions are NO0B Jan Mayen and Svalbard in Norway, and ME00 Crna Gora in Montenegro. Since Montenegro comprises only one NUTS-2 region, the study excludes it.

Based on Table 6A.1, the sample covers 291 NUTS-2 regions with yearly data from 2000 to 2025. One region, UKI3 Inner London – West, contains extreme values on all variables, which influence the spread of the data. For robustness, analysis is also conducted without this region. If these results differ significantly from the initial results, they are commented. Regarding the sum of NUTS-2 regions, CEC is the biggest, with 106, while SDE is the smallest, with 25. LME includes 44 regions, MED 62 and EAST 54.

Table 6A.2 presents the mean value for different time periods for all three indicators of interest, both in total and by each VoC category. There is a clear tendency for all variables to increase over time, which holds for all VoC categories. The employment growth seems less linear for MED and EAST; there was a slight drop in 2011–2015 before growth increased again.

In addition, we studied tertiary education rates (ages 25–64) using data from Eurostat (see Table 6A.3). We applied the same strict rules regarding missing values as for other indicators, meaning that if a region had one missing value during the timespan, then it was dropped. To avoid dropping too many regions,

Table 6A.1 *Countries included in the study and their VoC category*

VoC category	Country
Continental European Capitalism (CEC) VoC = 1	Austria
Continental European Capitalism (CEC) VoC = 1	Belgium
Continental European Capitalism (CEC) VoC = 1	Czech Republic
Continental European Capitalism (CEC) VoC = 1	France
Continental European Capitalism (CEC) VoC = 1	Germany
Continental European Capitalism (CEC) VoC = 1	Luxembourg
Continental European Capitalism (CEC) VoC = 1	The Netherlands
Liberal market economics (LME) VoC = 2	Ireland
Liberal market economics (LME) VoC = 2	UK
Social-democrat economics (SDE) VoC = 3	Denmark
Social-democrat economics (SDE) VoC = 3	Finland
Social-democrat economics (SDE) VoC = 3	Sweden
Social-democrat economics (SDE) VoC = 3	Norway
Social-democrat economics (SDE) VoC = 3	Iceland
Mediterranean capitalism (MED) VoC = 4	Portugal
Mediterranean capitalism (MED) VoC = 4	Greece
Mediterranean capitalism (MED) VoC = 4	Italy
Mediterranean capitalism (MED) VoC = 4	Spain
Mediterranean capitalism (MED) VoC = 4	Malta
Mediterranean capitalism (MED) VoC = 4	Cyprus
Eastern and Central Europe capitalism (EAST) VoC = 5	Bulgaria
Eastern and Central Europe capitalism (EAST) VoC = 5	Hungary
Eastern and Central Europe capitalism (EAST) VoC = 5	Poland
Eastern and Central Europe capitalism (EAST) VoC = 5	Estonia

VoC category	Country
Eastern and Central Europe capitalism (EAST) VoC = 5	Latvia
Eastern and Central Europe capitalism (EAST) VoC = 5	Lithuania
Eastern and Central Europe capitalism (EAST) VoC = 5	Romania
Eastern and Central Europe capitalism (EAST) VoC = 5	Slovakia
Eastern and Central Europe capitalism (EAST) VoC = 5	Slovenia
Eastern and Central Europe capitalism (EAST) VoC = 5	North Macedonia
Eastern and Central Europe capitalism (EAST) VoC = 5	Serbia

Source: Authors' own calculations.

Table 6A.2   *Mean value for indicators of interest by all VoC categories*

VoC	Indicator	2000–2005	2006–2010	2011–2015	2016–2020	2021–2025	2000–2025
All	PPS[1]	20019.8	24048.2	25743.7	28745.4	35487.5	26547.8
All	GDP[2]	25787.1	27791.6	28025.8	29693.8	31323.0	28419.0
All	Employment[3]	0.440	0.452	0.447	0.464	0.478	0.456
CEC	PPS[1]	22611.7	26790.1	29357.0	32594.0	39121.3	29807.0
CEC	GDP[2]	29332.7	31615.4	32543.8	33898.0	34978.4	32352.3
CEC	Employment[3]	0.446	0.458	0.465	0.476	0.488	0.466
LEM	PPS[1]	24331.4	27804.5	29481.0	33056.7	38724.1	30435.4
LEM	GDP[2]	36390.2	38930.8	39645.2	42560.0	45580.2	40458.6
LEM	Employment[3]	0.476	0.481	0.476	0.494	0.498	0.484
SDE	PPS[1]	24105.4	29851.2	32068.0	34624.6	44483.7	32683.5
SDE	GDP[2]	39540.6	42976.3	43600.2	46668.8	47588.3	43900.4
SDE	Employment[3]	0.487	0.498	0.490	0.497	0.505	0.495
MED	PPS[1]	19994.9	23447.1	22558.2	24642.9	30773.7	24118.4
MED	GDP[2]	23022.8	23629.8	21652.2	22368.9	24017.1	22941.4
MED	Employment[3]	0.424	0.435	0.404	0.425	0.445	0.426
EAST	PPS[1]	9556.0	13608.9	16335.1	19666.4	26964.4	16931.2
EAST	GDP[2]	6993.9	8957.4	9797.1	11508.9	13394.7	10009.8
EAST	Employment[3]	0.398	0.418	0.417	0.446	0.469	0.429

Notes: 1 GDP per capita at current prices expressed in purchasing power standard (PPS).
2 GDP per capita at constant prices expressed in EUR2015. 3 Employment per capita.
Source: Authors' own calculations.

Table 6A.3   *Mean value for indicators of interest by all VoC categories*

VoC	2007–2010	2011–2013	2014–2016	2017–2019	2007–2019
All	23.98	27.78	29.09	31.24	27.48
CEC	24.99	27.58	29.55	31.72	28.20
LME	31.20	35.28	28.28	40.26	35.86
SDE	31.75	34.35	37.35	39.98	35.54
MED	19.83	22.31	24.61	26.81	23.12
EAST	17.93	20.82	23.01	24.92	21

Source: Authors' own calculations.

we started this indicator in 2007 and continue until 2019. Eurostat does not contain data on the UK after 2019 due to Brexit, and therefore, we stop our analysis at this point. These two time restrictions are implemented and needed to secure enough observations for the SDE and LME groups for this education indicator. In total, we ended up with 260 regions for this indicator. Inner West London, which did contain extreme values for the other indicators, was dropped due to our strict missing value policy.

Regarding methodology and definitions, we lean on Eurofound and its work regarding the EU convergence monitoring hub. The CV is used to describe sigma convergence. For beta convergence, we implement a simple unconditional regression using standard robust errors. The log annual average growth rate for the indicator of interest is used as the dependent variable and regressed on the log of the indicator of interest in 2000 (for education, this is set to 2007).

7.   Social convergence and the transitions: which direction?

Gerben Hulsegge, Steven Dhondt, Hans Christian Garmann Johnsen, Pascal Kampert and Jon P. Knudsen

INTRODUCTION

The global political environment of the past decade was marked by unprecedented complexity and uncertainty. Escalating geopolitical tensions, the digital transformation driven by artificial intelligence (AI), and migration flows significantly impact European Union (EU) citizens (Eichhorst et al., 2018). These interconnected forces profoundly and rapidly affect socio-economic inequality and skill demands across the EU, often intensifying inequalities and exacerbating skill mismatches (Mathijssen et al., 2024).

Within such a context, the EU wants to achieve social convergence and a just transition[1]. Given that the three transformations discussed in this book drive economic change and disrupt the EU's social fabric, social convergence may be further away than expected. Baldwin (2018) expects economic forces to push for global economic convergence. Technology enables developing countries to catch up with their developed counterparts and achieve higher economic performance. Other observers are not that optimistic. Streeck (2023) has no sympathy for a "borderless world of free markets under American law". He even pleads for deglobalisation, which is "a non-globalist global order, indeed a non-globalised constitution for a global society governing its global economy while respecting the diversity of its local economies and societies". The EU is at a crossroads. Does it build its social convergence on the (US)

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[1]   A Strong Social Europe for Just Transitions. Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, 2020.

globalisation (or hyperglobalisation [Rodrik, 2019]) and technological dominance, or does it try to find an alternative route?

Despite these challenges, recent surveys indicate that EU citizens continue to support active EU policies favouring globalisation, digitalisation, and mobility (Hoffmann & Vries, 2024). For instance, 55 per cent of EU citizens view globalisation as an opportunity, and 70 per cent believe the EU should play a more active role in world affairs. Additionally, 73 per cent of EU citizens see digitalisation as an opportunity, and 61 per cent agree that policies to protect jobs affected by robotisation should be implemented at the EU level. Finally, most EU citizens believe freedom of movement has had more benefits than costs for their country. These results suggest that, despite the rise of populist movements within the EU, citizens still believe in the positive welfare effects of globalisation, technology, and migration. However, support for digitalisation, globalisation and migration may gradually diminish in the coming years. This is driven by the EU's stagnating economy, rising living costs, increasing far-right influence on politics, and broader international political developments and conflicts (Streeck, 2023). With the second Trump administration, anxious and critical sentiments towards migration technology and globalisation might rise even further in Europe.

Against this backdrop, the EU and its member states must contemplate a new social policy narrative towards EU-internal convergence. The European Commission has always believed that its social policy should be able to manage the three transformations. Also, in the new European Commission (2025–2030), the adage remains that economic convergence, built on the three transformations, requires social convergence (Dhondt, 2024). If we believe in this social convergence, how does this relate to the policies conducted by the different EU member states? Do the member states want this social convergence? Which convergence is this? We know that the social models of the member states are quite different (Esping-Andersen, 1990), even 30 years after the Maastricht Treaty. Can social convergence be achieved if we keep having such different social models?

The central question of this chapter is how the EU should navigate the rapidly changing areas of globalisation, technology, and migration and the extent to which considerations of inequality and skills play a crucial role. Based on GI-NI research (e.g., Aldaz et al., 2025; Kampert et al., 2024; Los & Ye, 2023; Mathijssen et al., 2024), this chapter argues that European prosperity is best advanced through increased but carefully guided globalisation, digitalisation, and migration. What are the arguments for a narrative of social convergence? What is needed in the EU to counteract deglobalisation trends, increase EU-internal technology investments, and fill labour market gaps with targeted migration while mitigating inequality and skill mismatches?

Our argument is built up in three steps:

1. We begin by discussing how social policy in the EU addresses inequality and skills development. How does EU social policy respond to new challenges? What does social convergence mean in this context? Are we seeing a convergence in social models?

2. We describe two countries' perspectives on managing inequality and skills. Member states have a significant voice in social policy, generally more so than any EU institution (Daly, 2019). We examine the cases of the Netherlands, a wealthy country with a robust social system, and Norway, a country in a similar context, outside the EU but in the European Economic Area (EEA). The 'outside' perspective of Norway is interesting to see how much traction EU policies may have. The changed international environment (think 'Trump') challenges the outside-EU neighbours even more than in the past. These countries are selected due to their advanced social policies and welfare systems, which provide valuable insights into effective strategies for addressing inequality and skills mismatches. Their high rankings on various economic and social indicators underscore the effectiveness of their social policies. Both nations have demonstrated significant progress in these areas through innovative social policies and investments in education and training, highlighting best practices and lessons that can inform EU-wide policy development. At the same time, these countries face barriers to adapting to the three major transformations and securing regional convergence. The historical context and policy evolution in both countries provide a rich basis for understanding the adaptation of social policies to new challenges. The comparative analysis between a member state (the Netherlands) and a non-EU country (Norway) within the EEA offers insights into the impact of different governance structures on social policy outcomes. Can we observe differences in their approaches? Have these member states changed their social models over time? Moreover, how do these changes relate to EU policymaking?

3. We also need to be forward-looking and understand what is needed for future social convergence. Based on a scenario analysis constructed and validated in prior GI-NI research, with varying degrees of (de)globalisation, digitalisation, and mobility, we demonstrate the significant risks associated with deglobalisation, insufficient investment in technology, and restricted migration for EU citizens, overall welfare, and inequality.

These steps bring us to the question of what is expected of social convergence in Europe. Can social convergence arise in the context of conflicting economic developments? Streeck (2023) indicates that Europe has opportunities to move forward without the need for political convergence. We address these questions in the final section of the chapter.

STEP 1: THE LIMITS OF EUROPEAN SOCIAL POLICY

The Unfulfilled Ambitions of the EPSR

While many member states continuously declare their interest in aligning social standards across Europe, policy implementation often clashes with the EU principle of subsidiarity, meaning that the EU does not interfere where national systems are sovereign. Social convergence across the continent has been a European policy objective since the Treaty of Rome. It was emphasised in the social protocol of the Maastricht Agreements, although it was ultimately excluded from the final agreement (Treaty Establishing the European Economic Community [Treaty of Rome], 1957; Treaty on European Union [Treaty of Maastricht], 1992). This objective faced significant challenges during the period of stringent fiscal policies implemented post-2009, which were primarily aimed at preserving the monetary union of the Euro. At the time, policymakers equated convergence with fiscal prudence, demanding that countries implement reforms and demonstrate 'solid' financial management as a condition for receiving solidarity support. However, this approach often reflected social convergence only in outcomes rather than underlying social models (Daly, 2019; Van Cleynenbreugel, 2019).

The severe fiscal constraints following the Eurocrisis limited investments in sustainable development and social welfare systems. In response, the European Pillar of Social Rights (EPSR) was proclaimed in 2017 to articulate a broader social perspective. The EPSR focuses on 20 principles and rights, including social protection, labour law standards, unemployment protection, minimum pay and income, and access to essential services. This initiative directly influences national economic and social policies (Dhondt et al., 2022; Hacker, 2023). The EPSR envisions a European social union, delineating clear social outcomes that the EU should aspire to achieve. However, it stops short of prescribing a unified social model.

