

The Czech Academy of Sciences, Institute of Geonics

Palacký University Olomouc, Faculty of Science

journal homepage: www.geonika.cz/mgr.htmldoi: <https://doi.org/10.2478/mgr-2023-0007>

Spatial patterns of EU funds absorption in Romanian rural municipalities

Anca Monica MARIN^{a*}, Eugen GLĂVAN^a, Alin CHIȘ^b, Bogdan CORAD^c

Abstract

This study analyses the spatial differences in EU funds absorption among Romanian rural municipalities through the 2014–2020 programming period. The absorption capacity for EU funds is measured by the volume of spent EU funds by inhabitant, for each Romanian rural municipality. The results of the analysis highlight the importance of the territorial dimension when studying the distribution of EU funds among the rural municipalities of Romania. Affiliation with a specific development region (NUTS 2), county (NUTS 3) or a functional urban area (FUA) is used to differentiate the volume of absorbed EU funds. In Romania, rural municipalities with higher levels of absorbed EU funding are, to a statistically higher extent, located in development regions in the Centre, North-West, South-West and West of the country; in communes with no change, or even an increase, in population between 2014 and 2021; in the highest quartile of fiscal capacity and in communes with experience with EU funding from the preceding programming period. This article adds to the growing body of territorial evidence and can be used as a policy instrument to more closely examine the intervention tools embedded in EU funding policy.

Keywords: structural funds; rural municipalities; funds absorption, Romania

Article history: Received 19 January 2023, Accepted 30 May 2023, Published 30 June 2023

1. Introduction

Romania became a member of the European Union in 2007. Since that time, a substantial volume of EU funds has been available for a diverse set of potential beneficiaries, including rural municipalities. Although territory represents an important characteristic in EU funding policy design, highly disaggregated analyses of the results of all sources of EU funding are scarce. This article addresses this gap by providing research results from an extensive dataset on EU funding for all rural municipalities in Romania.

The aim of this study is to identify and analyse the spatial differences in EU funds absorption for Romanian rural municipalities in relation to the 2014–2020 programming period. The absorption capacity of EU funds is measured by the volume of spent EU funds by inhabitant for each Romanian rural municipality. The research area is Romania, and the research period is 2016–2021, which corresponds to registered payments of EU funds to local budgets during the programming period of 2014–2020.

Data have been processed in such a way (see section 4.2) as to allow comparisons between municipalities from Romania as well as, if the case occurs, municipalities from other EU countries. The absorption capacity is expressed in euro at constant 2010 prices per inhabitant and reflects the sum for the entire period of 2016 to 2021. The process of data management can be replicated within

different spatial contexts in other EU member states at the local administrative unit (LAU) level. Moreover, the publicly available database on which the current study is based can provide grounds for further analyses and comparative approaches, as subject to data availability.

The study's novelty rests on an analysis of spatial differentiation at the lowest disaggregated level throughout the entire rural space in Romania. Whereas the national and regional (NUTS 2) levels are more addressed, less is known about the counties (NUTS 3) and even much less about the LAU level. Since EU funding policy at least partially aims at reducing disparities, a spatial analysis of EU fund absorption by municipalities is an essential tool for evidence-based policy making. Unlike some of the preceding examples, we explore this topic by analysing actual payments made rather than allocations, and in addition, we add the annual absorbed funds into a global sum that best reflects the multiannual absorption capacity for the entire programming period.

The paper is structured as follows. Section 2 outlines some of the approaches to EU fund absorption from a territorial perspective. Section 3 presents the general characteristics of rural municipalities in Romania to better contextualise the paper's results within the national frame of reference. Data sources and analysis methods are presented in Section 4, while the results and discussion are presented in Section 5 and Section 6, respectively.

^a Research Institute for Quality of Life, Bucharest, Romania (*corresponding author: M. Marin, e-mail: monicatoba@hotmail.com)

^b Independent Expert

^c Romanian Centre for Economic Modelling, Bucharest, Romania

The final section, Section 7, provides conclusive remarks and suggestions for next steps and the further use of results analysis at the EU, national and local levels.

2. EU funds absorption: Various approaches from a territorial perspective

The absorption capacity for EU funds has been studied at multiple levels, including the national (EU Member State) level, the operational program (across the EU and/or member states) level, the NUTS 2 level, the NUTS 3 levels and, in the same vein as that in the current study, the LAU level. EU funds absorption has been analysed also in relation to the timeframes prior to the implementation of the EU funded projects/programs (as a type of ex-ante assessment), as well as during the implementation and upon its completion.

At the member state level, applying a systemic view of absorption capacity groups the macroeconomic conditions, co-financing capacity and administrative capacity on the supply side, whereas the capacity of beneficiaries to prepare projects rests on the demand side (Šumpíková et al., 2006). Good governance and financial capacity have been identified as belonging among the factors that differentiate levels of EU fund absorption among EU member states (Achim & Borlea, 2015), alongside administrative capacity (Marinas & Prioteasa, 2016; Țigănașu et al., 2018), government effectiveness and fighting corruption (Incaltarau et al., 2020) and high income levels (Tosun, 2014)¹. Under the same level, ex ante assessments of the absorption capacity of Romania indicated a rather preliminary stage of preparations at the onset of the first programming period (Oprescu et al., 2006) and the need to integrate perspectives between the European and national levels of operation (Cace et al., 2009).

At the regional level, several regional characteristics highlight the presence of 'pro-cohesion' policies in disadvantaged areas (Collins et al., 2017), together with the role of administrative capacity, which in turn is influenced by political interference, government stability and political accountability (Milio, 2007); the importance of studying regional absorption capacities within the context of multilevel governance (Cunico et al., 2022); the high relevance of the means by which regional absorption capacity is actually computed, alongside the means by which political accountability is shared between regions and the EU (Aivazidou et al., 2020); the significance of an integrated approach, including the motivations of public servants and the political salience of policies (Domorenok et al., 2021); and the context in which 'artificially created' NUTS 2 regions can absorb EU funds (Maier et al., 2021). The term 'artificial' refers here to the process of constructing NUTS 2 regions in Romania, in the sense that it mirrors only statistical associations of counties. They have been developed in 1998, in response to the need to allocate and coordinate EU pre-accession funds like Phare programs. Correspondingly, the National Institute of Statistics has eight regional directorates and, computes, similar to other EU countries, statistics at regional level (in addition to the county and LAU levels). Nonetheless, in the next programming period Romania has distinct regional operational programs for each region, which makes a more decentralised management level of the EU funds in respect to this funding line.

