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THE EUROPEAN COHESION FUNDS POLICY IN THE REGIONAL SCIENCE LITERATURE: A SYSTEMATIC REVIEW

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The European Cohesion Funds Policy in the Regional Science Literature: A Systematic Review[∇]

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ABSTRACT

This paper employs a top-down methodological approach to identify the most relevant contributions in the literature on the impact of European Cohesion Policy and European Structural and Investment Funds (ESIF) on regional development. After a broad-spectrum bibliometric review, identifying the overall structure of research in this field, we systematically narrow its focus to quantitative studies and, ultimately, to econometric analyses of ESIF effectiveness. The results indicate that empirical research on ESIF has grown in complexity, with increasing reliance on advanced econometric techniques such as spatial econometrics, difference-in-differences, and regression discontinuity designs. While a large portion of the literature finds positive effects on economic growth, employment, and regional convergence, these effects are frequently conditional on governance quality, institutional frameworks, and regional characteristics. In contrast, some studies report insignificant or even negative impacts, highlighting inefficiencies in fund allocation and policy implementation. The findings emphasize the necessity for context-specific policy adaptations, ensuring that ESIF continues to support the evolving needs of regional economies in the European Union.

JEL Codes: R11, R12, R58, O43

Keywords: EU structural funds, regional growth, EU Cohesion Policy, Bibliometric analysis

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1. INTRODUCTION

The international scientific community has shown increasing interest in assessing the impact of European Structural and Investment Funds (ESIF) on regional development. This interest aligns with the growing financial dimensions of these funds and the evolving significance of the European Cohesion Policy (ECP). Over time, the ECP has expanded in scope and complexity, integrating new strategic objectives, instruments, and funding mechanisms. This evolution has been paralleled by advances in data availability and econometric techniques, enabling more sophisticated analyses of regional impacts.

While many studies have provided valuable insights, there remain opportunities to consolidate findings and explore emerging areas, particularly in aligning evaluation methods with the increasingly multifaceted goals of the ECP. For instance, some quantitative studies on the impact of ESIF, such as Pinho et al. (2015) and Butkus et al. (2019), as well as meta-analyses like Dall'Erba and Fang (2015), provide traditional bibliometric reviews of econometric studies but do not employ structured search methodologies such as Systematic Literature Review (SLR). Conversely, works like Foglia (2023) and Nishimura et al. (2021), which conducted large-scale bibliometric analyses of ECP-related publications (identifying 1,255 and 170 studies, respectively), provide valuable insights into the scientific production in this domain. However, these studies neither emphasize the methodologies employed nor focus on the identification and analysis of quantitative approaches in detail.

This paper seeks to address these gaps by conducting a phased “top-down” bibliometric analysis, beginning with a broad-spectrum SLR to identify and characterize scientific studies addressing the ECP in its various dimensions, irrespective of methodology or geographical scope. Subsequently, the focus narrows to quantitative methodologies, culminating in an in-depth analysis of econometric studies evaluating the regional impact of structural funds. The process is further refined to include a more traditional bibliometric review of econometric studies, with the distinct advantage of being firmly grounded in systematic bibliometric review methodology. This layered approach aims to consolidate the state of knowledge, identify critical research gaps, and underscore the policy implications of econometric evaluations, emphasizing the need for continuous assessment and adaptation to ensure that Cohesion Policy effectively addresses the evolving needs of the EU. The paper, thus, will be an excellent instrument for scholars interested in analysing the quantitative assessment of European structural funds in several

regional dimensions, for it provides a systematic review of the most influential contributions to the literature in this field.

The paper is structured as follows: Section 2 presents the SLR methodology, detailing the search strategy, inclusion criteria, and data processing. Section 3 describes the descriptive analysis, outlining key publication trends, authorship patterns, and journal distribution. Section 4 provides the results of the bibliometric analysis, identifying major themes, clusters, and evolving research trends on ESIF. Section 5 reviews econometric studies assessing ESIF impact, summarizing their methodologies, temporal and geographical scope, and key findings. Finally, Section 6 discusses the broader implications of these findings, identifies gaps in the literature, and situates this research within the wider context of European Cohesion Policy studies.

2. THE SYSTEMATIC LITERATURE REVIEW METHODOLOGY

The systematic literature review employed in this study aims to provide a structured and transparent approach to identifying, selecting, and analysing the existing body of research on the European Cohesion Policy (ECP) and its instruments. Given the complexity and breadth of this policy field, the SLR ensures a comprehensive and unbiased assessment of the scientific literature, capturing both the evolution of research themes and methodological approaches. This process allows for a more precise identification of knowledge gaps, particularly concerning the impact of ESIF on regional development. The review follows a multi-step approach, refining the scope from a broad bibliometric analysis to a focused selection of quantitative and econometric studies, ensuring a robust foundation for subsequent empirical investigations.

2.1 Methodological approach

Bibliometrics, a term initially suggested by Pritchard in 1969 to replace the term statistical bibliography, is defined by this author as the application of mathematics and statistical methods to books and other media of communication (Pritchard, 1969). Bibliometric studies grew exponentially in the 1970's (Okubo, 1997) and, since then, the methods and the databases used allowed the development of sophisticated analysis, solidifying its status as an instrument to measure science's output.

Kitchenham (2004) published influential guidelines for conducting systematic literature reviews (SLR) in the domain of software engineering, contributing to the widespread

adoption of this methodology. A SLR is a comprehensive analysis of scientific publications with the aim of identifying, reviewing and characterising the scientific knowledge published in a particular domain which, in our case, is the ECP and its strategic instruments. This analysis seeks to identify the evolution and trend of this topic in the specialised journals under analysis, including research focused on the impact of the ECP on the growth and convergence of the European regions. Unlike a traditional literature review, by adopting explicit, replicable and transparent criteria, SLR allows the selection of relevant articles with strategies that minimize bias and random error (Cook et al., 1997). This involves developing a clear research question, defining precise search terms, and systematically searching across multiple academic databases relevant to regional development, economics, and European policy. Through this process, the SLR will critically appraise the relevance of the studies identified, categorize them by methodology, and ultimately present an organized and insightful analysis of the current state of knowledge on ECP's impact on regional development.

The planning and development of the Review Protocol is a critical step for an SLR. A pre-defined protocol is necessary to reduce the possibility of researcher bias and ensure transparency and replicability of the review process. The protocol should include elements like the background and the research question, the search strategy and terms used, study selection criteria, and procedures for including or excluding a study (Kitchenham, 2004). By adhering to a pre-defined protocol, researchers can minimize the risk of selectively including or excluding studies based on their findings or preconceptions.

On the basis of a review protocol, a database was built and then the papers that presented studies based on quantitative empirical analyses were identified. In this way, it was possible to assess the dynamics of research on the subject of the ECP and, in particular, to identify the distinctive characteristics of the subset of studies classified as quantitative in nature.

The definition of a review protocol began with the definition of the research question. The object of the study of the SLR is to identify and characterise the scientific production of the study of the impact of ECP and its main instruments, namely the ESIF, on the regional development of the EU.

Published articles were collected from the two most relevant databases, Scopus and Web of Science (WoS), between 1 and 4 February 2024. To ensure greater rigour and consistency, the search focused on scientific articles published up to 2024 and peer-

reviewed, omitting elements such as conference proceedings, technical reports and book reviews. The language used was English, since the vast majority of papers have titles and abstracts in this language.

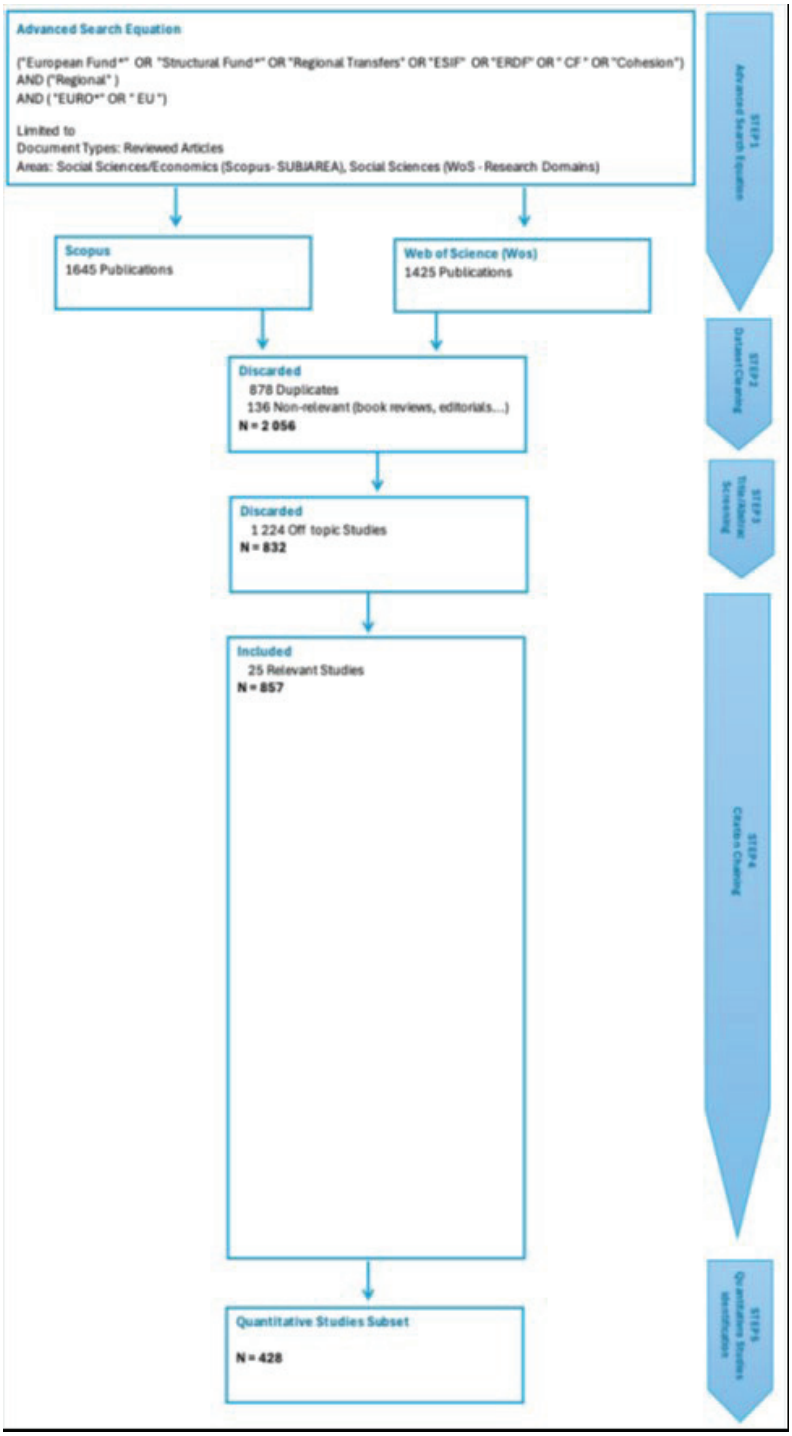
2.2 Research, data collection and treatment

Bearing in mind the need in this first stage to employ a holistic view that allows for a comprehensive characterisation of the literature focused on ECP and capture its dynamics, it became necessary to use search criteria that were focused but, at the same time, broad enough to prevent the exclusion of relevant works.

Thus, the advanced search equation (Figure 1), favoured a wide search spectrum by including keywords associated with cohesion financing, while refining the results to the European regional context using terms like "REGIONAL," "EURO," or "EU ". The search was limited to peer-reviewed articles in the social sciences and economics domains indexed in Scopus and Web of Science databases. The aim was to identify published studies focused on analysing the impact of ECP, and particularly European Structural and Investment Funds (ESIF) on the growth and convergence of the European regions, irrespective of the study's methodology or geographical scope.