The COVID-19 pandemic highlighted the urgent need for a robust and adaptable social policy framework to address large-scale employment and social welfare disruptions. The unprecedented social and economic disruptions necessitated swift responses with instruments like the Temporary Support to Mitigate Unemployment Risks in an Emergency (SURE), the Recovery Resilience Facility (RRF), and European Social Fund Plus (ESF+), providing immediate relief and fostering resilience among EU member states (Hermans et al., 2023). Before the pandemic, the EU social policy focused on labour market activation measures to support unemployed individuals in re-entering the workforce (De Becker, 2024). However, this approach often neglected comprehensive unemployment protection. The pandemic prompted a shift towards

temporary support and policy adjustments within member states (De Becker, 2024). This shift highlighted the need for a more balanced approach integrating activation and protection measures.

Despite developing various measures since the pandemic to assist member states, these initiatives explicitly avoided creating incentives for member states to reduce their structural social protection measures. The EPSR, therefore, does not alleviate the tensions between member states and the EU (Daly, 2019). At the same time, while social policy regimes remain highly heterogeneous in approaches and impact, countries remain reluctant to give further powers to the EU, preferring to retain control over their social policies (Papp, 2019). Consequently, aligning laws in the social domain remains limited, as the diverse socio-economic contexts make it difficult for member states to adopt similar institutions. This fragmentation is further exacerbated by varying national priorities and economic conditions, which complicate efforts to harmonise social policies across the EU.

The EPSR and the Transformations

In this context, the EU has developed policies addressing the social implications of the GI-NI project's three transformations: globalisation, technology, and migration. The EU is committed to reducing inequality and fostering skill development through targeted policy initiatives and funding mechanisms. This commitment is translated into action plans aimed at complementing national social policies. For employment, skills, and social protection, three key objectives have been set:

1. At least 78 per cent of the population aged 20–64 should be in employment by 2030;
2. At least 60 per cent of all adults should attend training annually;
3. The number of people at risk of poverty or social exclusion should be reduced by at least 15 million by 2030, lifting all citizens to at least 60 per cent of the median income in the EU.

The EU has also formulated concrete indicators to monitor progress in social convergence, focusing on metrics such as employment rates, training participation, and poverty reduction. In 2018, Eurofound developed a methodology to measure convergence (Stefanini et al., 2023). The current view is that the increase in social convergence could be seen up to 2008–09, but after that date, progress has remained limited (Hacker, 2023). Chapter 6 discusses this convergence with statistical data.

Several European Commission measures address the impact of the three transformations studied in GI-NI. In March 2021, the Commission introduced

the Recommendation of Effective Active Support to Employment (EASE) to transition from emergency job-preservation measures during the pandemic to new measures for a job-rich recovery, job creation and job-to-job transitions, particularly towards digital and green sectors (see EASE[2]). In May 2023, the European Year of Skills was launched to address skills gaps within the EU and enhance the EU skills strategy, focusing on reskilling individuals in digital and green technology skills and supporting small and medium enterprises (see European Year of Skills[3]). The European Skills Agenda (DG EMPL), a five-year plan, supports individuals and businesses in developing and utilising better skills by 2025. The agenda aims to strengthen sustainable competitiveness, ensure social fairness and build resilience to respond to crises, drawing on lessons learned during the COVID-19 pandemic (see European Skills Agenda – European Commission[4]).

The policy landscape derived from these actions mainly addresses equipping workers and member states with knowledge and infrastructure to adapt their skillsets to market demands individually. Our assessment is that the primary goal of the different measures is to steer workers towards the skills and jobs that current and future labour markets demand. However, no EU institution is responsible for navigating changing skill demands. Still, there are many initiatives by the European Commission and the European Centre for the Development of Vocational Training (CEDEFOP) to aid member states and relevant labour market stakeholders, for instance, through aiding lifelong learning. It is still up to the member states to take action (Greve, 2023; Petmesidou et al., 2023). Furthermore, the Green Deal supports skill transitions towards a more green and digital economy as a secondary objective.

Can We See Progress Towards a European Social Union?

Previous research indicates that the goals of the European Social Union, such as fostering social equity and achieving consistent policy implementation across member states, are not fully realised in practice (Dura, 2024). Although the EPSR aims for a high level of cooperation among all member states, in reality, it is more likely that only some countries will choose to implement these principles extensively, namely those who want to strengthen their social policy regardless of EU initiatives in the field. The EU-coordinated response to the COVID-19 pandemic is an exception to the rule; the EU still has no unified approach to social policy (Dura, 2024).

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[2] https://ec.europa.eu/commission/presscorner/detail/en/qanda_21_971
[3] https://year-of-skills.europa.eu/index_en
[4] https://employment-social-affairs.ec.europa.eu/policies-and-activities/skills -and-qualifications/european-skills-agenda_en

Social policy seems to be subordinate to economic policy, suffering from the ambiguities within that economic policy (Schout & van Riel, 2022). The economic policy focuses on further industrialisation (Green Deal) but has an unclear stance in the globalisation debate (Schwaag-Serger et al., 2024). This lack of clarity in economic policy creates challenges for developing a cohesive social policy. As a result, social initiatives often take a back seat, leading to inconsistent implementation across member states (Eick, 2024a).

The effects of globalisation, such as specialisation in business functions and tasks, along with future technological developments, including automation and digitalisation, are not yet fully integrated into European social policy. Labour market transformations, such as the decline of blue-collar work in countries like Germany and the simultaneous increase in white-collar jobs within the same industries in advanced countries, highlight the need for updated policies. Since the EU is still uncertain about its direction regarding international cooperation, technology, and migration, the direction of social policy within those domains remains unclear. This lack of integration is due to the complex and multifaceted nature of these issues, which require coordinated efforts across various policy areas, posing a significant challenge in current EU governance. Additionally, the rapid pace of technological advancements often outstrips the ability of policymakers to adapt and implement effective social measures. Social policy remains reactive rather than proactive. While Europe's ambitions for social policy reform are significant, they are often constrained by structural limitations and political divergences among member states. The two case studies shed some light on this.

STEP 2A: THE NETHERLANDS: NEO-LIBERAL SOCIAL POLICY OVERLOOKS TRANSFORMATIONS

The Netherlands, one of the first EU member states, has traditionally been classified as a corporatist state, which means that it strives to seek the best representation of common interests (Esping-Andersen, 1990, see 'Polder' politics). Over the past two decades, however, (neo)liberal policies have shifted this social model towards reduced social protection and increased liberalisation of labour market regulation (Ferragina & Filetti, 2022). The country has focused on addressing three major social transformations: globalisation, technological change, and migration. Compared to other European nations, the Dutch population perceives these transformations and their impacts more strongly and as quite important for the country (Dekker et al., 2020). This case study explores how these transformations are managed and identifies areas requiring action at the national and EU levels.

As one of the world's most open and prosperous economies, the Netherlands has been shaped profoundly by globalisation, particularly through trade. GI-NI

research highlights the Netherlands' significant growth in trade exposure with Eastern Europe between 2002 and 2018, accompanied by advancements in automation (Seghir & Smolka, 2024b). These trends have driven labour market changes, including greater flexibility of labour, increased demand for digital skills, and shifts from production to services, trade, transport, and logistics. Over the twentieth century, employment has transitioned from manufacturing to white-collar roles, such as research and development and managerial positions (Los & Ye, 2023). Despite these changes, unemployment has remained stable, and displaced workers have been absorbed into other sectors without significant short-term wage impacts (Los et al., 2023). Until recently, public opinion in the Netherlands largely supported globalisation (Dekker et al., 2020).

However, global trade has eroded the industrial base, with industrial employment constituting less than 8 per cent of total employment by 2023 (Statistics Netherlands, n.d.). Technological advancements have had limited additional effects on the labour market, given these longstanding structural changes. Nonetheless, niche technological sectors have experienced a resurgence, supported by microelectronics companies like Advanced Semiconductor Materials Lithography (ASML), BE Semiconductor Industries (BESI), NXP Semiconductors (NXP), and Advanced Semiconductor Materials International (ASMI). These developments, along with thriving firms, such as Randstad, Booking.com, and Adyen, have been underpinned by education investments, though skill mismatches persist.

Migration has further shaped the Dutch workforce, influenced by its colonial past and successive waves of labour migration to meet sectoral shortages (van Stiphout-Kramer et al., 2024). Historically, the country integrated migrants from Suriname, the Moluccas, Turkey, and Morocco. More recent migration has resulted from conflicts in Syria, Afghanistan, and Ukraine. Although public attitudes towards migration were traditionally positive, opposition to immigration has grown in recent years (Vrooman et al., 2023). Migrants have been disproportionately affected by structural labour market changes, with educational mismatches initially declining but rising again, particularly for women (Seghir & Smolka, 2024a, Table 6). Growing dissatisfaction among certain groups indicates that those most negatively impacted by globalisation, technological change, and migration may harbour grievances (Seghir & Smolka, 2024a). The new right-wing government has embraced anti-migrant sentiments as a central political goal. Migration policies often diverge from EU mandates, especially regarding non-nationals' access to social security benefits (Kramer & Heindlmaier, 2021).

Over the past two decades, debates on globalisation, technology, and migration have had limited influence on Dutch social policy. Dominated by liberal parties (VVD, D66), the policy agenda has prioritised labour market activation

and participation over social equality (Ferragina & Filetti, 2022; Stiller & van Gerven, 2012). While unemployment is low (3.7 per cent in 2024) and labour force participation high (73 per cent of the 15–75 age group), challenges include an ageing population, overreliance on flexible contracts, and workforce attrition due to retirement. Incremental increases in the retirement age have positioned the Dutch workforce as the longest working in Europe. Despite these challenges, the Netherlands consistently exceeds EPSR objectives for employment, skills, and social protection (Hacker, 2023).

The Dutch social system is characterised by robust financial support for welfare programmes, healthcare, and education, often described as a 'great equaliser' (van Mulligen, 2019). However, income inequality has risen due to inequitable taxation, including capped social security premiums, regressive indirect taxes, and lower taxation on capital income compared to wages (Rijksoverheid, 2022; van Essen et al., 2022; Vethaak & Jongen, 2024).

European social policy, a relatively recent phenomenon, is considered 'soft law', giving member states flexibility in implementation (Eick, 2024b; Hacker, 2023). In the Netherlands, initiatives like the European Digital Innovation Hubs aim to strengthen industrial digitisation, yet other schemes, such as SURE and the RRF, are less adopted due to perceived irrelevance[5]. Despite contributing to SURE[6], the Netherlands has not utilised these loans. However, it ranks among Europe's top three digital economies, meeting many Digital Decade Policy targets, with over 80 per cent of its population possessing basic digital skills[7].

Regarding the EU's minimum income proposal, the Dutch government asserts its autonomy in interpretation and implementation[8]. Existing programmes, such as the Social Assistance Act, General Old Age Pensions Act, and Supplementary Benefits Act, align with EU recommendations while maintaining flexibility. This reflects a recurring perception that EU social policy does not align well with Dutch needs, resulting in limited participation in such initiatives. Nonetheless, the Netherlands actively engages in skills development, digitalisation strategies, and gender income equality.

Despite a strong labour market, significant challenges remain. Skill shortages, declining educational outcomes (evidenced by low Programme for

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[5]   https://www.eerstekamer.nl/verslagdeel/20210518/goedkeuring_van_het: Behandeling Goedkeuring van het eigenmiddelenbesluit van de Raad van de Europese Unie – Eerste Kamer der Staten-Generaal.

[6]   https://economy-finance.ec.europa.eu/eu-financial-assistance/sure_en

[7]   https://www.rijksoverheid.nl/actueel/nieuws/2023/10/24/meer-mkbers -benutten-digitalisering-toegang-tot-gigabitinternet-verbeterd#:~:text=Al%20met %20al%20past%20nu,tot%20tenminste%2075%25%20in%202030

[8]   https://zoek.officielebekendmakingen.nl/h-tk-20242025-8-9.html

International Student Assessment [PISA] scores) (Meelissen et al., 2023), and social disparities persist. Precarious workers, comprising 16 per cent of the population, are especially vulnerable (Vrooman et al., 2023). Migrants form a large part of this group, feeling neglected by national and EU social policies, despite benefitting from regulations like the minimum wage (Eick, 2024b). In other EU countries, lower socio-economic groups tend to support EU social policy more strongly (Baute & Meuleman, 2020; Eick, 2024a). Paradoxically, in the Netherlands, such groups have historically been politically inactive but contributed to the populist surge in the 2023 elections (Ipsos, 2024). These elections emboldened the government to tighten migration controls, including reintroducing border checks, aligning with domestic sentiment but diverging from EU frameworks (Government of the Netherlands, 2024). Restrictive migration policies exacerbate social tensions, straining housing availability and undermining security in vulnerable communities. Policymakers' reluctance to address these issues perpetuates narratives that culturalise problems, disproportionately attributing them to migrants (Vermeij et al., 2024, p. 115). The EU could play a stronger role in advocating for comprehensive migrant integration by establishing clear guidelines and funding for housing, education, and employment initiatives, similar to its approach to fiscal oversight. However, such measures have not materialised.

In conclusion, the EU context seems to have had limited influence on Dutch social policy. The Netherlands remains a corporatist state, even after more than 20 years of politics dominated by liberal parties. On several occasions, these governments tried to shift the rules towards more liberalisation and less public funding for social programmes, but on each of these occasions, Dutch corporatist interventions (i.e. the Polder) were needed to appease societal tensions (Ornstein & Oude Nijhuis, 2020). The main conclusion for the Netherlands is that, even if it is more in line with the social targets of the EPSR than most EU countries, there is no drive to lead a European social policy (Hacker, 2023). Instead, the Netherlands prefers to follow its social policies, which depend on the policymakers in power at any given time and are subject to change.

STEP 2B: NORWAY: BETWEEN NATIONAL SOLUTIONS AND INTERNATIONAL INTERDEPENDENCY

Norway is outside the EU but part of the EEA. This arrangement gives access to the internal market and an obligation to implement most of the regulatory regimes decided by the EU. Still, it leaves the country without formal political EU representation. As such, Norway is aligned with European social policies and influenced by the European Social Charter, which guarantees social rights such as fair working conditions and social security. This promotes some consistency with EU social standards despite Norway's non-membership. The

EU's influence on the social dimension has traditionally been limited and only recently gained significance through the EPSR (Resolution and Report on the Action Plan to Implement the European Pillar of Social Rights, 2021). While this alignment supports convergence in social aspects, economic policies may still diverge due to different governance models, as the Netherlands and Norway perform above the objectives formulated in the EPSR.