A previous analysis performed at the NUTS 2 level differentiates the type of regions in the analysis of factors used to determine EU funds absorption (Kersan-Škabić & Tijanić, 2017). The study differentiates between convergence regions (GDP per capita of less than 75% of the EU average) and development regions (GDP per capita of more than 75% of the EU average). Labour force

characteristics, decentralisation, investments, the institutional framework, and infrastructure development all count in this respect. Labour force characteristics are measured in reference to the educational level, and the unemployment rate is a variable with a significant influence on the successful absorption of EU funds in all NUTS 2 regions, while the institutional framework, as measured in relation to good governance and control of corruption, is an important indicator, especially in convergence regions (Kersan-Škabić & Tijanić, 2017). The same factor, quality of governance, has been studied in relation to EU fund absorption as measured at the regional level and used as a standard deviation (reflecting the differences between the national average and the disbursed amounts) in the Bulgarian context, in which the regions are similar to those in Romania, as "there is no equivalent administrative territorial unit but only statistical regions" (Kalfova, 2019, 6). Further on analyses conducted at NUTS 2 level, a complex analysis highlights that the quality of regional government stands out as a significant predictor for Cohesion Policy performance – measured under three key dimensions – compliance, absorption and achievements (Mendez & Bachtler, 2022).

At the NUTS 3 level, the importance of both contagion and diffusion territorial processes and the significance of financing needs are highlighted in previous analyses (Maier et al., 2022). The cited analysis considers only those EU funds absorbed from the Common Agricultural Policy and managed through the AFIR (Agency for Financing Rural Investments). It emphasises the importance of spatial analyses that have been assimilated to contagion and diffusion, or a "longitudinal clusterisation," from East to West. The paper concludes as favouring factors being located in the Western part of Romania and making use of more performant local institutions (Maier et al., 2022).

At the municipality level, the beneficiary's capacity to initiate, conduct and successfully implement EU-funded projects can also be regarded as an input variable that influences the overall absorption capacity at the member state or operational program level (Boeckhout, 2002). Furthermore, regarding the municipalities, earlier research identified a typology of successful and passive municipalities (Cyburt, 2014), the role played by administrative capacity (Marin, 2015), the spatial position of municipalities in relation to the main urban centre of the subregion, the level of municipal socioeconomic development, local leadership (Cyburt, 2014), the absorption and development levels of the rural community, availability and the characteristics of state budget funding (Marin, 2021), residence areas (Hochholdinger et al., 2021) or institutional arrangements (Maier et al., 2021), the financial situation of local communities (Mirska, 2021), and the importance allotted in EU policy to specific needs, such as demographic decline, which affect rural areas (Weber et al., 2020).

A complex analysis of the development indicators of rural territorial units from Poland shows the importance of spatial attributes and the necessity of refining the allocation logic of the cohesion policy to develop the conditions necessary for the improved use of local resources (Gospodarowicz, 2022). Size and proximity to the central area are particularly emphasised as important factors in the delineation of different lines of development within rural areas, especially in the case of those which remain decoupled from the polycentric nature of the spatial structure (Gospodarowicz, 2022). Within the same country context, the importance of the local budget, the level of development and the "degree of deagrarianisation" of local economies is emphasised for the spatial distribution of the EU's Cohesion Policy (CP) at the rural level (gmina/commune) (Komorowski, 2021).

¹ In reference to a specific fund, namely, the European Regional Development Fund's (ERDF) for the programming period of 2000–2006

A prior analysis of the determinants of EU funds absorption by communes in a Polish region highlights the importance of previous experience using EU funds, as the employees of mayoralties have the opportunity “of learning incomprehensible language of programmatic documentation and complicated system of estimating the eligible costs” (Standar, 2010, 104). The same article stresses the importance of establishing a comprehensible prefunding system or ensuring access to credits, which, in their case, refers to preferential credits from the fund managed by the Bank of National Economy (BGK) (*ibid.*).

At the theoretical level, however, the discussion would benefit by enhancing the perspective with the following concepts and relationships relating to the characteristics of the funding environment:

- i. Complexity, or the complex knowledge required by the environment;
- ii. A lack of stability or dynamism, as measured by the rate of change in the environment; and
- iii. Resource availability, or the level of available resources in the environment (Sharfman & Dean, 1991, 683).

This theoretical lens views municipalities as open public organisations that influence and are influenced by their environment. From this perspective, the absorption capacity of municipalities can be influenced by many factors at the macro and meso levels, among which the programming phase of EU funds for each implementation period plays a key role. A good match between explicit or implicit local priorities and eligible funding lines at the national level is not always met. In addition, even when this match is achieved, the co-funding rates cannot be supported for all needed and eligible funding objectives. Hence, one of the key questions regards the application process itself, which is not captured by the analysed data. For instance, it is difficult to say whether all the areas examined in this article have actually tried to submit EU funded projects and whether they were eligible for specific EU funding lines. Moreover, some of the funding lines even offer ‘predetermined’ projects, thus the idea of ‘open competition’ becomes no longer valid.

One approach that can capture a systemic view of external fund absorption and its relationship to its environment comes from the field of organisational sociology, which views organisational effectiveness as “the ability of the organisation, in either absolute or relative terms, to exploit its environment in the acquisition of scarce and valued resources” (Yuchtman & Seashore, 1967, 898). This capacity is assimilated as a “bargaining position” for the organisation, or “a more general capability of the organisation as a resource-getting system” (*ibid.*). Although this definition seems to be appropriate in the case of EU funding, it is still difficult to operationalise in an integrated model that encompasses all types of environmental influences that impact an organisation. It can be the case that some of these influences, such as resource availability, can significantly influence both annual absorption capacity (such as the delayed opening of certain Operational Programs) and overall absorption capacity.

Earlier research has analysed the importance of EU funds compared to funds from the largest of the state budget-funded programs (PNDL II) (Marin, 2021), especially at the county level. The current study considers absorption capacity to be a process variable, in which prior experience from the first programming period (2007–2013) is considered. Hence, as a process variable, it is difficult to establish the causality of absorption capacity, as in some instances, a good absorption capacity in the preceding programming period can attract highly qualified human personnel, which acts as a positive influence in the studied timeframe. It is still possible that some LAUs attracted a high volume of funds during the 2007–2015 timeframe that required a high co-funding

rate, which would have left little room for co-funding projects in the programming period of 2014 to 2020. A multiannual plan of public investments, which has already been initiated in the national fiscal budgetary strategy for 2020–2022 (Ministry of Public Finance, 2019), can contribute to solving this issue.

The same problem is anticipated regarding a World Bank project on the coordination of investment priorities that uses an estimate on prudent capital expenditure margins for county councils (World Bank, 2016, 759). Another problem, also related to fiscal capacity, is that of the sustainability of the implemented investment. In this sense, previous studies computed a specific index for the financial sustainability of investments conducted in rural areas, particularly for road and social infrastructure (World Bank, 2016).

