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Horizon Europe and regional funds as factors in the development of small and medium-sized enterprises in the EU

Abstract

Research background and purpose: The objective of this article is to analyse and compare the impact of the Horizon Europe programme and EU structural funds on the competitiveness and innovative capacity of small and medium-sized enterprises (SMEs) in the European Union. The study pays particular attention to regional diversity and the absorptive capacity of institutions, which determine the extent to which different regions benefit from EU innovation and cohesion policies.

Design/methodology/approach: The discussion is based on a comparative analysis of secondary data, policy documents, and previous empirical studies on SME participation in EU innovation programmes. The study identifies the main channels of influence through which Horizon Europe and EU structural funds affect research and development (R&D) investment, productivity growth, and innovation performance. Furthermore, the analysis examines moderating factors such as regional absorptive capacity and institutional quality, which condition the effectiveness of policy implementation.

Findings: The results indicate that Horizon Europe exerts a stronger impact on R&D activities and product innovation, while EU structural funds have a more pronounced effect on productivity growth, digitalisation, and technological modernisation. The interaction between the two instruments generates complementary effects, particularly in regions with high absorptive capacity. In less developed regions, however, the effects tend to be gradual, focusing primarily on technology adoption and capacity building rather than on breakthrough innovation.

Value added and limitations: This article contributes to a deeper understanding of how different EU policy instruments jointly influence SME innovation and competitiveness. It highlights the importance of institutional quality and absorptive capacity as key determinants of policy effectiveness and provides policy-relevant insights for the design of integrated innovation support systems across EU regions.

Keywords: *SMEs, Horizon Europe, structural funds, innovation policy, absorptive capacity, regional competitiveness*

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1. Introduction

Small and medium-sized enterprises (SMEs) are the backbone of the European Union economy, accounting for over 99% of all businesses and generating over two-thirds of private sector jobs (European Commission, n.d.). Their importance is growing in the context of the economic, social and environmental challenges facing Europe. Globalisation, digitalisation, energy transition and the effects of the COVID-19 pandemic have highlighted that the competitiveness and resilience of European economies largely depend on the innovation and adaptability of the SME sector (OECD, 2022).

The role of SMEs in building the EU's competitiveness and economic resilience stems from their flexibility and innovative potential, which determine the pace of digital and green transformation (OECD, 2019). At the same time, there remains a visible innovation gap between highly developed countries and new EU members, which increases the risk of deepening regional inequalities (European Commission, Directorate-General for Research and Innovation, 2024). In this context, the effective use of public funds under EU support programmes, including Horizon Europe and the Structural Funds, is of key importance. The effectiveness of these instruments determines the ability of SMEs to increase innovation, generate employment and strengthen regional competitiveness (Chesbrough et al., 2023).

In this context, instruments supporting research, development and innovation, as well as regional policies that provide SMEs with access to finance, knowledge and new markets, are particularly important. A key tool is Horizon Europe, the largest research and innovation programme in the EU's history, with a budget of €95.5 billion for the period 2021-2027. The programme addresses climate, energy and health challenges while strengthening the competitiveness of businesses by supporting breakthrough innovations and the development of an integrated European research and innovation area.

Structural and investment funds also play an important role, including programmes under the new 2021–2027 financial perspective, which support regional development, innovation and ecological transformation. In Poland, this includes, among others, European Funds for regions, as well as a dedicated programme, European Funds for Eastern Poland, aimed at reducing development disparities. An analysis of the effectiveness of these mechanisms makes it possible to assess the extent to which EU support instruments actually increase the innovation and competitiveness of SMEs, depending on regional conditions and the specific characteristics of enterprises.

The need to address this issue stems from the growing pressure associated with digital, energy and ecological transformation, as well as from the experiences of recent global crises, which have highlighted the weaknesses of European economies. In this context, research on the effectiveness of EU support instruments for SMEs is essential in order to better design public policies that strengthen the resilience of enterprises and increase

their adaptability. The analysis presented in the article makes it possible to determine whether Horizon Europe and the Structural Funds act as a real catalyst for SME development and to what extent they contribute to building economic and innovative cohesion within the European single market.

2. Literature review

Scientific research and reports by EU institutions consistently emphasise that small and medium-sized enterprises (SMEs) are the foundation of the modern European economy. Eurostat data (2021) shows that SMEs generate more than half of the added value in the European Union and account for about two-thirds of private sector employment. In structural terms, large enterprises dominate high-tech sectors, while SMEs demonstrate greater operational flexibility, the ability to adapt quickly to changing market conditions and significant potential for job creation (Storey, 2016). Their importance has grown particularly in the context of the digital, green and social transitions, which are key priorities of EU economic policy for the period 2021-2027.