Norway resembles the Netherlands in that it is in a group of countries historically referred to as small and medium-sized (nation-)states with well-functioning political, social, and economic structures (Esping-Andersen, 1990). The institutional set-up has enabled various segments of society to seek compromises across historical divides, bringing social rights and welfare to be taken as universal. Yet there are demographic, economic, and institutional differences compared to the Netherlands.

Demographically, Norway is a large but sparsely populated country, while the Netherlands is the opposite, being one of Europe's most densely populated. Economically, the Norwegian business structure is strongly dominated by oil and gas, marine and maritime activities, the abundance of hydroelectric power, and the availability of rich mineral and forest resources. While being an advanced society, these traits contribute to giving the country a parallel imprint of being a frontier economy. In recent decades, the earnings, especially from exporting oil and gas, have made the country a net creditor internationally, putting it in a position of relative freedom of choice for domestic spending. Institutionally, the historical segmentation of Norwegian society differs from the Dutch principle of pillarisation ('verzuiling'). In Norway, cultural, political, and economic rifts, often with strong regional anchoring, divide society and must be considered prerequisites for compromises (Rokkan, 1967). Two such arenas for compromises should be mentioned. First, there is the historical compromise between capital and labour made in the 1930s. In 1935, the National Labour Union (LO) signed a general agreement with the National Confederation of Employers (NAF) regulating working life into a terrain of negotiation, often cited as the birth of the Norwegian model, predating the more famous Swedish model by two years (Rokkan, 1967). The same year, a social-democrat government was established after an agreement was reached with the Agrarian Party (Bondepartiet) on a programme introducing many of the themes that would later form the basis of the welfare state model.

Second, the regional dimension is interlinked with social policy. Again, there is a historical backdrop. Norway's business structure varies substantially from one region to another, and this has been the case even more historically. The battle for national political hegemony displays this struggle, broadly speaking, opposing the peripheries to a national centre, often deemed unacquainted with ordinary people's lives and living conditions. Throughout the nineteenth century, the periphery gradually gained parliamentary control, meaning that all

aspects of politics and policy development ever since need to pay attention to the geographical dimension, not least as regards industrial and social policies (Wicken, 2017). The rebuilding of the country following the end of World War II implied an even firmer institutional safeguarding of the periphery (Knudsen, 2018).

Following this, the feature of demographic sparsity applies to all the Nordic countries except Denmark, and this topic was highlighted when Finland, Norway, and Sweden applied for EU membership in the early 1990s. Subsequently, a specifically targeted area for the northern periphery was developed under the structural fund umbrella (Méndez et al., 2006). Other issues were highlighted in the discussion between Norway and the EU, especially related to fisheries, but, in the end, Norway voted "no" to EU membership in 1994. There are several ways to interpret this turn, and one of them is to see the outcome as a trade-off between material and identity-related factors (Gstöhl, 2002). Norway and Switzerland were both in a position where economic arguments did not outpace strong identity-related sentiments against joining the EU, as both countries were not reliant on EU funding for securing national budgets or well-being. On the contrary, the electorate, especially in the Norwegian geographical periphery, held the view that they would be better off without joining. The equation was calculated differently in Finland and Sweden, with their different business structures and economic outlook.

In line with this way of reasoning, it is fair to say that the present discussion in Norway on social convergence and transition is very different from that in other European countries. There is a concern about the interface between the Norwegian labour market and that of the EU, and this debate is mainly related to skill needs and a perceived need for qualified labour within different sectors of the economy (KBU, 2023). Concomitantly, there has been a debate about a possible weakening of the Norwegian work–life model characterised by a comparatively well-paid and highly unionised workforce caused by the influx of migrant workers coming from countries with other traditions. Lately, this debate has become less articulated following the upswing of wage levels in Eastern Europe and a tendency for many of these migrant workers to return to fill vacancies in their countries of origin. The debate about harmonising criteria for skill needs and the regulatory amendments needed to align with the rest of the EU in this respect continues to evolve on a bureaucratic level without stirring much emotion. The debate about harmonising social policies, in general, is almost absent, as the levels of contribution normally lie well above minimum standards in the EU. What is an issue, though, is the transferability of national social payments to people moving to EU countries, permanently or temporarily, be they EU or Norwegian citizens.

The most pressing question raised by the challenges dealt with in this book is the possible consequences of an upcoming trade war between the EU, US,

and China. Norway is not a member of the EU Customs Union and will be severely hit by an abrupt slowdown in economic globalisation as a small, open economy, heavily relying on trade for its earnings and well-being. This was also the message brought forward by the governor of the Norwegian National Bank, Ida Wolden, in her yearly address to the Supervisory Council of the bank on 13 February 2025 (Norges Bank, 2025). Moreover, in doing so, she referenced the late Norwegian economist Victor D Norman (1946–2024), who is considered the inventor of the concept of Norway as a small, open economy gaining from global free trade. The possibility that Norway could profit from playing as a free state in a world of unrest or trade barriers is almost absent from the debate, the only empirical case of such a situation being the boom in shipping during World War I, when Norwegian shipping companies made huge profits as neutral players at the expense of thousands of sailors losing their lives when ships were sunk.

More specifically, a trade war between the EU and the US could put Norway in a difficult position, facing tariffs from both sides. This would be especially problematic if the EU imposes protective tariffs against third countries under World Trade Organization rules. Since the EU is Norway's largest trading partner, the government has argued that the EEA Agreement allows Norway to be included in the EU's Customs Union. More generally, the recent debate in Norway's social system centres on whether the country can sustain its current generous welfare policies in the long run. While Norway boasts a high employment rate among individuals aged 25–55, its workforce participation among those over 55 lags behind the rest of Scandinavia. Adjusting pension rules has garnered broad consensus, but reforms to sick leave policies and permanent social benefits remain contentious (Rolfsen, 2024). These issues are likely to become significant political topics in the years ahead.

There is a debate about whether Norway will see a period of reindustrialisation or not, using its energy resources to meet global demands. However, such reindustrialisation is dependent on exports for it to work. The emerging battery industry illustrates both the case and its dependency on foreign markets. Without inclusion in a coherent EU battery policy, Norwegian initiatives in this sector will struggle to compete (Wardeberg et al., 2024). The worst case would be a trade conflict involving the EU, the US, and China. As a small, open economy outside the EU Customs Union, Norway would then be in the loser's corner.

STEP 3: FORESEEING THE FUTURE OF WORK

The country reports reveal a significant divergence between the objectives of EU policy and national intentions in social policy, given the major transformations. This divergence hinders efforts to address major risks of deglobalisation,

insufficient technological investment, restricted migration for EU citizens, overall welfare, and inequality. A foresight study was conducted to understand these risks and the necessary policy measures to achieve social convergence. Four scenarios were developed using a mixed-method foresight approach. This approach combined quantitative findings from the GI-NI studies on the impact of digital transformation, globalisation, and migration on skills demand and inequality, with desk research, qualitative consultations, and workshops with experts (Boza & Reizer, 2023; Dabed et al., 2024; Kampert et al., 2024; Los et al., 2023b, 2023a; Los & Ye, 2023; Nikolova, 2022; Preenen et al., 2023). The scenarios explore the interaction between varying degrees of digital transformation and globalisation and their impact on welfare, skills demand and inequality. The focus is now on the scenario where both digital transformation and globalisation in the EU and world stall, resulting in an insular and technologically conservative world. This scenario likely indicates the risks for the EU and member states if they do not develop an alternative approach to the major transformations.

BOX 7.1   EXPLAINING THE SCENARIO OF DEGLOBALISATION AND STAGNATING DIGITAL TRANSFORMATION (SEE HULSEGGE ET AL., 2024 FOR A FULL OVERVIEW)

In this scenario, we will likely see reduced cooperation and knowledge exchange between the power blocs: the US, BRICS and the EU, further impeding digital transformation. The slowdown in technological progress diminishes labour productivity and global trade, leading to economic growth deceleration and broader global economic struggles. Escalating national tensions emphasises more focus on sovereignty, decreasing labour migration between blocs and exacerbating polarisation within and across the EU.

Deglobalisation, coupled with less mobility and labour migration, poses further risks to the EU's economy. It could lead to significant labour shortages in key sectors such as healthcare, agriculture, and construction, impacting productivity and economic growth. Additionally, with an ageing population, fewer migrants could exacerbate challenges like increased pressure on pension systems and healthcare services. Migrants also bring diverse skills and perspectives that drive innovation, so reduced migration could limit new skills and ideas, hindering technological and economic advancements.

This scenario suggests that socio-economic inequality may be reduced in the short term within and between countries, with countries within the EU converging temporarily. Technological stagnation and factors like reshoring (reinstating previously outsourced jobs) lead to slightly narrower socio-economic inequalities as they are met with decreasing demand for highly skilled workers. Additionally, Southern and Eastern EU countries may benefit most from reshoring and nearshoring, and stalling digital transformation may allow them to catch up technologically. However, this comes at the cost of generally lower numbers of job opportunities across all skill levels and, most importantly, sustained economic stagnation and potentially even economic contraction.

In the long term, this leads to significant risks of increasing inequalities. The initial reduction in inequality may reverse, leading to more significant disparities. Vulnerable groups, such as low-skilled workers, migrants, and women, will face heightened employment barriers and job insecurity. Reduced economic activity will exacerbate employment barriers, especially for these vulnerable groups. During economic hardship and periods of job scarcity, competition intensifies, potentially resulting in medium-skilled workers displacing lower-skilled workers. Vulnerable groups are exposed to the increased precarity of labour contracts. Multifaceted policy measures are needed to protect these groups and promote economic stability.

With technological growth stagnating, the demand for advanced technology decreases across all education levels. However, changes in global value chains still require workers in specific regions, occupations, and companies to reskill. Economic hardship and strained educational systems will make it difficult for workers to acquire new skills, hindering their ability to adapt to changing job market demands. Comprehensive support systems are essential to guide and equip those at risk, ensuring inclusivity and equity in reskilling initiatives. Economic struggles increase competition for well-paid jobs, benefitting higher-skilled workers with more development opportunities, while lower-skilled workers face limited growth prospects and competitive disadvantages. High-skilled workers experience fewer negative impacts from changing labour market dynamics. It remains crucial for companies to keep up with essential innovations, necessitating the continued need for high-skilled workers. In periods of economic struggle, high-skilled workers may also take over roles traditionally held by medium-skilled workers, exacerbating competition and reducing opportunities for lower-skilled workers, leading to a more polarised labour market. Reforming collective

labour agreements can help maintain productivity and prevent precarious employment.

Promoting innovation and R&D will be essential for economic recovery and growth, which is particularly challenging with reduced labour migration and increasing critical skills gaps. The EU must, in this scenario, find ways to foster innovation internally and effectively leverage existing resources despite reduced openness and limited international collaboration. Supporting companies in adapting to changing business models and market trends is crucial for resilience and competitiveness.

Prolonged economic stagnation could lead to a cycle of reduced investment, lower productivity, and limited job creation. Stabilising labour markets with declining demand requires a comprehensive policy strategy, including rethinking production systems to mitigate supply chain risks and prioritising the production of strategic goods and services. Technological sovereignty, self-reliance, and optimal use of existing technologies are vital for boosting productivity and economic resilience.

The major challenge for the EU in this scenario is to promote innovation and R&D despite reduced openness, limited access to international talent, and restricted knowledge exchange between EU countries and internationally. This challenge is compounded by economic stagnation, which limits available financial resources for investment.

This scenario and its policy implications underscore the enormous challenges posed by deglobalisation combined with stagnating digital transformation for the EU's prosperity and social convergence. The lack of collaboration, knowledge exchange, and limited financial resources exacerbate these challenges. This seems to be a scenario to avoid at all costs.

When we examine the other scenarios, the downsides of this scenario become even clearer. In scenarios where deglobalisation is paired with accelerating digital transformation (the 'Streeck scenario'), or where globalisation continues alongside stagnating digital transformation, we still foresee slow to moderate economic growth and increased welfare. Although the challenge of mitigating inequality and social divergence remains significant in those scenarios as well, the financial resources and opportunities available to address these challenges are more present.

The findings of the scenario study highlight the critical importance of EU collaboration and investing in both digital transformation and international collaboration. Possibly, the EU should develop an alternative to hyperglobalisation that puts too much of a reliance on the US economy (Rodrik, 2019). By fostering its programme for technological advancement (Draghi, 2024)

and maintaining open, cooperative international relationships, the scenarios implicate that the EU will be better able to navigate the complexities of global economic shifts and work towards greater social convergence and economic resilience (see also Schwaag-Serger et al., 2024).

DISCUSSION AND POLICY IMPLICATIONS

The EU has focused significantly on social convergence over the past decade. The EPSR was intended to mark a departure from years of fiscal austerity policies. This social policy aimed to transcend the national focus of social policy in Europe and offer a new perspective for citizens and workers. The various rules have garnered support from social partners and thus seem to embody the European social market model. Continuing Hacker's (2023) analysis, the EPSR appears to combine elements of the corporatist and the (Nordic) social democratic social models. In recent years, with the SURE and RRF instruments, the European Commission has attempted to let the EPSR guide national social investment. However, countries still prioritise their own agendas despite the EPSR's social indicators highlighting clear imbalances in national social policies (Hacker, 2023). The Commission aims for social convergence towards these standards, but the standards do not provide significant triggers for adjustment. The EPSR seems still far from being an instrument to shape European solidarity.

At the same time, this fragile European social policy has come under pressure from several shocks. Technology, globalisation, and migration have pressured policymakers to devise alternative solutions to continue enabling social convergence. Over the past decade, several initiatives have responded to these challenges: SURE, RRF, Year of Skills, and the Migration Pact. European policies seem responsive to these challenges. However, the question remains whether these policies have had a significant impact (Hacker, 2023). Achievements also seem fragile to a large extent. Despite discussions on a 'Just Transition', it remains to be seen whether the achievements of recent years (minimum wage, green transition, CSRD) will receive as much attention in the new European Commission and Parliament. Policymakers are facing unprecedented challenges, including the effects of the recent pandemic and war at the borders.