Absorption capacity can be viewed as a particular type of organisational capacity. In its turn, organisational capacity can be defined according to i) analysis layer; ii) stage of the project cycle; iii) dimensions; or iv) function. Depending on these elements, the definitions of organisational capacity have many similarities with those of absorption capacity. If one considers it as a stage of the project cycle, the definitions of organisational capacity as a result or impact focus on the issue of organisational effectiveness (Bryan, 2011). In terms of dimensions and/or function, capacity as a resource is a perspective that emphasises the function of attracting resources, similar to the absorption capacity (*ibid.*). In this paper, absorption capacity is used in the sense of organisational effectiveness, related to allocating financial resources.

One of the first systematic studies (as considered by Wostner, 2008) conducted on absorption capacity in relation to the topic of structural funds has been conducted at state level by Boot et al. (2001). Similar definitions and analysis patterns are used in the report for DG Regio/DG Enlargement (Boeckhout et al., 2002). A systemic vision, delimiting the demand (beneficiaries) from the supply (managing authorities) of structural funds is introduced at the state level (the absorption capacity was considered equivalent to the macroeconomic capacity in the first phases of studies on this topic).

Within the field of organisational sociology, the theory of open systems (Katz & Kahn, 1966) encompasses a systemic view on the organisations and acknowledges the two-sided facet of influences from the organisations into the environment, as well as from the environment on the organisations. This view is aligned with the perspective on absorption capacity as a specific type of organisational effectiveness, placing the emphasis on the organisation’s relationship with the environment, in the sense of the organisation’s attempt to attract resources from the environment.

As a summary of the variables listed above, explanatory factors for organisational effectiveness tend to make a distinction between organisational and environmental factors (Moynihan & Pandey, 2005, 423). Both categories of factors are essential, and there is also a certain overlap between them. The product of interaction with the environment – autonomy and resources can be used by managers to use organisational variables (Moynihan & Pandey, 2005, 424). If we focus the analysis at the level of individual public organisations such as municipalities or territorial administrative units, explanatory variables can be grouped under the following categories: organisational factors related to (i) administrative capacity (including specialised personnel, systems and procedures), financial capacity, size of the organisation, partnerships with other organisation, previous experience with EU funding, whereas environmental factors pertain to: (ii) spatial attributes of the locality (including affiliation to a particular regional development level); (iii) demographic/social structure of the administrative unit and/ or locality’s general development level; (iv) structure of local economies, or (v) macroeconomic variables (related to the Member State’s overall absorption capacity, logic of allocating resources from EU funds and State Budget, etc.).

Correspondingly, this paper explicitly analyses, based on the availability of data, the following types of factors:

- Organisational factors, such as (a) financial autonomy (fiscal capacity), (b) previous experience with EU funding, (c) availability of State Budget funding for the organisation, and
- Environmental factors related to (d) spatial attributes – (d1) affiliation to a specific development region, (d2) being part of a functional urban area, (e) community level variables – demographic and social structure of the locality – (e1) population dynamics and (e2) presence of a marginalised community within the locality and (f) overall level of development of the locality (composite index, summing up several social and economic indicators).

Nonetheless, the most important questions regard the impact of EU funds on local development and on improving citizens' quality of life. This is in fact the key aspect of the relevance of this topic. Prior analyses conducted at the municipality level for countries in Central and Eastern Europe have shown that there is a positive impact on local socioeconomic development; however, it is difficult to state the scale of this impact, especially given the long-term impacts of some EU-funded programs (Spychała, 2020). Additionally, as with the EU funds absorption capacity, several factors have been identified relating to the differentiated impact of EU funds, including the level of territorial capital (Fratesi & Peruca, 2014). A recent study on Romania highlights the growing regional disparities regarding the high absorption capacity of EU funds that is mostly attributed to capital cities (county seat municipalities) (Sandu, 2022).

The current study centres around characteristics at the locality level and analyses the characteristics of EU funds absorption as related to locality factors. The locality's absorption capacity, however, also relates to that at the national-, regional- and county-levels to varying degrees. We do not account for this in our analysis, so it should be subject to further analyses in the future.

3. Geographical context: The general characteristics of rural municipalities in Romania

This section briefly introduces the key characteristics of local public administration in Romania to ground the results reported in the next part of the paper in a more contextualised understanding.

The Romanian system of public administration is represented by a two-tier local government structure including 3,181 municipalities (3,180 municipalities plus the municipality of Bucharest, the capital city) and 41 county councils. The open database used for analyses includes 3,187 cases of local public administration organisations, as it also covers the six districts of Bucharest, which are organised as separate municipalities of Bucharest. In fact, the six municipalities of Bucharest are given a different set of responsibilities than the rest of the municipalities in Romania. This is why they generally require a distinct analysis path to achieve meaningful results, especially when compared to the rest of the urban municipalities in Romania.

The set of 3,181 municipalities includes 2,862 rural municipalities², 217 towns and 102 cities³. Local and county council representatives are elected. The members of the local councils (municipalities) are elected both by secret ballot and by direct suffrage. The legal framework does not include a statement on subordination relationships between the two levels of public administration – the county and the local councils. County represents the second tier of local public administration and there are 41 counties in Romania. In each county, there

are several urban and rural localities, but there are no formal subordination relationships between the counties and territorial administrative units (for more information on NUTS 3 codes in Romania, see Eurostat (2023)). The Administrative Code states that the relationships between local and county public authorities are based on the principles of local autonomy, legality, cooperation, solidarity, equal treatment and responsibility (art. 85, para 1). The same legal document affirms that there are no subordination relationships between these two structures, but rather that they have a collaborative relationship (art. 85, para 2). The fundamental law of Romania, however, which is the text of the Romanian Constitution, mentions that the county council represents the public authority for coordinating the activity of rural and urban local councils to supply county-level public services (Article 122 of the Romanian Constitution). The mayors are the executive bodies of the local councils/municipalities. The president of the county serves as its leader.

The territorial structure of Romania's rural area is fragmented, and it includes a substantial number of municipalities that have 5,000 or fewer inhabitants. These municipalities represent more than one-third of the population of the total number of municipalities (excluding the municipality of Bucharest). Moreover, data from the latest available Population Census (2011) show that approximately one-quarter of the rural municipalities in Romania contain under 2,000 inhabitants. It would be very useful to compare these population data with the updated census data from 2022 to identify the differences. A small population of less than 2,000 inhabitants can be a significant challenge for a municipality applying for EU funding, especially in the case of public physical investments, such as water, sewerage or sanitation.