The literature on the subject also emphasises the role of SMEs as catalysts for innovation (Acs & Audretsch, 1990). Smaller entities are more likely than large corporations to engage in niche research and development projects, introduce incremental innovations and form an integral part of regional innovation ecosystems (Hirsch-Kreinsen, 2016). According to OECD research (2019), SMEs are responsible for a significant proportion of the process and organisational innovations implemented in Europe, which, although rarely reported as patents, have a direct impact on the productivity and competitiveness of the economy. Nevertheless, their potential is limited by a number of development barriers, including: a deficit in external financing, a shortage of highly skilled technological personnel, lack of access to capital markets and a limited scale of international activity.

From the perspective of the European Union's economic policy, supporting the SME sector has been one of the main priorities of its development strategy since the beginning of the 21st century. A key document was the Small Business Act (SBA) of 2008, which introduced the 'Think Small First' principle, requiring the specific characteristics and needs of SMEs to be taken into account at all stages of the legislative process (European Commission, 2008). The SBA set out a framework for action to improve access to finance, support innovation, internationalisation and digitisation of the sector.

In subsequent years, this strategy was developed and updated in the context of new challenges, in particular the green and digital transitions. In the document EU SME Strategy for a Sustainable and Digital Europe (European Commission, 2020), the European Commission identifies three main areas of action: increasing the resilience of SMEs, supporting their digital transformation, and involving them in the process of achieving climate goals. Empirical literature confirms that the effectiveness of these

policies varies across regions and sectors. Research by López & Kundu (2019) shows that Western European countries achieve a higher return on public investment in SME innovation than Central and Eastern European countries, which is due to differences in institutional potential and absorption capacity.

At the same time, studies by Klodt (2017) and Bukowski & Szpor (2020) indicate that in Poland and other countries in the region, the low quality of strategic management in SMEs, insufficient research and development infrastructure, and poor cooperation between science and business remain limitations. In this context, EU financial instruments and programmes such as Horizon Europe and structural and investment funds, which aim to increase the innovativeness of enterprises and support sustainable regional development, are of particular importance.

Despite extensive analysis of the importance of SMEs in the literature, there is a lack of comprehensive research assessing the synergistic effects of support under EU programmes such as Horizon Europe or the Structural Funds for the 2021–2027 period. It is also important to take into account sectoral and regional differences in the absorption of support, as SMEs operating in traditional industries may face different challenges than companies in the digital or green economy sectors.

Additionally, from a research perspective, it is worth emphasising the need for an interdisciplinary approach combining economic, managerial and social analysis. Such an approach will allow for an assessment not only of the financial effectiveness of support, but also of its impact on the innovation, adaptability and long-term resilience of SMEs. Based on a review of the literature, the following research objective and research hypothesis were formulated:

- research objective: Analysis of instruments supporting the development of SMEs in the European Union, with particular emphasis on the Horizon Europe programme and EU funds for 2021–2027.
- main hypothesis: Horizon Europe and the 2021–2027 structural funds contribute to the growth of innovation and competitiveness of SMEs in the EU, with these effects varying and depending on the absorption capacity of individual regions.

3. Methods

In line with the research objective, this study adopts an analytical-comparative and exploratory approach, integrating both quantitative and qualitative analyses. A mixed-methods research design was employed, combining literature review, desk research, and the examination of secondary data from reports published by the European Commission, Eurostat, OECD, as well as national innovation agencies, including PARP and NCBR. The study covers the period 2021–2027, allowing for an evaluation of the outcomes of previous policy cycles and the initial implementation of the new EU financial perspective.

The research was conducted in three stages:

1. Analysis of EU strategic documents, including framework programmes and regional policies concerning SMEs, to identify the main directions of support and objectives of public intervention.
2. Review of academic literature in the fields of innovation economics, industrial policy, and strategic management, aimed at identifying research gaps and determinants of policy effectiveness.
3. Quantitative and qualitative analysis of EU fund utilisation by SMEs in selected Member States, with a particular focus on Poland.

In the empirical part, a comparative analysis approach was applied to assess differences in the efficiency of support across countries and regions. This analysis was complemented by indicator-based measures, including innovation intensity indicators (e.g. the European Innovation Scoreboard developed by the European Commission, Directorate-General for Research and Innovation, and the Global Competitiveness Index) and competitiveness indicators (e.g. European Innovation Scoreboard, Global Competitiveness Index).

