How to reinforce the place-based approach to cohesion policy?

Raquel Ortega-Argiles

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Group of high-level specialists on the future of Cohesion Policy

The European Commission, the Directorate-General Regional and Urban Policy (lead) and the Directorate-General Employment, Social Affairs and Inclusion (associated) have set up a Reflection Group on the future of Cohesion Policy. The group includes high-level members from academia and practice and in 2023 will meet nine times to reflect on current and future needs and the functioning of Cohesion Policy.

The group will offer conclusions and recommendations that will feed the reflection process on Cohesion Policy post-2027 including through the 9th Cohesion Report in 2024 and the mid-term review of Cohesion Policy programmes in 2025.

About the author

Professor Raquel Ortega-Argilés is the Chair of Regional Economic Development at Alliance Manchester Business School (The University of Manchester). She is a member of the Manchester Institute of Innovation Research and The Productivity Institute. Raquel Ortega-Argilés is also the Director of The Productivity Institute's Productivity Lab, a centre of excellence for data-related activities, including joining data in a central repository and creating opportunities for augmented datasets.

Disclaimer

Key words

Cohesion policy, innovation, technological diversification, globalisation, regional productivity

Contact

EUROPEAN COMMISSION
Directorate-General Regional and Urban Policy
Unit B.1 — Policy Development and Economic Analysis

E-mail: REGIO-FUTURE-COHESION-POLICY@ec.europa.eu
European Commission
B-1049 Brussels

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Acronyms

BERD	Business enterprise expenditure on research and development
CGE	Computable general equilibrium
EU	European Union
GERD	Gross domestic expenditure on research and development
GSE	Greater South East of England
GVA	Gross value added
ICT	Information and Communication Technology
NUTS	Nomenclature of territorial units for statistics
OECD	Organisation for Economic Cooperation and Development
ONS	Office for National Statistics
R&D	Research and Development
RIS3	Research and innovation strategies for smart specialisation
SEIM-UK	Socio-Economic Impact Model for the United Kingdom
SME	Small and medium-sized enterprises
UK	United Kingdom
UKRI	United Kingdom Research and Innovation
US	United States

1 The challenges of Cohesion Policy in today's world

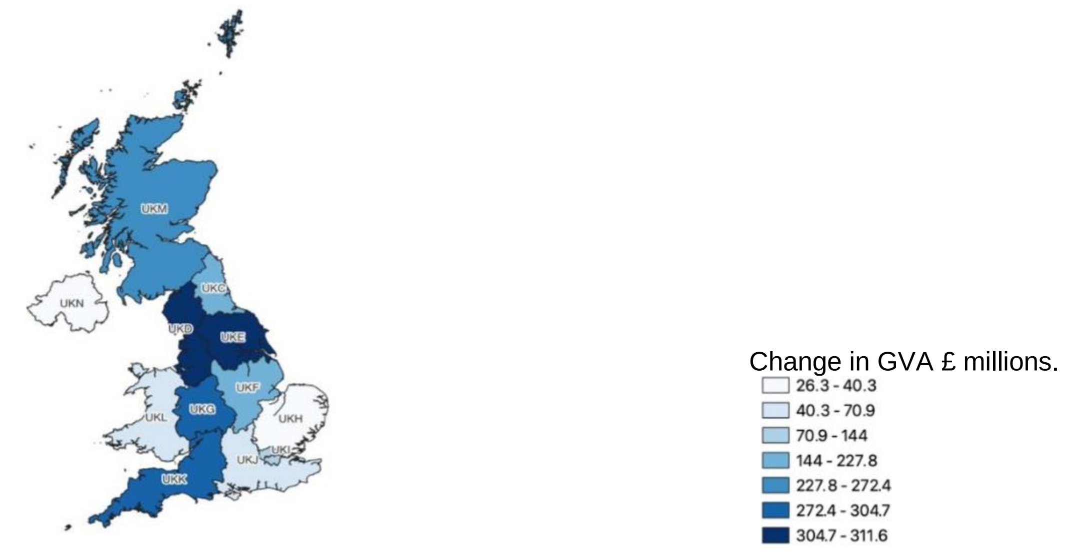
This short paper will examine three recent empirical lines of research, each of which provides different insights and implications for understanding the European regional economic and regional policy context. The major common feature these three lines of research identify is that regional responses to innovation-related and technological change-related processes and policies are heterogeneous. However, underneath this heterogeneity are some observable patterns, an understanding of which is important for the design of Cohesion Policy (McCann and Ortega-Argiles, 2021a, 2021b). The uneven regional effects of knowledge and innovation- related activities and investments can be understood by looking at the evidence in particular countries where such data has become available.

2 The uneven regional effects of innovation and innovation-oriented policies

A recent international example of R&D redistributive policy initiatives is set in the UK; the Levelling Up White Paper sets plans for how R&D investment will be spent and locally redistributed (Jones, 2022). The proposed increased public investment in R&D (*R&D Levelling up mission*) is set to expand across the North, Midlands, South West, Scotland, Wales and Northern Ireland. It will seek to leverage at least twice as much private sector investment over the long term to stimulate innovation and productivity growth across the country (HM Government, 2022b). This mission aims to increase research and innovation capacity around the UK, reducing spatial disparities in R&D investment and activity and improving intangible capital and living standards across the UK. Following similar attempts to evaluate the impact of R&D or R&D policies using input-output techniques (Dietzenbacher and Los, 2002; Brautzsch et al., 2015), Ma et al. (2023) use the multi-regional Socio-Economic Impact Model for the UK (SEIM-UK) to evaluate three proposed R&D spending scenarios. Based on official documents and combining information from data from different sources (UKRI and ONS), the authors calculate the current UK R&D sub-national and sectoral distribution (GERD and BERD) and set up different redistribution scenarios of R&D spending in the UK. The analysis assesses the extent to which such proposed changes will impact the UK regions (12 UK NUTS1) regarding output, GVA and employment. At the macroeconomic level, the findings give similar results for the three different redistributive scenarios. However, the findings suggest that impact varies significantly across the other UK NUTS-1 regions in different scenarios. Scenario 2, which allocates more GERD to areas with previously low funding levels, yields the largest effect. On average, output, employment and GVA in regions outside GSE increase by 0.33%, 0.37% and 0.34%, respectively, showing a potentially positive effect on the levelling up of R&D in the country. Ma et al. (2023) also show that the areas that present higher interregional connexions within the country are the ones that generate higher multipliers. Even if the funds are destinated to areas outside the South of England, given the strong links of these areas with other parts of the country, these areas still benefit from the new redistribution of public funds for R&D across the country.