Nishimura et al. (2021) employed a similar methodology but used tighter criteria, with search equations that are focused on structural funds and, simultaneously, on economic development, growth or impact, which necessarily translates into a significantly smaller number of studies (170, after excluding duplicates). Foglia (2023) performs a larger spectrum bibliometric analysis of the scientific literature of the European cohesion, focusing on the topic of smart specialization and on the WoS database, obtaining a total of 1,246 papers. Both studies use data collected in October 2020. The proposed approach in our work is more complex, involving different stages, analysing a broad universe of scientific production to subsequently segment and characterise the specific sub-segment of quantitative studies and, at a later stage, develop a specific analysis of econometric studies on the impact of the ESIF, on a regional scale.

Figure 1. Flow diagram of the steps of the literature search process



Source: Own elaboration

Figure 1 illustrates the systematic literature search process. The initial search yielded 1,645 articles from Scopus and 1,425 from Web of Science. In the second stage, the dataset obtained was cleaned, eliminating duplicates (878 articles) and non-relevant records such as editorials and book reviews (136 articles), totalling 2,056 publications. The third stage consisted of screening by reviewing titles and abstracts, considering all publications that address the topic of ECP, discarding off-topic articles. Studies that do not address any dimension of the cohesion policy, its instruments or its impacts (1,232) were not considered.

In a further effort to enhance the comprehensiveness of the search strategy, the fourth step employed "citation chaining," also known as "snowballing". This approach, following guidelines proposed by Wohlin et al. (2020), focus systematic, rather than automatic searching, complementing the initial search with high quality, relevant papers. This technique identified 25 additional studies that, while not indexed in the Scopus and WoS databases, were deemed highly relevant to the evaluation of the ECP's impact, particularly the impact of ESIFs on regional development. These studies, primarily working papers and technical reports (grey literature), were widely recognized and cited within the field and demonstrably aligned with the thematic criteria established for the initial search equation. The inclusion of these relevant studies enriched the final database, bringing the total number of records to 857.

The final stage of the analysis involved classifying the selected articles as “quantitative studies”, defined as those that primarily employing quantitative empirical analysis methods. This encompasses a range of methodologies, including cluster analysis, construction of macroeconomic indices, statistical analysis, general equilibrium models, data envelopment, input-output, fund absorption analysis, and other econometric models. In total, 428 studies, representing 49.24% of the initial pool, were classified as “quantitative studies”.

It is acknowledged that some degree of subjectivity is inherent in classifying studies based on methodology. However, the classification process was guided by a predefined set of criteria established during the systematic literature review protocol. This systematic, transparent and replicable approach minimizes the potential for bias and ensures a robust foundation for further analysis of the quantitative literature subset.

3. DESCRIPTIVE ANALYSIS

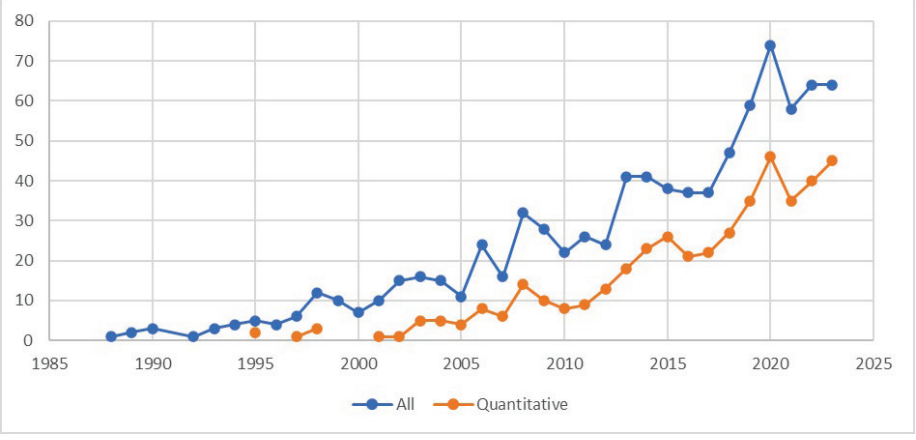
The descriptive analysis examines the evolution of research on ECP and ESIF by mapping key trends in the scientific production of the field. It highlights the volume of published studies over time and identifies the academic journals where these works are most frequently disseminated. Additionally, it provides an overview of authorship patterns, including the most prolific contributors and the extent of collaboration within the research community. By structuring these elements, this section contextualizes the bibliometric results and offers insights into the trajectory of academic discussions on cohesion policy.

3.1. Evolution of scientific production on European Cohesion Policy

Research on the European Cohesion Policy (ECP) emerged in the wake of the Single European Act (SEA) of 1986, which formally established regional policy as a competence of the European Community and inscribed social and economic cohesion as an objective. Since then, there has been a substantial increase in published articles, with 64 identified in 2023 and 2022 alone, representing an average of 5.5 articles per month.

The production of quantitative studies on the ECP's impact exhibits a similar pattern, with a delayed start. While the first quantitative studies appeared around 1995, their share of total ECP research has grown steadily. In the first decade of the 21st century, they constituted around 30.4% of identified research. This figure has climbed to an average of 61.3% in the past ten years (2014-2023), even reaching 70.3% in 2023.

Figure 2. Evolution of Scientific Production on European Cohesion Policy



Source: Own elaboration based on WoS and Scopus

3.2 Journals with the highest scientific production

Table 1 presents a summary of journals with the highest number of studies referenced. Among the 857 analysed documents of "All articles" dataset, 363 journals were used for dissemination. Regional Studies (Citescore 2022: 9) stands out with 88 publications, followed by European Planning Studies (Citescore 2022: 7) with 53 and Investigaciones Regionales (Citescore 2022: 1.8) with 24. This concentration, representing 18.9% of total publications, suggests a potential dominance of these journals within the field.

The analysis of the 428 "quantitative" studies, published in 206 different journals, reveals similar leadership by Regional Studies, European Planning Studies, and Investigaciones Regionales, with 55, 19, and 17 published articles, respectively. This consistency reinforces the dominance of these journals across different research approaches within ECP research. However, the share of the total articles published in these three journals, at 10.6%, is lower when compared with the complete dataset of articles.

Table 1. Journals with the highest scientific production

No.	All		Quantitative	
	Journal	Studies	Journal	Studies
1	Regional Studies	85	Regional Studies	55
2	European Planning Studies	53	European Planning Studies	19
3	Investigaciones Regionales	24	Investigaciones Regionales	17
4	European Urban and Regional Studies	17	Papers in Regional Science	14
5	Sustainability (Switzerland)	16	Journal of Regional Science	10
6	Regional and Federal Studies	15	Sustainability (Switzerland)	10
7	Papers in Regional Science	15	Journal of Common Market Studies	8
8	Journal of Common Market Studies	13	Socio-Economic Planning Sciences	6
9	Journal of Regional Science	10	Regional Science and Urban Economics	5
10	European Environment	10	-	-

Source: Own elaboration based on WoS and Scopus

3.3. Authors with the highest scientific production

The 857 studies were written by 1,455 different authors (Table 2), with Andrés Rodríguez-Pose, Ricardo Crescenzi, and Mindaugas Butkus presenting the highest number of publications. 32% of the articles are written by only one author, while 30.7% and 24.5% have two or three authors, respectively. In the subset of data related to the 428 quantitative studies, the panorama does not change substantially. The list of authors with the highest published scientific production is similar.

Table 2. Authors with the highest scientific production

No.	All		Quantitative	
	Journal	Studies	Journal	Studies
1	Rodríguez-Pose, A.	12	Rodríguez-Pose, A.	11
2	Crescenzi, R.	10	Butkus, M.	9
3	Butkus, M.	9	Maciulyte-Sniukiene, A.	9
4	Fratesi, U.	9	Pellegrini, G.	9
5	Maciulyte-Sniukiene, A.	9	Crescenzi, R.	8
6	Pellegrini, G.	9	Fratesi, U.	8
7	Bachtler, J.	8	Matuzevičiute, K.	8
8	Dąbrowski, M.	8	Arbolino, R.	7
9	Dall'erba, S.	8	Cardenete, M. A.	7
10	Giua, M.	8	Dall'erba, S.	7
11	Matuzevičiute, K.	8	De Blasio, G.	7
12	Arbolino, R.	7	Di Caro, P.	7
13	Barbero, J.	7	Giua, M.	7
14	Cardenete, M. A.	7	Barbero, J.	6
15	De Blasio, G.	7	Cerqua, A.	6
16	Di Caro, P.	7	Gallo, J. L.	6

Source: Own elaboration based on WoS and Scopus

The analysis of authorship patterns in Table 3 reveals interesting trends: 32% of the articles are written by a single author, while 67.8% involve collaboration between two or more authors (30.7% with two authors and 24.5% with three authors). A comparison with the subset of data for quantitative studies (428 studies) reveals a potentially significant difference. The weight of single-authored articles drops to 20.6% in quantitative studies, suggesting a higher degree of collaboration within quantitative research in ECP.

Table 3. Number of authors per article

# Authors	All		Quantitative	
	No. Studies	%	No. Studies	%
1	274	32,0%	88	20,6%
2	263	30,7%	127	29,7%
3	210	24,5%	143	33,4%
4	74	8,6%	47	11,0%
5 and above	36	4,2%	23	5,4%

Source: Own elaboration based on WoS and Scopus

4. BIBLIOMETRIC ANALYSIS

The articles database was processed in VosViewer version 1.6.18, an open-source tool for visualizing and analysing scientific literature and producing bibliometric visualizations, developed by the Centre for Science and Technology Studies (CWTS) at Leiden University. The analysis focused both on all 857 articles identified and on the subset of 428 quantitative articles, to build maps based on keywords and terms extracted from titles and abstracts, based on co-occurrence data. VosViewer clusters related topics and fields, assisting in discerning and analysing intricate relationships among key concepts, research

hotspots and identifying core issues and concepts. Items, like keywords or terms, are connected with links, and clusters are sets of grouped items where one item cannot belong to more than one cluster.

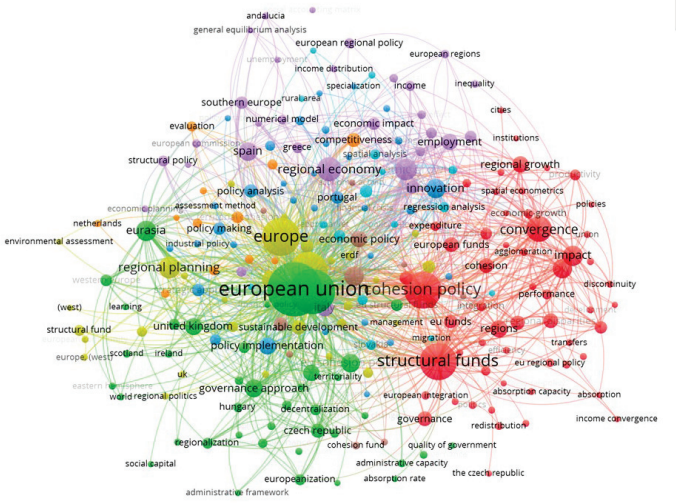
4.1 Keywords co-occurrence

A co-occurrence analysis was conducted in VosViewer using the keywords extracted from the published articles and generating co-occurrence maps. These maps helped us identify and characterize thematic clusters within the research. This analysis was performed for both the entire dataset of articles (all articles) and the subset focusing on quantitative research (quantitative articles).

4.1.1 All articles

The co-occurrence map of keywords for all 857 identified ECP articles was generated in VosViewer, setting a minimum threshold of 5 occurrences per keyword. This resulted in 230 out of 2,295 keywords meeting the criteria, and 8 clusters being identified, as shown in Figure 3.

Figure 3. Co-occurrence map of keywords (Network Visualization), all articles



Source: Own elaboration using VosViewer

This co-occurrence map provides a comprehensive visual representation of the key topics and their relationships within the literature on the European Cohesion Policy and European Structural Funds, complementing the thematic organization of the keyword clusters. We can observe that the central and most prominent terms are, unsurprisingly, "European Union", "regional policy", "cohesion policy", "Europe", and "structural funds," indicating that these are the core concepts discussed in the literature and closely related terms include "regional growth," "economic growth," "regional development," and "convergence," aligned with the objectives and instruments of the ECP. Terms such as "innovation," "investment," "employment," "governance," and "environment" are also clearly visible, suggesting that these themes are frequently explored in the context of the ECP's impact on various aspects of regional development. The presence of terms like "Southern Europe," "Eastern Europe," "Western Europe," and "the Czech Republic" indicates that a significant portion of the literature covers or emphasizes different geographical regions within Europe. Other terms like "evaluation," "impact," "assessment," and "numerical model" reflect the literature focus on studies evaluating and modelling the impact of the ECP and its instruments.