To deepen the interpretation of quantitative results, qualitative methods were employed, including content analysis of strategic documents, which enabled the identification of success factors and barriers to the implementation of EU programmes. To enhance reliability, triangulation of sources and methods was applied, allowing verification of results from multiple analytical perspectives.

The research sample was selected based on the principle of regional representativeness. Countries with varying levels of economic development were analysed Poland, Germany, Spain, and Finland which allowed for the identification of different models of absorption and utilisation of EU funds by SMEs.

The findings are both descriptive and diagnostic, enabling an assessment of the effectiveness of current support programmes and the formulation of policy recommendations for enhancing SME innovation capacity. However, certain limitations should be noted, including the incomplete comparability of data between countries and the limited access to microeconomic (firm-level) datasets, which may affect the scope of interpretation and the generalisability of conclusions.

4. Results

Small and medium-sized enterprises (SMEs) form the backbone of the European Union's economy, accounting for around 99% of all businesses and over two-thirds of private sector jobs. Their role is not limited to generating employment, but also includes shaping market dynamics, increasing the competitiveness of the economy and accelerating the transfer of innovation. Compared to large corporations, these

enterprises are characterised by greater flexibility and the ability to respond quickly to changing economic conditions. At the same time, the limited scale of their operations means that they often encounter barriers that prevent them from fully exploiting their potential, including limited access to capital, difficulties in international expansion, a shortage of highly qualified staff and limited opportunities for research and development. As a result, SMEs often lag behind larger entities in terms of innovation and internationalisation (Krupnik et al., 2022). All these factors show that SMEs, despite their key role in the EU economy, require special support in order to fully exploit their development potential. The scale of their importance and diversity is best illustrated by the structure of enterprises shown in Figure 1.

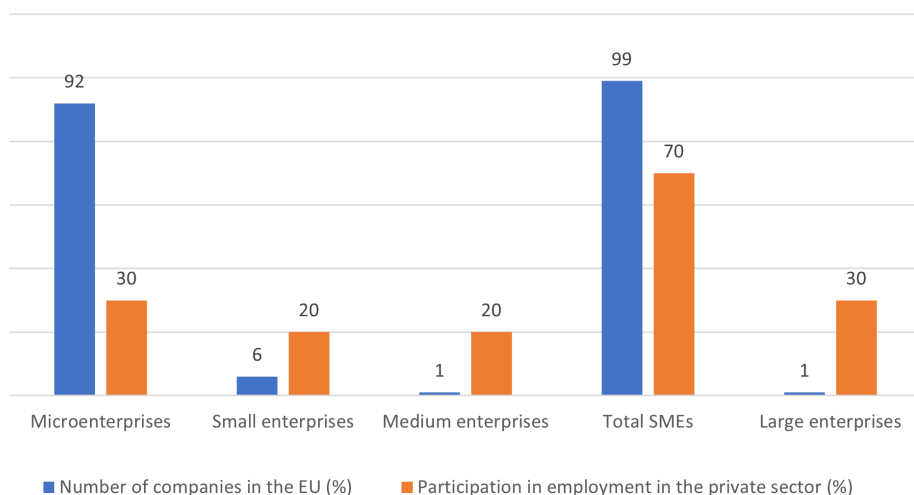


Figure 1. Structure of SMEs in the EU

Source: European Commission (n.d.)

The Horizon Europe programme for 2021–2027, with a budget of €93.5 billion, is the European Union’s key instrument for supporting research and innovation. Its priorities include combating climate change, digital transformation, energy security and public health. The breakdown of the budget into main priority areas is shown in Figure 2.

