MAPPING HUMAN CAPITAL INVESTMENTS ACROSS THE EUROPEAN UNION 2014–2020 CYCLE

Mihaiela Simona ȘTEFĂNESCU
Bucharest University of Economic Studies, Bucharest, Romania
stefanescumihaiela22@stud.ase.ro

Sofia Elena COLESCA
Bucharest University of Economic Studies, Bucharest, Romania
sofia.colesca@man.ase.ro

Mihaela PĂCEȘILĂ
Bucharest University of Economic Studies, Bucharest, Romania
mihaela.pacesila@man.ase.ro

Ștefan Gabriel BURCEA
Bucharest University of Economic Studies, Bucharest, Romania
stefan.burcea@amp.ase.ro

Abstract
Three of the main objectives of the Cohesion Policy for the 2014-2020 programming cycle were related to employment, social inclusion and training. Human capital is recognized as a critical driver of both social and economic cohesion across regions, and has therefore been a central focus in terms of both research and funding allocation. This paper analyzes the outcomes reported by EU Member States by the end of 2022, with the aim of conducting a comparative analysis across countries. The attempt was to first determine clusters depending on Member States profile, so that the comparison be reasonable both in terms of resources but also in terms of needs, and then identify performers in each group regarding the implementation of programs directed to the development of human capital. Four clusters were identified taking into consideration three relevant indicators in terms of cohesion: population, GDP per capita, and persons at risk of poverty or social exclusion - rural areas. For the comparison, four human capital indicators were considered, employment, unemployment, educational attainment, and rural residence, by analyzing achievements reported for the 2014–2020 period (the last finished cycle) against the baseline needs identified during the implementation period.
Keywords: human capital programs, agglomerative hierarchical clustering, comparative analysis, EU member states

1. INTRODUCTION

It has long been discussed and extensive research was made regarding the influence of European Union policies and investment in lowering discrepancies and/or attenuating disparities between its Member States and regions. According to studies, one of the main factors influencing economic, social and territorial development is human capital (Marinas et al., 2023). As such, there has been a growing interest on the level of investment and impact of funds directed to human capital. The European Structural and Investment Funds play an important role in financing European Union Member States and its regions (especially those whose *GDP per capita* is below EU average), in areas related to human capital (Tijanić & Kersan-Škabić, 2023).

In the attempt to measure the level of development of certain areas as compared to the other or the progress registered in some regions against other, human capital and its role for economic growth fall under scrutiny. It is directly or indirectly linked to the level of income, level of production, level of innovation or knowledge, capacity to attract funds, etc. This is why investment in human capital seems to be one of the key elements when it comes to addressing regional disparities.

Moreover, in a comparative analysis of how well regions or countries performed in addressing human capital needs, there are different aspects to be considered, such as the magnitude of interventions as compared to the real need, the achievements compared to initial objectives or achievements compared to resources

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invested, the impact of interventions on short or long term, the impact of various factors over the process of intervention or impact over the envisaged effects, specificities of the areas or fields of intervention, the influence of the characteristics of the target groups, the interactions between the fields, etc.

Among the different aspects to be considered, the focus of the present paper was on the achievements reported by EU Member States regarding the human capital interventions for 2014-2020. The research question was to make a comparative analysis on how Member States performed as compared to other having similar national characteristics and how well each of the Member States falling in the same category or cluster performed compared to the needs registered within the period of intervention. Components considered for the study were related to labor market (employment/unemployment), educational attainment level and residence environment (rural focus). It was also of interest for the present study to search for further questions on what could be the contextual factors that triggered the results registered.

2. LITERATURE REVIEW

The Cohesion Policy with its three main pillars, economic cohesion, social cohesion and territorial cohesion, represents one of the most important policies of the European Union dealing with disparities in wealth and development among Member States and regions of Member States. It is an investment policy with a structure of more financial instruments that now account for about one third of the European Union budget and, according to Europe 2020 guidelines, it is designed to contribute to economic development, employment opportunities, increase of competitiveness in a sustainable manner (Brandsma, et al., 2015).

For its fifth programmatic period (2014-2020), the policy included 11 thematic objectives among which three are concerned with what it is called social policy (Ballantyne & Mascioli, 2024), namely: sustainable & quality employment (TO8), social inclusion (TO9) and educational and vocational training (TO10) (Themes, 2025).

Even though investments in human capital is commonly assumed to belong to social policy, it also represents one of the main factors driving economic growth and, not the less, involved in territorial cohesion. Training, re-skilling or upskilling contribute to labor productivity (Crucitti et al., 2024), and thus to economic cohesion, while, on the other side, also have the indirect impact on brain drain to other more developed regions, with impact on territorial cohesion.

Labor migration decisions are generally fueled by employment opportunities and better wages and, even though mobility is encouraged by the same policy, migration is the one that contributes to enlarging the discrepancy between workforce originating areas and the targeted ones (Biedka et al., 2021). This is why, when evaluating the effect of investment in human capital, there should be considered not only the direct and indirect effects, but also complementary measures or contextual factors involved in reaching the objectives

2.1. Aspects related to Labor Market

Public labor market policies or private human resources strategies are related to level of educational attainment, income levels and/or employment opportunities, level of participation to labor market, workforce mobility, etc.

Employment / unemployment rates are under the influence of many factors, some of them related to educational attainment level and some related to residential environment. They have internal or external causalities, such as: the need to adapt to ever changing requirements due to technological developments, digitalization and change in job profiles, the need to overcome social or economic burdens (for example: economic crisis / health crisis determining loss of jobs with direct consequence on income level).

The global financial crisis determined a general decline in national public investments and, to overcome the economic burden, the decision at EU level was for a larger investment policy (Ballantyne & Mascioli, 2024) with recovery and resilience objectives.

The economic and industrial transformation of some areas generally brought structural unemployment (Biedka et al., 2021), while for some other regions the economic pattern related to a traditional sectoral structure (i.e. small agricultural farms) makes it difficult to stay competitive in terms of economic growth and labor force

attractivity, even though it highly contributes to other valuable objectives like preservation of natural and cultural heritage.

Europe 2020 covering the 2014-2020 programmatic period focuses on five interlinked policy areas: (1) employment, (2) research and development (R&D), (3) climate change and energy, (4) education and (5) poverty and social exclusion (Wüst & Rogge, 2022). Even though employment is one separate area, thus underlining its importance, it stays in line with other policy areas with impact over economic growth. Wüst & Rogge (2022) also state that most countries in Southern-Eastern and central regions are positioned behind other EU countries, such as the Scandinavian and northern ones.

Moreover, there are authors (Di Caro et al., 2018; Hijzen et al., 2018; Di Caro and Fratesi, 2023) arguing that recalibrating cohesion policies to focus more on human capital can mitigate the negative effects of economic shocks on the labor market. On the other hand, other researchers (Charon et al., 2014; Amendolagine et al., 2024) emphasize that the positive impact on employment varies from one region to another, depending on their trade linkages and geographical interconnections.