Figure 1.A Regional GVA change (in £m) Scenario 1 - Equal Uplift

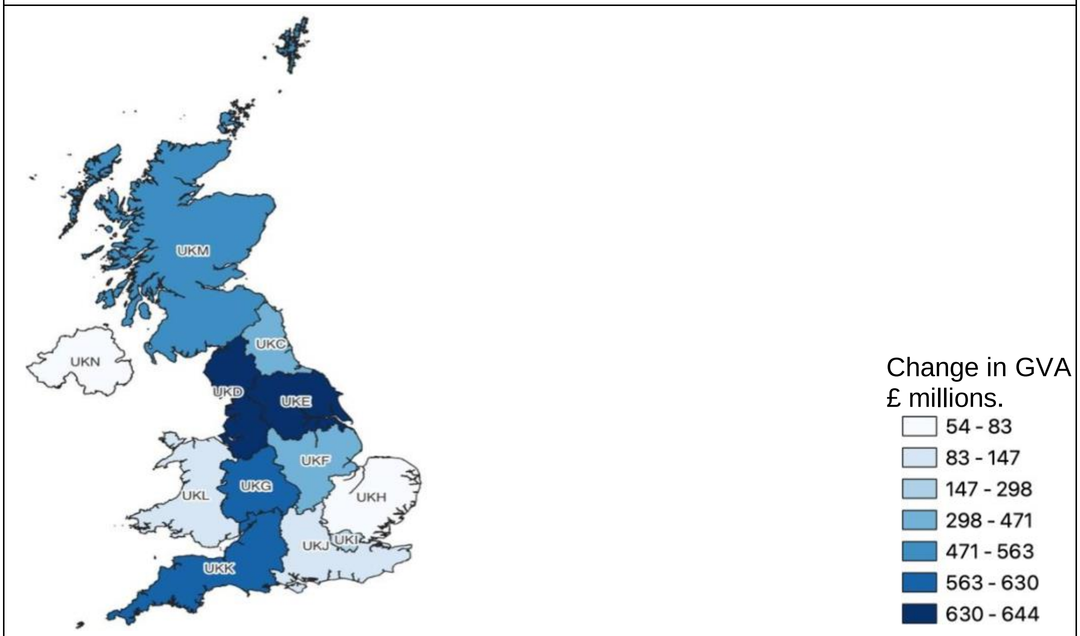
Map: Scenario 1 – Equal Uplift



Note: London (UKI), South East (UKJ), East of England (UKH), North West (UKD), West Midlands (UKG), South West (UKK), East Midlands (UKF), Yorkshire and The Humber (UKE), Scotland (UKM), North East (UKC), Wales (UKL), Northern Ireland (UKN)

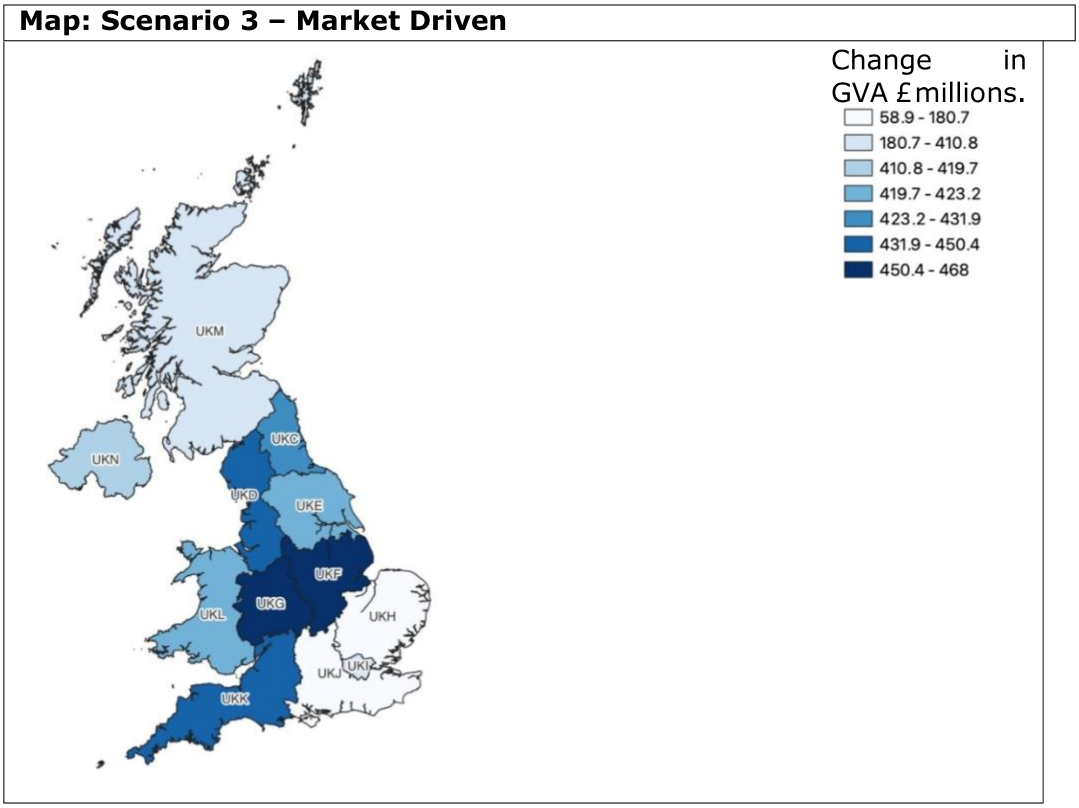
Figure 1. B Regional GVA change (in £m) Scenario 2 - Redistributive