The level of fiscal autonomy among Romanian rural municipalities significantly varies by development region (Tab. 1). The municipalities from the lower quartile of fiscal capacity (as measured by revenues per inhabitant) are more likely to come from the Northeast and Southwest development regions. In contrast, the rural municipalities from the upper quartile of fiscal autonomy, to a much higher extent, come from the development regions of West, North West, Centre and Bucharest-Ilfov. These four development regions are precisely those regions of Romania with the highest GDP per capita. In fact, measured against the EU-27 average, the development region of Bucharest-Ilfov comes in above the EU-27 value. It is the only development region in Romania with a higher value than the EU-27 average (purchasing power standard (PPS, EU27 from 2020), per inhabitant in percentage of the EU27 (from 2020) average, Gross domestic product (GDP) at current market prices by NUTS 2 regions [NAMA_10R_2GDP], Eurostat database).

The size of the local budget and level of fiscal autonomy are important not only in the provisioning of general public services but also specifically for the topic of this study, for ensuring the co-financing aspect of EU-funded projects. Communes that place in the upper quartile of fiscal capacity are more likely to cover the co-funding requirement of a large-scale project and therefore can attract a higher volume of EU funding. As shown in Table 1, all communes from the highest development region, Bucharest-Ilfov, place in the upper quartile of fiscal capacity. Notably, Table 1 presents the pre-pandemic levels of fiscal capacity as a three-year average. It is possible that the level of rural fiscal capacity might be significantly different when computing the average values of 2020, 2021 and 2022 separately.

Development regions in Romania are not part of the local public administration structure. Although we present results as

² The Baneasa municipality from Constanta County was considered a city until 2019, when it was reclassified as a commune. In the current analysis, we consider it to be a rural locality.

³ Annex to Law No. 290/2018, Statistical situation documentary on administrative organisation of Romania's territory.

| | | Fiscal capacity | | | | Total |
|--------------------|-----------------|-----------------|----------------|------------------|---------|-------|
| | | Lower Q | Medium – low Q | Medium – upper Q | Upper Q | |
| Development Region | North East | 71.1 | 20.0 | 5.3 | 3.6 | 100 |
| | South East | 23.9 | 28.4 | 26.1 | 21.6 | 100 |
| | South | 28.9 | 25.2 | 33.3 | 12.5 | 100 |
| | South West | 35.0 | 45.1 | 13.7 | 6.1 | 100 |
| | West | 5.0 | 13.9 | 28.5 | 52.7 | 100 |
| | North West | 7.4 | 32.8 | 31.8 | 28.0 | 100 |
| | Centre | * | 19.3 | 40.1 | 38.9 | 100 |
| | Bucharest-Ilfov | 0.0 | 0.0 | 0.0 | 100.0 | 100 |
| | Total (N) | 788 | 757 | 700 | 617 | 2,862 |
| | Total (%) | 27.5 | 26.5 | 24.5 | 21.6 | 100 |

Tab. 1: Fiscal capacity by development region: Rural localities in Romania (%) (Notes: Q = quartile. Gray cells indicate significantly higher values (adjusted residuals), * indicates a value of lower than 10 cases. Fiscal capacity is measured as municipal own revenues by inhabitant (in constant euro at 2010 prices, per inhabitant), with values averaged for the years of 2016, 2017 and 2018)

Source: authors' calculations, based on public data regarding local budget execution for all communes in Romania

disaggregated by this territorial dimension, development regions in Romania are statistically constructed. They have been set up in relation to EU programming fund absorption, but it is important to note that unlike other EU countries, Romania does not match them with corresponding structures of local public administration. The landscape of fragmented local administrative units, coordination issues between a significant number of local and central public authorities, as well as poor financial autonomy in the case of rural administrative units have been put forward as some of the key needs for which a territorial reorganisation would be needed. For particular funding lines, especially for the Common Agricultural Policy, local action groups (GAL) have been used as a case to increase administrative capacity and, potentially, effectiveness of EU funds. Local action groups represent partnerships between public institutions and private or civil stakeholders. Latest available data (November 2022) indicates a list of 237 local action groups which cover a large part of the rural territory (Ministry of Agriculture and Rural Development, 2022). In addition, intercommunity development associations also represent an example of further integration of territorial administrative units, with the county as being one of the possible partners of this type of association.

Given the characteristics of the local public administration in Romania, several attempts to introduce territorial administrative reorganisation have been submitted in the past, yet, without success. The objectives of decreasing regional inequalities, coupled with increased regional financial autonomy (Dragoman, 2011) have also been advocated in favour of a meaningful territorial administrative reform. Potential explanations for these unsuccessful attempts are also attributed to “the weak effect of the European acquis regarding regional policy” that resulted in setting up statistical regions without accompanying decision-making responsibilities (Salageanu, 2012).

4. Data and methods

4.1 Data sources

The cumulative EU funds for the period of 2014–2020 are based on financial data from local budget execution, as published by the Ministry of Development, Public Works and Administration, Directorate for Local Fiscal and Budgetary Policies (2021).

4.2 Data aggregation

The data management process involved merging all the information for all the localities in Romania by assigning correct unique identification codes (SIRSUP, LAU 2 codes) for all municipalities for each the analysed years. The entire process of data aggregation is presented in the technical description of

the EU FAR open database (Marin et al., 2022a). The category of EU funds from the programming period of 2014–2020 is registered as a distinct category in the local budgets' execution beginning in 2016 (nonetheless, this also delays approval of the corresponding operational programs and certification of management authorities). Notably, the information in the database refers to payments (executed budget) rather than allocations and includes all sources of EU funding, irrespective of the funding line (European Regional Development Fund, European Social Fund, or Norwegian cooperation programs).

The key variable of the study represents the total sum of EU funds, expressed in euro at constant prices per inhabitant.⁴ The data management process involved converting the sums reported by municipalities in Romanian lei (the national currency) at the end of each year into Euro at constant 2010 prices per inhabitant: Eurostat indicator [NAMA_10_GDP], 2010 = 100. GDP and main components (output, expenditure and income), Price index (implicit deflator), 2010 = 100, euro, National accounts indicator (ESA 2010), Gross domestic product at market prices. The population information comes from the National Institute of Statistics – Tempo online database – Pop107D, Population by home (as of January 1), by age group, gender, counties and localities. The detailed explanation on the process of data transformation and aggregation is described in Marin et al. (2022a). The exact steps and indicators for this process are described in the technical description of the EU FAR database. In earlier research, the absorbed funds at the national and NUTS 2 level were aggregated by standard deviation, rather than by sums, as a measure of regional policy efficiency (Kalfova, 2019) that was based on a localisation of the project at the NUTS 3 level. The current paper, however, uses funds already localised at the LAU level from all EU funding lines. It uses the summative approach of expenditures, which is also used in the spatialisation and harmonisation of a large dataset regarding payments from the Common Agricultural Policy (Nicholas et al., 2021).