In their study analyzing the impact of cohesion policy funds allocated for training on the labor market in Italy during the recent economic crisis, Di Caro et al. (2018) conclude that human capital policies are essential, particularly in areas where the population has a low level of education. However, according to Crescenzi and Giua (2020), this positive impact on employment was short-lived in Italy as it disappeared after the crisis.

Overall, the funds allocated through Cohesion Policy have contributed to increasing the employment rate in the most disadvantaged regions of the EU (Crescenzi and Giua, 2020), with the highest levels recorded in German regions, followed by British ones (Criscuolo et al., 2019), during the recovery period after the recent economic crisis.

2.2. Aspects related to Education & Training

According to scientists (Rasmussen, 2014), there are a few elements to consider for the framework of lifelong learning among which: regulations applied, formal recognition, funding needed, educational institutions, spaces dedicated to learning and related to work, formal primary and secondary educational system (as the basis for further studies) and commitment to lifelong learning.

The author draws to the conclusion that different historical trajectories of the countries are essential for the contemporary education as well as for the promotion and development of lifelong learning strategies (Rasmussen, 2014).

As the interventions funded under Cohesion Policy focuses on the beneficiaries, which may result in a decline in the area's development (Dubel & Pawłowska, 2020), one point is to reach as many beneficiaries as possible and, on the other hand, to achieve the best results possible with people involved in the program. Yet, the real situation on the labor market as well as its main characteristic related to short-term employment within the labor force brought other perspectives on the achievements of the programs implemented. The results are not only related to the rate of employment, but also to the increase of competitivity on labor market. Even though results must be interpreted with a large dose of caution, authors' conclusions indicate that training has significantly contributed to boosting the competitiveness of individuals in the labor market (Dubel & Pawłowska, 2020).

Equally, cohesion policy has contributed to economic and social convergence between Member States, with education and training programmes considered essential tools to support less developed regions in attracting and making efficient use of human capital (Casas et al., 2025) and to increase employability, especially in the context of digitalization and the green transition (Tijanić, & Kersan-Škabić, 2025). Therefore, training and education projects funded by Cohesion Policy support the retraining of workers and the formation of skills relevant to new labor market requirements, such as digital and environmental skills (Crescenzi & Giua, 2020). However, brain drain remains a challenge, with estimated losses of billions of euros for countries such as Italy and Belgium, although notable progress has been made through programs dedicated to talent mobility (Eurofound, 2025).

According to the European Union (2024) investment in human capital has reduced regional disparities and supported the integration of young people into the labor market. Between 2014-2020, NEET rates (young people not in employment or enrolled in education or training) fell and cohesion programs generated more than 370,000 jobs and supported upskilling of the workforce. Bachtler et al. (2017) also emphasizes the contribution of cohesion programmes to reducing unemployment, especially among young people, and recognizes their ability to improve career prospects.

The literature recognizes difficulties such as lack of resources and weak administrative capacity in some regions, which limit the impact of initiatives on human capital development. Díaz Ramírez et al. (2023) suggest that private sector involvement in education, better integration of vocational training with labor market needs, and improved monitoring mechanisms can amplify the effectiveness of education and training programs. Education and training strategies should also address intra-country disparities, encourage talent mobility and attract investment for innovation and regional development.

2.3. Aspects related to Residential Environment

Human capital is not only influenced by indicators like training & education, but reflects the effects of public policies in many economic and social areas like housing, socio-demographic strategies, health & wellbeing, science & technology, culture, local development, entrepreneurship and infrastructure, etc.

As scholars indicate, it is equally important the place of residence regarding education level and having a job. Thus, the larger the locality, the greater the possibility that both education levels and work frequency increase (Dubel & Pawłowska, 2020).

However, when it comes to rural area, the effectiveness of Cohesion Policy depends on various factors, such as local resources, human capital and institutional development (Becker et al., 2012; 2018; Komorowski et al., 2021; Profiroiu et al., 2024).

On the other hand, according to findings of other authors (Biedka et al., 2021), investment in human capital in rural areas did not have the desired effect. They classified regions into metropolitan regions, traditionally rural regions, structurally burdened urban regions (with structural unemployment) and structurally burdened polycentric regions (with structural unemployment) and findings show that strengthening the human capital does not preserve it for the locality. The existence of a highly developed labor market pole can have a positive impact by reducing brain drain. This can lead to an increase in the number of trained individuals attracted which in turn keeps territorial disparities. Also, it seems that investment in human capital does not significantly contribute to preventing depopulation – out of the same reasons related to migration to economic poles.

Moreover, as suggested by Komorowski et al. (2021) in a study conducted in Poland, the effects of cohesion policy on rural development in areas characterized by adverse demographic processes, limited financial resources available to local administrations, and a high share of agriculture in the local economy, are difficult to measure. On the other hand, the authors mentioned above highlight that the impact of cohesion policy interventions is limited in rural areas. This is particularly true in areas characterized by fragmented agriculture and a common practice of commuting among individuals with multiple professional activities who supplement their income through work carried out in the city.

Analyzing the impact of cohesion policy in urban and rural areas, other authors (Gagliardi and Percoco, 2017) have concluded that European cohesion funds have had a positive economic effect, particularly in rural areas near cities. Their main advantage lies in meeting the growing demand for space and hosting flows of people as well as economic activities. In this regard, as indicated by Barca et al. (2012), the application of cohesion policy must take into account the specificities of each area, particularly with regard to isolated rural areas or overcrowded and deteriorated urban neighborhoods, which have different characteristics, including both strengths and weaknesses (Wibisono, 2024).

Considering that some scholars revealed insignificant returns of investments in human capital, we may note that *GDP per capita* may not have been influenced in case of workforce migration. On the other hand, when it comes to social and labor market integration of individuals in the marginalized communities, a higher cost per

trainee and longer time is needed to bring about change. In other words, integrating a worker into the job market requires two or even three years of training (Crucitti et al., 2024).

2.4. Role of the actors involved in the process of human capital development

According to studies, each country displays a different pattern in terms of territorial and/or administrative morphology and subsidiarity and, depending on this, it also differs the capacity to attract and manage funds directed to human capital. Moreover, Ballantyne & Mascioli (2024) state that not only the morphology of the country differs, but there are also significant gaps between regions.

It may be important to mention that territorial representation of actors involved in the process of human capital development – directly related to the access and communication to program beneficiaries – as well as the institutional capacity of actors are very important aspects in reaching the intended objectives. National and regional governments are thus responsible for the transposition and implementation of cohesion policy in their regions. In the area of human capital development, governments implement training, education, and active labor market policies tailored to the specific needs of their respective regions (Rodríguez-Pose, 2025). At the national level, governments allocate and monitor European funds for human capital development. Also, at local level authorities implement concrete projects targeting social inclusion and education to support the development of human capital at community level. These are key initiatives in adapting cohesion policies to local needs and supporting vulnerable groups, including by stimulating the participation of young and disadvantaged people in the labor market (Dettmer& Sauer, 2022).