Map: Scenario 2 – Redistributive



Note: London (UKI), South East (UKJ), East of England (UKH), North West (UKD), West Midlands (UKG), South West (UKK), East Midlands (UKF), Yorkshire and The Humber (UKE), Scotland (UKM), North East (UKC), Wales (UKL), Northern Ireland (UKN)

Figure 1. C Regional GVA change (in £m) Scenario 3 – Market Driven



Note: London (UKI), South East (UKJ), East of England (UKH), North West (UKD), West Midlands (UKG),South West (UKK), East Midlands (UKF), Yorkshire and The Humber (UKE), Scotland (UKM), North East (UKC), Wales (UKL), Northern Ireland (UKN)

What this UK-specific analysis demonstrates is that the regional outcomes of an innovation-focused mission-oriented type of policy, such as Cohesion Policy, are very dependent on the specific manner in which the policy is implemented. Even if national outcomes vary very little, the geographical and distributional outcomes may differ substantially according to the policy design and implementation logic. Similarly, using an interregional CGE model across all EU regions, Barbero et al. (2021) show that the geographical concentration of knowledge spillovers can lead to an uneven distribution of innovation activities, thus exacerbating the disparities between the core and the periphery (Bottazzi and Peri 2003; Crescenzi and Rodriguez-Pose 2011; Crescenzi and Giua, 2020). The fact that geography shapes the outcomes of knowledge- related and innovation processes means that regional policies must be carefully designed to deal with these distributional effects. This is the case in the UK, and it will be equally, if not more, applicable to the EU regional context, characterised as it is by an even more diverse range of institutional and geographical settings.

Key Takeaways from Our Research

(1a) From the research on the geographical impacts of publicly funded UK innovation-related investments, the UK interregional input-output analysis finds that innovation-related investment policies which favour regions which previously had received lower levels of public funding generate the largest overall returns.

(1b) Regions that are highly connected in terms of income and knowledge networks always benefit from such policies, even if the funding is mainly directed to other places. The reason is that the stimuli to local production and trade also ripple through the interregional trade linkages, thereby benefitting those already well-connected regions.

Taken together, these findings imply that innovation-related investments in many economically less advantageous regions are not a drag on the overall economy. Rather, they act both as a catalyst for narrowing interregional gaps while also enhancing aggregate growth.

3 The uneven regional effects of technological diversification on regional productivity

Rocchetta, Ortega-Argilés and Koegler (2021) jointly analyse the impact of technological diversification and diversity on regional productivity using both entropy-based measures of technological variety – here termed as 'entropy' (Castaldi et al., 2015; Frenken and Nuvolari 2004)– and a measure of technological co-occurrence – here termed as 'coherence' (Rocchetta and Mina, 2019). Moreover, they analyse the combined effect that entropy and coherence may exert on the actual shape of these relationships. Most previous analyses assume linear relationships and a non-continuous distribution of the knowledge space dimension. In contrast, we move beyond these previous analyses by examining the combined effect of different aspects of relatedness and diversity in shaping non-linear relatedness–productivity growth relationships.

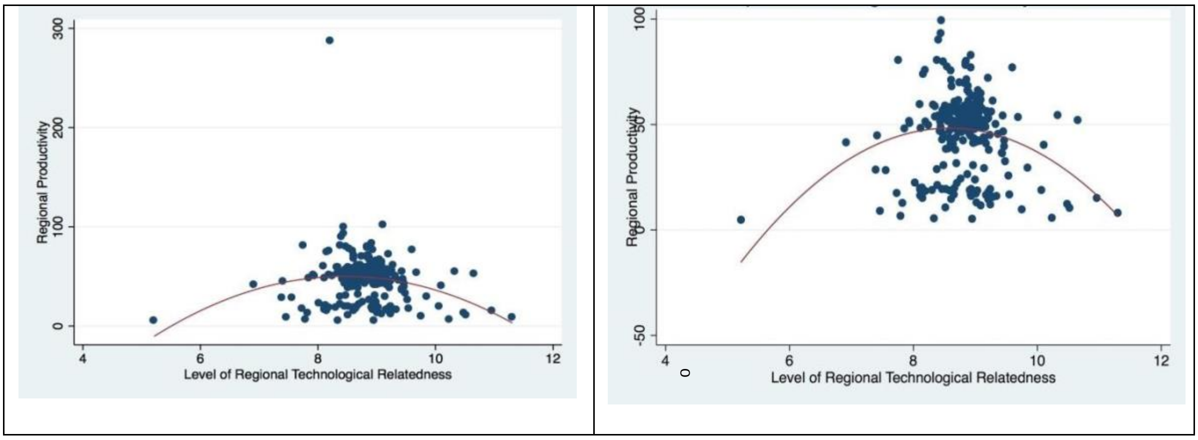
With a sample of 268 European Union (EU) regions formed by regional employment data, information on the industrial structure, data found in patent records and multilevel modelling, we demonstrate that different technological diversification measures measured as coherence and entropy-variety have different non-linear effects on regional productivity growth (Rocchetta, Ortega-Argilés and Koegler, 2021). While focusing on these different aspects of relatedness and variety on regional productivity growth, the authors also control for important regional productivity determinants like the effect of the region's employment density, technological capital stock, human capital level, or population size. Regional control variables allow for controlling for the availability of a skilled labour force and the presence of agglomeration economies (Cingano and Schivardi, 2004; Dettori et al., 2012).

The analysis includes two novel methodological approaches. First, working on the assumption that regional productivity is influenced by national and regional factors, multilevel modelling techniques are employed to estimate the degree to which each spatial level (national or regional) contributes to explained and unexplained variations of regional productivity. Secondly, the analysis control for the non-linear effect of regional labour productivity growth of both technological coherence and the entropy-variety dimensions of relatedness.

These non-linear effects work in opposite directions to each other. The analysis shows that higher regional productivity returns can be found in regions investing both around their existing technological capabilities as well as in more distant knowledge domains. The findings have significant implications for understanding regional productivity growth processes and the implementation of Smart Specialisation Strategies.