By comparing the co-occurrence map with the keyword clusters in Table 4, we can see that the clusters effectively capture the diverse themes and concepts present in the literature. Analysing the keywords within each of the 8 clusters reveals the dominant thematic spectra of the published literature on ECP. This analysis provides a comprehensive overview of the research themes in cohesion policy, highlighting its multifaceted approach and its objectives in terms of territorial cohesion and reducing regional disparities. In table 4, it's possible to find the list of keywords, by cluster. Designations have been assigned to each of these clusters to capture their "thematic identity." This comprehensive analysis of keyword clusters provides valuable insights into the diverse research themes and focus areas within the literature reflecting its multidimensional nature.

Table 4. List of keywords per Cluster, all articles

Cluster	Keywords
1 - Core concepts of ECP	absorption; absorption capacity; agglomeration; allocation; cities; cohesion; cohesion policy; competition; convergence; development; discontinuity; disparities; dynamics; economic geography; economic-growth; efficiency; EU; EU funds; European integration; European structural funds; European union regional policy; European-union; euroscepticism; expenditure; funds; governance; government;

Cluster		Keywords
		growth; impact; implementation; income convergence; indicators; infrastructure; institutional quality; institutions; integration; model; panel data; performance; policy; politics; redistribution; region; regional disparities; regional economic growth; regional growth; regions; spatial econometrics; spillovers; structural and cohesion funds; structural funds; the Czech Republic; transfers; union; EU regional policy; European funds; policies; productivity.
	2 - Governance and Implementation of ECP	absorption rate; administrative capacity; administrative framework; brexit; Bulgaria; central Europe; Czech Republic; decentralization; Eastern hemisphere; EU cohesion policy; EU structural funds; Eurasia; European Union; European Union cohesion policy; europeanisation; europeanization; financial policy; governance approach; Hungary; institutional framework; Ireland; learning; multi-level governance; multilevel governance; partnership; partnership approach; Poland; political economy; quality of government; regional policies; regional policy; regionalism; regionalization; Scotland; social capital; structural change; territoriality; United Kingdom; Western Europe; world.
	3 - Economic Development Strategies in ECP	assessment method; cost-benefit analysis; decision making; development strategy; eastern Europe; economics; entrepreneurship; estimation method; financial crisis; industrial policy; innovation; innovation policy; investment; modeling; peripheral region; policy analysis; policy implementation; policy making; policy strategy; Portugal; public policy; public sector; research and development; resilience; smart specialization; smart specialization; specialization; stakeholder; strategic approach; technological development; technology policy; tourism; transport infrastructure.
	4 - Funding instruments and sustainability	cluster analysis; data envelopment analysis; economic development; environmental assessment; ERDF; Europe; Europe, (west); European cohesion policy; European Community; European regional dev. fund; European social fund; European structural and inv.funds; financial provision; management; policy approach; regional development; regional planning; regional politics; renewable energy; resource allocation; Romania; small and medium-sized enterprise; SMES; structural adjustment; structural fund; sustainability; sustainable development; UK; urban development; west.
	5 - Economic Impact of ECP	Andalucia; econometrics; economic growth; economic impact; economic planning; empirical analysis; employment; European commission; European regional policy; European regions; finance; general equilibrium analysis; Greece; gross domestic product; heterogeneity; human capital; income; income distribution; inequality; Italy; numerical model; policy development; regional convergence; regional economy; social accounting matrix; Southern Europe; Spain; spillover effect; structural policy; unemployment.
	6 - Rural Transformation, Labor Markets, and ECP	capital; common agricultural policy; comparative study; labor market; local government; migration; policy impact; policy reform; public spending; regression analysis; regression discontinuity design; rural area; rural development; rural policy; Slovakia; spatial analysis.
	7 - Cross-Border Cooperation and Territorial Development	border region; competitiveness; cross-border cooperation; evaluation; France; Germany; Interreg; Netherlands; Poland [central Europe]; socioeconomic conditions; territorial cohesion; territorial management; territorial planning.
	8 - Infrastructure Investment and Economic Growth in ECP	cohesion fund; economic activity; economic integration; economic policy; European regional dev. fund (ERDF); investments; spatial distribution; subsidies; total factor productivity; transportation infrastructure.

Source: Own elaboration

Each cluster represents a distinct but interconnected aspect of ECP, reflecting the breadth of academic inquiry in this field. The first cluster, **Core Concepts of ECP**, encompasses the fundamental themes and terminologies central to understanding the policy. It covers aspects such as allocation, governance, economic growth, and regional development, with a strong focus on the impact and implementation of structural funds. It highlights discussions on how structural funds contribute to regional growth, convergence, and overall impact, with key terms suggesting an emphasis on measuring outcomes and the practical aspects of policy implementation.

Closely linked to these foundational concepts is the second cluster, **Governance and Implementation of ECP**, which examines the governance structures and implementation processes of ECP. It highlights administrative capacities, decentralization, partnership approaches, and institutional frameworks, reflecting discussions on the effectiveness and efficiency of policy implementation.

The third thematic area, **Economic Development Strategies in ECP**, focuses on various strategies and approaches to economic development within the framework of ECP, involving themes such as innovation policy, economic resilience, and regional development strategies. It focuses on economic growth, convergence processes, and strategies for promoting balanced regional development, including the reduction of regional disparities.

A crucial dimension of ECP research is addressed in the fourth cluster, **Funding Instruments and Sustainability**, which examines the evaluation of funding instruments and sustainability measures within ECP. This includes the allocation of funds and their impact on various socio-economic indicators, such as structural funds, impact evaluation, and regional performance indicators. A strong emphasis is placed on methodologies aimed at assessing policy effectiveness.

Complementing this financial perspective, the fifth cluster, **Economic Impact of ECP**, analyses the economic outcomes and impacts of ECP in relation to its core objectives. It includes topics such as economic growth, labour market effects, income distribution, and regional development, with a particular focus on the reduction of disparities among regions, a fundamental goal of the policy.

Rural Transformation, Labour Markets and ECP constitute the core of the sixth cluster, focusing on rural transformation, labour market policies, and the related impacts of ECP. This cluster covers policy instruments, rural development, labour market dynamics, and human capital formation, which are essential components of regional development strategies. It also highlights the use of regression discontinuity design and

spatial analysis, suggesting that empirical studies in this area frequently employ these techniques to assess policy impact.

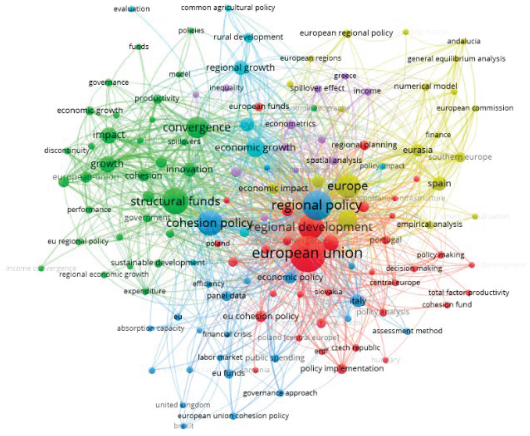
Beyond national borders, the seventh cluster, **Cross-Border Cooperation and Territorial Development**, focuses on cross-border cooperation and territorial development within the ECP framework. It emphasizes themes such as regional cohesion, border regions, and territorial governance, reflecting their importance in the programmatic objectives of ECP.

Finally, the eighth cluster, **Infrastructure Investment and Economic Growth in ECP**, examines the impact of investments in transportation and economic infrastructure on regional development, including the contributions of funding mechanisms such as the Cohesion Fund and the ERDF. It also focuses on their role in fostering economic growth within ECP and includes aspects related to economic policy, infrastructure development, and spatial distribution.

4.1.2 Quantitative Articles

Examining the 428 articles classified as "Quantitative", we observe a distinct thematic specialization profile, as expected. 133 keywords out of 1,376 met the 5-occurrence threshold. Figure 3 visualizes the 6 identified clusters and their relationships. As expected, this sub-dataset map is more focused on econometric analysis, governance effectiveness, and spatial econometrics, indicating a more targeted investigation into policy impacts.

Figure 4. Co-occurrence map of keywords (Network Visualization), quantitative articles



Source: Own elaboration using VosViewer

In Figure 4, the central and most prominent terms are “European Union”, “regional policy”, “cohesion policy”, “Europe” and “structural funds”, indicating that these are the core concepts extensively discussed in quantitative studies and closely align with the major keywords of “all articles” dataset.

Additional terms like “innovation,” “productivity,” “employment,” “economic impact,” “labour market,” and “governance” are also highly emphasized, suggesting that these themes are frequently analysed in the context of the ECP’s impact on various aspects of regional development.

Other terms such as “evaluation,” “impact,” “assessment”, “efficiency”, “performance”, and “numerical model” reflect the quantitative nature of these studies, emphasizing the evaluation and modelling of the ECP’s impacts. The presence of “panel data”, “regression analysis”, “econometrics”, “spatial analysis” and “empirical analysis” further underscores the methodological approaches prevalent in quantitative research on this topic.

The map also highlights specific geographical regions, with terms like “Southern Europe,” “Central Europe,” “Eastern Europe,” “Spain,” and “Poland” indicating a focus on different areas within Europe.

Table 5 identifies the keywords that comprise each of the 6 clusters, along with the designation that seeks to identify the thematic identity of each cluster. The clusters in the subset of quantitative studies prioritize specific thematic areas within cohesion policy, particularly related to econometric, statistical, and spatial methodologies, potentially reflecting a greater concentration of research in these specific areas compared to the broader themes of the entire dataset. By focusing on specific aspects, this subset does not directly address themes such as regionalization, European integration, territorial cooperation and cities, which are covered in the broader dataset.

Table 5. List of keywords per Cluster, quantitative articles

Cluster	Keywords
1 - Economic Convergence and Cohesion Policy	Central Europe; cohesion fund; competitiveness; Czech Republic; data envelopment analysis; decision making; economic activity; economic development; economic integration; ERDF; EU cohesion policy; European cohesion policy; European funds; European regional dev. fund (ERDF); European struct. and inv. funds; European Union; Hungary; investment; Poland; Poland [Central Europe]; policy analysis; policy implementation; policy making; Portugal; regional convergence; regional development; regional planning; Romania; Slovakia; spatial distribution; structural change; sustainability; territorial cohesion; total factor productivity; transport infrastructure.

Cluster	Keywords
2- Impact of Cohesion Funds on Regional Growth	agglomeration; allocation; cohesion; convergence; discontinuity; economic geography; economic-growth; EU regional policy; EU structural funds; European-Union; expenditure; funds; governance; government; growth; impact; income convergence; infrastructure; innovation; integration; model; performance; policies; policy; productivity; regional disparities; regional economic growth; regions; spillovers; structural and cohesion funds; structural funds; sustainable development; union.
3 - Governance, Institutions, and Cohesion Policy Effectiveness	absorption capacity; administrative capacity; assessment method; brexit; cohesion policy; decentralization; economic policy; efficiency; EU; EU funds; European Union cohesion policy; euroscepticism; financial crisis; governance approach; institutional framework; institutional quality; Italy; labour market; modeling panel data; public spending; quality of government; regional policy; United Kingdom.
4 - Econometric Analysis of Cohesion Policy Impacts	Andalucía; economic impact; empirical analysis; Eurasia; Europe; European Commission; European regional policy; European regions; finance; general equilibrium analysis; gross domestic product; investments; numerical model; regional economy; smart specialisation; social accounting matrix; southern Europe; Spain; structural policy; transportation infrastructure;
5 - Spatial Econometrics and Cohesion Policy	econometrics; estimation method; European structural funds; Greece; heterogeneity; human capital; income; income distribution; inequality; spatial analysis; spatial econometrics; spillover effect.
6 - Cohesion Policy and Rural Development: Impact on Employment and Growth	common agricultural policy; economic growth; employment; evaluation; policy impact; regional growth; regression analysis; regression discontinuity design; rural development.