4.3 Data analysis

In this article, we use the term ‘rural’ to refer to the territorial organisation of the country. The detailed classification is openly available from the National Institute of Statistics (see Tempo online database, 2022). On the basis of this classification, there are currently 2,862 municipalities (communes) in the rural area of Romania. Therefore, we do not consider the classification of LAUs or communes into three types of area on the basis of density that is used by Eurostat, according to which rural areas correspond to thinly populated areas and more than 50% of the population lives in rural grid cells (Eurostat, 2020).

⁴ Variable name in the database: [SUM_EU_2016_2021_inhab]. For values per year, the following variables are available: [SUM_inhab_2016], [SUM_inhab_2017], [SUM_inhab_2018], [SUM_inhab_2019], [SUM_inhab_2020] and [SUM_inhab_2021]

Several predictors have been systematically tested in reference to the volume of absorbed EU funds, including the level of fiscal capacity (the average value of a municipality's revenues in euro at constant 2010 prices per inhabitant), affiliation with a development region, county and functional urban area (FUA), population dynamics in 2021 compared to those in 2014, EU funding in the previous programming period of 2007–2013 (as registered in the local budgets execution reports for 2016 through 2021), the presence of a marginalised community, funding from state-budget programs, and level of development. A complete list of variables used in the analysis is available in the Appendix of this article.

4.4 Limitations

It would be useful to further disaggregate the data by type of accessed operational program, as budgetary coding allows for this refinement of data. The format for budgetary reporting includes separate codes for funds originating from the European Regional Development Fund, European Social Fund, Cohesion Fund, European Agricultural Fund for Rural Development, European Fund for Fisheries and those funds corresponding to the European and Economic Space, as well as to other programs. Nevertheless, in the current format of budget execution, this information is not recorded by the operational program.

Another limitation of the analysis is that it implicitly assumes a high degree of homogeneity among eligible conditions for accessing EU funds for rural municipalities, which is in fact not always the rule. For instance, the volume of EU funds differs according to the regional degree of development (GDP per capita less than or greater than 75% of the EU average). Moreover, municipalities from counties in border regions can also benefit from an increased volume of funds through territorial cooperation operational programs.

Another limitation of the database relates to missing information about the leaders of the municipalities throughout the analysed period. The analysed data are for the period of 2016 to 2021, yet Romania underwent general local elections in September–October of 2020. It would be useful to know whether there has been continuity in the mayor's position and whether the mayor's political affiliation changed as a result of those elections. However, the current format for publicly displaying data on local elections does not allow for this type of analysis.

5. Results

5.1 General results

The peak of EU funds absorption by Romanian rural municipalities occurred in 2020. Table 2 shows that both the highest average value for 2020 and the greatest amount of absorbed EU funds are the highest values for the maximum level for the same year. Consequently, the largest standard deviation again occurs in 2020. In contrast, the low volumes that were absorbed in 2016 indicate an early stage of preparations for contracting and implementing projects in the 2014–2020 programming period. Additionally, the commune with the highest

level absorbed almost double the funds of the commune with the next highest level. In total, over the whole period, in reference to the last variable used in Table 2, fewer than 50 communes achieved an absorption volume of more than 1,000 Euros in constant 2010 prices per inhabitant.

5.2 Characteristics of categories of EU funding in rural areas

This section presents the results of the analysis, making a distinction between municipalities with zero funding from the programming period of 2014–2020 and those that succeeded in securing various levels of funding from the entire volume of EU funds available for Romania. In total, there are 462 municipalities that are considered 'white spots' on EU funding during this timeframe, out of which 25 municipalities are from urban areas and 437 municipalities are from rural areas. This analysis shows the importance of spatial location (NUTS 2 and NUTS 3 levels) to the identification of white spots for EU funding. As EU funding policy mainly rests on development indicators such as GDP per capita at the NUTS 2 level, the study can provide a comprehensive lens for identifying regional differences in the white spots of EU funding in Romania. Additional lines of statistically significant differences have been identified regarding fiscal capacity, population dynamics, EU funding in the previous programming period, state budget funding, level of development and inclusion in a FUA.

Rural municipalities with the lowest levels of EU fund absorption (including cases of localities with zero funds) from Romania tend to occur at a significantly higher extent in the South development region of Romania.

In contrast, the rural municipalities with the highest levels of EU fund absorption are more likely to be located in the Centre, North West, South West and Western development regions. Compared to the EU-27 average, only the development region of Bucharest-Ilfov is above the EU-27 average (purchasing power standard (PPS, EU27 from 2020) per inhabitant in percentage of the EU-27 average and the GDP at current market prices by NUTS 2 regions [NAMA_10R_2GDP]). In this respect, the development region of the North East has the lowest value, followed by that of the South, South West and South East (data for 2019). Consequently, the regions with the highest values (with the exception of Bucharest-Ilfov region) of GDP per capita are the Western, Northwestern and Central regions. Therefore, the highest levels of EU funds absorption are associated with some of the highest levels of GDP per capita, with the exception of the Southwestern region (see Tab. 3).

Nevertheless, the development region of Bucharest-Ilfov, which registers the highest GDP per capita, presents contrasting characteristics and tends to also be associated with the cases of white spots of EU funding. Cases of communes that did not absorb any EU funding occur to a statistically higher extent in the development region of Bucharest-Ilfov. For a nuanced interpretation, it is important to mention that we examine only the role of rural municipalities in this paper and, nonetheless, the development level of the entire region is associated with that of the capital city, which is a dynamic not covered in this analysis.

| | EU funds per inhabitant in | | | | | | |
|-----------------|----------------------------|----------|----------|-----------|-----------|-----------|------------------|
| | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | Sum of 2016–2021 |
| Mean | 1.8 | 14.1 | 24.1 | 36.1 | 43.8 | 35.4 | 155.3 |
| Median | 0.0 | 0.0 | 0.3 | 7.1 | 7.5 | 3.2 | 45.9 |
| Std. Deviation | 17.8 | 55.9 | 62.1 | 70.2 | 93.6 | 82.3 | 242.8 |
| Minimum | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Maximum | 353.3 | 1264.7 | 850.0 | 777.1 | 1,862.2 | 1,585.8 | 2,517.8 |
| Sum | 5,147.8 | 40,252.3 | 68,948.3 | 103,460.8 | 125,459.9 | 101,338.4 | 444,607.6 |
| Number of cases | 2,862 | 2,862 | 2,862 | 2,862 | 2,862 | 2,862 | 2,862 |