Does this make social convergence towards greater equality and better skills possible and desirable? Is such convergence feasible? Is European social policy truly taking shape? Can it transcend national borders? Countries seemed to be gradually aligning with the EU policy goals (Eurofound & Mascherini, 2020), but examples from the Netherlands and Norway show an à la carte approach to European social policy. Countries participate when it suits them, not out of European solidarity or an intention to contribute to social convergence (Hacker,

2023). The Norwegian case does indicate that the current international conditions may bring the external members of the EU, somewhat closer to the EU social agenda. Social convergence appears to be coincidental, temporary, and more a consequence of global developments than specific European policies. Thus, the impact of EU social policies on skills and inequality can be considered marginal, although they can provide valuable guidance for member states. Schout and van Riel (2022) indicate that the primary responsibility for convergence lies at the national level and that the quality of institutions plays the most prominent role, which implicitly extends to social policies. They argue that economic policy initiatives, rules, regulations, and oversight at the EU level have been ineffective, underscoring the need to strengthen national institutions. The SURE scheme seemed to initiate a European unemployment compensation scheme, where the EU could 'stabilise' the economy. In practice, the impact of SURE has been very limited. However, the countries that utilise it will eventually have to repay the debts incurred.

Trend analysis shows that European investment funds have not made a significant difference. The main beneficiaries of EU investment funds in Southern and Eastern Europe exhibit different growth patterns. Ireland and Eastern European countries have managed to catch up, while Southern countries continue to lag behind. Further research is needed to explain the differences in convergence and the relationship with public investment (Hacker, 2023; Hermans et al., 2023).

The question remains whether social convergence is desirable and whether we should pursue further social convergence at all. This is where the foresight study and the results noted in Chapter 6 are important. These studies indicate that less technology or globalisation means that social convergence is even less likely. However, even in a scenario of substantial investment, choices remain necessary: the question is whether these choices will work in practice. As Rodrik (2019) warns of convergence towards hyperglobalisation, what constitutes an EU direction is not yet clear. Whether all current actions are appropriate is questionable if we do not know how best to achieve social convergence. There are several elements missing that are needed to achieve social convergence.

A first observation is that, while we consider social convergence important, it is politically challenging to reach a consensus on it. Why is that? First, more discussion on the desired social model is needed. There is talk of the EU being a social market model, but the outline of that model is imprecise. Until such an outline is defined, the different national social models, as described by Esping-Andersen (1990), will continue to coexist. The Netherlands and Norway have different social models (corporatist versus social democratic), yet they score better on EU convergence objectives. Choosing a social model is essential because it clarifies how social conflicts should be resolved. The

European level lacks sufficient instruments to realise political compromises in the social domain. If we examine the development of social models in different member states, they do not significantly change in practice. Furthermore, they are developed in social and political processes throughout history, only partly relying on off-the-shelf models. Only the new member states (e.g., Slovenia) are building new models. However, countries appear reluctant to learn from each other or to be guiding countries. The Netherlands and Norway make little effort to 'export' their models.

A second observation is that we need a different order in the convergence debate. It is tempting to prioritise economic instruments to achieve progress in Europe. This strategy remains central to the European Commission. European leaders (notably Von der Leyen, Draghi, and Lagarde) expressed a preference for creating a unified European capital market. This would give businesses and small and medium-sized enterprises access to more funds and revitalise the European innovation model. The lesson from 2024 Nobel laureates Acemoglu, Robinson, and Johnson (see Chapter 9) is that politics and economics need each other, but political institutions need to counterbalance the economic forces. Creative destruction as an economic mechanism can only work if political institutions can make an economy function, and when social policy measures are in place to cushion the effects of its operations. Democracy is an important precondition, and it is questionable whether the EU meets the conditions of a strong democracy (Mounk, 2018).

The problem with social convergence is that political convergence in Europe has lagged for several decades. This needs to be addressed. A European social model can be developed only when the political model shows progress. Such a European social model should express how we want to shape solidarity at the European level. If the impact of technology, globalisation, and migration continues to be felt in the coming years, it must be clear how we want to address these issues at the European level. Acemoglu's (2024) speech to the Nobel Prize Committee highlighted how technology affects the balance between utility for the 'rich' and the 'poor' in a country. That balance reflects what our social model embodies. We should recognise the influence of technology and other factors (i.e., migration, globalisation) on that balance. As Acemoglu shows, technological transformation can go in several directions. If we want to emphasise the positive impact of technology, we must steer towards that.

A follow-up question is what constitutes an effective social model with a different organisation of solidarity. To achieve European prosperity and social convergence, our analysis indicates that increased, yet carefully guided, globalisation, digitalisation, and migration are crucial. A robust social convergence narrative depends upon effectively addressing the following four key elements:

- Addressing regional differences in models: We should not ignore these social models' obstacles to social convergence. The EU needs to define clearly what type and scale of support it is willing to provide to lagging regions. What support are we prepared to give to lagging regions? The Cohesion funds have had an impact but may not be sufficient to guarantee further convergence. Although convergence is expected in most scenarios, the risk of lagging regions remains high, especially given the challenges posed by deglobalisation and rapid digitalisation.

- Influencing the direction of technology: As Acemoglu (2024) points out, we have opportunities to influence the direction of technology. The question is whether the EU can hold its own in this international debate and sketch an alternative future for hyperglobalisation. The EU AI legislation seems to indicate that it can. This legislation provides the EU with leverage to tackle the practices of global companies, ensuring technology supports, rather than disrupts, social cohesion.

- Targeted mobility and migration for talent: Addressing the EU's talent shortage requires targeted mobility and migration strategies explicitly tailored to sectors experiencing critical skill gaps. Effective policies must prioritise streamlined skill recognition, proactive integration programmes, and close collaboration with employers. Such measures should be accompanied by robust domestic reskilling and upskilling initiatives to avoid exacerbating inequalities and skill mismatches, thereby fostering broader social acceptance, cohesion, and sustainable economic growth. In this way, targeted migration becomes a contributor to social convergence, rather than a cause of fragmentation.

- Quality of work: Rodrik and Sabel (2019) discuss the importance of quality work. The EPSR mentions a healthy, safe, and well-adapted work environment and data protection. However, none of the 20 principles focuses on improving the quality of work within organisations. The design of workplaces largely determines whether employees can manage the impacts of technology. The European Commission does pay attention to the quality of work, as seen in the proposal to make Industry 5.0 central to its industrial policy (Breque et al., 2021). Among other things, work should be 'human-centric'. This principle is not included in the EPSR. If employees and social partners want to manage transformations, more attention is needed for 'human-centric work'. Baldwin (2018) suggests that policies should shift towards creating good quality jobs, mainly in the service sectors, without relying solely on the manufacturing sector, supporting and encouraging firms' participation in global value chains, and focusing on protecting workers rather than jobs. Prioritising the quality of work contributes to social equity and convergence.

Social convergence in Europe can be achievable and desirable, but only if the priorities are right: convergence should first be political, then social, and only then economic, not the other way around. As Acemoglu, Robinson, and Johnson argue, economic integration is insufficient for achieving social and political convergence. European social convergence, therefore, needs a new narrative that enables the EU to find a role in the various transformations central to the GI-NI project. We have identified the elements that make an alternative narrative possible, which can serve as an antidote to populist spin in European and national politics.

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8. Skills between reality and misconceptions: what they can (and cannot) solve

Cinzia Alcidi and Laura Nurski

INTRODUCTION

In recent years, skills have emerged as a central concept in labour market analysis, offering a more dynamic and granular understanding of workforce capabilities than traditional indicators such as education levels or occupations. Once considered secondary to formal qualifications, skills are now seen as a crucial determinant of employability, productivity, and economic resilience. This shift reflects broader transformations in the world of work and has significant implications for how we approach labour market policies, workforce development, and economic inclusion. Several key factors explain the growing emphasis on skills, defined as "the ability to perform a task well"[1]. (Rodrigues et al., 2021), and reflect several key developments.

First is structural shifts and a growing mismatch between skills supply and demand[2]. For the past two decades, major economic and technological transformations – most notably digitalisation, globalisation, and the green transition – have placed unprecedented pressure on labour markets. These shifts have changed the nature of work, leading to greater volatility in skill demand. While mismatches between the skills that workers possess and those that

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[1]   This definition is borrowed from the Joint Research Centre. In their definition, one skill relates to one task while competencies (that include bundles of skills, knowledge, attitudes and expertise) relate to bigger task domains (or bundles of tasks, that could be jobs). Following Autor (2011), a task is the unit of work activity that produces output.

[2]   See https://www.ilo.org/resource/article/what-skills-mismatch-and-why -should-we-care#:~:text=Simply%20put%2C%20it%20is%20a,to%20the %20skills%20of%20individuals

employers seek have always been a feature of labour markets, the scale and persistence of these mismatches have increased[3].

When skill mismatches become widespread, they can have far-reaching consequences, including lower labour productivity, reduced firm-level innovation, wage stagnation, and higher unemployment or underemployment. Workers who lack the right skills may find it harder to transition between jobs, while employers struggle to fill vacancies. In this context, skills development is increasingly framed as a strategic response, offering a way to enhance adaptability, employability, and economic competitiveness.

Second is the rise of skills-based hiring and the changing role of qualifications. The role of formal qualifications in hiring and career advancement is evolving. While degrees and certifications continue to be important, they are increasingly supplemented – or even substituted – by demonstrated skills and competencies. This trend gained momentum with the so-called 'Great Resignation'[4] and intensified during the COVID-19 pandemic when labour shortages in key sectors pushed employers to adopt more flexible hiring criteria.

Recent employer surveys reported in the media and developments in job posting content reflect a declining emphasis on traditional credentials and a growing preference for a skills-first approach, where recruitment focuses on candidates' demonstrated abilities rather than their formal education. Companies are adopting more sophisticated tools, including skills-based assessments and AI-driven recruitment platforms, to identify talent beyond conventional degree requirements. This shift appears to have several positive implications. Skills-based hiring allows employers to consider a broader and more diverse range of applicants, including those who may not have had access to high-quality education but have acquired valuable skills through experience. By focusing on practical competencies, companies can reduce hiring inefficiencies and better match workers to roles that fit their strengths.

Furthermore, soft and transversal[5] skills – such as adaptability, critical thinking, and collaboration – are gaining importance across industries. These

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[3]   Among others, the Organisation for Economic Co-operation and Development (2024) finds that skill gaps are widespread, especially in technical skills, teamworking and problem solving. These gaps lead to challenges, including increased workloads for existing staff, higher operating costs and difficulties in implementing new work practices.

[4]   See https://hbr.org/2022/03/the-great-resignation-didnt-start-with-the-pandemic

[5]   According to the European Skills, Competences, Qualifications and Occupations Member States Working Group on terminology for transversal skills and competences, "Transversal skills and competences are learned and proven abilities which are commonly seen as necessary or valuable for effective action

skills are increasingly sought by employers, yet there is little consensus about their conceptualisation in the workplace and their integration into formal education and qualification frameworks, which are still at an early stage. This gap highlights the need for new approaches to skills recognition and validation, ensuring that workers' full range of competencies is acknowledged and rewarded.

Third, skills are being increasingly used as an analytical lens. Beyond their practical role in hiring and workforce development, skills also provide a powerful analytical tool for understanding labour market dynamics. Compared to traditional classifications based on occupations or educational levels, skills offer greater granularity – allowing policymakers and researchers to track emerging trends, identify areas of demand, and design targeted interventions.

However, while the focus on skills brings important advantages, it should not replace traditional labour market indicators altogether. Occupations and qualifications remain essential concepts, particularly in the context of:

- Collective bargaining and worker protections: Many labour rights and social protections are structured around occupational categories, making them crucial for wage setting, job security, and working conditions.
- Education and workforce preparation: Despite shifts towards skills-first hiring, education systems continue to play a foundational role in preparing individuals for work, life, and citizenship, equipping them with both technical knowledge and essential cognitive and social skills.
- Sectoral analysis and policy design: While skills provide fine-grained insights, occupations offer a broader structural perspective that remains vital for workforce planning, industrial strategy, and social policy.

Ultimately, the interplay between skills, occupations, and qualifications should be seen as complementary rather than competing. While skills provide flexibility and responsiveness to labour market changes, occupations anchor work within broader institutional frameworks, and formal education remains a critical foundation for lifelong learning. In this interplay, skills can be seen as a linking pin between occupations and qualifications. While qualifications and occupations can be matched one-to-one in some instances (e.g., in regulated professions), in many other cases, partial skill overlaps between the two can

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in virtually any kind of work, learning or life activity". They are 'transversal' because they are not exclusively related to any particular context (job, occupation, academic discipline, civic or community engagement, occupational sector, group of occupational sectors, etc.).

allow a wider set of transition pathways between education and the labour market.

Such developments have been accompanied by an increased policy interest in skills driven by emerging shifts in companies' approaches, as well as the gradual appreciation of risks that industrial transformations would pose to workers.

This chapter explores both the potential and the misconceptions surrounding upskilling, reskilling, and broader skill development – highlighting what these efforts can realistically achieve, where their limitations lie and why it matters.

THE POTENTIAL OF SKILLS IN ADDRESSING CURRENT TRANSFORMATIONS AND THE POLICY DEBATE

In today's knowledge economy, a highly skilled workforce is increasingly recognised as a driver of productivity and efficiency. Skilled workers enable businesses to innovate, generate higher-value production, and maintain leadership in critical industries. This is particularly evident in sectors reliant on STEM (science, technology, engineering and maths) expertise, digital literacy, and problem-solving abilities, which fuel research, technological progress, and entrepreneurship.