Source: Own elaboration

The first cluster, **Economic Convergence and Cohesion Policy**, addresses the fundamental aspects and outcomes of economic convergence within the framework of ECP. It focuses on how ECP contributes to economic activity, regional development, and overall cohesion. Prominent within this cluster are studies examining regions and countries that are significant recipients of cohesion funds, emphasizing their role and experiences in the implementation of ECP. Key themes include the impact of ECP on economic growth, regional convergence, and the effectiveness of structural funds.

Closely related to this is the second cluster, **Impact of Cohesion Funds on Regional Growth**, which explores the specific effects of cohesion funds on regional economic growth. Research in this area highlights questions of fund allocation, expenditure efficiency, and their overall effectiveness in fostering regional development. Keywords such as “model,” “convergence,” “performance,” “spillovers,” and “discontinuity”

suggest a strong presence of econometric impact analyses aimed at quantifying the effects of ECP interventions.

The third cluster, **Governance, Institutions, and Cohesion Policy Effectiveness**, shifts focus to the governance mechanisms, institutional quality and overall effectiveness of cohesion policies. It highlights the role of administrative capacity, policy implementation, and institutional frameworks in determining policy outcomes. Modelling, panel data, and assessment method keywords reinforce the quantitative nature of the literature present in this cluster.

A more technical dimension of ECP research is found in the fourth cluster, **Econometric Analysis of Cohesion Policy Impacts**, which delves into the econometric and empirical analyses of the impacts of cohesion policies. It addresses various quantitative methods to assess the economic outcomes, policy effectiveness, and regional impacts of the ECP.

The fifth cluster, **Spatial Econometrics and Cohesion Policy**, concentrates on the role of spatial econometric methods in analysing the impact of cohesion policy. Contains keywords related to spatial econometric methods and the analysis of the impacts of cohesion policy. It points to quantitative studies focused on how spatial factors, spillover effects, and others, influence policy outcomes and regional development.

Finally, the sixth cluster, **Cohesion Policy and Rural Development**: Impact on Employment and Growth, focuses on the specific role of cohesion policy in rural development, employment, and economic growth, as well as econometric studies based on regression discontinuity models. It emphasizes the role of policy in promoting rural development and promoting inclusive economic development.

4.2 Title and Abstract Terms Co-occurrence

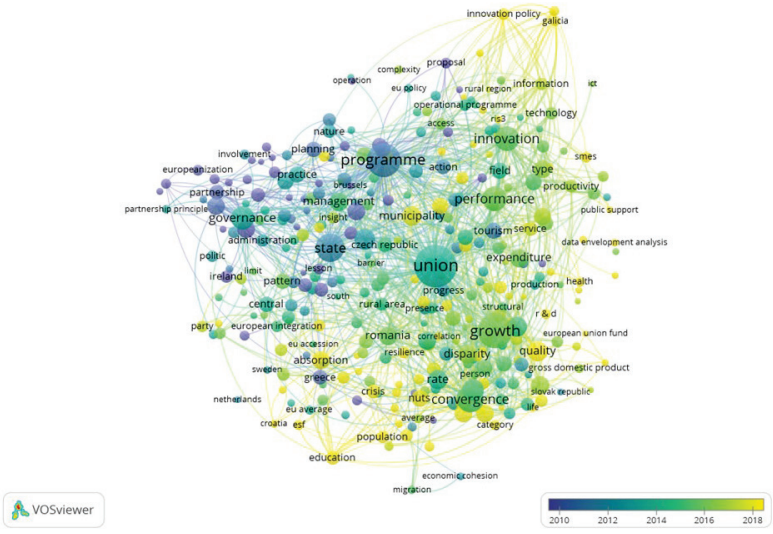
Given the complexity of ECP research, a multi-dimensional approach is crucial. Keywords reflect, necessarily, a narrower analysis and depend on a more subjective classification process. Therefore, a co-occurrence analysis of terms taken from the titles and the abstracts of the selected articles allows for a more comprehensive capture of the key thematic areas within the research. The VosViewer map chosen was Overlay Visualization, similar to the Network Visualization used in Figures 2 and 3, but colouring the items differently, using the variable year of publication. This is particularly helpful, considering the large volume of terms extracted.

4.2.1 All Articles

For the 857 identified ECP studies, VosViewer was used to create co-occurrence maps of terms taken from the titles and abstracts of the publications. The minimum threshold for a term's occurrence was set to 10, which determined the eligibility of 535 out of 12,805 terms. For each of these terms, a relevance score was determined, and 60% of the most relevant terms were selected, resulting in 321 terms. Figure 4 depicts the overlay visualization which highlights the time dimension alongside thematic clusters. This can be particularly useful in revealing how research focus has evolved over time within the field of ECP. Terms are coloured based on their publication year, providing a visual indicator that mimics a temporal lens, providing insights into the evolving research focus and how thematic prominence has shifted over time.

The analysis of this map reveals an interesting evolution in research focus. Older Publications terms (Dark Blue) like "Programme," "Europeanization," "Partnership," and "Brussels", focus on the frameworks and governance structures for cohesion policy, involving foundational principles and early implementation challenges.

Figure 5. Co-occurrence map (Overlay Visualization) of terms (title and abstract), all articles



Source: Own elaboration using VosViewer

Intermediate Publications (Light Blue to Green), reveal a shift towards evaluating the economic impacts of cohesion policies. These studies increasingly focus on terms related

to the measurement of the effectiveness in promoting economic growth and regional development, such as “economic growth”, “regional convergence”, “disparity”, “expenditure” or “productivity”.

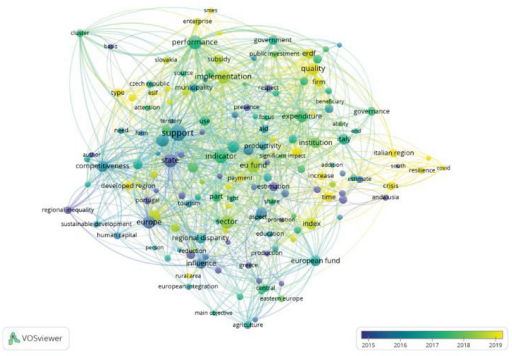
More Recent Publications (Yellow), depict the emergence of terms focused on new and more complex challenges for ECP, like R&D, “innovation policy”, “quality”, “health” and, inevitably, “crisis” and “resilience”, reflecting a growing emphasis on quantifying the impact of ECP on more dimensions beyond the traditional growth and convergence themes.

It is observable an increased emphasis on empirical analysis, econometric methods, and spatial analysis, reflecting a trend towards rigorous quantitative research. Recent publications highlight specific terms like “absortion”, “nut”, “policy efficiency”, “index”, and “data envelopment analysis”, indicating some predominance of analytical studies, using more sophisticated quantitative methods to evaluate specific policy outcomes.

4.2.2 Quantitative Articles

Mirroring the analysis conducted for all articles, we employed the same methodology to explore the thematic landscape of the 428 quantitative studies. A minimum threshold of 10 occurrences per keyword in titles and abstracts was also applied, resulting in the identification of 264 terms out of 6,789. After filtering for the top 60% most relevant, 158 terms were selected. Figure 5 shows the corresponding overlay visualization map and as expected, a stronger emphasis on terminology related to empirical methodologies is exhibited, revealing a clear evolution in the focus of quantitative ECP research.

Figure 6. Co-occurrence map (Overlay Visualization) of terms (title and abstract), quantitative articles



Source: Own elaboration using VosViewer

Earlier terms (Dark Blue) such as “Europe”, “State”, "estimation", “regional development”, “production” and “regional inequality” were more prominent, pointing towards a foundational emphasis of the quantitative approaches, reflecting the data limitations of the time and initial research focused on establishing frameworks and theoretical models.

Intermediate publications (Light Blue to Green), comprise terms like “empirical evidence”, “programme”, “indicator”, “intensity”, “productivity”, “institutional quality”, governance, “performance”, “cluster”, indicating a shift towards a growing sophistication in the quantitative methods used to assess the impact of ECP.

Recent research trends (Yellow) include “quality”, “absorption”, “firm”, “population”, “R&D”, “developed region”, “crisis”, “resilience”, “payment” and “data envelopment analysis” reflecting a growing interest in the qualitative aspects of regional development and policy impact and, at the same time, a focus on resilience against economic shocks.

4.3 Title and Abstract Terms Word Cloud

A simple word cloud technique using the terms extracted from the titles and abstracts of the selected literature, without clustering and networking techniques applied, can also be helpful providing a bird’s eye view of the emphasis present in both datasets, all articles and quantitative articles. By comparing these word clouds (Figure 6), it is possible to discern some basic differences and similarities in the themes covered in the overall literature selected versus those specifically addressed by quantitative studies. Overall, both word clouds prominently feature terms such as “regional”, “policy”, “cohesion”, “funds”, “development”, “impact”, “growth”, “economic”, “structural”, “support” and “regions”.

Figure 7. Word cloud representation of Titles and Abstracts

Source: Own elaboration using wordclouds.com

The green word cloud, representing all articles, shows a broader range of terms. Key terms include "governance", "national", "funding", "local", "social", "territorial", "union", "objective", "policies" and "evaluation." This suggests a comprehensive exploration of ECP, covering various dimensions such as governance structures, social impact, territorial cohesion, and policy evaluation.

The blue word cloud representing quantitative articles, when compared with the green cloud (all articles), emphasizes terms like "data", "spatial", "effect", "effectiveness", "results", "performance", "model", and "evaluation". This indicates a concentration on empirical data analysis and modelling to assess the economic impacts of cohesion policies. Terms such as "panel", "effect", "spatial" and "evaluation" highlight the methodological rigor and focus on quantitative assessments.

4.4. Brief conclusions

Summing up, broader literature includes a diverse range of topics, reflecting a holistic approach to understanding ECP. In contrast, the quantitative subset is more focused on specific empirical and econometric analyses, suggesting a more detailed investigation into the effectiveness and impact of cohesion policies using statistical and modelling techniques. All in all, these systematic analysis of co-occurrence maps have revealed a multifaceted landscape of research on the impact of the ESIFs. While all four maps (covering keywords and titles/abstracts for both all articles and quantitative studies) identified core themes like regional development, convergence, program design, and evaluation, some key distinctions emerged.

Maps focusing on all studies (Figures 3 and 5) highlighted a broader range of thematic areas, including disparities, sustainability, territoriality, European integration, among others. The analyses of quantitative studies (Figures 4 and 6) revealed a more concentrated focus on methodological aspects and more detailed analysis. Here, clusters emerged around program design and expenditure, firm-level performance evaluation, and the quantitative assessment of regional development impacts. These findings suggest that quantitative research delves deeper into the technical aspects of ESIF implementation and intervention effectiveness.

The Word Cloud (Figure 7) depicts an overview of an exploration of thematics across different analysis types aligned with the cluster techniques, painting a comprehensive picture of ESIF research. Overall, we believe this work highlights the multifaceted nature of the field, encompassing diverse research questions, methodologies, and helps understand the

evolution from foundational research to more sophisticated, empirical evaluations, reflecting the maturation of the literature studying European Cohesion Policy and the impact of Structural funds.

5. ECONOMETRIC STUDIES ON ESIF IMPACT

The analysis of ESIF impact has increasingly relied on econometric methods to assess the effectiveness of cohesion policy in promoting regional development. This section reviews studies that apply quantitative techniques to measure the relationship between ESIF and key economic indicators, such as growth, employment, and convergence. By examining the methodologies, geographic scope, and main findings of these works, this section provides a structured synthesis of the empirical evidence on the causal effects of cohesion policy.

5.1 Quantifying the Impact: Econometric Analyses of ESIF impact on Regional Growth in Europe

Building on the findings from the systematic literature review (SLR) analysis above, a selection of key studies has been drawn from the identified subset of 428 quantitative studies. These studies were chosen based on two primary criteria:

1. Econometric Methodology: The study employs an econometric approach to assess the impact of ESIF on regional growth.
2. Research Question Relevance: The study directly addresses the research question: What is the impact of ESIF on regional growth in Europe?