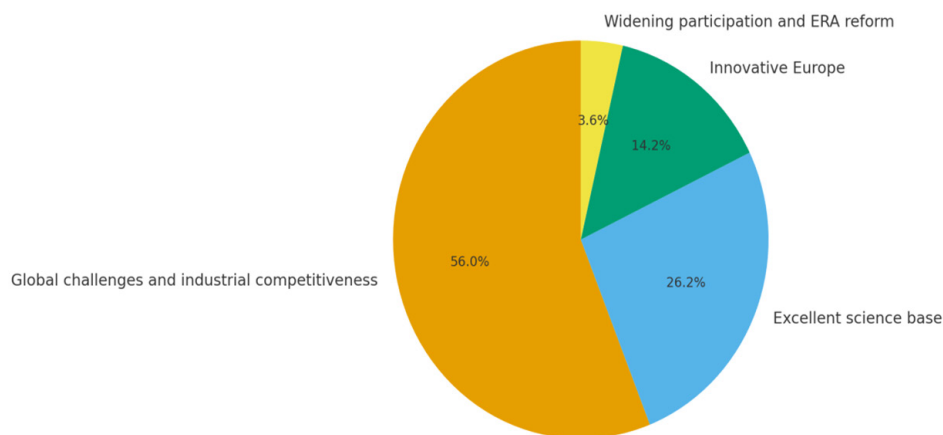


Figure 2. **Horizon Europe priorities**

Source: European Commission, Horizon Europe – budget 2021–2027.

This program strengthens the competitiveness of the European economy while supporting the achievement of sustainable development goals. In the context of SMEs, the activities of the European Innovation Council (EIC) are particularly important, as it offers a set of financial instruments aimed at developing breakthrough technologies. The flagship EIC Accelerator mechanism supports projects characterized by high investment risk and, at the same time, the potential to create new markets. Funding covers, among others, projects in the fields of artificial intelligence, photonics, nanotechnology, biotechnology, and the circular economy, enabling companies to implement innovations that are not available under traditional market conditions. This allows SMEs to actively participate in building the global competitiveness of the European economy (European Commission, n.d.).

Translated with DeepL.com (free version) Horizon Europe is complemented by EU structural and investment funds, such as the European Regional Development Fund (ERDF) and the European Social Fund Plus (ESF+). In the current financial perspective for 2021-2027, particular emphasis has been placed on supporting innovation and digitization in businesses, developing a low-carbon economy, and strengthening human capital. While Horizon Europe focuses on international research and development projects, structural funds play a key role in implementing innovation results at the local and regional level (Lewandowska et al., 2015). They enable the financing of investments in infrastructure, the implementation of digital technologies, the internationalization of activities, and ecological transformation. As a result, structural funds are an important complement to research and development programs, creating conditions for the practical

application of innovation at the local and regional levels. The table 1 summarizes the key differences and similarities between Horizon Europe and structural funds.

Table 1. **Comparison of Horizon Europe and structural funds**

Feature / Instrument	Horizon Europe	Structural Funds (ERDF, ESF+)
Scale	International	Local/regional
Type of support	R&D, innovation	Infrastructure, digitalisation, skills development
Beneficiaries	SMEs, start-ups, universities	SMEs, local government entities
Objective	New technologies and markets	Implementation of innovation results, local development

Source: own study based on European Commission documents and program data from Horizon Europe and the 2021–2027 structural funds (European Commission, n.d.)

In Poland, this support takes the form of various national and regional programs. Each province has its own set of instruments supporting the development of SMEs, which allows for the adaptation of measures to the specific characteristics of the local economy. Additional support for less developed regions, such as Eastern Poland, is particularly important, as it helps to reduce development disparities and strengthen territorial cohesion. As a result, SMEs gain access to funds that enable both business development and the implementation of new innovation-based business models.

The combination of instruments offered under Horizon Europe and structural funds creates a comprehensive system of support for enterprises, combining various aspects of development: technological, organizational, financial, and social. On the one hand, SMEs can carry out research projects and develop breakthrough technologies, and on the other, they have the opportunity to use funds earmarked for infrastructure modernization, skills development, and internationalization. This kind of synergy increases the resilience of the SME sector to economic shocks and accelerates the processes of digital and green transformation.

However, it is worth noting that despite the wide range of instruments available, SMEs face barriers to accessing funds. These include complex application procedures, insufficient knowledge about financing opportunities, and limited administrative resources on the part of enterprises (Walaszczyk & Belina, 2017). Increasing the effectiveness of support therefore requires simplifying application mechanisms, developing advisory services and strengthening intermediary institutions.

The role of the Horizon Europe programme in building the competitiveness and innovation of SMEs goes beyond the simple distribution of funds. This programme, in synergy with EU structural funds, creates an integrated support ecosystem that

enables both the generation of new technologies and their implementation in economic practice. The combination of a research and development perspective with investments in infrastructure, digitalisation, energy transition and human capital development leads to multidimensional development effects that strengthen the position of European companies in global markets.