As AI and digitalisation reshape industries, the demand for new and increasingly complex skills continues to rise. Without proper investment in training, societies risk deepening digital divides, leaving low-skilled workers at a disadvantage. Lifelong learning plays a crucial role in bridging this gap, ensuring that people from diverse backgrounds – including marginalised groups – have access to quality employment. By expanding opportunities for skill development, economies can promote inclusiveness, reduce social exclusion, and foster greater equality in the labour market.

Beyond digitalisation, the transition to a greener economy brings other pressing needs for workforce development. Emerging sustainable industries require new expertise, making upskilling essential for meeting climate goals and supporting environmentally friendly economic models.

Finally, a skilled workforce enhances economic resilience. In times of disruption – whether due to automation, geopolitical shifts, or environmental challenges – workers with adaptable skills are better equipped to transition between sectors, reducing long-term unemployment and mitigating the risks associated with structural change.

Building on this potential and given rising challenges, skills have become a central pillar and part of the solution in policy discussions on the future of work, but also on economic challenges. Policymakers are increasingly presenting skills as the silver bullet: the instrument to boost competitiveness, drive

innovation, and reduce inequality. However, too often, the debate is riddled with misconceptions that oversimplify the role of skills in the labour market and society, while the reality is far more complex.[6]

The development of skills and adult learning is not new in the European Union (EU) policy debate. They have been the object of EU policy discussions since the Lisbon Strategy in 2000. The strategy, which aimed to make the EU "the most competitive and dynamic knowledge-based economy in the world" by 2010, included skills development and adult learning as essential components for boosting employment, economic growth, and social cohesion. Among different initiatives, the strategy placed a strong emphasis on lifelong learning and digital skills. Recognising that continuous skills development was crucial for adapting to technological changes and labour market demands, it stressed the need to improve education and training systems, ensuring people could upskill and reskill throughout their lives. Additionally, it also encouraged the development of ICT skills to prepare the workforce for digital transformation.

The Lisbon Strategy was only partially successful, being unable to fully meet its ambitious targets by 2010. However, it laid the foundation for later initiatives. Notable examples include the Education & Training 2020 Strategic Framework (Council of the European Union, 2009) and the Council Recommendation on Upskilling Pathways: New Opportunities for Adults (Council of the European Union, 2016), which targeted low-skilled individuals, regardless of their employment status. In 2017, the European Pillar of Social Rights (EPSR), endorsed by the European Parliament, Council of the European Union, European Commission, and social partners, further reinforced the principle that everyone should have access to lifelong learning opportunities to acquire and maintain relevant skills throughout their lives.

More recently, the European framework on skills development has expanded significantly, reinforcing the idea that all individuals should have the right to high-quality, inclusive education and training opportunities. In 2020, the European Commission released its Communication on a European Skills Agenda for Sustainable Competitiveness, Social Fairness, and Resilience, advocating for "a skills revolution and a paradigm shift in skills policies". This agenda included 12 flagship actions to be achieved by 2025, with a strong focus on upskilling and reskilling. Among these actions, the Pact for Skills called on stakeholders to invest in training, ensuring that all working-age individuals across the EU can continuously develop their skills in response to evolving labour market demands. The Proposal for a Council Recommendation on Vocational Education and Training (VET) for Sustainable Competitiveness, Social Fairness, and Resilience (European Commission, 2024) aims to

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[6]   See also Nurski (2025).

modernise VET systems by making them more adaptable to the twin green and digital transitions. The EPSR Action Plan, endorsed in Porto in 2021, outlines concrete actions to implement its principles and proposes a headline target for skills to be achieved by 2030, with at least 60 per cent of all adults participating in training every year. While progress has been made, and some countries (like Sweden) have already achieved the targets, others are very far from them, and continued efforts are required. Finally, two Council of the European Union recommendations were adopted in 2022 and 2023, one to empower individuals to manage their lifelong learning pathways through learning accounts and one to establish a common framework for micro-credentials, facilitating their recognition across Member States.

All these initiatives underscore the EU's commitment to fostering a skills-based economy. However, not all actions of the skills agenda have been implemented, and tangible impacts have been slow to materialise.

Recently, the demand for skills has been driven by more than just the digital and green transitions. Geopolitical shifts have intensified pressure on the EU's capacity to innovate, compete globally, and rethink trade relations and production systems. These changes have significant implications for the labour markets, further highlighting the crucial role of skills in ensuring economic resilience and adaptability.

The European Commission's (2025) Competitiveness Compass for the EU, which comprehensively emphasises Europe's ambition towards sustainable prosperity and competitiveness, puts the promotion of skills as a key enabler for Europe's competitiveness. Among the initiatives to achieve it is the Commission's Union of Skills, announced in March 2025. The initiative, designed to enhance human capital and strengthen the EU's competitiveness, focuses on four pillars, namely how to improve basic skills, promote lifelong learning, facilitate cross-border recruitment, and attract global talent. Unlike previous skills initiatives, it is built on a new governance framework, informed by a European Skills Intelligence Observatory. Key foreseen measures include a Basic Skills Support Scheme, a Skills Guarantee pilot, and a Skills Portability Initiative to ensure that workers can develop and transfer their skills seamlessly across the EU. To support this vision, the Commission has also introduced new 2030 targets, focusing on reducing underachievement in literacy, mathematics, science, and digital skills while increasing STEM participation – particularly among women. The EU has also introduced new tools to attract skilled professionals from outside Europe. While the strategic direction is clear, implementation will take time.

In the meantime, the evolving EU policy debate reflects a growing reliance on skills as a solution to a wide range of economic and social challenges. As digital transformation accelerates, the green transition becomes more urgent, and geopolitical shifts reshape global markets, policymakers increasingly

position skills as a catch-all remedy. While skills play a crucial role, they are not a silver bullet. Misconceptions about what they can achieve and how to foster a skill-based workforce deserve clarification.

SKILLS ARE BEYOND JOB MATCHING, THEY ARE A DRIVER OF COMPETITIVENESS

The first misconception is that skills are only about people being able to match a job's requirements. In reality, skills are about production, innovation, and, ultimately, competitiveness.

Competitiveness used to be narrowly equated with cost efficiency, particularly labour costs, but this interpretation is increasingly at odds with the EU's economic ambitions and social values. Traditional measures of competitiveness like unit labour cost – often used to compare the EU to economies like those of the US or China – promote a low-cost, high-output model of competitiveness. However, this approach is neither sustainable nor realistic for Europe. Competing on low wages is a race that the EU cannot and should not attempt to win. Not only does it contradict the EU's model of a social market economy, but it also fails to recognise that advanced economies thrive by creating value, not just cutting costs.

If firms (and economies) shift from a price-based competition model to one rooted in innovation, quality, and product differentiation, the role of labour changes. Workers are no longer seen merely as an input to be minimised but as a key asset that drives productivity and economic renewal. Innovation-driven growth requires investment in skills, lifelong learning, and work environments that enable knowledge creation and application.

From a policy standpoint, this implies that strategies for skills development should be integrated into broader economic and industrial strategies. This viewpoint aligns with recent economic theories that take a system view approach, where industrial strengths, interconnected sectors, and knowledge spillovers are drivers of economic complexity but also crucial elements for maintaining a competitive edge (Balland et al., 2022). For Europe to uphold its position on the global stage while ensuring social and environmental sustainability, it must adopt a skills-based approach to competitiveness (Nurski & Alcidi, 2025). Skills are more than a supporting factor – they are fundamental to innovation and firms' productivity.

Innovation–Skills Nexus: Capital, People, and Places

While the potential of skills is increasingly praised, the debate about how to tap such potential tends to be confined to mitigating labour and social issues and disconnected from the core discussions on innovation and its drivers.

The Competitiveness Compass dedicates pages to 'closing the innovation gap' – with strategies focused on supporting start-ups, increasing R&D spending, and investing in AI, data, and cloud infrastructure. However, skills and quality jobs appear only as an afterthought, tucked away under the category of 'horizontal enablers'.

This framing suggests that innovation is primarily driven by capital, investment, and technology, with skills playing a supporting role. But this does not reflect the reality. Innovation is fundamentally driven by people. It is human creativity, not capital, which sparks new ideas and advances technology. It is individuals, not financial investment alone, who turn those ideas into products, services, and processes. And it is people, not just resources, who transform innovation into viable business models, organisational evolution, and broader societal change.

Although capital is a crucial element for innovation, it alone is insufficient. If capital by itself were enough to spur innovation, then merely increasing R&D expenditures or utilising AI infrastructure would inevitably lead to breakthroughs. Yet, history tells us otherwise. The most groundbreaking innovations – from the printing press to the internet – resulted not just from financial backing but from human creativity, collaboration, and problem-solving. Even in today's age of AI, people still design algorithms, train machine learning models, and decide how these instruments are used in productive contexts to generate economic value.

This is to say that innovation does not happen in isolation. It thrives in environments where people are encouraged to experiment, challenge assumptions, and take risks. This is why places like Silicon Valley or research hubs like Cambridge have become innovation powerhouses – not simply because they attract venture capital but because they cultivate dynamic ecosystems where skilled individuals with diverse expertise and perspectives can interact, share ideas, and push boundaries.

To close innovation gaps, capital investment in R&D and digital infrastructure needs to be matched by investment in people – their skills, their ability to collaborate, and their capacity to think critically and creatively. Furthermore, it must be recognised that money and people interact and create value in places. The most dynamic and innovative regions in the world are not merely the result of high R&D spending or well-educated workforces. They thrive because they provide the right environments – both physical and institutional – for ideas to take root, evolve, and turn into tangible innovations.

Places matter because innovation is fundamentally a social process with people at the centre. It originates from collaboration, the free flow of ideas, and diverse perspectives coming together to challenge conventional thinking. The most successful innovation ecosystems facilitate these interactions through universities, research institutes, coworking spaces, innovation incubators, and

industry clusters where entrepreneurs, scientists, and policymakers can cross paths. Proximity fosters creativity: it allows for spontaneous conversations, knowledge spillovers, and partnerships that might never emerge in isolation. Recent research shows that remote collaborations are less likely to lead to breakthrough discoveries than on-site teams (Lin et al., 2023).

However, fostering innovation-friendly places is not just about building high-tech hubs or special economic zones. It is about creating cities and regions where skilled workers want to live, work, and stay. Affordable housing, efficient public transport, and accessible services are just as critical to innovation as investment in AI or biotechnology. A thriving start-up ecosystem means little if workers cannot afford to live nearby and commutes drain productivity, or if rigid local policies discourage entrepreneurial activity.

Moreover, innovation should not be confined to a handful of elite tech hubs working in isolation. Many regions struggle with economic stagnation and brain drain precisely because they lack the conditions to retain and attract talent. For innovation to be truly inclusive, there is a need to invest in places that have been left behind – supporting regional development, upgrading local education and training systems, and ensuring that all communities have access to the infrastructure and networks that drive economic renewal.

Innovation is not just about pouring money into R&D or assembling the right mix of technical expertise. It is about where people work, how they connect, and whether they have the conditions to experiment, take risks, and translate ideas into action. Ignoring the role of places and people risks creating innovation deserts – regions with potential but without the conditions to harness it. Fostering vibrant, inclusive places is as important as investing in technology and skills.

SKILLING CAN HELP SOCIAL MOBILITY BUT WILL NOT SOLVE INEQUALITY

A second misconception is that skilling can make a big dent in economic inequality. A growing argument in the policy debate is that skills can be used to reconcile inequalities and competitiveness – a win-win where upskilling both enhances productivity and raises wages and opportunities. The idea is sensible and appealing: if we equip individuals with better skills, they can preserve their job or their employability, they can grow professionally, access higher-paying and better jobs, and reduce income and opportunity inequalities in the process. However, while reducing structural barriers to skilling, especially for disadvantaged groups, is crucial, the belief that skilling alone will lead to a fairer distribution of prosperity is naïve. Skills can help individuals climb the mobility ladder, but they cannot, on their own, bridge the deeper chasm of inequality. Individual skill acquisition may indeed improve personal economic

mobility, but inequality is not just a function of skills – it is embedded in the structure of the labour market and in broader economic and social systems.

The notion that merely increasing training opportunities will guarantee a more equitable society fails to consider the systemic obstacles that contribute to economic and social inequality. If reducing inequality is the goal, more direct and effective levers exist in the fiscal system, such as progressive taxation and redistribution. Skill policies may help individuals, but they are not substitutes for policies that actively address structural inequities.

On an individual scale, acquiring new skills can provide access to improved job prospects, ease career shifts, and bolster earning potential. Employees who regularly refresh their skills – whether through mastering new technologies, enhancing problem-solving skills, or cultivating leadership traits – are more equipped to navigate a changing job market. In this respect, skills serve as a means for mobility, assisting individuals in advancing within current frameworks.

Nevertheless, skills alone cannot eliminate the systemic inequalities that dictate who has access to opportunities from the outset. Employment outcomes are shaped not only by skills but also by larger factors like economic circumstances, availability of quality education, social networks, discrimination, and job prospects in various regions and industries. Structural inequalities – such as disparities in wealth, education, and social capital – forge divides that skills alone cannot bridge.

For instance, two people with identical training may encounter vastly different career opportunities due to their location, family heritage, or inherent biases present in hiring and promotion processes. A highly skilled individual in a declining sector may find it challenging to secure a job not because of insufficient training but rather as a result of economic downturns in the region. A low-income worker might lack the financial stability needed to engage in training programmes or change careers, even in the presence of reskilling options. Women and ethnic minorities frequently encounter systemic obstacles that hinder their career advancement, irrespective of their skill levels.

This illustrates why initiatives that concentrate solely on skills development – without tackling these foundational issues – may risk overstating their potential benefits. This approach also puts undue responsibility on individual shoulders. While it is crucial to invest in skills, such efforts should be accompanied by wider initiatives aimed at establishing equitable labour market conditions. This encompasses fair compensation, robust worker protections, access to childcare, unbiased hiring and promotion practices, and policies that strive to distribute the advantages of economic growth more evenly.

In summary, even though skill development can assist individuals in climbing the ladder, it cannot level the playing field on its own. An effective approach to diminishing inequality must extend beyond lifelong learning and recognise

the necessity for structural changes that confront the fundamental causes of economic and social inequities.