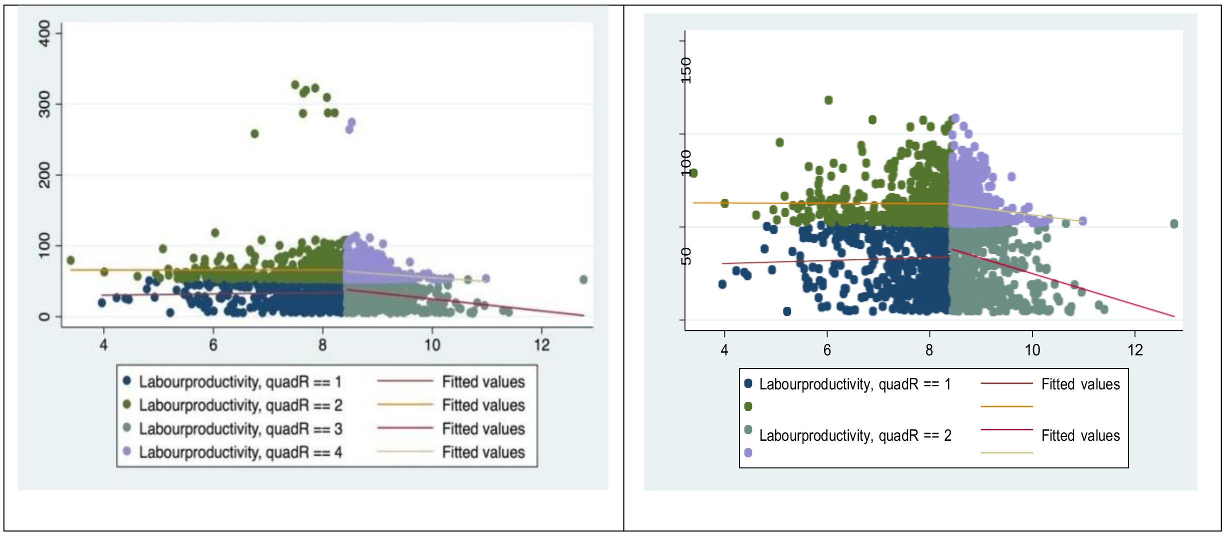
Our multilevel panel analyses of EU27 plus UK and Norway NUTS II regions highlight that relatedness and variety affect labour productivity growth. The evidence produced in the study demonstrates that the relationship between relatedness and regional productivity growth is non-linear andmexhibits an inverted U-shape while. In contrast, the relationship between variety and regional productivity is non-linear and is U-shaped.

Figures 2a and 2b –The relationship between regional technological relatedness (coherence) and regional productivity (with and without London)



Source: Rocchetta, Ortega-Argiles and Koegler 2021

Figures 3a and 3b. The relationship between the four quadrants of regional technological relatedness (coherence) and regional productivity (including and excluding London)



Source: Rocchetta, Ortega-Argiles and Koegler 2021

These findings imply that activities aimed at the technological upgrading of the regional economies at lower productivity levels must be built around related technologies (Kogler, 2017; Boschma, 2012; Balland et al., 2019). At the same time, however, each region, once it has built its portfolio of related technologies and has grown in terms of productivity, needs to diversify its knowledge base to maintain a satisfactory level of regional growth in the long run.

Similar findings also concern the closely related issue of local ‘embeddedness’, which along with technological diversification, is one of the core elements of smart specialisation (McCann and Ortega-Argilés, 2015). Kitsos et al. (2019) conducted a study on the impact of local industrial embeddedness on economic resilience in UK regions during the 2008 financial crisis.

Again, we found an inverted U-shaped relationship between complexity and lock-in effects (Kitsos et al., 2019), mirroring our findings in Rocchetta et al. (2019).

Key Takeaways from Our Research

(2a). From the research examining the non-linear relationships between EU regional technological relatedness, coherence and regional productivity, a key finding is that building relatedness enhances regional productivity up to an average level of regional productivity, beyond which productivity begins to fall. Similar findings are evident from the UK research regarding the non-linear effects of embeddedness.

(2b). Enhancing relatedness and embeddedness are such core principles of RIS3 smart specialisation. However, this research suggests that once a region moves beyond average productivity performance, greater technological relatedness or embeddedness leads to adverse 'lock-in' types of effects.

4 The uneven effects of globalisation and automation in European regions and workers

Recent work looks at the relative contribution of automation and globalisation on wages and employment in different countries. Terzidis and Ortega-Argiles (2021) use the Dutch context to combine technology (Autor et al., 2003) and trade-related (Blinder, 2009; Costinot & Vogel, 2010) shocks and investigate their joint potential to polarise local employment growth. The Netherlands is a technologically advanced country (OECD, 2013) and highly integrated into the global value chains; therefore, it is a particularly interesting candidate for this type of analysis. Utilising worker-level data coupled with novel, interregional data on trade in intermediate products, the analysis indicates that both automation and the global division of labour contribute to the transformation of employment in the Netherlands. Specifically, the analysis uncovers distinct causal effects from technology and trade along the various occupational skill segments, which -taken together- polarise employment growth.

The skill composition of the national labour market in the Netherlands has changed notably in the last decades. In particular, employment growth is dominated by expansion at the upper and lower ranges of the skills distribution, giving rise to something of a 'hollowing out' of the middle-skills groups and increasing employment and skills polarisation. Moreover, this is true even in a country with a very strong social and welfare redistributive institutional set-up, so these labour market polarising tendencies may be even greater in other countries with less sophisticated social safety nets.