While sample size (number of regions or time period) was considered during selection, priority was given to studies that demonstrably address the research question through a robust econometric methodology. This focus on methodological rigor and thematic relevance departs from an initial SLR process, which helped mitigate selection bias by establishing clear selection criteria, but it is important to acknowledge that the final selection process inherently involves a degree of subjectivity. However, the aim is not to present an exhaustive list of econometric studies on ESIF impact. Rather, the goal is to curate a representative dataset that reflects the current state of art of the knowledge and the evolution of research on this topic.

The studies have been categorized based on relevant characteristics such as methodology, timeframe (period) of the study, regions investigated, and the primary results obtained. Table 6 presents the 70 studies included in this analysis, providing a comprehensive overview of the authors, years, titles, main results, econometric methodologies, analysis focus, periods, and units of study. The information from column 5 of Table 6, which lists the abbreviations of the econometric methodologies used in each study, has been included in the Appendix, where a short description of these methodologies is provided.

Table 6. Econometric Studies on ESIF Impact

Author(s)	Year	Main Results (Impact of ESIF)	Analysis	Econometric Methodology	Period	Units
Cappelen, A., et al	2003	Positive effect on growth, but stronger in more developed regions	Economic Growth	OLS	1980-1997	105 NUTS-1/2 EU-15
Ederveen, S., H.L.F. de Groot, and R. Nahuis	2003	On average, ineffective. Positive and significative impact, but only in countries with good institutional quality	Economic Growth	OLS	7 periods of 5 years,1960 -1995	EU-13 Countries
Ederveen, S., et al.	2003	Positive and significative impact, only in a model with specific regional effects	Economic Growth	OLS	1981-1996	183 NUTS-2 EU-15
Rodríguez-Pose, A. and U. Fratesi	2004	Very weak but positive and significative impact. Support to agriculture has short-term positive effects on growth, but wane quickly. Only investment in education and human capital has medium-term positive and significant returns.	Economic Growth	OLS, LSDV, GLS	1989-1999	152 NUTS-2 EU-15
Beugelsdijk, M. and S.C.W. Eijffinger	2005	Positive impact on growth and convergence	Economic Growth / Convergence	GMM	1984-2002	EU-15 Countries
Puigcerver-Peñalver, M.	2007	Positive and significant impact, but stronger in the first programming period	Economic Growth	OLS; FE	1989-1993 1994-1999	41 Regions Obj. 1 EU-15
Bähr, C.	2008	Positive and significative impact when decentralization is accounted	Economic Growth	OLS	1960-1995 (7 periods)	EU-13 Countries
Dall'erba, S. and J. Le Gallo	2008	Positive benefit on growth, but in least developed regions that growth suffers from the small extent of regional spillover effects	Economic Growth	ML, GMM, SEM	1989-1999	145 NUTS-2 EU-12
Esposti, R. and S. Bussoletti	2008	Positive impact on growth, but modest	Economic Growth	GMM-SYS; GMM-DIFF	1989-1999	206 NUTS-2 EU-15

Author(s)	Year	Main Results (Impact of ESIF)	Analysis	Econometric Methodology	Period	Units
Ramajo, J., et al.	2008	Faster faster conditional convergence in regions belonging to Cohesion Countries (Ireland, Greece, Portugal and Spain)	Convergence	OLS, ML-SAR	1981-1996	163 NUTS-2 EU-12
Dall'Erba, S., R. Guillain, and J. Le Gallo.	2009	Significative impact, but negative	Productivity	OLS, SAR	1989-1999 1989-2004	145 NUTS-2 EU-12
Becker, S.O., P.H. Egger, and M. von Ehrlich	2010	Positive and cost effective impact on growth in Obj. 1 regions, but not significant on employment	Economic Growth / Employment	DiD-RDD	1989-1993 1994-1999 2000-2006	NUTS-2/3 EU-25
Mohl, P. and T. Hagen	2010	Positive and significative impact in Obj. 1 regions	Economic Growth	LSDV, GMM, SYS-GMM, FE-SAR	1995-2006	124 NUTS-1/2
Fiaschi, D., A. Lavezzi, and A. Parenti	2011	Positive effect on productivity growth, but larger impact of Obj.1 funds	Productivity	OLS, SDM	1980-2002	173 NUTS-2 EU-12
Aiello, F. and V. Pupo	2012	Positive impact on convergence, but low and no impact in terms of productivity	Economic Growth / Productivity	GMM-SYS, LSDV	1996-2007	Italian Macro-regions
Kyriacou, A.P. and O. Roca-Sagalés	2012	Positive and significative impact in regional disparities reduction	Convergence	FGLS	1994-1999 2000-2006	EU-14 Countries
Pellegrini, G., et al.	2012	Positive and significative impact	Economic Growth	RDD	1994-1999 2000-2006	NUTS-2 EU-15
Becker, S.O., P.H. Egger, and M. von Ehrlich	2013	Positive impact in 30% of regions	Economic Growth	RDD, HLATE	1989-1993 1994-1999 2000-2006	186 to 251 NUTS-2 EU-25
Bouayad-Agha, S., N. Turpin, and L. Védrine	2013	Positive and significative impact	Economic Growth	GMM, SDPD	1980-2005	143 NUTS-1/2 UE-14
Rodríguez-Pose, A. and K. Novak	2013	Positive, mostly insignificant impact but marked improvement between the second and third programming periods	Economic Growth	FE	1994-1999 2000-2006	133 NUTS-1/2 EU-15
Crescenzi, R. and M. Giua	2014	Positive and significative impact, but more positive in regions with most favourable socio-economic environment	Economic Growth	FE, SAR	1994-1999 2000-2006 2007-2013	139 NUTS-1 and NUTS- 2 EU-12
Fratesi, U. and G. Perucca	2014	Positive and significative impact, more effective when there is territorial capital	Economic Growth	OLS	2006-2010	108 NUTS-3 EU-14

Author(s)	Year	Main Results (Impact of ESIF)	Analysis	Econometric Methodology	Period	Units
Pinho, C., C. Varum, and M. Antunes	2015	Positive and significative impact, especially in richer regions, with higher levels of education. Cohesion regions do not convert more transfers into more growth.	Economic Growth	FE	1995-1999 2000-2006 2007-2013	92 NUTS-1/2 EU-12
Pinho, C., C. Varum, and M. Antunes	2015	Positive and significant impact, but in regions with low levels of human capital and innovation	Economic Growth	FE	1995-2009	137 NUTS-1/2
Rodríguez-Pose, A. and E. Garcilazo	2015	Positive and significative impact but above a threshold government quality improvements are more important	Economic Growth	FE	1996-2007	169 NUTS-1/2 in 18 EU Countries
Coppola, G. and Destefanis, S.	2015	Weak, but significant, impact on total factor productivity change but virtually no effect on capital accumulation or employment.	Productivity, Employment, TPF	FE	1989-2006	20 Italian NUTS-2
Pellegrini, G., EC: DG REGIO and Università di Roma Sapienza	2016	Positive and significative impact	Economic Growth	RDD	1994-1999 2000-2006	202 NUTS-2 EU-27
Bondonio, D., et al.	2016	Positive impact, more intense in Obj. 1 regions	Economic Growth	RDD, PSM, GPS	1994-1999 2000-2006 2007-2013	259 NUTS-2 EU-15
Crescenzi, R. and M. Giua	2016	ESIF associated with stronger regional growth rates in all regions, however, stronger in the regions with the most favourable socio-economic environment	Economic Growth	FE, SAR, SDM, SEM	1994-1999 2000-2006 2007-2013	139 NUTS-1/2 EU-15
Gagliardi, L. and M. Percoco	2016	Positive and significative impact, particularly evident for rural areas close to the city	Economic Growth	RDD, OLS	2000-2006	1233 NUTS-3
Pontarollo, N.	2016	Positive impact for both growth of productivity and GDP per capita is not always the case	Economic Growth / Productivity	GAM	2000-2006	202 NUTS-2 EU-15
Arbolino, R. and R. Boffardi	2017	Positive and significative impact, but magnitude depends on institutional quality	Economic Growth	FE	2007-2015	20 NUTS-2 Italy
Crescenzi, R., U. Fratesi, and V. Monastiriotis	2017	Positive impact, however, the magnitude is conditioned on the structure of the expenditure, more than with individual regional characteristics	Economic Growth	FE	1989-2013	15 NUTS-2

Author(s)	Year	Main Results (Impact of ESIF)	Analysis	Econometric Methodology	Period	Units
Di Cataldo, M.	2017	Positive impact on growth and employment, but effect may not be long-lasting	Economic Growth / Employment	SCM, DiD	1994-1999 2000-2006 2007-2013	134 wards from Cornwall and 94 from South Yorkshire, UK
Host, A., V. Zaninović, and P. Krešimir	2017 (Host et al., 2017)	Positive impact is significant only in those countries where the institutional quality is at the high level	Economic Growth	FE, RE, OLS	2000-2013	EU-27 Countries
Cerqua, A. and G. Pellegrini	2017	Average positive effect on regional growth, but the estimated function is concave and presents a maximum value	Economic Growth	RDD	1994-2006	208 NUTS-2 EU-15
Fiaschi, D., A.M. Lavezzi, and A. Parenti	2017	Positive impact on labour productivity, only form Obj. 1 funds and other funds different from Obj. 2	Productivity	OLS, SDM	1991-2008	175 NUTS-2 EU-28
Becker, S.O., P.H. Egger, and M. von Ehrlich	2018	Positive and significative impact (short-lived)	Economic Growth Employment Investment Public Investment	RDD	1989-1993 1994-1999 2000-2006 2007-2013	187 to 253 NUTS-2 EU-25
Bourdin, S.	2018	Differentiated effects of the cohesion policy according to EU regions and their institutional quality	Economic Growth	GWR	2000-2014	248 EU NUTS-2
Crescenzi, R. and M. Giua	2018	Positive and significant effect on both growth and employment in the EU. However, the regional impacts are not uniform across the Member States	Economic Growth	RDD	2000-2010 2010-2014	NUTS-3 AT, BE, FI, DE, IT, ES, UK
Piętak, Ł	2018	Positive and significative impact in Spanish regions. The impact on convergence process was insignificant	Economic Growth / Convergence	GMM, GMM-SYS, OLS, FE	1989-2016	17 NUTS-2 Spain
Šlander, S. and P. Wostner	2018	CP increases public development investments in target areas which should lead to stronger growth performance	Structural Public Expense	FE	1990-1993 1994-1999 2000-2006	EU-15 Countries
Bourdin, S.	2018	Significant positive influence of the cohesion policy on growth, higher for core regions	Economic Growth	SDM; GWR	2000-2016	147 Central and Eastern NUTS-3
Breidenbach, P., T. Mitze, and C.M. Schmidt	2018	Contribution insignificant or even negative for several peripheral EU regions, due to spatial spillovers and lower levels of institutional quality	Economic Growth	FE, GMM-SYS, Spatial GMM-SYS	1997-2007	127 NUTS-2 EU-15