EDUCATION AND TRAINING ARE IMPORTANT, BUT SKILLS ARE SHAPED BY WORK

The third misconception about skills is the idea that they exist independently from the workplace as if individuals acquire skills elsewhere – primarily through formal education and training – and simply bring them into their jobs. This assumption underpins many traditional policies, which continue to emphasise degrees, certifications, and training programmes as the primary, if not the only, pathways for skill development. While these are important, they represent only a fraction of how skills are built and refined.

Skills are not just something an individual possesses. They are something that is practised, developed, and adapted over time. By definition, a skill is the ability to perform a task well, and the most effective way to build skills is by actively engaging in real-world tasks – not by simulating them in a classroom. While education and training can provide foundational knowledge, it is practice, exposure to real work challenges, and continuous engagement with evolving tasks that truly shape one's capabilities.

The workplace, rather than being viewed as a static environment where pre-acquired skills are merely applied, should be recognised as the central space where skills are developed, honed, and transformed. Whether through mentorship, collaboration, problem-solving, or hands-on experience with real-life challenges, the work environment plays a fundamental role in shaping long-term skill development.

In other words, while our initial skills may qualify us for our first job, it is the tasks we perform, the cultures we navigate, and the challenges we tackle over time that determine how our skills evolve. In many cases, career progression does not just involve gaining new skills; it also involves losing some of the competencies we originally acquired (Figure 8.1). This is particularly true for highly educated professionals, whose career advancement often shifts them away from the specialised technical skills they developed during their studies towards new capabilities in leadership, strategic thinking, and problem solving. The economist who becomes a policy advisor may no longer rely on advanced econometric modelling but gain expertise in management, negotiation and communication. The engineer who moves into management may no longer design systems but instead become skilled at leading teams. Often, such career transitions require a combination of formal learning (e.g. through MBA courses) and a lot of on-the-job practice and learning.
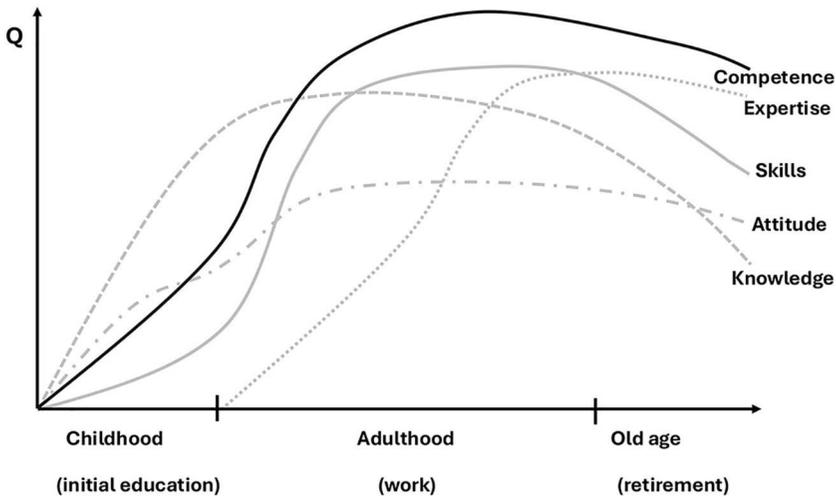
Figure 8.1   *An illustration of the development of competence over the course of life*

A narrowly focused approach to skills – one that sees them as fixed assets rather than dynamic capabilities – ignores the reality of how people learn, grow, and adapt throughout their careers. This has significant policy implications.

Skilling should not be seen as an isolated, individual responsibility but as a systemic and dynamic process deeply embedded in workplaces, industries, and broader economic structures. Companies that invest in enriched and challenging job design, continuous learning, knowledge sharing, and internal mobility create environments where workers not only contribute effectively but also expand their capabilities in ways that benefit both the individual and the organisation. In this view, governments that support work-based learning, apprenticeships, and lifelong skill development initiatives can contribute to building more resilient and adaptable workforces capable of navigating economic shifts and technological change.

CONCLUSIONS

The notion that skill policies are a quick fix to economic and social challenges – achievable through minor adjustments to education systems and occasional training – must be reconsidered. Effective skilling strategies should recognise

workplaces as the primary environments for skill development, ensuring that learning is not confined to pre-employment education but continues throughout an individual's career. Adult learning should not be reduced to a standardised compliance exercise imposed from the outside but should be an integral, dynamic process embedded within work itself, whose value is recognised by workers and organisations.

Without this shift in perspective, skill policies will continue to fall short, failing both workers and the broader economy. Real transformation requires acknowledging that skills are not merely acquired but developed over time through experience, collaboration, and adaptation to evolving challenges. Embedding this understanding into policies and organisational practices is essential to fostering continuous, lifelong learning that benefits individuals, businesses, and society.

At the same time, while investing in skills holds great potential, it is not a universal remedy for all economic and social problems. To be truly effective, skill policies must be complemented by broader social policies – extending beyond traditional active labour market measures – to address structural inequalities and ensure inclusive economic growth.

This has important implications for the design of skill policies and their intended purpose. Relying on skills alone to address complex economic and social challenges is both unrealistic and counterproductive. Instead, skill policies should be part of a broader, integrated strategy that combines lifelong learning with strong labour market structures and inclusive social policies. Only by adopting this holistic approach can we ensure that skill development drives economic competitiveness, fosters social mobility, and fuels innovation in a way that benefits both individuals and society as a whole.

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PART IV

Rethinking policy for an uncertain future

9. Reimagining European policy: skills, inequality, and the path to convergence

Steven Dhondt, Leire Aldaz Odriozola and Ulrich Zierahn-Weilage

INTRODUCTION

This book synthesises the findings from our GI-NI Horizon 2020 project to derive policy implications concerning inequality and skills. Inequality is a topic that has been on the scientific and political agenda since the earliest days of social science publications. This book argues that inequality should remain on the policy agenda for the European Union (EU) and its Member States. New forms of inequality arise, new challenges pose themselves, and politicians need to reconsider solutions and approaches. However, even if our results are convincing, currently, the topic of inequality may be struggling for attention.

It is worth mentioning that after the first year of the GI-NI project, we had the opportunity to discuss our initial results with Professor Luc Soete. As one of the leading thinkers in Europe on innovation (Schwaag-Serger et al., 2024), he challenged us to look at our research results within the context of the time (i.e., 2022). The research programme was conceived at the end of 2019. We wrote into our proposal that COVID-19 might be a 'black swan' for our programme. Not only did the COVID-19 pandemic affect our research, but we were confronted by the Ukraine war, the European minimum wage legislation, and the changeovers in policies in the United States (US). At the start of our research, we had not built in activities that explicitly considered these developments. Let us revisit the challenge that Professor Soete posed to us.

This chapter elaborates on why a reconsideration of inequality and skills for the European policy agenda is needed. We build on the discussions started in the previous chapters, connect them to the current international context, and explain how very different developments, such as globalisation and political realignments within and between countries, can be connected to this debate on inequality, skills, and transformation. The chapters in this book contain

different perspectives on inequality, all in need of policy responses. We bring these perspectives together in a final conclusion.

This chapter is structured around five topics. First, we present the challenges that the GI-NI project has faced. Second, we discuss how the current discussion can be interpreted and how to progress. We use the framework presented by Acemoglu (2024) to contextualise our results and clarify the policy implications. Third, we argue why technology itself is insufficient to understand the issue of inequality. Fourth, we explain how to understand the GI-NI results from an inclusivity perspective. Finally, we reflect on a redirection of the policy agenda for the EU.

A CHALLENGED SOCIAL AGENDA

The European Parliament agreed on 19 October 2022 with the Minimum Wages Directive (Directive (EU) 2022/2041 of the European Parliament and of the Council on adequate minimum wages in the European Union [OJ L 275, 25.10.2022, pp. 33–47[1]]). The goal of the directive was fourfold: to provide workers with a decent standard of living, reduce in-work poverty, promote social cohesion and upward social convergence, and reduce the gender pay gap.

In the economic literature, minimum income regulations have encountered mixed responses. On the one hand, minimum income provides guidance for employers to adjust to the reality of higher wages. They need to focus on activities that generate more income, and start automating activities for which the labour factor becomes too expensive. On the other hand, minimum wages can have unintended side effects if they are set too high. For example, Gregory and Zierahn (2022) find that an exceptionally high minimum wage in a low-wage industry in Germany actually reduced the real wages of skilled workers. While these impacts may be helpful from an inequality perspective (less wage dispersion), the impacts on high-skilled workers may not be helpful for the transitions that the industries need to make. Nevertheless, this is an exceptional scenario, and moderate minimum wages typically are not associated with such negative side effects. For the trade unions, the EU policy change was an important victory. Up to 2022, the progress in the social domain has remained quite limited. The European Pillar of Social Rights (EPSR) (2017) came after a period of crushing austerity policies. The Juncker Commission wanted to reset the European agenda away from cost-cutting to a more inspiring perspective of social rights (Dura, 2024).

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[1]   http://data.europa.eu/eli/dir/2022/2041/oj

The EPSR contains aspirational objectives on which no unity of vision exists across European countries. When the EU put the minimum wage directive on the agenda, there was significant resistance from employers and specific countries. Nevertheless, the directive was accepted because of the austerity policies of previous years. Although the social domain was not actually a European policy domain, it was precisely in the austerity policy that countries were given direction in the social domain. Employers could not dryly claim that the social domain was excluded from European policy. Trade unions achieved a significant shift in social policy in the European domain with the minimum wage directive (Dura, 2024; Natili & Ronchi, 2024).

In the same timeframe, the COVID-19 pandemic hit Europe, and Russia invaded Ukraine. The pressure of both on the various national budgets in Europe has been quite substantial. It is clear that governments are having to put the brakes on budgets again, and the European social domain is coming under renewed pressure. It does not help the social domain that in the US, the new policy is focused on maximum cutting of government spending. European social policy has landed in a vacuum with great uncertainty about what will be realised of the high ambitions in the coming years. This was apparent in the policy agenda of the new European Commission that started in 2025. Initially, there was little reference to the EPSR. The social agenda has been replaced by an 'activation agenda' in which individual citizens have to take care of their own social issues. According to the Commission Work Programme 2025 (COM[2025] 45 final), which lists the most significant new policy and legislative initiatives to be implemented in the forthcoming year, just three of the 45 new initiatives are aligned with the policy objective of social fairness. Among them, a new non-legislative action plan to implement the EPSR is expected by the end of the year.

Does this change remove inequality from the political agenda?

A MODEL TO INTERPRET SCIENCE, TECHNOLOGY AND INEQUALITY

Inequality remains an important topic in the scientific debate. If Google Books Ngram Viewer is to be believed, topics such as inequality and the 'Gini coefficient' have gained traction in recent years[2]. The topic of 'inequality' also remains worth a Nobel Prize in Economics: In November 2024, Professor Daron Acemoglu, Professor Simon Johnson, and Professor James A. Robinson were awarded for their work on institutions and inequality. During his

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[2]   The data stops in 2023, and these topics may have since become less prominent in research and publications.

acceptance speech, Daron Acemoglu presented a simple framework to characterise and assess a large number of historical movements that he has been studying over the decades[3]. The framework has its limitations, but it helps him to reflect on and reinterpret his entire body of work. This framework is equally useful for contextualising the results in this book and deriving policy implications from them. First, we present the framework below before using the model to frame the findings of our book and the GI-NI project for inequality.

The centrepiece of his framework is the Utility–Technology Possibilities Frontier (UTPF), which informs us about the levels of utility, welfare, or prosperity that different groups can achieve given institutional and technological choices. Figure 9.1 summarises the main thought of Acemoglu. He considers a world with just two groups, the rich and the poor, with the assumption that the rich are initially politically more powerful/dominant. This simplification serves to illustrate the arguments. He starts with a trade-off in utility that the rich (Ur) make on one side, versus the poor (Up) on the other side. In his presentation, he also uses the contrast of employers (or Capital) versus employees (the Labour factor). Technology can play a role in taking the utility curve to a higher level (more prosperity). The outside frontier in Figure 9.1 represents the frontier of potential utility levels that the two groups can reach. Close to the axes, the curve is inward-shaping, highlighting that very unequal distributions are Pareto-inferior. That is, for example, if the poor are very poor, raising their utility level also raises the utility level of the rich – for example, because fewer investments into gated communities are necessary. The left-pointing arrows indicate a movement on the frontier, which is typically associated with rising utility for one group at the expense of the other group. This typically reflects relative shifts in power relations. A shift to the left benefits rich groups; a shift to the right benefits poor groups.

The shift remains on the frontier when society can use 'efficient' tools. However, the outcomes are vastly different. Point B results in higher profits for workers, while Point A favours capital owners. Remaining at Point C, at a lower utility curve than possible, creates an economic losers' mechanism, meaning more progress is possible, but it is blocked by specific institutions. Acemoglu derives from history that the evolution of trade-offs in utility between different groups has not been a neutral activity. The rich are sufficiently politically powerful to attract the most utility for themselves. The poor can only attract more utility through hard struggle. Acemoglu also cites several historical examples where the rich and powerful were willing to block new technological applications (think of Galileo) if they were convinced that the new technology would

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[3] https://www.nobelprize.org/prizes/economic-sciences/2024/acemoglu/speech/
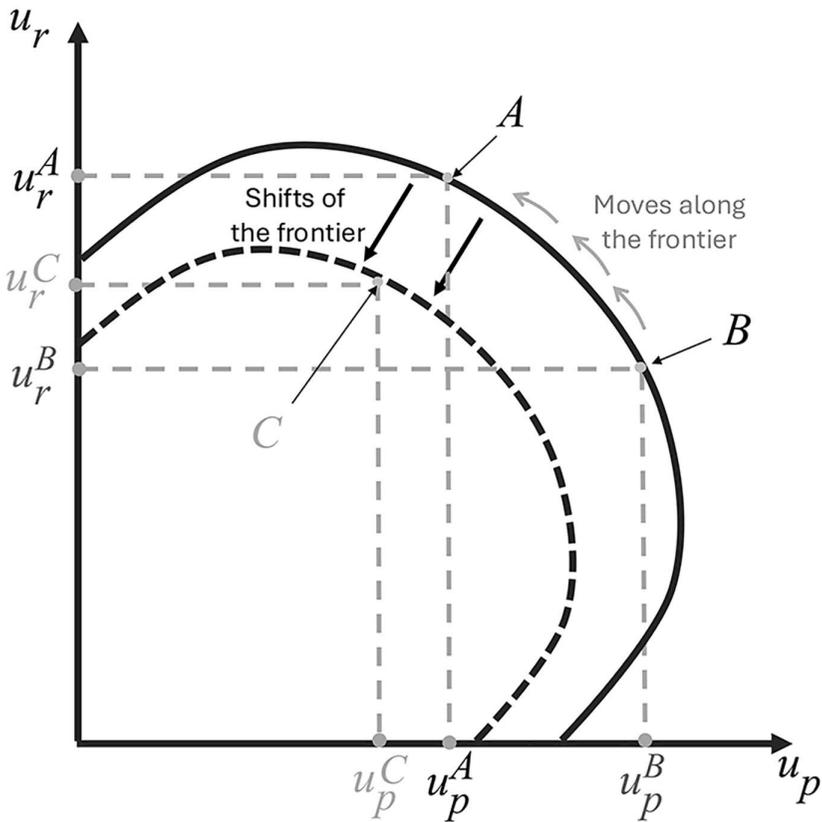
Source: Acemoglu (2024).