Figure 4a. Dutch Regional employment polarisation

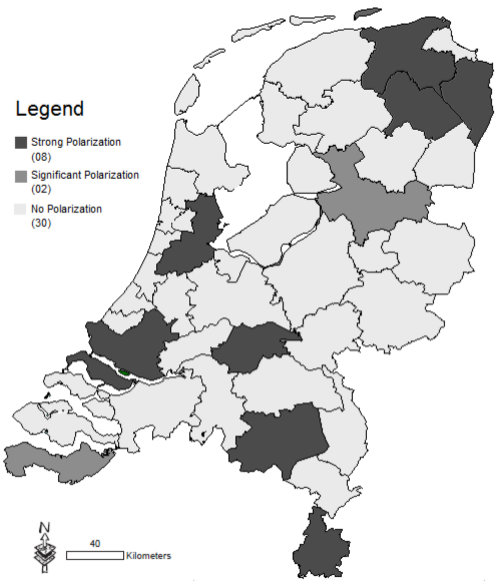
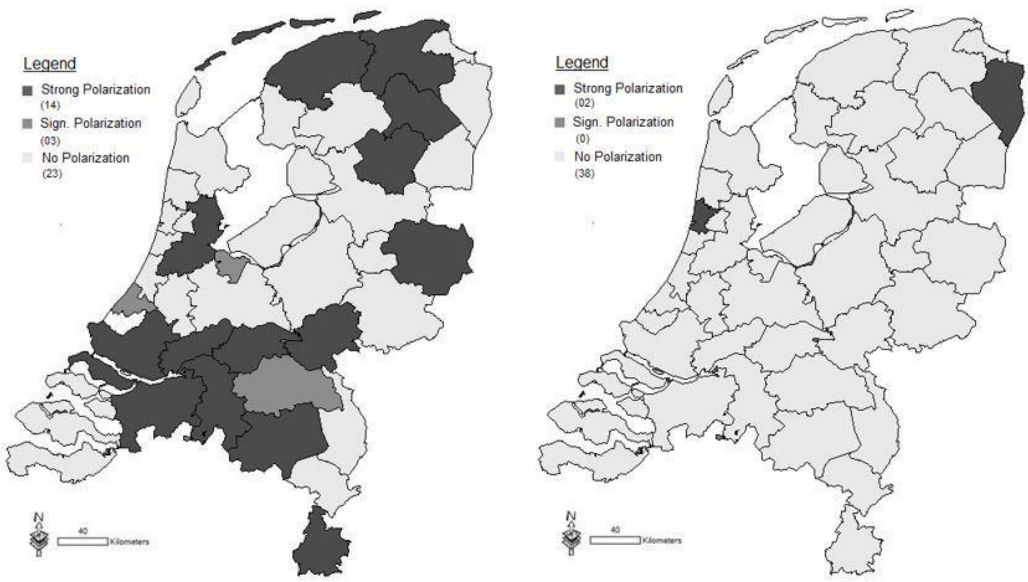


Figure 4b. Regional employment polarisation by age group



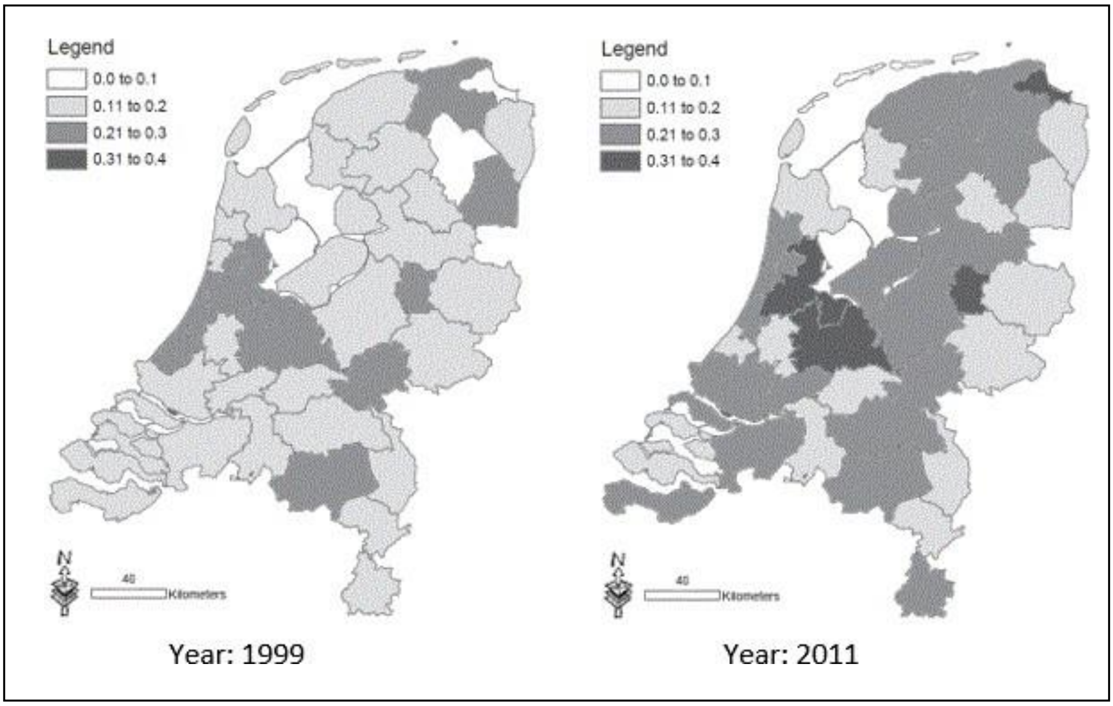
(a) Young (age < 39) workers (b) Senior (age ≥ 39) workers

However, contrary to international evidence which is dominated by the US experience in which employment polarisation is greater in bigger cities the findings of Terzidis and Ortega-Argiles (2021) demonstrate that more polarised employment growth is found in less densely populated areas and those relatively specialised in high- (ICT) and low-skilled (industry) sectors.

The demographic analysis also shows that employment polarisation is not uniform across all gender and age groups; instead, it mainly occurs amongst male and young workers. The analysis finds clear effects of automation negatively affecting lower-paid jobs and positively affecting higher-paid jobs; globalisation, as measured by international trade linkages, has clear positive effects on low-skilled and high-skilled employment, while no effect was found for medium-skilled workers. The effect of trade varies when considering different age groups and trade destinations, and employment polarisation is more pronounced amongst young workers.

Considering the Dutch skills mismatch, which is close to the OECD average, Terzidis and Ortega-Argiles (2021) find an increasing imbalance between the demand and the supply of skills amongst male and young workers. They also identify a positive relationship between labour productivity and both employment polarisation and skills mismatch for low productivity levels, while the relationship turns negative for higher labour productivity (Terzidis and Ortega-Argiles, 2021).