The study conducted by Ballantyne & Mascioli (2024) also mentions three distinct layers/space subsidiarities (national/regional/local) and, for each of them, three types of actors – public, private (business) and civil society (so called third sector). In their opinion, subsidiarization seems to have various consequences for the design and implementation of social policy. While public actors (no matter the layer) bring control, regulation and surveillance, private actors are expected to improve efficiency and effectiveness in providing social services. Therefore, companies and training providers contribute to human capital development by investing in employee training and education. Through public-private partnerships, the private sector helps to adapt education and training programs to labor market requirements (Radkevych, 2023).

According to Ballantyne & Mascioli (2024) the social economy brings innovative practices and is also concerned in breaking beneficiaries' reliance on services, the authors conclude that the third sector is as much involved as the public sector in social policy making. Moreover, Lindström et al. (2022) suggest that civil society organizations play a key role in promoting social inclusion, especially for vulnerable groups. Non-governmental organizations and other civil society entities implement education and social inclusion projects that support human capital development at local and regional levels.

The contextualization of interventions should not only bring together the various actors mentioned, but also investigate what the policy should add as complementary to the existent assets so that to make available resources needed. In terms of interventions and their outcome, the institutional and administrative capacity are claimed to be important as well as the improved strategy and space planning that help coordinate spending (Biedka et al., 2021).

To increase the chances of success, strategies must be based on local/regional resources. Not only the peculiarities of the regions, but also their constant transformation and reconstruction call for adapted approaches. Effective collaboration between the three types of actors already mentioned (public/private/non-governmental) can create lasting relationships that can strengthen the identity of a territory (Provenzano & Seminara, 2024). As argued in the literature, social networks have the ability to influence learning processes, generate problem-solving opportunities and create new ideas. In this context, universities and research centers can provide the knowledge and data needed for evidence-based policy development. Jagódka & Snarska (2023) consider that academia and research are considerably involved in assessing the impact of cohesion policy on human capital development and in proposing innovative solutions to improve education and training programs.

In the attempt to search for the progress of regions and cause for it, it is highly important to check for the impact of financing programs intended for their development, but also necessary to find the reason of territorial fragmentation and inequalities. The concept of capabilities is related to both the personal and institutional levels. In terms of welfare policies, Andreotti, Mingione and Polizzi (2012) indicate that social policies are more effective if the public sector is able to activate and coordinate the different resources and providers of the territory. Given that the actors involved have different interests, needs, expectations and capacities, the real challenge for social cohesion is how to involve local knowledge and, by involving it, how the engagement of different actors and their interaction can influence local development (Borén & Schmitt, 2021). According to scholars, the loops of the learning process are influenced by actors' long-term relationships and involve their background in a particular field and their professional experience (Borén & Schmitt, 2021).

Promoting rural development in EU is strongly connected to regional cohesion because type or organization (fragmentation) and social, cultural and economic pattern may influence dependencies as well as partnerships. In the new approach based on the multisectoral perspective, emphasis is placed on the collaboration and involvement of all actors interested in rural development. Whether they are from the public, private and third sectors, or simply local residents, they are all influential and play a collaborative role in the formulation and implementation of rural development policy (Gargano, 2021).

To just bring an overview on the studies exemplified, human capital is strongly related to social, economic and territorial development & cohesion and, as an influencing factor, its development depends in turn on coordinated action and integrated interventions, enabled by mobilization of actors found in different layers of governance. Without the focus on integrated interventions, funds may enlarge disparities due to magnetism of economic poles and, as a consequence, much more attention must be given to reasons and roots of disparities and not only the outcome of funded programs.

Besides the level of involvement of actors (public/private/third sector) as well as residents, other influencing factors like the experience gathered from previous financial cycles, social and economic burdens, traditions and cultural and natural heritage should be taken into consideration.

3. METHODOLOGICAL APPROACH AND DATA

As mentioned in the previous sections of the paper, the focus of the study was on the achievements reported by EU Member States regarding the human capital interventions for 2014-2020. Data subjected to analyses was extracted from the Cohesion Open Data Platform (EC - Cohesion Open Data Platform, 2025). Alongside with achievements reported, another point of interest was related to the needs registered by countries during the implementation period for aspects regarding labor market (employment/unemployment), educational attainment level and residence environment (with a rural focus) and for these, data was extracted from Eurostat - the statistical office of the European Union (Eurostat, 2025) and from the World Bank (2025).

The attempt of the study was to first determine groups depending on Member States profile – so that the comparison be reasonable both in terms of resources but also in terms of needs – and then identify performers in each group regarding the implementation of programs directed to the development of human capital.

For the first stage of the analysis, various approaches were considered and the most suitable was found to be the agglomerative hierarchical clustering (AHC) method. This was done by means of XLSTAT software. According to different scholars, cluster analysis is suitable to group countries and regions with similar characteristics (Tijanić & Kersan-Škabić, 2023). Indicators selected for cluster analysis were (a) population by broad age group / 2021, (b) real GDP per capita / 2021, and (c) persons at risk of poverty or social exclusion / rural areas / 2021 – data extracted from Eurostat. Reference year was 2021 because it falls within the implementation period (2014-2020/2023 according to n+3 years) and also census occurred in 2021.

Aforementioned indicators were selected as relevant for analysis because it was important to compare the number of program participants against population in number of persons, while GDP per capita represents an argument for funds allocation. The risk of poverty in rural areas was considered relevant as this indicates to a certain extent regional disparities.

Management Research and Practice
Volume 18, Issue 1 / March 2026

For AHC method, dissimilarity was used for proximity type (Euclidean distance) and regarding the agglomeration method - Ward's method was used with variation of 2 to 4 clusters and consolidation with K-means method.

For the second stage, comparative analysis was conducted considering on one side the results reported by Member States found in the same cluster for 2014-2020 programming period and, on the other side, statistical data on the four components already mentioned, namely: (1) employment and (2) unemployment (thousand persons reported by Eurostat), (3) educational attainment level (thousand persons reported by Eurostat) and (4) population in rural area reported in 2017 (thousand persons reported by Eurostat and World Bank). The last two points also need some further clarification in the sense that:

- (3) educational attainment level was analyzed only for number of persons with ISCED 0-2 (Less than primary, primary and lower secondary education) classification according to International Standard Classification of Education (ISCED 2011); also, data extracted from Eurostat only referred to persons aged 15-64 (percent of persons with ISCED 0-2 out of total population), while data extracted from achievements reported for program/s participants are not exposed by age category.
- (4) for population in rural area, data was considered only for 2017 – year for which data was reported separately in terms of program achievements. Population residing in rural area was calculated by subtracting the urban population (reported by World Bank for 2017) from the total population (reported by Eurostat for 2017).

The analysis considered the achievements reported by Member States until the end of 2022 and the first observation regarding the results is that the achievements were not available for the entire period of the programming cycle (2014-2020 cycle ended in December 2023 according to the rule n+3 years), which means that final results for the entire period might slightly change. Another important aspect is that data was excluded from the analysis for Interreg program (the program includes 36 countries, out of which 9 countries are not EU) and for United Kingdom (left the EU in 2020).