Figure 9.1   Utility–technology possibilities frontier

provide more opportunities for the poor to attract more utility to themselves. Technological progress is thus not a linear process but depends on this balancing of interests. Acemoglu uses this model to describe other situations that may arise. A 'holdup' by the rich can arise when moving to a higher utility curve brings benefits mainly to the poor. The rich may refrain from further investing (the 'holdup') as they do not sufficiently benefit from those. This implies a lower-than-optimal level of investment and utility. This is what Acemoglu calls the economic losers mechanism. The rich prefer a situation in which all lose, but they retain their political and economic power. A 'collapse of state capacity' is a situation where the state is misused to keep money flowing to the

rich, and institutions are misused to steer incentives in the wrong direction. He also presents the economic losers and the political losers. The former refers to the loss of economic benefits by the rich due to institutional or technological changes to which they are reticent. The latter corresponds to the temporary concession made by the rich to the poor in order to stay in power. He highlights the importance of institutions and the usefulness of the frontiers to tackle these issues. Using Acemoglu's thinking to make sense of current developments in the US is not difficult.

Acemoglu's framework helps us to understand how the direction of technological change is shaped by institutions, groups' interests, and the balance of power. For example, some public alarmists claim that half of the jobs are at "risk of computerisation" (see, e.g., Frey & Osborne, 2017). We show in Chapter 2 that such claims are exaggerated and mislead the public debate into a false fear of a jobless future while missing that they are the key problem is rising inequality. Based on such claims, Carl Benedikt Frey, in his book *The Technology Trap* (Frey, 2019), argues that resistance to technological development would come mainly from the workers. Workers would not understand the possible long-term positive effects of technology and would resist change. In particular, his example is the struggle of the Luddites in 1810–1813 against the Spinning Jenny and other automation. Frey fears that workers' resistance to the latest technologies, such as robotisation and artificial intelligence (AI), would hinder further progress. However, Acemoglu's framework highlights that the direction of technological change and the degree to which new technologies are implemented are actually shaped by institutions, power relationships and group interests. Those who control the resources for investing in technological change are likely to shape the intensity and direction of technological change for their own benefit, not considering what would be optimal for society as a whole. This may result in a situation where the poor lose out. Whether or not technological change is labour-displacing is in itself an endogenous outcome that policymakers can try to shape by developing suitable institutions.

THE LIMITS OF INDUSTRY 4.0

This framework helps us contextualise the research findings of the previous chapters in the book and the GI-NI project. It is also important to understand the context in which the GI-NI project was developed. *The Technology Trap* explained the impact of new technologies mainly as labour substituting. Frey feared that Western society would stop progressing because the working class resisted technological advancements. His fear was a resurgence of Luddism, as technology primarily substituted labour for capital. However, technological development is not exogenous, and policymakers should focus on shaping

institutions that direct technological change towards a path that is beneficial for society as a whole.

In 2019, there was still a strong belief in the possibilities of Industry 4.0. Industry 4.0 was an industrial policy launched in Germany that focused entirely on 'connected technologies'. The policy was launched in 2011 at the Hannover Messe, the major German technology fair. Industry 4.0 was adopted at the EU-level to replace a policy focused on knowledge development (Lisbon Agenda).

Expectations for this connected technology were also high. Applications such as cobots and AI were expected to lead to massive labour substitution, as indicated above. Arntz et al. (Arntz et al., 2017) and institutions such as the Organisation for Economic Co-operation and Development (Nedelkoska & Quintini, 2018) highlighted that such fears are exaggerated, that the real challenge is changing skill requirements and rising inequality, and that policymakers should rather focus on how to enable workers to make use of new technologies for raising prosperity rather than seeing them as a competitor.

This brings us to the first GI-NI research findings commented on in this book.

First, the results can be interpreted into Acemoglu's model. The latest connected technologies and robots were expected to push the technology frontier upwards. In the model, Industry 4.0 technologies allow the utility function to move upwards. With this shift, companies and workers should be motivated to seize new opportunities. However, research by Arntz et al. (2024b) revealed that the speed of technology adoption is slow. While a large share of firms either already use new technologies or consider using them soon, those technologies make up only about 8–9 per cent of the total capital stock. The situation can be compared to the introduction of the electric car: while the share of electric cars in new sales is large, their share in the total stock of cars remains small because cars are typically used for many years, and replacing all cars takes time. Nevertheless, Arntz et al. (2024a) show that the adoption of new technologies also continues to be associated with declining routine tasks. Interestingly, this is mostly driven by firm heterogeneity. Their findings indicate that firms require complementary investments in the right skills to successfully adopt new technologies. Further, their findings suggest that an acceleration of technology adoption would be associated with faster de-routinisation and an increase in between-firm heterogeneity.

Why have more companies not taken this leap? A second study in the project was concerned with the rise of mark-ups in Spain. In the US, companies such as Amazon, Google and Facebook were formed during the Industry 4.0 period. All these 'superstar' companies are making maximum use of the latest technologies. These companies are able to leverage these new technologies to charge prices that far exceed their marginal cost, giving these firms

major market power and calling them mark-ups. The question in the GI-NI project was, therefore, whether the latest Industry 4.0 technology would enable European companies to generate and attract more profits. Smolka & Taleb (in Arntz et al., 2024) examined whether similar industry trends to those in the US were found in Spain. The question was whether mark-ups – caused by strong market concentration where a few firms take the majority of profits – occurred. The answer was no. Technology fosters more competition rather than concentration. In other words, labour-saving technology may shift the axis, but few companies or workers benefit from the promised higher utility. Our results with Industry 4.0 are consistent with an institutional context where the benefits primarily accrue to capital.

The preliminary message is clear: it is insufficient to focus solely on technology to predict progress. Just because technology enables significant advancements does not mean the utility of groups will increase. It is even unclear if the Industry 4.0 technologies allow companies to reach higher utility functions in terms of the Acemoglu framework. The belief that the superstar companies have an insurmountable lead and will accumulate enormous value is not guaranteed. The example of the Chinese firm DeepSeek[4] illustrates this point. Companies such as OpenAI, Google, and Facebook assumed that they had a technological head start with large language models and privileged access to high-performing computer processing power. DeepSeek showed that the models could be replicated with significantly lower investment and significantly less computer power, as was expected earlier. Similarly, Smolka & Taleb's research (in Arntz et al., 2024) on the Spanish industrial sectors reinforces this conclusion.

Given these results, what does this mean for such a policy as Industry 4.0? In 2021, the European Commission launched an alternative industrial policy called Industry 5.0 (Breque et al., 2021). The idea was that the implementation of digital technologies required a more human-centric approach by companies to become more successful. At first, the shift to Industry 5.0 was not fully understood in the scientific field. Many technologists assumed that the European Commission was pointing to a new technological revolution grafted onto technologies that were more people-centred (Coronado et al., 2022). Initially, technology experts questioned what concepts like human-centricity, sustainability, and resilience truly meant. They quickly began advocating for 'human-centred technology', meaning technology that is fully personalised (Rojas et al., 2018). However, in doing so, they failed to communicate the message effectively. Rather than stressing the personalisation of technology, the policy stressed the need to include the workforce in the development and

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[4]   https://www.bbc.com/news/articles/c5yv5976z9po

implementation of digital technologies. The core idea was that the capabilities of new technologies were misunderstood. Studies started to show that most connected technologies were not primarily 'labour-substituting' but rather 'labour-augmenting', meaning that they enhanced workers' capabilities (Autor et al., 2020). Making better use of these technologies requires building on the input of the users of these technologies. The implications can be modelled using the framework by Acemoglu. Figure 9.2 shows three lines: the thick dark line is the starting point, as indicated in the previous Figure 9.1. This line can shift to the right, as shown with the grey broken curve (B); this shift can extend to C, with a move to the dotted line. A shift to the right indicates increased opportunities for labour to benefit from technological development. The figure indicates that a shift of the utility to a higher level is possible. The logic here is that only through the cooperation of the labour force can the leap to a new frontier be achieved. The consequence is that most of the new utility is probably creamed off by the labour factor. The study by Arntz et al. (2024b) further supports this by showing that most Industry 4.0 companies enhance skilled
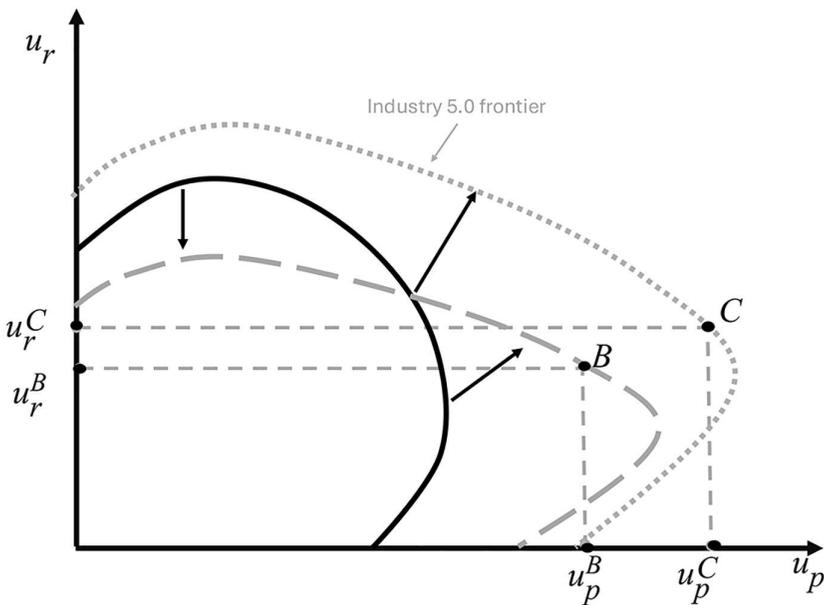
Source: Adapted from Acemoglu (2024).

Figure 9.2   *Technological change in favour of the labour factor*

workers' capabilities. The condition for this, however, is participation by workers in technology development and implementation. This finding aligns with the arguments of Autor et al. (2024), who add a historical perspective to the shift in capabilities of new technologies. Throughout history, job and technology developments have alternated between substitution and augmentation. Policymakers can – and should – set suitable institutions so as to ensure that the path of technological change benefits society more broadly instead of only those who have the power and resources.

In terms of the model, this means a shift in utility from point B to point C. Labour augmentation means an increase in worker utility.

Acemoglu warns that capital owners may prefer shifts in both the technological frontier as well as where we land as a society on that frontier, which are more beneficial for themselves – and less beneficial for workers. They might resist investments that would benefit workers ('hold-up') while focusing on those that predominantly benefit themselves. They may also invest in technology that reduces the utility of the labour factor (see B_2 in Figure 9.3).
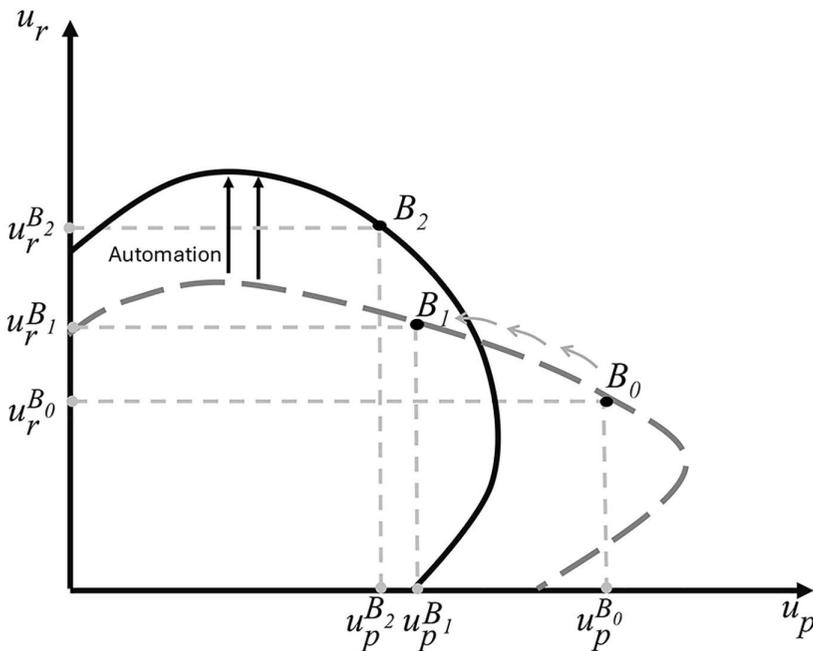
Source: Adapted from Acemoglu (2024).

Figure 9.3   Automation in favour of the capital factor

Economic analysis has not yet proven that we are in this situation, but it may be worth researching whether the current investment slowdown[5] is related to the reduced commitment of managers and companies to invest in productivity-enhancing technologies.