Figure 4.c Skills mismatch index regional analysis



The unequal effects are manifested at the individual and the regional level. The automation displacing low-skilled labor effects take the form of increasing job insecurity for the most vulnerable groups, including the low-skilled who face the risk of technological displacement or the workers in routine-based occupations who often see their jobs shipped to emerging economies. Furthermore, Brakman et al. (2021) illustrate that the unequal distributional consequences from automation and import competition are further aggravated by crises such as the 2008 global financial crisis and the COVID-19 pandemic, which particularly hit the low- paid, the self-employed, workers with flexible working arrangements or the young people who find it increasingly difficult to start their careers.

Key Takeaways from Our Research

(3a.) The global impacts of automation and import competition lead to greater local job polarisation.

(3b.) From the research examining job polarisation in The Netherlands, job polarisation is a more serious phenomenon amongst younger workers, and also it is not necessarily an urban phenomenon, as is the case in the USA. Job polarisation is also very evident in smaller centres, and places specialised in either high or low-technology sectors.

5 Lessons Learned

The Combined Key Takeaways from Our Three Lines of Research are:

1a. From the research on the geographical impacts of publicly funded UK innovation-related investments, the UK interregional input-output analysis finds that innovation-related investment policies which favour regions which previously had received lower levels of public funding generate the largest overall returns.

1b. Regions which are highly connected in terms of income and knowledge networks always benefit from such policies, even if the funding is mainly directed to other places. The reason is that the stimuli to local production and trade also ripple through the interregional trade linkages, thereby benefitting those regions which are already well-connected.

Taken together, these findings imply that innovation-related investments in many economically less advantageous regions are not a drag on the overall economy. Rather, they act both as a catalyst for narrowing interregional gaps while also enhancing aggregate growth.

2a. From the research examining the non-linear relationships between EU regional technological relatedness, coherence and regional productivity, a key finding is that building relatedness enhances regional productivity up to an average level of regional productivity, beyond which productivity begins to fall. Similar findings are evident from the UK research regarding the non-linear effects of embeddedness.

2b. Enhancing relatedness and embeddedness are such core principles of RIS3 smart specialisation. However, this research suggests that once a region moves beyond average productivity performance, greater technological relatedness or embeddedness leads to adverse 'lock-in' types of effects.

3a. The global impacts of automation and import competition lead to greater local job polarisation.

3b. From the research examining job polarisation in The Netherlands, job polarisation is a more serious phenomenon amongst younger workers. Also, it is not necessarily an urban phenomenon, as is the case in the USA. Job polarisation is also very evident in smaller centres, and places specialised in either high or low-technology sectors.

The observations arising from these three lines of research imply that:

Innovation-related and R&D-related policies aimed at regions traditionally under-resources in these arenas can provide a positive stimulus both to reducing regional inequalities and also enhancing aggregate growth (McCann and Ortega-Argiles, 2021a,b). However, job polarisation is an increasing feature of local economies in many different types of places, so policies must ensure that the benefits of regional innovation-related investments must be spread and shared throughout the local economies. RIS3 smart specialisation is well positioned to facilitate this. However, while RIS3 smart-specialisation types of policies built around enhancing local technological relatedness, coherence and embeddedness are an important potential source of regional productivity growth for economically weaker regions, this is only true up to a point. Once a region moves above average productivity levels, then greater relatedness, coherence and embeddedness run the risks of reduced productivity due to problems of 'lock-in'. The institutional problems associated with technological lock-in and inertia require broad-based policy interventions to help localities transition from one technological regime to another. Modern regional innovation policy (e.g., smart specialisation), therefore, needs to be designed to counter or overcome both the market failures and system failures associated with insufficient knowledge exchanges and institutional weakness, which are either partly due to problems of economic geography or partly manifested in terms of economic geography.

Fostering innovation is essential for maintaining economic growth in many regions. Unfortunately, some parts of Europe are experiencing a widening gap in innovation, with certain member states and regions making progress while others need to catch up. To bridge this gap, it is necessary to enhance innovation diffusion at both national and regional levels, particularly in less developed or peripheral regions.

While smart specialization strategies introduced by the cohesion policy for 2014-2020 can be beneficial, in order to optimise their endogenous regional potential they often need to address the bottlenecks in their regional innovation systems (Szerb, Ortega-Argiles, Acs, and Komlosi, 2020; Ortega-Argiles, 2022). The smart specialisation approach has been seen as problematic for various reasons (e.g., Hassink and Gong, 2019; Benner, 2020; Hassink and Kiese, 2021; Giustolisi et al., 2023). In economically weaker regions, local knowledge- and innovation- related investments must be increased to boost regional technological coherence, relatedness, and embeddedness to improve the resilience of the innovation system. Such policies are more likely to produce positive returns in regions far from the technological frontiers than in those close to or on the frontiers, but only as long as the key blockages and weaknesses in the regional innovation system are identified and addressed. Szerb, Ortega-Argiles, Acs, and Komlosi (2020) demonstrate a methodology for doing this using widely-available EU data, in order to facilitate the broader goals of smart specialisation.

The research outlined above suggests that the broader goals and key priorities for economically weaker regions are:

- to increase the diversity of the related technologies, activities and market segments around the existing core technologies, skills and competences of the local economy;
- enhance the middle-skills components of the local economy;
- increase the local multipliers for knowledge-related activities and investments.

In economically weaker regions, smart specialisation offers opportunities to make progress on all three priorities, but making progress on all three priorities requires local and regional collaboration and coordination across different arenas.

Increasing the related diversification of technologies and activities requires firms to experiment with other closely related markets and industries. This can be done by either applying their existing technologies in different market segments, or by adapting their existing technologies within the same or similar market segments. These innovation processes will involve a certain amount of experimentation, trial and error – the entrepreneurial search processes – but public funds can be provided to facilitate such processes (Ortega-Argiles, 2022). This could be, for example:

- by using funds to underwrite the risk associated with facilitating collaborations between different groups of firms, either related horizontally (alliances) or vertically (supply chains) to trial new technologies, activities or product-market and service-market segments.
- funding specialist testing and trialling laboratories whereby public funds provide essential equipment and kits for use by specific consortia of local firms for which such equipment and facilities would otherwise be prohibitive.
- linking local firms with local universities or research institutes on funded projects specifically aimed at enhancing the local technological diversification of local firms.
- greater collaboration between local firms and between local firms and institutions should help to increase local multipliers – based on shared experience and familiarity of competences.
- SMEs and start-ups should be the priority focus of these activities. Large firms must be part of the agenda, but only as long as SMEs are also an integral part of the agenda.