Tab. 2: Descriptive statistics for EU funds absorbed by rural municipalities

Source: authors' calculations based on the EU FAR database. The values are expressed in euro at constant 2010 prices per inhabitant

| | | Volume of EU funds from the 2014–2020 programming period | | | | | |
|--|--|--|---------|----------------|------------------|---------|-------|
| | | Zero funding | Lower Q | Medium – low Q | Medium – upper Q | Upper Q | Total |
| Fiscal capacity | Lower quartile | 14.2 | 14.5 | 29.7 | 22.0 | 19.7 | 100 |
| | Medium-low quartile | 12.7 | 8.5 | 27.5 | 25.0 | 26.4 | 100 |
| | Medium-upper quartile | 14.4 | 8.7 | 25.1 | 23.9 | 27.9 | 100 |
| | Upper quartile | 20.7 | 8.9 | 17.7 | 22.5 | 30.1 | 100 |
| | Bucharest -Ilfov | 78.1 | * | * | * | * | 100 |
| Development Region | Centre | 6.2 | 8.1 | 22.1 | 28.3 | 35.3 | 100 |
| | North East | 14.8 | 12.6 | 23.1 | 27.9 | 21.5 | 100 |
| | North West | 8.2 | 9.4 | 22.6 | 23.8 | 36.0 | 100 |
| | South | 26.0 | 13.5 | 30.6 | 17.7 | 12.1 | 100 |
| | South East | 16.6 | 10.7 | 28.2 | 22.0 | 22.5 | 100 |
| | South West | 11.0 | 7.6 | 29.2 | 22.1 | 30.1 | 100 |
| | West | 15.3 | 7.5 | 21.0 | 24.6 | 31.7 | 100 |
| | EU funding in the programming period of 2007–2013 (in 2016–2021) | No | 16.9 | 11.3 | 27.9 | 22.7 | 21.2 |
| Yes | | 10.7 | 7.5 | 18.5 | 25.1 | 38.2 | 100 |
| Population dynamics in 2021 compared to 2014 | Decrease of more than 10% | 21.5 | 7.7 | 30.6 | 19.3 | 20.9 | 100 |
| | Decrease of less than 10% | 14.3 | 10.6 | 26.6 | 23.4 | 25.0 | 100 |
| | No change or increase | 14.5 | 10.7 | 18.8 | 25.4 | 30.5 | 100 |
| Presence of a marginalised community | No | 15.7 | 9.9 | 25.4 | 23.6 | 25.4 | 100 |
| | Yes | 14.4 | 11.1 | 25.4 | 22.9 | 26.2 | 100 |
| Part of Functional Urban Area (FUA) | No | 15.0 | 10.4 | 26.0 | 22.8 | 25.8 | 100 |
| | Yes | 20.3 | 8.3 | 12.8 | 33.8 | 24.8 | 100 |
| State budget funding | No | 21.6 | 10.6 | 26.5 | 19.7 | 21.6 | 100 |
| | Yes | 14.6 | 10.2 | 25.3 | 23.7 | 26.1 | 100 |
| Level of development | Developed | 14.9 | 11.1 | 20.0 | 27.7 | 26.3 | 100 |
| | Getting out of poverty | 19.8 | 7.4 | 26.8 | 20.8 | 25.2 | 100 |
| | In stagnating poverty | 13.0 | 11.7 | 30.0 | 20.5 | 24.9 | 100 |
| | Dynamic average developed | 15.9 | 8.5 | 27.6 | 23.1 | 24.9 | 100 |
| | Stagnating average development | 11.3 | 10.5 | 22.6 | 26.6 | 29.0 | 100 |
| | Higher average dynamic development | 18.3 | 10.3 | 22.1 | 20.6 | 28.6 | 100 |
| | Missing information | 20.7 | 10.3 | 15.2 | 31.7 | 22.1 | 100 |
| Total (%) | | 15.3 | 10.3 | 25.4 | 23.3 | 25.7 | 100 |
| Total (N) | | 437 | 294 | 727 | 668 | 736 | 2,862 |

Tab. 3: Characteristics of the volume of EU funds absorption for the rural municipalities of Romania (%) (Notes: Q = quartile; * represents less than 5 cases; grey cells indicate significantly higher values [adjusted residuals])

Source: authors' calculations

Additionally, cases of white spots in rural areas tend to occur in the development region of the South, as already mentioned.

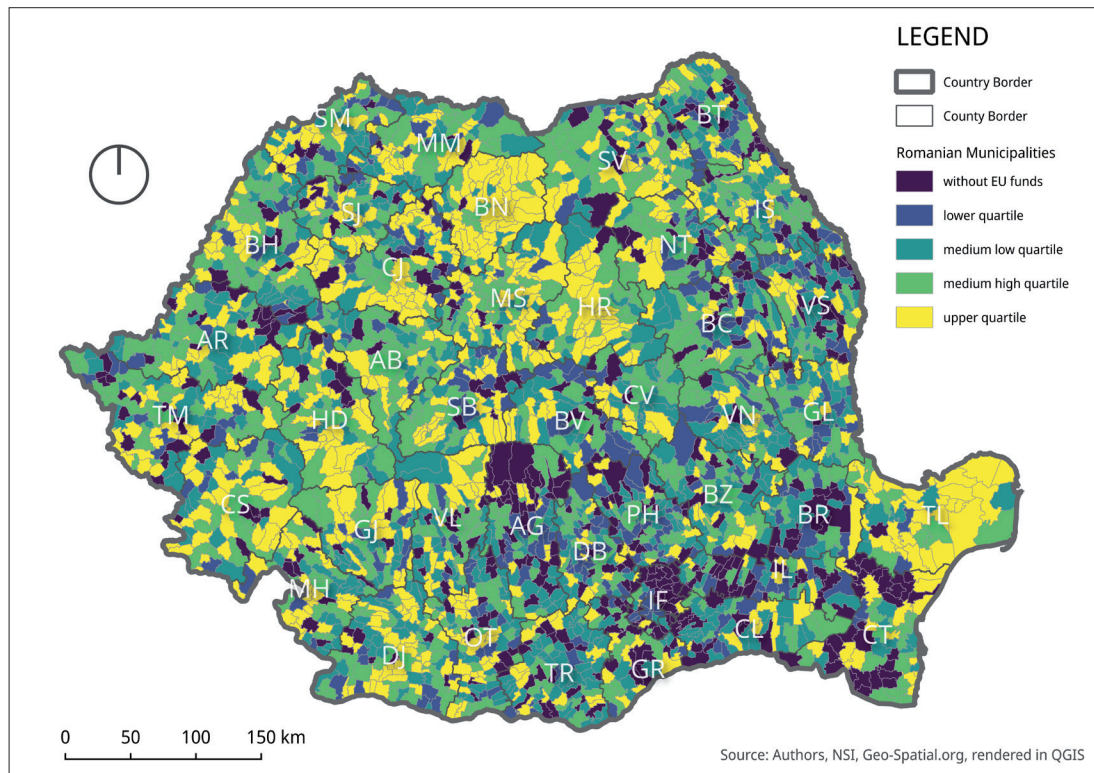
At a more disaggregated level, namely the county level (NUTS 3 level), the communes that place in the upper quartile of EU funds absorption are more likely to be from the counties of Bistrița-Năsăud, Cluj, Harghita, Hunedoara, Mureș and Tulcea. Within this set of counties, Cluj has the highest GDP per capita (after Bucharest) in Romania. Cluj county has a value of 29,800 purchasing power standard (PPS, EU27 from 2020) per inhabitant (Eurostat database, GDP at current market prices by NUTS 3 regions [NAMA_10R_3GDP]). This indicator for the rest of these counties, Bistrița-Năsăud, Harghita, Hunedoara, Mureș and Tulcea, range from 15,500 (Bistrița-Năsăud) to 17,400 (Hunedoara) (Fig. 1).