REDUCING INEQUALITY

Let us now broaden the discussion to the other two key themes of this book: globalisation and migration. The Acemoglu framework does not make any distinctions between the rich and poor groups that are identified. The groups are considered homogeneous. However, even in an environment of labour augmentation, not all workers necessarily benefit. The chapters in this book have explored developments in employment opportunities and utility for different groups of workers.

Both the scientific and political debates emphasise how globalisation and technological innovation have intertwined effects on employment and firm innovation. DeepSeek's development of its own low-cost chatbot illustrates that China's technological capabilities, alongside those of other emerging economies, are catching up. Baldwin (2016) noted that information technology has been a driving force behind this economic convergence. Developing countries do not need to follow the painstaking trajectory that developed countries have followed. They can use the new technologies to reach higher productivity levels directly. Several of our studies (Astarita & Alcidi and Johnsen et al. [in Astarita et al. 2025]; Hulsegge et al., 2025) have looked more deeply into convergence trends in the European context. An important result is that the social situations in the West and East of Europe are converging. However, a new social divide between the North and South of Europe is emerging. Mediterranean regions seem constrained by their social models, which appear to keep them on a specific trajectory, limiting their ability to break out of established patterns and improve their socioeconomic position. It seems that coordinated market economies or Mediterranean market economies often cannot emulate social innovations as well as more liberalised market economies. Convergence is limited by social factors and path-dependent innovation. As Basu and Weil (1998) discussed in their paper about 'appropriate technology', some technology development requires a changed social infrastructure for these technologies to be implemented. The social infrastructure is limiting the catch-up.

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5   https://cepr.org/voxeu/columns/corporate-investment-europe-snapshot-2024-eib-investment-survey

One aspect newly highlighted in Acemoglu's model relates to conflicts within the labour force, particularly between different worker groups. The chapters in this book place significant emphasis on these dynamics. Using the Acemoglu model, we can model the outcome of possible conflicts between worker groups. Figure 9.4 illustrates a situation where the utility workers draw of new technologies is important. The shaded area in the figure represents various scenarios where discussions and conflicts between workers lead to suboptimal utility outcomes. This can result in shifts from point B0 to point B1, leading to reduced utility for workers or an unequal distribution of benefits across worker groups.

Such disparities can stem from broad developments like globalisation. Los et al. (2023a) have shown that globalisation within Europe has contributed to shifting employment conditions, particularly for female workers. But globalisation also leads to new forms of inequality. Globalisation made fabrication
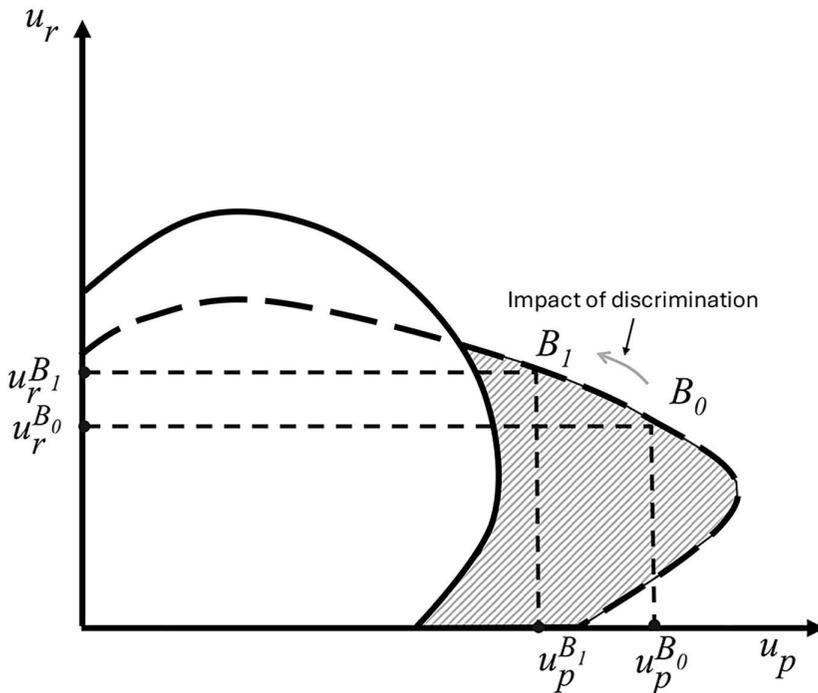
Source: Adapted from Acemoglu (2024).

Figure 9.4   Discrimination leads to lower utility for the labour factor

workers face much stronger import competition than workers in other business functions (R&D, management, marketing), even if these workers were active in the same industry. That leads to a new type of inequality (Los et al., 2023b). Next, they found that high import exposure tends to increase the likelihood that a worker moves to a different region and/or switches to a job in a different business function. German workers who move and/or switch enjoy higher wages than similar workers who stay put. This is an outcome in the short term (up to two to three years afterwards; the German data do not allow us to study the long-term differences). In contrast, the wages of Dutch workers are generally not affected positively or negatively by a switch to a different occupation. However, the job satisfaction of Dutch workers tends to be higher for switchers than for similar non-switchers in the long run. The differences are small, though.

Additionally, discrimination between groups can persist, preventing all workers from equally benefiting from technological advancements and skills development. Research by Boza and Reizer (2023) reveals that women not only remain underrepresented in high-paying firms but even earn lower wage premia than men when they enter high-paying firms. They show that performance pay and overtime payments are the main drivers of these gender differences. Similarly, Aldaz et al. (2025) found that migrants are often excluded from career advancement within labour markets. As they state, newcomers have a lower occupational attainment than natives, and they also suffer from a significant initial earnings gap. Immigrants fill the lower rungs of the occupational ladder, often entering jobs characterised by gender norms. However, some integration of foreign-born workers occurs over time, and these differences progressively narrow. They adjust to labour market conditions and their skills and knowledge are recognised, increasing their ability to compete with local workers. Nevertheless, their career progression occurs within the same 'labour segment', and even though there is a convergence between the wages of natives and immigrants, full assimilation is not achieved. They suggest that high degrees of import exposure made workers more likely to move to another region and switch functions. In turn, Seghir and Smolka (2024a), discussing the differences and convergence dynamics between migrants and natives in terms of educational mismatch, suggest that both male and female migrants face a strikingly higher probability of educational mismatch compared to natives. Women, in particular, experience a more pronounced disadvantage, characterised by a significant probability of educational mismatch. Interestingly, the initial gap for both men and women widens in the first few years after arrival, indicating a persistent challenge in labour market integration. Their research highlights the long adjustment period required for immigrants to close the gap with natives.

These examples demonstrate that while, in general, more utility could be generated and distributed, existing discrimination between worker groups prevents equitable outcomes. Whether these disparities serve as strategies benefiting capital is a subject left open for further discussion (Noble, 1987).

Acemoglu discussed how institutions can be (mis)used to improve the distribution of the utility that is generated by shifting the utility frontier. We can study changes in labour market policies from this same perspective: to what degree do they help shift the frontier and the position of worker groups? The first topic is labour mobility as a means for workers to shift to new opportunities in labour markets. To what degree can policymakers steer labour mobility to increase the utility for worker groups? Applying Acemoglu's framework, can workers take action to improve their own utility? The GI-NI studies have looked at several possibilities. Dabed et al. (2024) investigated the extent to which workers who are exposed to automation can find new job opportunities in other, less affected occupations. That is, does occupational change serve as an 'escape hatch' for highly exposed workers? The depressing answer is that, due to routine task overlap, highly exposed workers typically can only switch to other occupations that are similarly exposed to technology. Task reallocation provides little relief for affected job seekers, and large shifts in tasks – that is, significant re-skilling – are necessary for workers to find better job opportunities when facing the automation of routine tasks.

Los et al. (2023b) analysed the outcomes of labour mobility within different countries and found that German workers benefited from mobility, while mobile Dutch workers gained little after the China Shock.

Lindner et al. (2025) and Seghir and Nezhyvenko (in Aldaz et al., 2025) examined the effects of mobility of workers between countries and showed some positive impacts of migration. The former investigated the employment and wage effect of the opening of the Austrian border on the Hungarian border region and found that, as a result, wages rose and employment fell. The latter constructed an occupational shortage indicator to identify occupations facing shortages, finding evidence that immigrants play a significant role in alleviating job shortages in Western European countries, where immigration rates are rising and labour shortages persist.

Some results show some validation of the Baldwin thesis. Smolka and Georgiev (in Reizer et al., 2025) found that processing trade and offshoring contribute to skill development in host countries. While it is well known that China has become more technologically advanced through offshoring, his research establishes that similar trends are now occurring within the EU. Furthermore, Reizer's study (2024) shows that cross-border labour in Hungary has led to increased wages in the border regions of Hungary itself. These are examples of unintended but positive consequences for countries trying to catch up with developed nations.

The critical question remains: are there effective ways to reduce discrimination and improve access to skills and inclusive opportunities? The overarching conclusion from our studies is that European labour markets are not as efficient as commonly assumed. The distribution of utility among workers is not a neutral exercise.

WHO IS SERVED BY THE EUROPEAN SKILLS STRATEGY?

Against this background, we studied whether labour market mobility, an important state activity, can stimulate skills development. The EU is fully committed to the Skills Agenda. Developing higher skill levels is crucial in a labour market increasingly defined by augmentation. The policy aims to increase the number of technical professionals, which is a seemingly neutral goal. However, our framework suggests that skills investment can have diverging effects on the labour force.

The dotted line in Figure 9.3 can shift upwards, potentially maximising Capital's gains from European initiatives like the Skills Portability Initiative and the European Qualifications Framework. Youth Policy Dialogues and the Youth Advisory Board also contribute to this trend. However, the key question is: who ultimately benefits from these investments?

The framework represents these dynamics through leftward and rightward shifts in the figure. On the one hand, a skills agenda can generate more opportunities for managers – think of algorithmic management, social media industries, etc. It can increase the supply of technical specialists, easing current labour market shortages. On the other hand, it could empower workers, reducing conflicts between labour groups (e.g., through a minimum wage policy) and enabling workers to navigate augmentation opportunities more effectively.

Today, discussions around the Union of Skills emphasise mobility, migration, and job quality roadmaps. Acemoglu's perspective suggests that we must evaluate how much utility different stakeholders derive from these measures. Ultimately, European and national policies should aim to fully harness the benefits of labour augmentation and skill development. The critical question, then, is what frontier policymakers are envisioning. Drawing on Autor and Acemoglu, as well as GI-NI's findings, policies should aim for a rightward shift in the framework, favouring labour over capital.

REDIRECTING THE DRAGHI AGENDA

This brings us to the key policy recommendations from this book. The European Commission remains strongly committed to the Draghi agenda (Draghi, 2024), based on the belief that malfunctioning capital markets are the

primary obstacle to Europe's economic decline. The assumption is that increasing access to venture capital could drive technology and innovation. Not only do we need to restructure the innovation effort by looking at how companies fund their expansion, but we also need to understand how innovation is driven within these companies. Are technologies mainly labour-substituting or are they labour-enhancing? As the research seems to indicate, current technologies are mainly augmenting the capabilities of workers. Workers need to be at the centre of the changes within companies. From the Acemoglu perspective, labour augmentation may require more attention to the workers' utility.

Europe recognises that various institutional barriers hinder progress, innovation, and upscaling of innovations. Achievements occur when these barriers are addressed systematically. China's success in technological catch-up through strategic imitation over the past 40 years offers valuable lessons. The results of the studies in the GI-NI project confirm that Eastern EU countries can profit extensively from investments from Western EU companies. The challenge for Europe is to collaborate more effectively, enhance innovation, and strengthen competitiveness while prioritising social inclusion. The policy agenda of Industry 5.0 is well-positioned to make maximum use of the input from workers to adapt to technological change.

The discussion on technology and social policy has shifted over time. In the context of technology as mainly labour substituting, the idea was to develop new social approaches, such as a universal basic income (Hiilamo, 2022). In the context of labour-augmenting technologies, a skills and inclusion strategy is crucial. However, given the new political reality in the US, inclusiveness policies are more and more defined as contrary to the needs of blue-collar voters and disenchanted groups. Even the European agenda is shifting because of the fear of far-right populists. The fact that employment initially disappeared from the European agenda[6] and was only later reinstated reflects a lack of clarity within the European Commission about what lies at the core of Europe's trajectory. The belief that inclusiveness is less important is, from the perspective of the results of this book, a fundamental mistake. Blue-collar jobs may have disappeared forever and are not likely to return. Even China is shifting away from traditional factory work[7]. Any future jobs that will be created will not be fit for purpose for blue-collar workers. Access to new jobs requires further developing inclusiveness. Social policies need to take this integration of workers even more seriously than in the past.

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[6] https://www.brookings.edu/articles/unleashing-new-quality-productive-forces-chinas-strategy-for-technology-led-growth/

[7] https://www.brookings.edu/articles/unleashing-new-quality-productive-forces-chinas-strategy-for-technology-led-growth/

Two key observations arise here. The populist movements are often perceived as a tool to dismantle social Europe or, more broadly, social security in the Member States. However, we need to understand the rise of these movements from a broader perspective. The challenge is that the populists are a fragmented movement, with some factions being ultra-liberal and others leaning further left than traditional leftist parties. Developing a stronger social EU can serve as a strategy to force these movements into making definitive choices, potentially causing internal divisions. The European social agenda is, therefore, not only about addressing citizens' needs; it is also a strategic political agenda. The future policy agenda should not remain limited to economic instruments. The current global political environment shows that the European reaction is insufficient to deal with the many changes. A subsidy programme will not be sufficient to deal with the future challenges.

The bottom line, as discussed by Hulsegge et al. (2024), is that economic and social convergence cannot be achieved without political convergence. European unification must be put back on the agenda. This was not initially part of Ursula von der Leyen's plan, yet developments in the global discussions, for example with Ukraine and Greenland, demonstrate that the current European political decision-making structures are outdated. The same applies to issues of skills, inequality, technology, globalisation, and migration. As stated at the start of this concluding chapter, inequality remains, and will continue to be, a central theme in academic research and EU policy.

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