Author(s)	Year	Main Results (Impact of ESIF)	Analysis	Econometric Methodology	Period	Units
Coppola, G., et al.	2018	EU funds have a significant effect on GDP per capita, both with and without national co-financing.	Economic Growth	FE	1994-2013	20 Italian NUTS-2
Di Cataldo, M. and V. Monastiriotis	2018	ECP interventions are highly productive in UK, irrespective of place and local conditions	Economic Growth	FE	1994-2013	37 UK NUTS-2
Butkus, M., et al	2019	No positive or negative return on investing SF if all expenditures and funds are considered together. Positive return on ERDF. CF has negative return in terms of regional disparities	Convergência	DiD	1995-1999 2000-2006 2007-2012	1251 NUTS-3 EU-25
Fidrmuc, J., M. Hulényi, and O. Zajkowska	2019	Significant and positive effect on growth. Inter-regional spillovers important. Positive impact of institutional quality	Economic Growth	OLS, IV, SDM	1994-2014	272 NUTS-2 EU-28
Arbolino, R., P. Di Caro, and U. Marani	2019	Positive contribution to the resilience of Italian regional labour markets, but significant only when institutional quality is accounted	Labour Markets	GLS, GMM	2007-2013	20 NUTS-2 Italy
Butkus, M., A. Mačiulytė-Šniukienė, and K. Matuzevičiūtė	2019	Positive effect on growth but strong conditioning by the institutional quality of the regions	Economic Growth	FE	1995-1999 2000-2006	1247 NUTS-3 UE-25
Antunes, M., et al.	2020	No positive impact is detected	Economic Growth	OLS, FE, SDM	1995-2009	96 NUTS-2 EU-28
Butkus, M., A. Mačiulytė-Šniukienė, and K. Matuzevičiūtė	2020 (Butkus, Cibulskienė, et al., 2020)	Direction, size, and significance of the effect of the CP commitment intensity on growth and produvtivity are conditional to institutional quality	Economic Growth / Productivity	FE	2000-2006 2007-2013	270 NUTS-2 and 1326 NUTS-3 EU-25
Butkus, M., et al.	2020	2000–2006 had an overall negative effect on convergence dynamics. Only ERDF Obj. 2 contributed positively to convergence	Convergence	DiD	2000-2006	NUTS-3 EU-25
Butkus, M., et al.	2020	Impact of regional support on convergence is positive with the diminishing marginal effect as the intensity of payments is increasing	Convergence	FE, DiD	2000-2006 2007-2011 2009-2013	1251 NUTS-3 EU-25
Cerqua, A. and G. Pellegrini	2020	Results are consistent with the hypothesis that the EU regional policy is effective not only in the short term but also in the long term	Economic Growth	MBA	1991-2015	37 NUTS-2 EU-15
Jestl, S., A. Maucorps, and R. Römisch	2020	Negative effect of structural laggardness growth and a statistically significant, positive effect funding. Also a inadequate allocation of CP funding	Economic Growth	StrEqM	2008-2016	276 EU25 NUTS-2

Author(s)	Year	Main Results (Impact of ESIF)	Analysis	Econometric Methodology	Period	Units
Albanese, G., G. de Blasio, and A. Locatelli	2020	Positive effect only for the part of ERDF expenditure devoted to infrastructure. Characteristics of local context, do matter.	TFP Growth	Several Methods	2007-2015	Southern Italy LLMs
Canova, F. and E. Pappa	2021	ERDF has statistically positive short-term impact on all regional macroeconomic variables, but gains typically dissipate within 3 years. ESF has negative or insignificant, impact but exercises positive average effects after 2-3 years	Production, employment, productivity, investments, and labor market participation	IV, BA	1980-2017	279 NUTS-2 EU-28
Piętak, Ł.	2021	Influence of structural funds on convergence was positive but very weak in Poland	Economic Growth / Convergence	FE, GMM	2004-2016	16 NUTS-2 Poland
Koudoumakis, P., G. Botzoris, and A. Protopapas	2021	Positive and significative impact to the development and convergence of regions with a GDP p.c. PPS lower than than 90% of the EU average	Economic Growth	FE	1986-2016	237 EU Regions
Védrine, L. and J. Le Gallo	2021	Positive influence on growth. Trade-off between within and between regional disparities over the 2000-2014	Economic Growth	FE, SAR	2000-2014	205 NUTS-2 EU-25
Fernández, M., R. Bande, and R. Pereira	2021	Funds impact on positive public stock cap in Galicia. In Portugal, possible crowding-out of public investment	Production, Investment, Labour Demand	OLS	1980-2001	23 NUTS-2 ES and PT
Di Caro, P. and U. Fratesi	2021	Positive and significant effects registered in about 40% of regions. Effectiveness does not necessarily depend on the level of assistance, but can be related to the presence of a selected number of national and regional contextual factors	Economic Growth	DMG, LOGIT	1989-2015	250 NUTS-2 EU-25
Destefanis, S., M. Di Serio, and M. Fragetta	2022	ESIF provide the largest and most pervasively significant GDP multipliers. Nationally funded government investment and government consumption shocks are more limited	Economic Growth	BA PVAR	1994-2016	20 NUTS-2 Italy
Di Caro, P. and U. Fratesi	2022	Positive and significant effects during all the recessionary events, although with regional variation regarding regional labour market resilience. Region and crisis specific patterns during different shocks.	Employment	MGE	1980-2015	255 NUTS-2 EU-28
Scotti, F., A. Flori, and F. Pammolli	2022	Different Impacts depending on Sector. Larger spillovers in Belgium, the Netherlands and Slovakia	Economic Gowth / spillovers	OLS, FE, GMM, SDM, GPS	2007-2014	258 NUTS-2 EU-27
Staehr, K. and K. Urke	2022	ERDF may have had some effect, but it cannot be estimated precisely. Other	Public Investment	FE	2000-2018	EU-28 Countries

Author(s)	Year	Main Results (Impact of ESIF)	Analysis	Econometric Methodology	Period	Units
		ESIF does not seem to have been related to public investment in the EU countries				
Coppola, G. et al.	2023	Significant impact on sectoral products, in particular the ERDF as well as on aggregate GDP per capita	Multi-input, multi-output transformation function taken from production analysis	FE	1994-2016	20 Italian NUTS-2
Fusaro, S. and R. Scandurra	2023	Positive impact on population with lower-secondary and tertiary education, negative impact on those with upper-secondary education. In employment, positive response for youth of all education levels	Youth education and Employment	FE, IV	2007-2018	NUTS-2 EU-27
Veneri, P., M. Diaz Ramirez, and L. Kleine-Rueschkamp	2023	Regional transfers induce positive business dynamics' outcomes. Foster the net rate of firm creation and the jobs associated, raising regional labour productivity	Business Dynamics	RDD	2007-2013	159 NUTS-2 in 18 EU Countries

Source: Own elaboration

5.2. Characterisation of the econometric results

Hagen and Mohl (2011) succinctly formulate one of the most common conclusions regarding the scientific production of econometric studies on ESIF impact: "the empirical evidence has provided mixed, if not contradictory, results". Fourteen years later, the dataset analysed in this study, covering a period of 21 years (2003–2023) and comprising 70 different econometric studies employing multiple methodologies, does not alter this observation.

In a nutshell, we can say there is a significantly larger number of studies pointing to a positive effect on growth, employment, or convergence, particularly when conditionalities are considered. However, a substantial body of research finds no significant impact, while some studies even suggest an absence of tangible effects. We might argue that ESIF represents more than one-third of the EU's budget and continues to expand in both financial scope and policy instruments, so this evidence appears limited, but we must recognize the complexity of the task of identifying a clear causal effect on such a complex economic, social and political environment.

The econometric studies analysed can be categorized according to several key dimensions, beginning with the estimation methodologies employed. Ordinary Least Squares (OLS) is a commonly used approach, identified in 18 studies, including those by Cappelen et al. (2003),

Ederveen et al. (2003), and Rodríguez-Pose and Fratesi (2004). While its simplicity makes it a preferred method for establishing baseline estimates of ESIF impacts, it is often used in conjunction with more advanced techniques. The Generalized Method of Moments (GMM), identified in 11 studies, including Beugelsdijk and Eijffinger (2005) and Esposti and Bussoletti (2008), is frequently employed to address potential endogeneity issues. The Fixed Effects (FE) model is the most frequently applied methodology, appearing in 28 studies such as those by Pinho et al. (2015) and Rodríguez-Pose and Garcilazo (2015), largely due to its ability to control for time-invariant characteristics. In addition to these conventional approaches, there is a clear trend toward more sophisticated econometric techniques. Examples include Difference-in-Differences (DiD), as employed by Becker et al. (2010); Spatial Durbin Models (SDM), used in studies such as Fiaschi et al. (2017); and Regression Discontinuity Design (RDD), applied by Cerqua and Pellegrini (2017). The increasing use of these methodologies reflects an effort to better isolate the causal impact of ESIF.

The temporal coverage of the studies spans from the early 1980s to recent years, capturing the evolution of EU funding cycles. Some studies, such as Mohl and Hagen (2010), focus on earlier periods, specifically analysing data from 1995 to 2006, while others, including Staehr and Urke (2018), extend the analysis to more recent funding cycles. Many studies are structured around specific Multiannual Financial Framework (MFF) programming periods, such as 1989–1999, 1994–2006, and 2007–2013, allowing for comparative assessments of the evolving impact of ESIF over time.

The geographical coverage of these studies predominantly aligns with the regional scale used in ECP. The most common sample unit is a combination of NUTS-2 regions, sometimes complemented by selected NUTS-1 regions with similar characteristics. A smaller number of studies, particularly those with a more granular approach, analyse NUTS-3 regions across the EU, offering a more localized perspective. Specific regional case studies include Coppola et al. (2018), which focuses on Italian NUTS-2 regions, and Di Cataldo and Monastiriotis (2018), which examines UK regions. Meanwhile, other studies adopt a broader, country-level perspective, particularly relevant due to the novelty of the methodological approaches employed.

The main results of the econometric studies analysed can be categorized into three broad trends. A substantial number of studies report positive impacts of ESIF, particularly on economic growth, as evidenced in works such as Cappelen et al. (2003) and Crescenzi and Giua (2014). Other studies highlight benefits in employment and productivity, particularly when conditional factors such as institutional quality are accounted for. However, other

studies report mixed or insignificant impacts, as observed in Rodríguez-Pose and Fratesi (2004) and Antunes et al. (2020). These findings frequently highlight the variability of results based on regional characteristics and the efficiency of fund allocation. In contrast, a smaller subset of studies identifies negative impacts, such as those reported by Dall'Erba et al. (2009), where regions characterized by low institutional quality or ineffective fund utilization experience adverse effects.

6. CONCLUDING THOUGHTS

This systematic review and bibliometric analysis of studies on the European Cohesion Policy (ECP) and the European Structural and Investment Funds (ESIF) demonstrate the multidimensional nature of this research field. It highlights the evolution of scholarly interest, moving from foundational studies focused on policy design and early implementation to more sophisticated evaluations employing advanced econometric and spatial methodologies. Over time, research has shifted toward a more rigorous, evidence-based approach, seeking to better quantify the economic, institutional, and regional effects of ESIF.

The analysis reveals that regional development, convergence, and program evaluation emerge as core themes across the literature, reflecting the overarching objectives of ECP. These themes underscore the sustained academic interest in understanding how ESIF contributes to reducing regional disparities and fostering balanced economic growth across Europe. The strong emphasis on measuring policy impacts suggests a continuous effort to refine evaluation methodologies and provide empirical evidence for policy adjustments.

Methodological advances are particularly evident in quantitative studies. Econometric analyses have increasingly focused on the technical aspects of policy evaluation, addressing complex questions about efficiency, regional disparities, and the influence of institutional quality. These studies reflect a growing trend toward employing more sophisticated methodologies—such as spatial econometrics, Difference-in-Differences, and Regression Discontinuity Design —to provide more robust assessments of policy outcomes. While the broader literature on ESIF covers a wide range of topics, quantitative research tends to focus on specific outcomes such as economic growth, employment, and governance. These studies frequently analyse how regional and institutional contexts condition the impacts of cohesion policy interventions, highlighting the role of

administrative capacity, absorptive efficiency, and governance quality in determining the effectiveness of ESIF-funded projects.

Despite methodological improvements, the findings from econometric studies remain mixed. The majority of studies indicate positive impacts on regional growth, employment, and convergence, but these effects are often conditional on factors such as institutional quality, socio-economic environment, and targeted investments in education and infrastructure. In other words, most studies indicate that while ESIF can be an effective tool for promoting regional development, its success depends on the broader institutional and policy framework within which it operates. However, a significant number of studies report no significant impact or even negative effects, underscoring the importance of efficient fund allocation and strong institutional frameworks. In regions where governance is weak or where funds are not strategically allocated, the intended benefits of ESIF may not materialize, leading to inefficiencies or even counterproductive outcomes.