Strengthening the role of SMEs as drivers of innovation is not only a prerequisite for building the European Union's competitive advantage, but also an element ensuring its strategic autonomy in key sectors of the economy. In the face of global challenges such as energy crises, climate change and growing international competition, Horizon Europe, together with the Structural Funds, is becoming an instrument for building economic resilience and accelerating the digital and green transition. However, the long-term success of this approach depends on the ability of Member States and regions to absorb funds and eliminate bureaucratic and competence barriers that limit SMEs' access to financing. Only then will it be possible to fully exploit the potential synergies between research, industrial and regional policies. Consequently, Horizon Europe, supported by the Structural Funds, is not only a financial tool but also one of the pillars of the European development strategy, enabling SMEs to become global leaders in innovation while promoting more cohesive and sustainable development across the European Union.

The development of small and medium-sized enterprises (SMEs) is the foundation of the European Union's economy and one of the key areas for the implementation of innovation policy. In an era of accelerated technological change, global competition and digital-green transformation, the effectiveness of instruments supporting this sector is becoming particularly important. Among the tools of greatest importance for strengthening the innovative potential of enterprises are two programmes: Horizon Europe, focused on financing high-risk research and innovation, and the 2021-2027 Structural and Investment Funds, supporting modernisation and regional development.

The aim of this analysis is to assess the effectiveness of these instruments and identify the factors determining their effectiveness in relation to the innovation and competitiveness of SMEs. The study is based on a quantitative and qualitative approach, combining indicator analysis with an interpretation of institutional conditions. The empirical data comes from reports by the European Commission (2022–2024), the European Court of Auditors (2022) and national institutions implementing EU programmes. The analysis focuses on three key performance indicators:

1. Growth in expenditure on research and development (R&D)
2. Indicator of the introduction of new products and services
3. Growth in labour productivity

In order to compare the effectiveness of Horizon Europe and the 2021-2027 Structural Funds in terms of their impact on innovation and SME development in the European Union, a summary of the average values of the performance indicators is presented in the table 2.

Table 2. Comparison of the impact of the Horizon Europe programme and the 2021–2027 Structural Funds on selected areas of SME activity in the EU (in %)

Efficiency indicator	Horizon Europe	Structural Funds 2021–2027
Increase in R&D expenditure	+22%	+9%
Introduction of new products/services	+18%	+11%
Increase in labour productivity	+7%	+12%

Source: own study based on European Commission reports and European Court of Auditors (2022).

Based on the Table 2, it can be suggested that Horizon Europe generates stronger effects in the area of research and development and product innovation, while structural funds have a greater impact on productivity and technological modernisation. Both instruments contribute in a complementary manner to the growth of SMEs' development potential, but with varying intensity depending on the profile of the region and its absorption capacity.

Structural and investment funds, on the other hand, primarily affect the organisational and technological efficiency of SMEs. According to the European Court of Auditors (2022), the effectiveness of ERDF support for SME competitiveness depends on the design of funding mechanisms, the targeting of interventions and the ability of enterprises to effectively use available resources. These effects mainly included the modernisation of machinery, the digitisation of production processes, improvements in energy efficiency and the development of staff skills. However, there are clear differences between regions. The table below presents a summary and comparison of the impact of both instruments in two groups of regions with high and low absorption capacity.

Table 3. Comparison of the impact of Horizon Europe and the 2021–2027 Structural Funds on selected SME performance indicators by country group (in %)

Region	Programme	Growth in R&D	New products/ services	Increase in productivity
Germany, Finland, the Netherlands	Horizon Europe	+25%	+22%	+8%
Germany, Finland, the Netherlands	Structural funds	+11%	+12%	+13%
Poland, Czech Republic, Portugal	Horizon Europe	+10%	+8%	+4%
Poland, Czech Republic, Portugal	Structural funds	+7%	+9%	+11%

Source: own study based on European Commission reports and European Court of Auditors (2022)

The Table 3 confirms that regions with high absorption capacity are able to effectively use both types of support, achieving significant growth in innovation and productivity. In structurally weaker regions, however, a delay effect is observed, and support mainly yields results in the area of modernisation and efficiency improvement, while its impact on generating breakthrough innovations remains limited.

In Central and Eastern European regions, EU programmes have primarily contributed to the adaptation of existing technologies and increased local competitiveness, but have less often led to the creation of new, breakthrough solutions. Meanwhile, in regions with developed research infrastructure and cooperation networks, support from Horizon Europe has resulted in an increase in the number of patent applications, the creation of innovation clusters and the internationalisation of business activities.