At the county level, the communes that place in the lowest quartile of EU funds absorption (as distinct from the ones lacking EU funding) tend to be from the counties of Bacău, Dâmbovița, Galați, Neamț, Satu Mare, and Sibiu. In the case of Brasov county, there are less than 10 cases. Regarding the case of white spots from rural areas, a previous analysis shows that they tend to occur in the counties of Argeș, Brăila, Constanța, Giurgiu, Ialomița, Ilfov and Vaslui to a greater extent (Marin et al., 2022c). Additionally, if we complete the picture at the NUTS 3 level by using a composite territorial quality of life index, we see that, in contrast to the GDP/capita measure, Hunedoara and Bistrița-Năsăud counties have higher values than, for instance, Cluj county. Nevertheless, when reading these results, it is important to consider that at the NUTS 0 level in the European context, Romania places in a low position as a whole (ESPON, 2016).

Contrary to the expected relationship, there is no statistically significant correlation between the categories that measure EU funds level absorption and the typology of rural marginalised communities. Several possible explanations can be proposed here.

On the one hand, the presence of a marginalised community has been taken into consideration in several EU funding lines. Furthermore, these marginalised communities partially overlap with disadvantaged communities, as in the case of disadvantaged schools in the Operational Program for Human Capital (POCU 2014–2020). This does not mean however that it is certain that the funds absorbed by municipalities, including by this type of community, have actually been spent on disadvantaged communities. This question can only be assessed when information at a more disaggregated level is available, namely, information at the village level (SIRUTA inferior). An example of this type of analysis conducted for projects funded by Romania's largest State Budget Program (National Program for Local Development (PNDL 2)) is available in Marin (2021). Communes that place in the upper average quartile of EU funds absorption (but not the highest quartile) tend to be developed communes, where development is measured on the basis of the index compiled by Professor Dumitru Sandu. In addition, communes in the lower average quartile belong to the category of 'stagnating poverty'.

Levels of EU funds absorption by rural areas tend to have an ambivalent relationship with the degree of financial autonomy of the municipality. We have computed indicators on financial capacity as a mean average for the first three years of available data (2016, 2017 and 2018) in constant 2010 Euro per inhabitant as well as in shares of own revenues to total revenue. In this case, communes in the highest quartile of EU funds absorption also tend to be in the highest quartile of fiscal capacity. Communes without EU funds in this programming period, however, tend to be in the highest quartile of fiscal capacity too. To provide a better analytic lens to this subject, it might be useful to examine fiscal capacity considering the years of 2014 and 2015 as starting points for the examined programming period, yet this has not been the case in our study.



*Fig. 1: Distribution of volume of EU funds among Romanian municipalities (Note: The above map presents results for all Romanian municipalities, including the cases of 2,862 rural municipalities)
Source: authors' elaboration based on EU FAR Database*

EU funds absorption in the prior programming period (2007–2013) is relevant to the level of absorption in the following period, namely, the 2014–2020 period examined in this paper. Those that place in the lower and average to lower quartiles of EU fund absorption in 2014–2020 are, to a significantly larger extent, those without funds or projects in implementation from the previous programming period (2007–2013). Communes from the upper quartile are also more likely to have projects in implementation. A previous analysis (Marin et al., 2022c) shows that white spots in the current programming period tend to occur in communes that did not receive EU funding in the previous programming period. In addition, regarding relationships with urban areas, communes from the medium upper quartile are more likely to be part of a FUA: “A functional urban area consists of a city and its commuting zone. Functional urban areas therefore consist of a densely inhabited city and a less densely populated commuting zone whose labour market is highly integrated with the city” (Eurostat, 2018).

Furthermore, rural localities that place in the upper quartile of EU funds absorption are from communes with no change or even an increase in population between 2014 and 2021. In contrast, current white spots tend to occur in communes that experienced a population decrease of more than 10% in the same timeframe. Furthermore, the size of the population registered in the census matters. Communes in the average lower quartile tend to be in rural municipalities with up to 5,000 inhabitants. For a correct interpretation of these data, it is worth mentioning that the computational method for absorption capacity, and therefore for placement in the various quartiles, involves the consideration of the locality population for each of the analysed years (in euro at constant 2010 prices per inhabitant) and, therefore, it does not consider the population as registered in the latest available census.

6. Discussion

The analysis results highlight the importance of the territorial dimension to examining the distribution of EU funds, as has also been revealed by prior research (Capello, 2018; Collins et al., 2017;

Hochholding et al., 2021; Kalfova, 2019; Komorowski et al., 2021; Maier et al., 2021; Milio, 2007; Nicholas, 2021; Weber, 2020). The objective of reducing regional inequalities is an intrinsic part of the EU's goals of promoting economic, social and territorial cooperation (Article 174 of the Treaty on the Functioning of the European Union). The same article mentions particular attention given to rural areas and regions that have been affected by “severe and permanent natural or demographic handicaps” (OECD, 2022).

This analysis highlights the importance of both organisational – fiscal capacity and previous experience with EU funding, as well as of environmental factors – abundance of resources within the larger environment (State Budget funding), spatial attributes (affiliation to a specific development region and to a specific functional urban areas), together with community level variables – population dynamics in 2021 compared to 2014 and level of locality's development. Absorption capacity is thus depending on several sets of factors within and outside the organisation, which ultimately influence its relationship with the overall funding environment currently available in Romania.