The mixed results also highlight the complexity of assessing ESIF impacts and suggest that policy effectiveness is highly context-dependent. Factors such as regional economic structures, governance quality, and specific socio-economic conditions all play a crucial role in shaping the outcomes of ESIF interventions. As such, the variation in results observed across studies is not necessarily contradictory but rather reflective of the heterogeneous nature of policy implementation across diverse regional contexts. This reinforces the need for more targeted, region-specific policy approaches rather than broad, uniform funding mechanisms.

Given these findings, the policy implications are significant. The heterogeneous impacts of ESIF highlight the importance of tailoring strategies to regional specificities, enhancing institutional capacities, and ensuring efficient resource allocation. As studies increasingly point to the role of governance in moderating policy outcomes, it becomes evident that a one-size-fits-all approach to ESIF allocation may be insufficient. Instead, targeted interventions and region-specific adjustments could enhance policy effectiveness. Furthermore, the continuous refinement of evaluation methodologies is critical to maximizing policy impact and informing future iterations of ECP.

As the field matures, there is a growing need to integrate richer datasets, adopt innovative methodologies, and explore emerging themes such as resilience, sustainability, and long-term structural transformations. Future research could benefit from further disaggregation of impacts by regional and temporal dimensions, which would contribute to a more nuanced understanding of ESIF's effectiveness.

REFERENCES

Aiello, F., & Pupo, V. (2012). Structural funds and the economic divide in Italy [Article]. Journal of Policy Modeling, 34(3), 403-418. https://doi.org/10.1016/j.jpolmod.2011.10.006

Albanese, G., de Blasio, G., & Locatelli, A. (2020). Does EU regional policy promote local TFP growth? Evidence from the Italian Mezzogiorno [Article]. Papers in Regional Science, 100(2), 327-348. https://doi.org/10.1111/pirs.12574

Antunes, M., Viegas, M., Varum, C., & Pinho, C. (2020). The Impact of Structural Funds on Regional Growth: A Panel Data Spatial Analysis. Intereconomics, 55(5), 312-319. https://doi.org/10.1007/s10272-020-0921-1

Arbolino, R., & Boffardi, R. (2017). The Impact of Institutional Quality and Efficient Cohesion Investments on Economic Growth Evidence from Italian Regions. Sustainability, 9(8), 1432. https://doi.org/10.3390/su9081432

Arbolino, R., Di Caro, P., & Marani, U. (2019). Did the Governance of EU Funds Help Italian Regional Labour Markets during the Great Recession? JCMS: Journal of Common Market Studies, 58(2), 235-255. https://doi.org/10.1111/jcms.12900

Bähr, C. (2008). How does Sub-National Autonomy Affect the Effectiveness of Structural Funds? Kyklos, 61(1), 3-18. https://doi.org/10.1111/j.1467-6435.2008.00389.x

Becker, S. O., Egger, P. H., & von Ehrlich, M. (2010). Going NUTS: The effect of EU Structural Funds on regional performance. Journal of Public Economics, 94(9-10), 578-590. https://doi.org/10.1016/j.jpubeco.2010.06.006

Becker, S. O., Egger, P. H., & von Ehrlich, M. (2013). Absorptive Capacity and the Growth and Investment Effects of Regional Transfers: A Regression Discontinuity Design with Heterogeneous Treatment Effects. American Economic Journal: Economic Policy, 5(4), 29-77. https://doi.org/10.1257/pol.5.4.29

Becker, S. O., Egger, P. H., & von Ehrlich, M. (2018). Effects of EU Regional Policy: 1989-2013. Regional Science and Urban Economics, 69, 143-152. https://doi.org/10.1016/j.regsciurbeco.2017.12.001

Beugelsdijk, M., & Eijffinger, S. C. W. (2005). The Effectiveness of Structural Policy in the European Union: An Empirical Analysis for the EU-15 in 1995-2001. JCMS: Journal of Common Market Studies, 43(1), 37-51. https://doi.org/10.1111/j.0021-9886.2005.00545.x

Bondonio, D., Pellegrini, G., DG REGIO, Universitá del Piemonte Orientale, & Università di Roma Sapienza. (2016). Macro-economic effects of cohesion policy funding in 2007-2013. Executive Summary. Publications Office. https://doi.org/doi/10.2776/550227

Bouayad-Agha, S., Turpin, N., & Védrine, L. (2013). Fostering the Development of European Regions: A Spatial Dynamic Panel Data Analysis of the Impact of Cohesion Policy [Article]. Regional Studies, 47(9), 1573-1593. https://doi.org/10.1080/00343404.2011.628930

Bourdin, S. (2018a). Analyse spatiale de l'efficacité des Fonds structurels européens sur la croissance régionale [Article]. Revue d'Économie Régionale & Urbaine, Février(2), 243-270. https://doi.org/10.3917/reru.182.0243

Bourdin, S. (2018b). Does the Cohesion Policy Have the Same Influence on Growth Everywhere? A Geographically Weighted Regression Approach in Central and Eastern Europe. Economic Geography, 95(3), 256-287 https://doi.org/10.1080/00130095.2018.1526074

Breidenbach, P., Mitze, T., & Schmidt, C. M. (2018). EU Regional Policy and the Neighbour's Curse: Analyzing the Income Convergence Effects of ESIF Funding in the Presence of Spatial Spillovers. JCMS: Journal of Common Market Studies, 57(2), 388-405. https://doi.org/10.1111/jcms.12807

Butkus, M., Cibulskienė, D., Mačiulytė-Šniukienė, A., & Matuzevičiūtė, K. (2020). Non-Linear and Lagging Convergence Effects of the Eu's Regional Support at Nuts 3 Level. Journal of Urban and Regional Analysis, 12(1). https://doi.org/10.37043/jura.2020.12.1.3

Butkus, M., Mačiulytė-Šniukienė, A., & Matuzevičiūtė, K. (2019). Heterogeneous growth outcomes of the EU's regional financial support mediated by institutions with some empirical evidences at NUTS 3 level. Review of Regional Research, 40(1), 33-66. https://doi.org/10.1007/s10037-019-00137-z

Butkus, M., Mačiulytė-Šniukienė, A., & Matuzevičiūtė, K. (2020). Mediating Effects of Cohesion Policy and Institutional Quality on Convergence between EU Regions: An Examination Based on a Conditional Beta-Convergence Model with a 3-Way Multiplicative Term. Sustainability, 12(7), Article 3025. https://doi.org/10.3390/su12073025

Butkus, M., Mačiulytė-Šniukienė, A., Matuzevičiūtė, K., & Cibulskienė, D. (2019). What is the return on investing European Regional Development and Cohesion Funds? Difference-in-differences Estimator Approach. Ekonomický časopis, 67(6), 647-676. <Go to ISI>://WOS:000486568300005

Butkus, M., Mačiulytė-Šniukienė, A., Matuzevičiūtė, K., & Cibulskienė, D. (2020). Does Financial Support from ERDF and CF Contribute to Convergence in the EU? Empirical Evidence at NUTS 3 Level. Prague Economic Papers, 29(3), 315-329. https://doi.org/10.18267/j.pep.737

Canova, F., & Pappa, E. (2021). What are the likely macroeconomic effects of the EU Recovery plan? https://ideas.repec.org/p/cpr/ceprdp/16669.html

Cerqua, A., & Pellegrini, G. (2017). Are we spending too much to grow? The case of Structural Funds. Journal of Regional Science, 58(3), 535-563. https://doi.org/10.1111/jors.12365

Cerqua, A., & Pellegrini, G. (2020). I will survive! The impact of place-based policies when public transfers fade out.

Cook, D. J., Mulrow, C., & Haynes, b. m. c. (1997). Systematic Reviews: Synthesis of Best Evidence for Clinical Decisions. Annals of internal medicine, 126, 376-380. https://doi.org/10.7326/0003?4819?126?5?199703010?00006

Coppola, G., & Destefanis, S. (2015). Structural funds and regional convergence: some sectoral estimates for italy [Article]. AIEL Series in Labour Economics, 8, 307-333. https://doi.org/10.1007/978-3-642-55203-8_14

Coppola, G., Destefanis, S., Marinuzzi, G., & Tortorella, W. (2018). European Union and nationally based cohesion policies in the Italian regions [Article]. Regional Studies, 54(1), 83-94. https://doi.org/10.1080/00343404.2018.1447099

Coppola, G., Destefanis, S., Marinuzzi, G., & Tortorella, W. (2023). Regional policies and sectoral outputs in Italy. Regional Studies, 57, 1-15. https://doi.org/10.1080/00343404.2023.2166913

Crescenzi, R., Fratesi, U., & Monastiriotis, V. (2017). The Eu Cohesion Policy and the Factors Conditioning Success and Failure: Evidence from 15 Regions. Regions Magazine, 305(1), 4-7. https://doi.org/10.1080/13673882.2017.11868994

Crescenzi, R., & Giua, M. (2014). The EU Cohesion policy in context: regional growth and the influence of agricultural and rural development policies (LSE 'Europe in Question' Discussion Paper Series, Issue.

Crescenzi, R., & Giua, M. (2016). The EU Cohesion Policy in context: Does a bottom-up approach work in all regions? Environment and Planning A: Economy and Space, 48(11), 2340-2357. https://doi.org/10.1177/0308518x16658291

Crescenzi, R., & Giua, M. (2018). One or Many Cohesion Policies of the European Union? On the Diverging Impacts of Cohesion Policy across Member States. https://EconPapers.repec.org/RePEc:cep:sercdp:0230

Dall'Erba, S., & Fang, F. (2015). Meta-analysis of the impact of European Union Structural Funds on regional growth. Regional Studies, 51(6), 822-832. https://doi.org/10.1080/00343404.2015.1100285

Dall'Erba, S., Guillain, R., & Le Gallo, J. (2009). Impact Of Structural Funds On Regional Growth: How To Reconsider A 9 Year-Old Black Box. Region et Developpement, 30, 77-100. https://ideas.repec.org/a/tou/journl/v30y2009p77-100.html

Dall'erba, S., & Le Gallo, J. (2008). Regional convergence and the impact of European structural funds over 1989–1999: A spatial econometric analysis. Papers in Regional Science, 87(2), 219-244. https://doi.org/10.1111/j.1435-5957.2008.00184.x

Destefanis, S., Di Serio, M., & Fragetta, M. (2022). Regional multipliers across the Italian regions [Article]. Journal of Regional Science, 62(4), 1179-1205. https://doi.org/10.1111/jors.12592

Di Caro, P., & Fratesi, U. (2021). One policy, different effects: Estimating the region-specific impacts of EU cohesion policy [Article]. Journal of Regional Science, 62(1), 307-330. https://doi.org/10.1111/jors.12566

Di Caro, P., & Fratesi, U. (2022). The role of Cohesion Policy for sustaining the resilience of European regional labour markets during different crises [Article; Early Access]. Regional Studies, 57(12), 2426-2442. https://doi.org/10.1080/00343404.2022.2118252

Di Cataldo, M. (2017). The impact of EU Objective 1 funds on regional development: Evidence from the U.K. and the prospect of Brexit. Journal of Regional Science, 57(5), 814-839. https://doi.org/10.1111/jors.12337

Di Cataldo, M., & Monastiriotis, V. (2018). Regional needs, regional targeting and regional growth: an assessment of EU Cohesion Policy in UK regions. Regional Studies, 54(1), 35-47. https://doi.org/10.1080/00343404.2018.1498073

Ederveen, S., de Groot, H. L. F., & Nahuis, R. (2003). Fertile Soil for Structural Funds? A Panel Data Analysis of the Conditional Effectiveness of European Cohesion Policy. SSRN Electronic Journal. https://doi.org/10.2139/ssrn.338060

Ederveen, S., Gorter, J., Mooij, R., & Nahuis, R. (2003). Funds and Games: The Economics of European Cohesion Policy.

Esposti, R., & Bussoletti, S. (2008). Impact of Objective 1 Funds on Regional Growth Convergence in the European Union: A Panel-data Approach. Regional Studies, 42(2), 159-173. https://doi.org/10.1080/00343400601142753

Fernández, M., Bande, R., & Pereira, R. (2021). O papel dos fundos estruturais e de coesão no Processo de convergência europeia Galiza e a região Norte. In (pp. 366-396).