The second stage of the analysis comprised two steps for the clusters identified in first stage. The first step was intended to identify the best ranked country within the clusters in terms of program/s spending versus program/s participants and the other step was intended to indicate best fit between needs registered during the period of implementation *and* achievements of program/s regarding the four categories mentioned above (employment/unemployment/educational level/rural residence – number of persons). Some remarks are also included for a comparison between best ranked – best fit within the cluster.

4. RESULTS AND DISCUSSIONS

As mentioned before, for the first step of analysis, AHC method was applied by using three global indicators as country characteristics – *population*, *GDP per capita* and *risk of poverty and social exclusion*. The argument for AHC was to identify which are the Member States whose characteristics are most similar and thus fall in the same category, so as to enable a relevant comparative analysis between countries both regarding program achievements reported, and needs reported during the program/s implementation period.

As can be seen in Figure 1, the identified clusters are formed of the following Member States:

Cluster 1 - 9 Member States: Belgium, Czechia, Sweden, Portugal, Greece, Hungary, Netherlands, Austria and Romania;

Cluster 2 - 13 Member States: Bulgaria, Croatia, Cyprus, Denmark, Estonia, Finland, Ireland, Latvia, Lithuania, Luxembourg, Malta, Slovakia, Slovenia;

Cluster 3 - 3 Member States: France, Germany, Italy;

Cluster 4 - 2 Member States: Poland and Spain.

Management Research and Practice
Volume 18, Issue 1 / March 2026

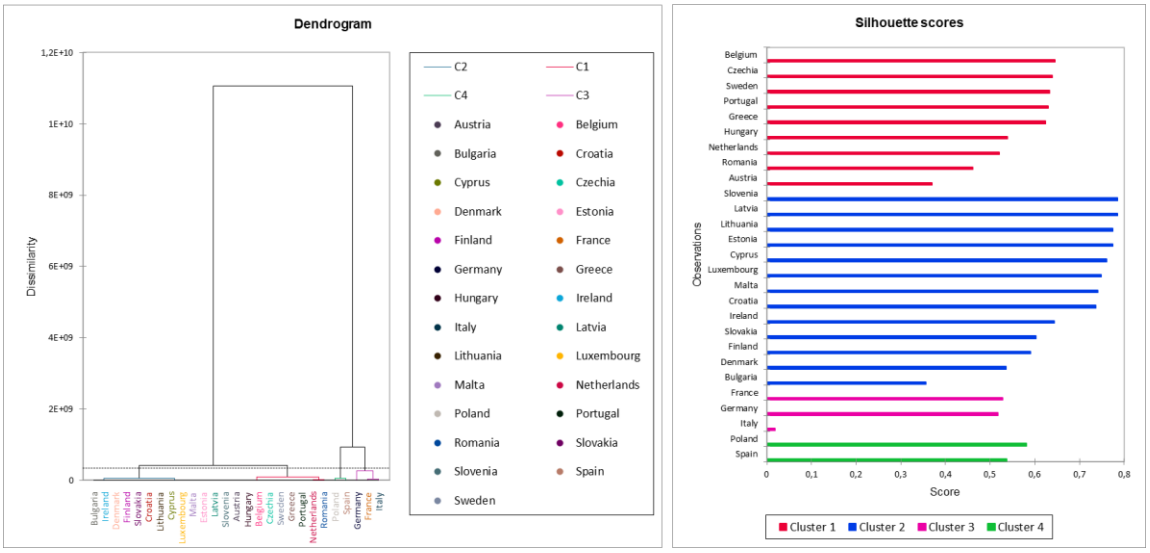

FIGURE 1 – AHC – DENDROGRAM & SILHOUETTE SCORES FOR 4 CLUSTER GROUPING

According to means by cluster (see Figure 2), cluster one and two include more countries, while three and four limit to 2-3 countries and this is probably due to the large populations adjusted by values reported for *GDP per capita* and *risk of poverty and social exclusion*.

To minimize within cluster variance, the means for all the variables were computed for each Member State and squared Euclidean distance was calculated to the cluster means. According to method, when the sum of squares is small, it suggests that our data are close to their cluster means, which shows that similar units are included in the same cluster. Profile plot included in Figure 2 presents the dependent variable adjusted. As can be seen, clusters 3 (France, Germany and Italy) and cluster 4 (Poland and Spain) are represented by countries with higher values in terms of population (over 37 million persons).

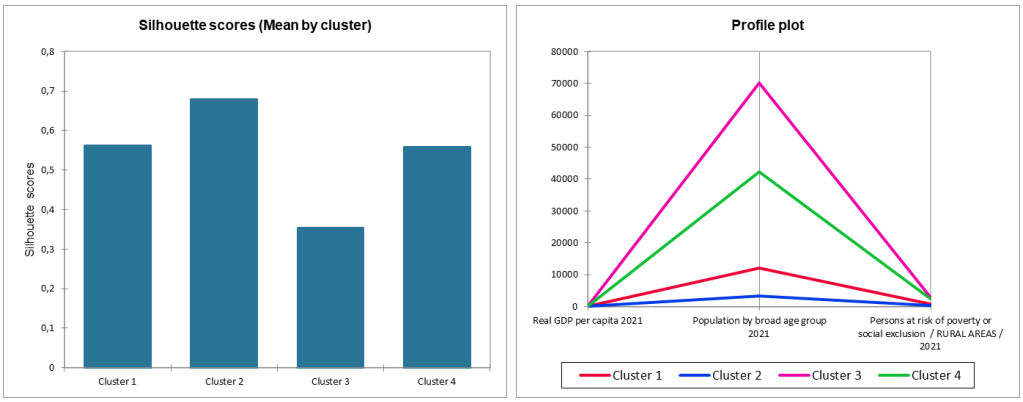

FIGURE 2 – AHC – MEAN BY CLUSTER & PROFILE PLOT

For Member States included in cluster one, population is medium-sized, but the values of the other two indicators fluctuate. Some countries, like Greece and Romania, present a higher value for the *risk of poverty and social exclusion rate* (rivaling in absolute values with those of countries over 37 mil. inhabitants), while others like Netherlands, Belgium, Sweden and Austria, present higher *GDP per capita*.

In cluster 2, on the other hand, fall small-sized Member States in terms of population, but that have medium-high *GDP per capita*. This is more the case of Northern and Central-Western Member States. These also have lower *rates for the risk of poverty and social exclusion*.

Cluster 4 includes big countries with strong economies (Germany, France, Italy), high *GDP per capita* and lower *rates for the risk of poverty and social exclusion.*

Management Research and Practice
Volume 18, Issue 1 / March 2026

Cluster 3, composed by Poland and Spain reflect big countries, but with medium values for *GDP per capita* and *the rate for the risk of poverty and social exclusion.*

Among Member States, there were countries that performed better during 2014-2020 programming period and this is reflected in the scatter graphs below (see

Figure 3) for which indicators considered were program/s total eligible spending (2022 included) & program/s participants (2022 included).