The interpretation of the results obtained indicates that the effectiveness of public interventions in the area of innovation depends to a greater extent on the institutional quality and absorption capacity of regions than on the scale of financial expenditure alone. The level of human capital development, the degree of administrative efficiency and the intensity of cross-sectoral cooperation between public administration, the science sector and enterprises play a key role here. In regions where these entities operate within a well-integrated innovation ecosystem, financial support translates into sustainable development effects and an increase in the long-term competitiveness of the economy. In regions with weaker institutional coordination, however, interventions are mainly short-term in nature and contribute to improving infrastructure and increasing productivity, but do not lead to the creation of sustainable technological advantages.

The analysis therefore shows that the two instruments are clearly complementary. Horizon Europe is a source of scientific and research innovation, while structural funds strengthen the capacity of enterprises to absorb and implement technology. Regions that skilfully combine both sources of funding achieve the highest synergies in terms of both innovation and productivity growth.

The findings of the study also have practical implications for public policy. Firstly, greater integration of research funding systems with regional policy is needed so that research projects translate into actual implementation in the SME sector. Secondly, efforts should be made to simplify application procedures and increase the accessibility of research programmes for enterprises from regions with lower potential. Thirdly, it is necessary to further strengthen innovation ecosystems – science and technology parks, knowledge transfer centres and cooperation clusters – which play a key role in transforming financial resources into real economic results.

In summary, the analysis confirms that Horizon Europe and the 2021–2027 Structural Funds effectively support the development of the SME sector in the European Union. However, their effectiveness varies across regions and depends on the absorption capacity of individual regions. Horizon Europe has a stronger impact on

increasing innovation and internationalisation, while the Structural Funds contribute to increasing productivity, technological modernisation and economic resilience. The combined use of both programmes enables the achievement of sustainable development effects and the building of a competitive European economy based on knowledge and innovation.

5. Conclusions

Small and medium-sized enterprises (SMEs) play a crucial role in shaping the socio-economic development of the European Union, contributing to employment growth, productivity, and the reduction of regional disparities (Lisowska, 2019; Charucka, 2014). Their capacity for innovation and adaptability to dynamic market conditions determines both the investment attractiveness of regions and the overall resilience of the European economy (Matejun & Miller, 2010). The European Union's support instruments – notably the Horizon Europe Programme and the Structural and Investment Funds for 2021–2027 – aim to stimulate research, foster innovation, modernise enterprises, and strengthen their operational capabilities (European Parliament, 2025; Bostan, 2022).

The Horizon Europe Programme, with its focus on research and development activities and the commercialisation of innovation, has significantly increased R&D expenditure and innovation intensity among SMEs, particularly in regions with a well-developed innovation ecosystem and strong absorptive capacity (Renda et al., 2015). The Structural Funds, by contrast, perform a complementary role: they support enterprise modernisation, the development of human capital, infrastructure improvements, and the strengthening of linkages between science and industry. In less developed regions, these funds have been instrumental in enhancing productivity and addressing institutional weaknesses, thus supporting the cohesion objectives of the European Union (Szörfi et al., 2025).

The analysis confirms the research hypothesis that both Horizon Europe and the Structural and Investment Funds for 2021–2027 contribute to improving the innovation and competitiveness of SMEs, although the effects differ depending on regional absorptive capacity. The effectiveness of these interventions is determined not only by the scale of financial support but, above all, by the quality of implementing institutions, the competences of human resources, and the intensity of cross-sectoral cooperation. Based on the analysis, the following recommendations can be made:

1. Strengthening regional absorptive capacity through investment in research and development infrastructure, human capital development, and collaboration between academia, public administration, and industry.
2. Integrating EU support instruments – combining Horizon Europe and Structural Fund mechanisms to achieve synergy between scientific innovation and business modernisation.

3. Developing sustainable innovation ecosystems, including business incubators, technology parks, and science–industry cooperation centres, to facilitate knowledge transfer and innovation diffusion.
4. Targeting support towards less-developed regions to reduce disparities in innovation performance and SME competitiveness across the EU.
5. Enhancing monitoring and evaluation frameworks to systematically assess the effectiveness of interventions in light of local institutional conditions and absorptive potential.

Adopting such an integrated approach would not only increase the efficiency of EU funding but also strengthen the long-term competitiveness and resilience of SMEs, thereby contributing to the sustainable development of European regions and the creation of a knowledge-based economy. The findings also enrich the debate on the effectiveness of EU innovation policy, highlighting that the key to success lies in the complementarity of support instruments and the institutional quality of their implementation.

Declaration of Generative AI and AI-assisted technologies in the writing process

During the preparation of this work the author did not use Generative AI and AI-assisted technologies in the writing process.

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