Local skills also need to be upgraded in order to allow for these diversification processes to succeed. However, the skills diversification of the local labour market cannot be a trial-and-error process, but a systematic long-run process of rethinking and redesigning local skills-training programmes. Moreover, the focus of these local skills-enhancement processes should also be on many of the middle-skills activities. It is these middle-skills cohorts who have suffered the most from job polarisation trends and who potentially form the bedrock of the local innovation ecosystems.

This requires building new relationships between local firms and local skills providers, such as training institutes and technical colleges, in order to better link local firms' demands to labour supply. These emerging demand profiles, and the redesigned and tailored training programmes, should be specifically targeted at new related technologies and activities. These enhanced skills-provision programmes could include, for example, internships, job-placement programmes, collaborative curriculum development processes, entrepreneurial skills, but the key aspect is that they have to be designed and delivered locally with explicit coordination between industry and skills-providers. In Switzerland and Germany, the chambers of commerce have traditionally played exactly these roles, but in many countries and many regions, such coordinating mechanisms do not exist.

At the same time as local development challenges, fostering a more outward-looking smart specialisation approach, emphasising the concept of external connectedness (McCann and

Ortega-Argiles, 2015), is also an important element for areas with a less developed knowledge capacity to create new development pathways. Increasing the knowledge capacity of regions can be done by establishing close collaborations between, as well as within, regions, which can be crucial in creating new opportunities for activities that may generate economic, social, and environmental co-benefits for more than one region and more than one local community (Giustolisi et al., 2023; Uyarra et al., 2018). Customised policy packages that match specific regional and national contexts with particular technological and skills characteristics have effectively supported specific types of innovation and technological diffusion and adoption.

Policy interventions, in particular, using demand policy measures better suited for non-core regions, can be seen as a way to promote innovation activities and product development with favourable demand conditions that drive new path development in places that need catching up (McCann and Ortega-Argiles, 2021b; Uyarra, Kundu, Ortega-Argiles and Harbour, 2023; Edquist and Zabala-Iturriagagoitia, 2012). European regional examples of demand policy measures can be found in the eco-industry in Eastern Lapland in Finland (Sotarauta et al., 2022) or the food sector in peripheral areas of Sweden (Grabher et al., 2008; Martin and Martin, 2023).

However, when designing local and regional place-based policies, it is essential to understand that regions and cities in Europe are affected differently by shocks such as technological change (digitalisation and automation), changes in global value chains (e.g., Brexit and Covid-19), and also by the effects of policy interventions themselves. Not only direct effects but also indirect and induced effects have to be considered in this uneven distribution of the effects of shocks. Any largely space-blind implementation of, for example, top-down mission-oriented policies, across Europe may create very different effects regionally and locally. Moreover, regions that are not directly participating in programmes can be indirectly affected by them. Therefore, a sound place-based evidence-based policy design with specific place-based sensitive considerations in the implementation phases is required where players such as regions, cities and local communities appear as the core of any policy strategy. At the same time, many of these difficult challenges (climate change, digitalisation, depopulation and demographic change) won't be able to be solved by only focusing on the lower levels of government; multi- level governance systems will be key to ensure stakeholder engagement and mobilisation for enhancing policy-sharing and policy-learning and for local institutional and governance capacity building.