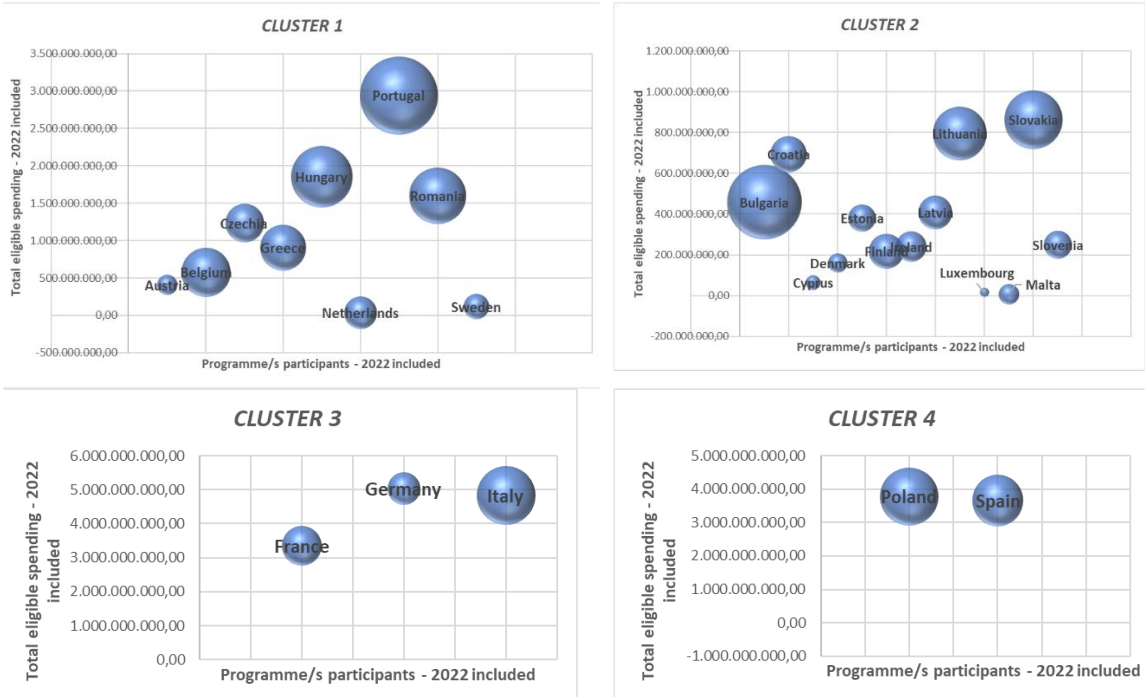

FIGURE 3 – MEMBER STATES PROGRAM/S PERFORMANCE BY TOTAL ELIGIBLE SPENDING VERSUS NUMBER OF PARTICIPANTS REPORTED

Generally speaking, performances should be related to the funds allocated. On the other hand, reported results limit to 2022, which means that achievements/spending for the last year of implementation are not covered. As scholars state, frequent changes of governments and the overlap between the closure of one program and the need to prepare and start of another one determine a concentration of expenditure towards the end of the financing cycle (Casula, 2020), which means that significant changes may appear for the analysis of final results of the program/s.

As Figure 3 shows, best ranked in clusters 1 are Portugal, Hungary and Romania and in cluster 2 Bulgaria, Slovakia and Lithuania. Considering that clusters 3 and 4 are only formed of 2-3 states, ranking is less significant due to arguments related to allocation of funds and reporting stage.

There should be though stated that, even if some countries seem to be ranked as performers in their cluster, in some cases this might not be entirely true.

For example, in cluster one, Portugal has a better position. It is true that it is one of the older MS, with higher expertise in funds management, which is shown by the fact that it started reporting since 2015, while Romania started reporting since 2017. This two years delay may reflect the difference, but also this gap may be regained by other MS in the cluster in the last period of implementation/reporting. On the other hand, MS like Belgium, Netherlands, Sweden and Austria may have directed their efforts towards activities with less beneficiaries (in numbers), as these are MS with a higher standard of living and supporting human resource through various national schemes.

Management Research and Practice
Volume 18, Issue 1 / March 2026

In cluster 2, Bulgaria breaks out the pattern, with a higher number of beneficiaries reported per total eligible spending. This may have other drivers as for example the cost for services provided (which differs a lot from country to country), or type of activities implemented (short term activities versus long term activities; single activity versus package of activities provided).

As for cluster 3, while Italy for example reported achievements both for regional operational programs, and for more targeted programs like *Youth employment* or *Social inclusion*, Germany reports achievements for a national program and for regional programs. The way funds were distributed/managed may have triggered a difference in results. On the other hand, the type of program beneficiaries and time/effort dedicated might be different and, as a result, show more or less participants in total (i.e. short time trainings of employees in different facilities/economic fields, services to facilitate integration on labor market of youth unemployed or postgraduate programs dedicated to academic students). Another reason for the difference might be the involvement of different actors in the process – example private sector involvement (especially for vocational training) which improves effectiveness.

In other words, this part of the analysis only shows the positioning of the MS within the cluster, but a further analysis needs to be conducted on the factors that may have triggered the results. There is for sure a mix of general and more particular/specific influencing factors that should be documented before drawing conclusions regarding performance or a better management of the program/s.

Regarding the second step of the analysis intended to identify the best fit between needs and results/achievements, a comparison analysis was conducted between the categories of beneficiaries to the program/s financed under European Cohesion Policy (thematic objectives 8, 9 and 10) and the same indicators in general population reported for reference year 2021.

In the following, results are presented as slope charts per cluster for: (a) employed population (2021) *versus* participants to the program/s employed category (2022 included); (b) unemployed population (2021) *versus* participants to the program/s unemployed category (2022 included); (c) population residing in rural areas (2017) *versus* rural participants to the program/s (2017); (d) ISCED 0-2 population (2021) *versus* program participants with ISCED 0-2 (2022 included). Indicator values are expressed as thousand persons.

An overall observation is the fact that each country uses statistical data available at the time program/s are designed according to thematic objectives selected and – for 2014-2020 programming cycle – most probably data available was at least two years behind. This means that objectives were set by each country considering the problems and needs present / documented in 2011-2012. Evolution is probably different for each country – most perceived in the case of labor market (employment/unemployment rate) – which depending on the country ability to adapt may have translated in shift of objectives / focus during implementation period.

Evident might be the situation on labor market due to sanitary crisis caused by Covid-19, which led to an increase in unemployment rate, but the other two categories might have suffered changes as well, because during the pandemic period the number of residents from rural area may have increased and also education attainment level might have been influenced due to face-to-face / on-line training conditions and material conditions of beneficiaries.