Fiaschi, D., Lavezzi, A., & Parenti, A. (2011). Productivity Growth across European Regions: The Impact of Structural and Cohesion Funds. In (Vol. Discusion Paper 84). Pisa: University of Pisa.

Fiaschi, D., Lavezzi, A. M., & Parenti, A. (2017). Does EU cohesion policy work? Theory and evidence. Journal of Regional Science, 58(2), 386-423. https://doi.org/10.1111/jors.12364

Fidrmuc, J., Hulényi, M., & Zajkowska, O. (2019). The Elusive Quest for the Holy Grail of an Impact of EU Funds on Regional Growth. https://doi.org/http://dx.doi.org/10.2139/ssrn.3507260

Foglia, F. (2023). Is smart specialisation monopolising the research on the EU cohesion policy? Evidence from a bibliometric analysis [Article]. Scientometrics, 128(2), 1001-1021. https://doi.org/10.1007/s11192-022-04585-2

Fratesi, U., & Perucca, G. (2014). Territorial Capital and the Effectiveness of Cohesion Policies: an Assessment for CEE Regions. Investigaciones Regionales, 165-191.

Fusaro, S., & Scandurra, R. (2023). The impact of the European social fund on youth education and employment [Article]. Socio-Economic Planning Sciences, 88, Article 101650. https://doi.org/10.1016/j.seps.2023.101650

Gagliardi, L., & Percoco, M. (2016). The impact of European Cohesion Policy in urban and rural regions [Article]. Regional Studies, 51(6), 857-868. https://doi.org/10.1080/00343404.2016.1179384

Hagen, T., & Mohl, P. (2011). Econometric evaluation of EU Cohesion Policy: a survey. International Handbook on the Economics of Integration, Volume Iii: Factor Mobility, Agriculture, Environment and Quantitative Studies, 343-370. <Go to ISI>://WOS:000288163800020

Host, A., Zaninović, V., & Krešimir, P. (2017). Cohesion Policy Instruments and Economic Growth: Do Institutions Matter? Ekonomska misao i praksa, 2, 541-559. file:///Volumes/Plobo/USC/Biblioteca/Papers/10_Host_Zaninovic_Parat.pdf

Jestl, S., Maucorps, A., & Römisch, R. (2020). The Effects of the EU Cohesion Policy on Regional Economic Growth: Using Structural Equation Modelling for Impact Assessment. https://ideas.repec.org/p/wii/wpaper/185.html

Kitchenham, B. (2004). Procedures for Performing Systematic Reviews. Keele, UK, Keele Univ., 33.

Koudoumakis, P., Botzoris, G., & Protopapas, A. (2021). The Contribution Of Cohesion Policy To The Development And Convergence Of The Regions Of The European Union. Regional Science Inquiry, 0(2), 277-290. https://ideas.repec.org/a/hrs/journl/vxiiiy2021i2p277-290.html (Regional Science Inquiry)

Kyriacou, A. P., & Roca-Sagalés, O. (2012). The Impact of EU Structural Funds on Regional Disparities within Member States. Environment and Planning C: Government and Policy, 30(2), 267-281. https://doi.org/10.1068/c11140r

Mohl, P., & Hagen, T. (2010). Do EU structural funds promote regional growth? New evidence from various panel data approaches. Regional Science and Urban Economics, 40(5), 353-365. https://doi.org/10.1016/j.regsciurbeco.2010.03.005

Nishimura, A., Au-Yong-Oliveira, M., & Sousa, M. J. (2021). ESIF Policies and Their Impact on The Development of EU Members: A Review and Research Agenda. Quality - Access to Success, 22(184), 49-63. https://doi.org/10.47750/qas/22.184.06

Okubo, Y. (1997). Bibliometric indicators and analysis of research systems : methods and examples.

Pellegrini, G., Terribile, F., Tarola, O., Muccigrosso, T., & Busillo, F. (2012). Measuring the effects of European Regional Policy on economic growth: A regression discontinuity approach. Papers in Regional Science, 92(1), 217-233. https://doi.org/10.1111/j.1435-5957.2012.00459.x

Pellegrini, G., Università di Roma Sapienza, & DG REGIO. (2016). Measuring the impact of Structural and Cohesion Funds using the Regression Discontinuity Design. https://ec.europa.eu/regional_policy/en/information/publications/evaluations/2016/measuring-the-impact-of-structural-and-cohesion-funds-using-the-regression-discontinuity-design-final-technical-report-work-package-14c-of-the-ex-post-evaluation-of-the-erdf-and-cf-2007-2013

Piętak, Ł. (2018). Did structural funds affect economic growth and convergence across regions? Spanish case in the years 1989–2016. INE PAN Working Paper Series, 44. Retrieved 1/1/2021, from

Piętak, Ł. (2021). Structural Funds and Convergence in Poland [Article]. Hacienda Publica Espanola-Review of Public Economics (236), 3-37. https://doi.org/10.7866/hpe-rpe.21.1.1

Pinho, C., Varum, C., & Antunes, M. (2014). Structural Funds and European Regional Growth: Comparison of Effects among Different Programming Periods [Article]. European Planning Studies, 23(7), 1302-1326. https://doi.org/10.1080/09654313.2014.928674

Pinho, C., Varum, C., & Antunes, M. (2015). Under What Conditions Do Structural Funds Play a Significant Role in European Regional Economic Growth? Some Evidence from Recent Panel Data. Journal of Economic Issues, 49(3), 749-771. https://doi.org/10.1080/00213624.2015.1072382

Pontarollo, N. (2016). Does Cohesion Policy affect regional growth? New evidence from a semi-parametric approach. In EU Cohesion Policy: Reassessing performance and direction (pp. 70-83). Routledge.

Pritchard, A. (1969). STATISTICAL BIBLIOGRAPHY OR BIBLIOMETRICS [Note]. Journal of Documentation, 25(4), 348-+. <Go to ISI>://WOS:A1969F015300009

Puigcerver-Peñalver, M. (2007). The Impact of Structural Funds Policy on European Regions' Growth : A Theoretical and Empirical Approach. European Journal of Comparative Economics, 4, 179-208.

Ramajo, J., Márquez, M. A., Hewings, G. J. D., & Salinas, M. M. (2008). Spatial heterogeneity and interregional spillovers in the European Union: Do cohesion policies encourage convergence across regions? European Economic Review, 52(3), 551-567. https://doi.org/10.1016/j.euroecorev.2007.05.006

Rodríguez-Pose, A., & Fratesi, U. (2004). Between Development and Social Policies: The Impact of European Structural Funds in Objective 1 Regions. Regional Studies, 38(1), 97-113. https://doi.org/10.1080/0034340031000163222 6

Rodríguez-Pose, A., & Garcilazo, E. (2015). Quality of Government and the Returns of Investment: Examining the Impact of Cohesion Expenditure in European Regions. Regional Studies, 49(8), 1274-1290. https://doi.org/10.1080/00343404.2015.1007933

Rodríguez-Pose, A., & Novak, K. (2013). Learning processes and economic returns in European Cohesion policy. Investigaciones Regionales - Journal of Regional Research(25), 1-20. https://EconPapers.repec.org/RePEc:ris:invreg:0175

Scotti, F., Flori, A., & Pammolli, F. (2022). The economic impact of structural and Cohesion Funds across sectors: Immediate, medium-to-long term effects and spillovers [Article]. Economic Modelling, 111, Article 105833. https://doi.org/10.1016/j.econmod.2022.105833

Šlander, S., & Wostner, P. (2018). Additionality of European cohesion policy [Article]. European Review, 26(4), 721-737. https://doi.org/10.1017/S1062798718000339

Staehr, K., & Urke, K. (2022). The European structural and investment funds and public investment in the EU countries. Empirica (Dordr), 49(4), 1031-1062. https://doi.org/10.1007/s10663-022-09549-6

Védrine, L., & Le Gallo, J. (2021). Does EU Cohesion Policy affect territorial inequalities and regional development? https://ideas.repec.org/p/hal/journl/hal-03327693.html

Veneri, P., Diaz Ramirez, M., & Kleine-Rueschkamp, L. (2023). Does European Cohesion Policy affect Regional Business Dynamics? Investigaciones Regionales - Journal of Regional Research, 57(57), 5-31. https://doi.org/10.38191/iirr-jorr.23.015

Wohlin, C., Mendes, E., Felizardo, K. R., & Kalinowski, M. (2020). Guidelines for the search strategy to update systematic literature reviews in software engineering [Article]. Information and Software Technology, 127, Article 106366. https://doi.org/10.1016/j.infsof.2020.106366

APPENDIX

Econometric Methodologies

BA	Bayesian Approach: Uses Bayes' theorem to update the probability of a hypothesis as more evidence becomes available.
BA PVAR	Bayesian Panel Vector Autoregressive Model: A Bayesian method that accounts for dynamic interdependencies across multiple time series and panel data.
DiD	Difference-in-Differences: Compares the changes in outcomes over time between a treatment group and a control group to estimate causal effects.
DMG	Dynamic Mean Group: Estimates long-run relationships in dynamic panel data models, allowing for heterogeneous slopes across groups.
FE	Fixed Effects: Controls for time-invariant characteristics in panel data by allowing individual-specific intercepts.
FLGS	Feasible Generalized Least Squares: An extension of GLS that estimates the covariance structure of the error terms.
GLS	Generalized Least Squares: Accounts for heteroskedasticity or autocorrelation in regression models.
GMM	Generalized Method of Moments: Uses moment conditions derived from the data to estimate parameters efficiently.
GMM-DIFF	Difference GMM: Applies GMM to first-differenced equations to control for unobserved fixed effects.
GMM-SYS	System GMM: Uses a system of equations in levels and first differences to improve efficiency in GMM estimation.
GWR	Geographically Weighted Regression: Local regression technique that accounts for spatial variability in the data.
HLATE	Heterogeneous Local Average Treatment Effect: Estimates treatment effects that vary across subpopulations.
IV	Instrumental Variables: Addresses endogeneity by using instruments—variables correlated with the endogenous explanatory variables but uncorrelated with the error term.
LSDV	Least Squares Dummy Variable: Fixed effects model with dummy variables.
MBA	Mean Balancing Approach: Balances treatment and control groups on observable covariates to estimate causal effects.
ML	Maximum Likelihood: Estimates parameters by maximizing the likelihood function, assuming a specific distribution for the error terms.
OLS	Ordinary Least Squares: Estimates regression parameters by minimizing the sum of squared residuals.
ML-SAR	Maximum Likelihood Spatial Autoregressive model: combines spatial autoregressive framework with maximum likelihood estimation to determine the model parameters
SEM	Spatial Error Model: Models spatial dependence in the error terms.
SAR	Spatial Autoregressive model: Accounts for spatial dependence by including a spatially lagged dependent variable
DiD-RDD	Difference-in-Differences with Regression Discontinuity Design: combines time-based comparisons and cutoff-based causal inference
RDD	Regression Discontinuity Design: combines time-based comparisons and cutoff-based causal inference
LSDV	Least Squares Dummy Variable: uses dummy variables to control for individual-specific effects in panel data regression.
SDPD	Spatial Dynamic Panel Data: incorporates both spatial dependence and temporal dynamics including lagged dependent variables over time and space.
PSM	Propensity score matching: estimates the causal effect of a treatment by matching treated and untreated units with similar propensity scores
GPS	Generalized Propensity Score Matching: extension of propensity score matching used for estimating causal effects in scenarios with multiple treatment levels or continuous treatments
SDM	Spatial Durbin Model: includes both spatially lagged dependent and independent variables to account for spatial spillover effects in the relationships between variables.
GAM	General Additive Mode: allows for non-linear relationships between the dependent variable and independent variables
SCM	Synthetic Control Method: estimates causal effects by comparing the treated unit to a weighted synthetic version of untreated units.
RE	Random Effects Estimator: assumes that individual-specific effects are uncorrelated with the independent variables
StrEqM	Structural Equation Model: used to test hypotheses about relationships among observed and latent variables.
LOGIT	LOGIT: predicts the probability of a binary outcome
MGE	Mean Group Estimator: estimates the long-run relationships by averaging the individual coefficients obtained from time series regressions for each cross-sectional unit

Source: Own Elaboration

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