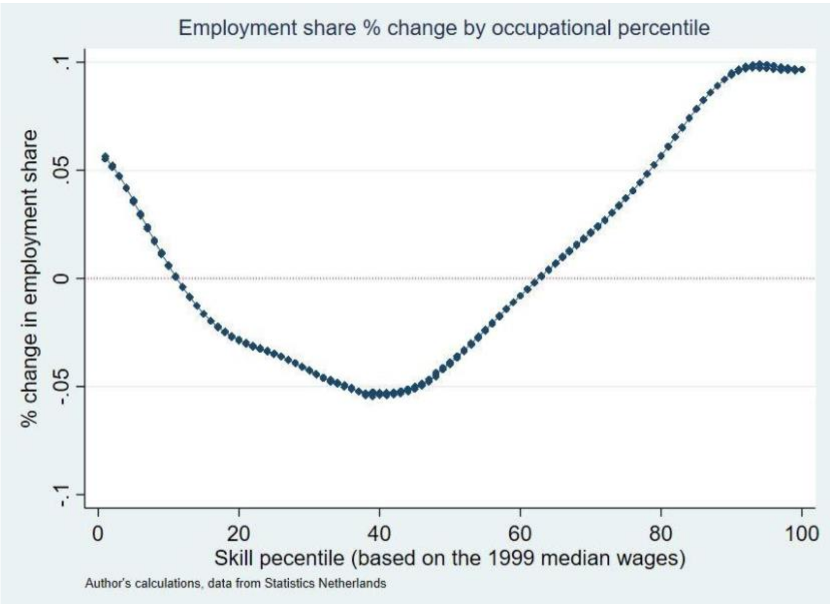
Appendix

Employment change by occupational skill group, Netherlands

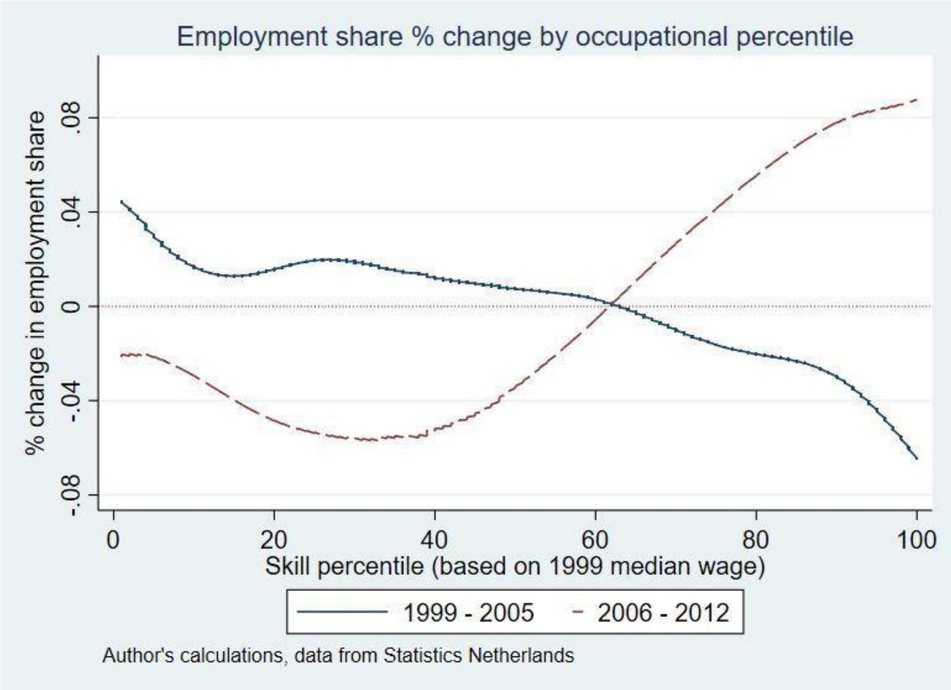
Occupational share	Employment share % change		
	1999-2012 (1)	1999-2005 (2)	2006-2012 (3)
Low-skill 20%	1.30%	2.02%	-2.78%
Medium-skill 20%	-6.88%	-0.54%	-4.84%
High-skill 20%	10.33%	-2.95%	7.97%

Note: Occupations are sorted based on the BRC 4-digit occupational coding.

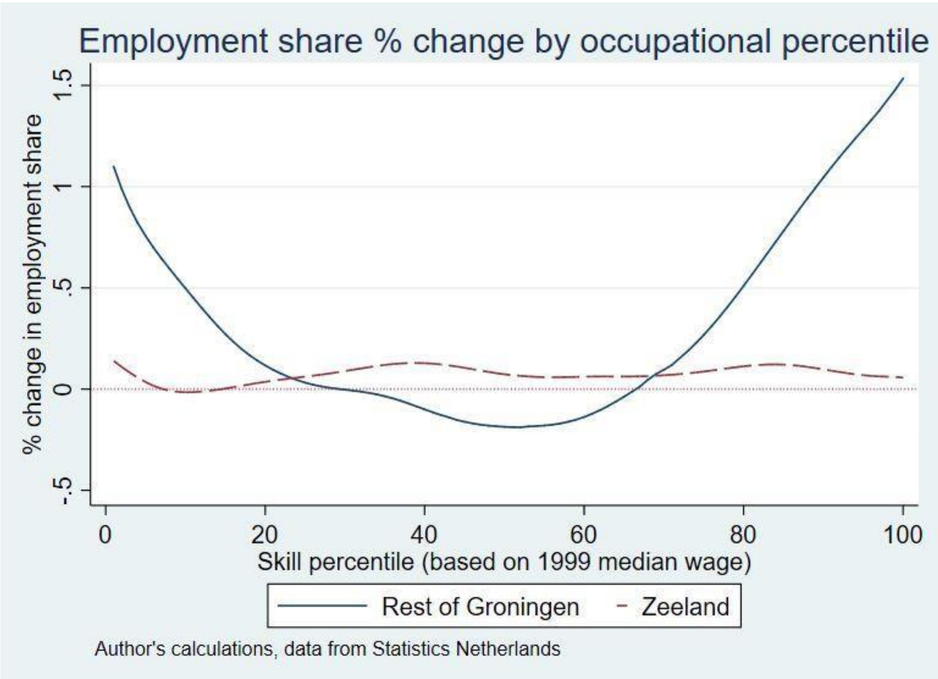
Employment share % change by occupational percentile for two periods Netherlands



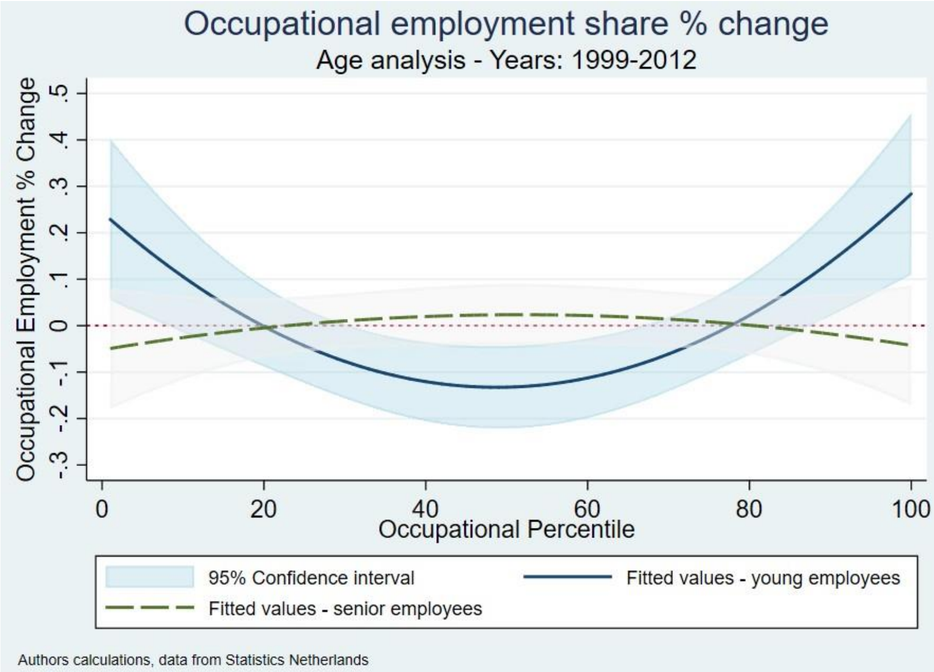
Employment share % change in the Netherlands by occupational percentile and subperiod, The Netherlands



Regional employment profiles, The Netherlands



Quadratic regression fit line by age group



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