4.1. Remarks for Cluster 1

In terms of *employment/employed*, when comparing indicator values for persons employed in total population and persons employed participating to implemented programs (see Figure 4), there is a reversal in ranking. This was no surprise as the higher the unemployment rate, the higher the efforts of MS to maintain the employed on the labor market and to integrate the unemployed. Also, this may be partially explained by pandemic effects and the fact that countries focused on the support given for employability (for the workforce to remain employed and also gain competences to shift to other fields of activities if needed).

Netherlands – at least for achievements reported until 2022 – registers the highest slope for employed persons participating to the program. According to data reported, Netherlands focused during 2014-2020 on *social inclusion* and less on *sustainable & quality employment*, which means that also the other indicators related to

labor market should be interpreted in this light. This is why it is important to also compare achievements to what was intended so with objectives settled by each MS.

On the other hand, there were MS which decided to continue funding some policies, but some other which decided to focus on other national priorities. This translated into a change regarding the way they negotiated/allocated funds for each thematic objective. In other words there can be a higher portion of funds during one programming cycle for one country and a lower portion of funds in the next programming cycles (see 2007-2013 versus 2014-2020). This is why further investigation is needed.

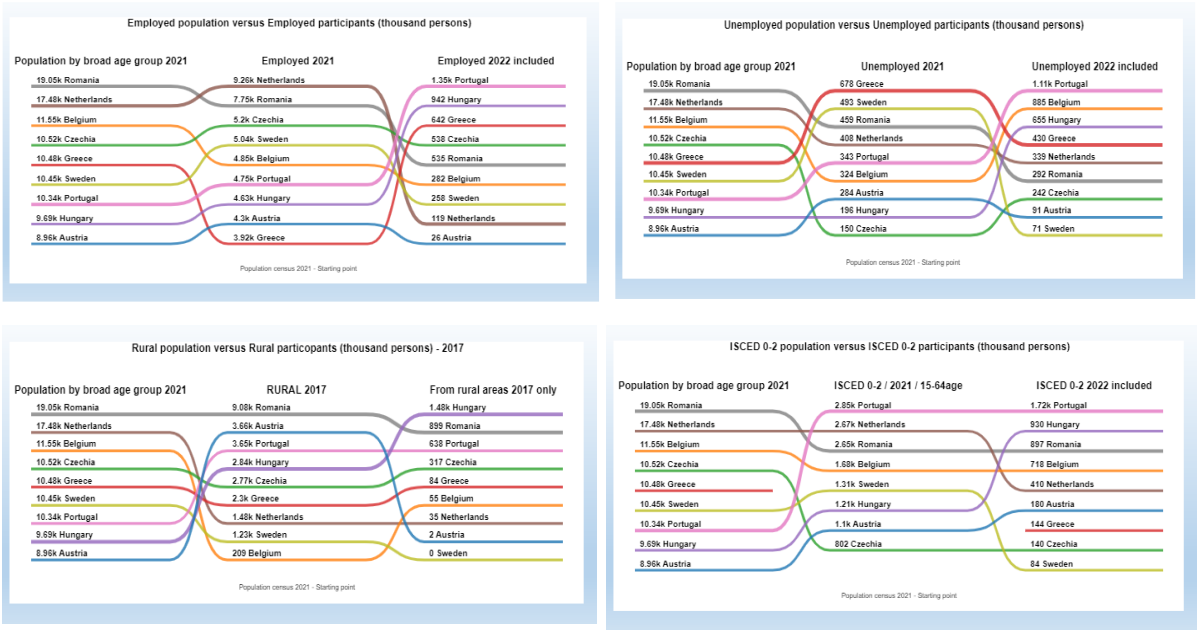

FIGURE 4 - CLUSTER 1 - SLOPE CHARTS FOR 4 CATEGORIES

Regarding *unemployment*, there is also a shift from best ranked to lower ranked, but this also needs to be contextualized. Greece for example was faced with a major financial crisis during 2009-2016, period in which Greece's economy dramatically contracted (by more than a quarter). For attenuation of effects of the economic crisis also the European Commission intervened, but some effects like unemployment were difficult to tackle. As a result, even though the number of potential beneficiaries in this category was high, the operational program/s may have provided support for just a small part of them. Sweden on the other hand has a different economic context and, as a more developed country, even though the support was given for unemployed, the analysis on the type of activities will probably show the focus. For example, if support is given for newly established SMEs, this means higher costs and fewer beneficiaries. If on the other hand occupational activities are funded – counselling, mentoring, mediation for integration on labor market, etc. – these may bring more beneficiaries for the same eligible expenditure. There must be also tested the efficiency of chosen supporting schemes. Yet, entrepreneurship alongside with upskilling (either for employed or unemployed) was the choice of many MS in the support of human capital.

As for the *rural residents/rural areas*, one important aspect to be mentioned is that most of the times these are more deprived. This is why dealing with needs and problems of rural residents may contribute to lowering disparities between regions. On the other hand, data is available, reported separately, only for 2017 and not for the entire programming cycle.

Within the cluster, most of the MS show a good focus on the needs of rural residents except for Austria which presents the highest slope. There are maybe two important factors contributing to this situation – the level of development coupled with the geographical localization (mountainous country). The level of development brings accessibility, high quality services of general interest (education and training included) and better

Management Research and Practice
Volume 18, Issue 1 / March 2026

employment opportunities, while the specificities of each area may either trigger limitations or development prospects.

In terms of educational attainment level, for *ISCED 0-2* category, countries provided support in a proportionate manner to persons with *less than primary, primary and lower secondary education level*. Unfortunately, comparison was not possible for Greece, because data was not available from Eurostat for the number of persons with ISCED 0-2 in total population.

Slopes are registered by Netherland and Sweden, countries that may have decided to focus the interventions on other types of beneficiaries. On the other hand, in these MS the culture of long-life learning is well rooted and education benefited of continuous support as compared to East-European countries which – out of objective reasons – neglected such policies for a long time these being underfinanced.

An important aspect to be also mentioned regarding the results of countries like Netherlands, Sweden and Austria is that these countries most probably had a lower allocation of funds according to criteria related to *GDP per capita* (as compared to EU average) that might have translated into a smaller number of total beneficiaries and, as such, lower number of participants per each category.

4.2. Remarks for Cluster 2

For the first category – *employment* (see Figure 5), higher slopes are registered for Denmark and Ireland and positive change for Lithuania, Malta, Latvia and Estonia. Considering the standard of living – see *real GDP per capita* for Denmark and Ireland that rank among the first in the EU – it was expected that support for employees would not represent a priority. One should also consider that some of the countries do provide support for the different categories subjected to analysis under nationally financed schemes whose results are not included in present study. This means that the real number of persons benefiting of support per category might be different for each country according to resources available. On the other hand, duration of some interventions for human capital (ex. three years training and follow-up) may lead to less results reported regarding the number of participants. This was a matter of strategy for each of the countries for the identified needs.

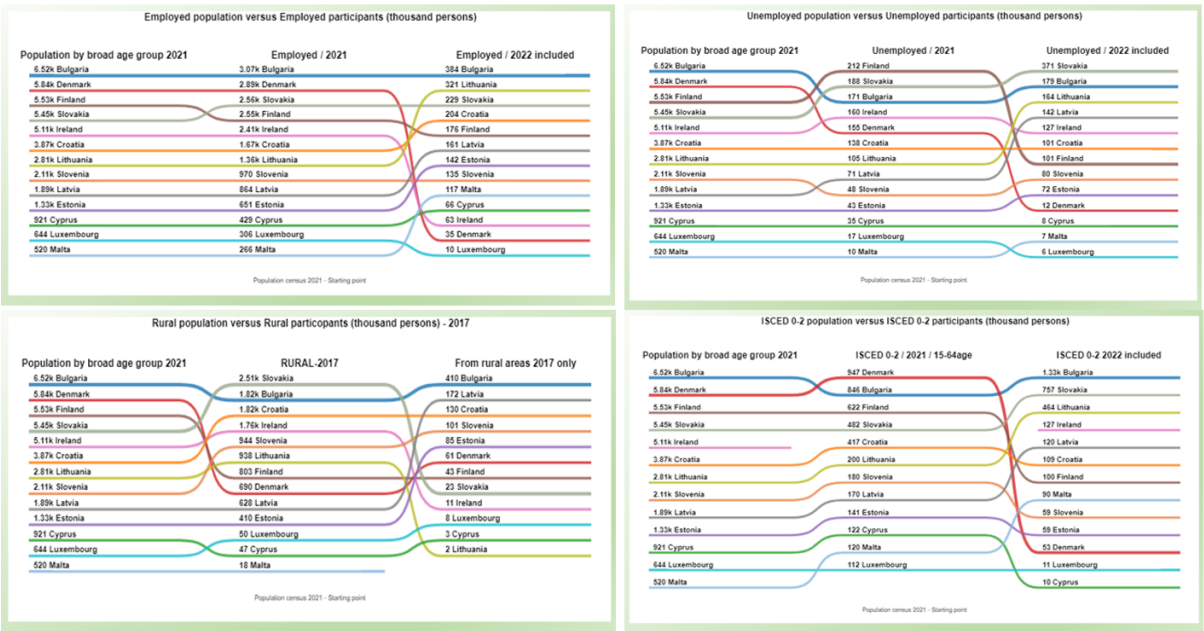

FIGURE 5 - CLUSTER 2 - SLOPE CHARTS FOR 4 CATEGORIES

The second category – *unemployment* – shows a different ranking from the employed category (see Figure 5). While Denmark still shows a high slope, together with Finland this time, higher number of beneficiaries are presented by Latvia and Lithuania. It seems that priority was given by the last one (Lithuania) especially to young people and their needs – employment included (according to the number of total participants reported

per age groups – the highest share is represented by participants below 25 years of age). Ireland for example, one of the MS with a good position regarding *GDP per capita*, also shows a good focus on the unemployed.

Regarding *rural residence* category (see Figure 5), Slovakia and Lithuania, together with Ireland present the highest slopes, while Latvia and Estonia seem to be some of the beneficiaries in this context; Malta reports no results for the category until 2022. If in the case of Slovakia – a mountainous country (see also Austria in cluster 1) – may have supported more the economic activities in rural areas (see *rural development fund*) and less the human resources, the positioning of Ireland and Lithuania (one of the MS with a fast economic development) is probably influenced by both the pattern of economic activities and the population density in rural areas, as Ireland for example experienced for a long period of time a decline in rural population and it is not the single one in the EU.

Other factors that may contribute to a better/poorer representation of certain categories within the achievements (see variation in ranking for some MS) are, among other, a good territorial representation of actors involved in human capital development and institutional capacity of these actors. Thus, further analysis needs to be conducted on the influencing factors.

For *ISCED 0-2* category (see Figure 5), the higher slopes are registered by Denmark and also by Finland, while Slovenia and Cyprus show a lower decrease. For Ireland, data was not available regarding educational attainment level (*less than primary, primary and lower secondary education*) for age groups of interest in total population. If Denmark and Finland most probably have nationally funded supporting schemes for this category of beneficiaries, Cyprus – with lower population and lower resources – most probably needs to set priorities related to human capital and thus employment, training, social inclusion matters.

We also need to mention that reported achievements must be compared with originally intended results – on one hand because this reflects the targets established by each MS and, on the other hand, because objectives might have been set to a lower value due to statistic data available while documenting the needs for the program/s design.

4.3. Remarks for Clusters 3 and 4

Slope charts provided below (see Figure 6 and Figure 7) are self-explanatory, but a few remarks may be added as compared to ranking in terms of program/s spending vs. program/s participants. In case of Cluster 3, ranking is preserved for all categories except persons employed – for this Germany ranks the first. As for Cluster 4, Spain leads for two categories (unemployment and educational attainment level / ISCED 0-2), at least for results reported 2022 included.

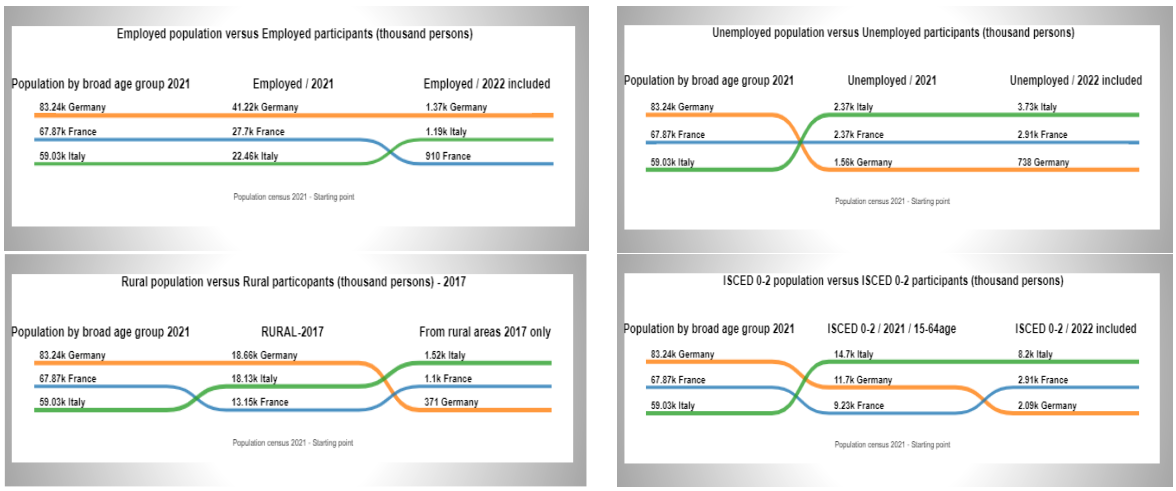

FIGURE 6 - CLUSTER 3 - SLOPE CHARTS FOR 4 CATEGORIES

FIGURE 7 - CLUSTER 4 - SLOPE CHARTS FOR 4 CATEGORIES

An important aspect to be mentioned regarding the results reported by Member States is that, according to criteria related to *GDP per capita* (as compared to EU average), some countries had less funds allocated compared to other which also triggered a smaller number of participants to the program/s per each category. This is why the intention was to conduct a comparative analysis between countries falling in the same cluster, having similar characteristics.

On the other hand, some of the countries – depending on evolution at national level (contextual changes) – may have registered a shift of focus for the interventions, with a change in value for certain indicators related to labor force. In this sense, the sanitary crisis determined by Covid-19 as well as the economic crisis that followed, alongside with humanitarian crisis due to armed conflicts in different parts of the world (Russia-Ukraine war close to the EU territory being just one example) may have influenced the conditions of program/s implementation both in term of focus shifts (targeted results changed), and in terms of access to and willingness of potential beneficiaries to participate in the program/s.

In any case, as studies show (Dubel & Pawłowska, 2020), the more beneficiaries are involved among the ones presumably slowing down progress of regions and the better the results registered with these beneficiaries, the better the chances of success for the program. This is why, both the number of participants per category (*employed* – to better adapt to labor market changes, *unemployed* for better chances of integration / maintaining on the labor market, *rural residents* to be better equipped for development in their residence environment), and the *level of education attained* represent an indication of program/s performance.

In this context, there can be stated that within cluster analysis revealed positive results as compared to needs registered within the period of intervention for most of the countries during the fifth financing cycle / 2024-2020, according to the allocation of funds. The differences indicated by the analysis will most probably be decreased by final results of the programming cycle.

5. CONCLUSIONS

The aim of the present study was to conduct a comparative analysis between Member States grouped in the same cluster regarding the achievements reported for the fifth financial cycle of the Cohesion Policy (2022 included). The four clusters analyzed were formed by taking into consideration three relevant indicators in terms of cohesion - (a) population, (b) GDP per capita, and (c) persons at risk of poverty or social exclusion - rural areas. Achievements reported for 2014-2020/2023 were considered for four indicators of human capital – employment, unemployment, educational attainment level and rural residence – for a comparison analysis with needs registered during the implementation period (2021 reference year).

Generally, the best ranked countries within the clusters (in terms of program/s spending *versus* program/s participants) also preserved a best fit to the needs registered during the implementation period - for the four categories under analysis (employment/ unemployment/ educational level/ rural residence).

Management Research and Practice
Volume 18, Issue 1 / March 2026

Among the few exceptions registered are the results of program participants falling in the category *rural residents* for two countries in cluster 2 – Slovakia and Lithuania. These two countries show a drop of 6-7 ranking places between rural residents in total population vs. rural participants to the program. Yet, there should be considered that participants to the program from rural areas were reported separately just for 2017 (which means numbers per entire programming cycle might reflect a different position) and, on the other hand, some MS may have supported more the economic activities in rural areas (see *rural development fund*) and less the human resources.

If generally Member States with higher allocations also shown good positions for the number of participants to the program/s, which indicates they took advantage of the opportunity offered by the Cohesion Policy funds, it was also of interest to check which are the countries with the highest slopes per category – in cluster 1 and 2 (numerous as group members).

In cluster 1, the highest slopes (population vs. program/s participants per category) were: Netherlands / employed; Sweden / unemployed; Austria / rural residence; Netherlands & Sweden / ISCED 0-2). In cluster 2, the highest slopes were registered by: Denmark / employed; Finland / unemployed; Slovakia / rural; Denmark / ISCED 0-2.

In most of the cases, lower number of participants were reported by MS with a higher standard of living and, most probably, a lower allocation of funds. In any case, on one hand, the Member States do have other national funding schemes for the same categories of beneficiaries (i.e. employed, unemployed, rural residents, persons with low educational attainment level), which change the balance of total beneficiaries per country and, on the other hand, within the thematic span (see activities specific to sustainable & quality employment, social inclusion and educational & vocational training), some countries might have focused better on other types of beneficiaries (ex. problematics of elderly – a challenge for more and more countries or the education at early stages / children).

Program/s reports conducted by each country at the end of the implementation period will include the analysis of results as compared to initial design / objectives for each thematic objective, which will also bring more clarity to identified differences.

As mentioned before, achievements reported by Member States for 2014-2020 programming cycle are preliminary (2022 included, even though the financing cycle ended in December 2023), which means that certain changes may appear according to final results of the program/s. Other limitations of the analysis are related to the lack of consistent data at regional level. Most of the times, intra-country or inter-regional variations are higher and local and regional characteristics determine disparities and this is why a better understanding on regional contexts and program results would be important for policy improvements.

Further investigation on the various factors that might have influenced the results achieved by Member States for program/s implemented may clarify the drivers and offer indications on development policies. Among these there can be mentioned: the access to beneficiaries or territorial representation of actors involved in the process, type of actors involved (i.e. public/private/non-governmental), infrastructure, institutional development/capacity, duration of interventions, efficiency of some supporting schemes, characteristics / specificities of areas, other assets of the regions, continuity of funds allocation from one programming cycle to the other, etc.

As already stated, one of these factors are the actors involved and their level of mobilization (public/private/third sector and national/regional/local level). A good relation between national and regional/local government may lead to a fair allocation of resources and to avoidance of resources overlap. On the other hand, a good territorial structure/representation may lead to a better access to/connection with potential beneficiaries which may avoid difficulties in challenging contexts like the ones present during 2014-2020 programming cycle. The willingness to embrace change, the exchange of ideas and knowledge and the culture existent regarding collaboration may build networks which in turn help for the exchange in territorial concerns (Ballantyne & Mascioli, 2024; Krabokoukis et al, 2024).

Also, the institutional capacity of actors along the process may improve management and control issues and overcome challenges related to administrative burdens and weak monitoring and evaluation mechanisms by

ability to identify and propose corrective measures. According to studies, strong points are broadly linked to funding, level of specialization, networking & learning, but also ability to coordinate policy (Chamusca, 2023).

Learning is also a process of acquiring knowledge on how to better prepare strategies and implement programs. Experience from previous programming cycles, but also a better insight on the social, cultural and economic patterns of regions may contribute to better results in lowering regional disparities, as both economic growth, and social development are dependent on a proper employment/administration of assets and strengths of regions (Chamusca, 2023).

Level of education of the workforce may contribute to regional competitiveness – as the higher this is the better the chances to experiment a positive effect regarding economic growth (Pinho et al, 2015). Nevertheless, the regional development also has an important impact on employees' mobility or localization and it seems that it is only possible to consolidate the potential of local human capital if efforts are made to keep this capital local (Biedka et al., 2021).

In the light of the afore-mentioned aspects, other research questions and studies that could improve knowledge over the effects of interventions should focus on comparative analyses of context factors present at start, during implementation and post-implementation (during program/s preparation or design through its implementation) – so that corrective measures to be put in place if this is the case. There should also be analyzed not only the desired outcomes, but also the non-desired ones – as it is the case of workforce migration and its causalities.

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