Affiliation with a specific NUTS 2 or NUTS 3 is used to differentiate the volume of absorbed EU funds. Although, as earlier stated, development regions are only statistical constructs, their importance in differentiating the EU funds absorbed by municipalities located in rural areas has been proven by this study. The importance of development regions will grow even further in the upcoming years. For the next programming period, namely 2021–2027, the programming of regional operational programs is specific to each development region (on December 2, 2022, four regional development programs have been approved by the European Commission for the development regions of the Northwest, South, Southwest and West (see MFE, 2022). The coordination of implementation of these regional-level programs, however, is not managed by a local public authority in Romania. Rather, at the regional level, intermediate-level organisations in the EU funding structure are represented by regional

development agencies, which represent funding structures that are organised similarly to those of nongovernmental organisations. Additionally, although the current study did not assess the quality of governance or other structural characteristics at the regional level, differentiation by this type of territory well aligns with the studies of Kersan-Škabić and Tijić (2017) and Kalfova (2019). In Romania's case, longitudinal clusterisation at the NUTS 3 level ranging from east to the west is partially confirmed by these studies, but the two studies are not directly comparable. Our study takes into consideration the entire volume of funds, while the study previously conducted in Romania only analyses the funds from the Common Agricultural Policy (Maier et al., 2022). In our study, the counties from which rural municipalities with the highest volume of funds are more likely to come are indeed located in the Western part of the country, with the exception of Tulcea. Tulcea County presents a special case, as it is both a border county and a special program for developing local communities from the Danube Delta (integrated territorial intervention, or ITI Danube Delta, which is located in the South East development region). The rest of the counties identified by the current analysis, Bistrița-Năsăud, Cluj, Harghita and Hunedoara, are located in the North West, West and Centre development regions.

Furthermore, the size of the budget and level of development also count in determining EU funding levels, which aligns with earlier research (Cyburt, 2014; Komorowski et al., 2021; Marin, 2014; Mirska, 2021), as do issues related to the demographic decline in parts of the examined rural areas, which was pointed out in Weber et al. (2020). The importance of lack of prior experience with EU funding to the case of 'white spots' is in line with earlier research regarding the earlier programming period, mostly in reference to rural municipalities.

Notwithstanding, EU funding policy has been advocated several times as an important pillar in addressing the needs of rural shrinkage areas (Weber et al., 2020). This study explicitly addresses this topic and opens up the debate for a similar analysis at the EU level. The analysed database provides improvement to the integration of all sources of EU funding, although a better differentiation among funding lines could render a more nuanced picture on this topic.

7. Conclusions and next steps

Spatial attributes of a commune, such as development region and county affiliation, can be used to differentiate levels of EU funds absorption. Furthermore, financial capacity, affiliation with a FUA, demographic decline, population size, and state budget fund or EU funds absorption in the previous programming period can also be used to account for statistically significant differences in the capacity of rural municipalities to attract EU funds during the 2014–2020 programming period. In Romania, rural municipalities with higher levels of absorbed EU funding are to a statistically higher extent in the Centre, North West, South West and West development regions, in communes with no change or even an increase in population between 2014 and 2021, in the highest quartile of fiscal capacity, and possessing previous experience on EU funding from the prior programming period. They are also likely to be in the counties of Bistrița-Năsăud, Cluj, Harghita, Hunedoara, Mureș and Tulcea. Furthermore, communes from the medium upper quartile of EU funding tend to be more developed communes, part of a FUA and in the Central and Northeastern development regions. As all the data from the analysed programming period (2014–2020) will become available from the same information source (local budget execution reports), it is possible that these characteristics/groupings might yield different results. Moreover, it would be good to have a finer picture on the different allocations of EU funding, based mainly on the NUTS 2 dimension, to provide

an improved contextualisation of results. This criterion might become more pronounced for the programming period of 2021–2027, as part of the EU funds are allocated in Romania through individual regional operational programs.

The study's results are derived from an extensive database including all available information on EU funding (2016–2021) for all rural municipalities in Romania. Consequently, its results can serve as a reliable source of information, which can, however, be revised as further updates on EU funding at the municipality level become available through the next batch of local budget execution reports. Notwithstanding, the latest population census conducted across the EU can provide better information on the diverse characteristics, challenges and needs of rural areas across the EU, especially following the pandemic and the currently unfolding war in Ukraine and coupled with increasing energy tariffs. Additionally, a qualitative approach to assessing the motivations for (not) entering EU funds competition and/or the 'soft side' of the internal organisational structure of 'success' municipalities can result in new insights with relevant guidance for both academics and practitioners.

This study contributes to the growing knowledge on territorial evidence and can be further used as a policy instrument to more closely examine the intervention tools embedded in EU funding policy. The final results from the selected program period can provide a different picture. Even under these circumstances, this study can be used as a way of exploring the improved coordination of policy interventions that ultimately benefit a larger spectrum of rural areas. The use of an open database and the study's analyses represent an invitation to, on the one hand, replicate the methodology used here in other EU countries, especially in rural areas, and, on the other hand, to use the available data as an extensive case study (with almost 3,000 localities) in one member state for which EU funding has only recently become available. From a systemic approach, the results highlight the view on the absorption capacity as the complex set of interrelationships of public organisations with the characteristics of the environment. The results of the analysis are valuable to the design of integrated place-based strategies for EU, national and local level stakeholders, with an ultimate goal of improving the quality of life for citizens living in rural areas.

Acknowledgements

This analysis is part of EU FAR – EU Funds by Area Results project. This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 101017536. It is supported by the Research Data Alliance through the RDA Open Calls as part of the EOSC Future project.

References:

- Achim, M. V. & Borlea, S. N. (2015). Determinants of the European Funds Absorption 2007–2013 in European Union Member States. *The West East Institute*, 175–188. <https://www.fincrime.net/storage/app/uploads/public/60a/517/2bc/60a5172bc3247577715807.pdf>
- Aivazidou, E., Cunico, G., & Mollona, E. (2020). Beyond the EU Structural Funds' Absorption Rate: How Do Regions Really Perform? *Economies* 8(3), 55. Doi: 10.3390/economies8030055
- Boeckout, S., Boot, L., Hollanders, M., Reincke, K., & de Vet, J. M. (2002). Key Indicators for Candidate Countries to Effectively Manage the Structural Funds. NEI Regional and Urban Development. Rotterdam, Principal Report for EC DG Regio/DG Enlargement.
- Boot, L., de Vet, J., & Feekes, F. (2001). Absorption Capacity for Structural Funds in the regions of Slovenia. Final Report. Rotterdam, NEI Regional and Urban Development.
- Bryan, T. K. (2011). Exploring the Dimensions of Organizational Capacity for Local Social Service Delivery Organizations Using a Multi-Method Approach. [Doctoral thesis. Virginia Polytechnic Institute and State University]. http://scholar.lib.vt.edu/theses/available/etd-12182011-102130/unrestricted/Bryan_TK_D_2011.pdf.

- Cace, C., Cace, S., Iova, C., & Nicolaescu, V. (2009). Absorption capacity of the structural funds. Integrating perspectives. *Revista de Cercetare si Interventie Sociala*, 27, 7–28.
- Capello, R. (2018). Cohesion Policies and the Creation of a European Identity: The Role of Territorial Identity. *Journal of Common Market Studies*, 56(3), 489–503. <https://doi.org/10.1111/jcms.12611>
- Collins, A., Leonard, A., Cox, A., Greco, S., & Torrisi, G. (2017). PERCEIVE Project Deliverable Report on the synergies between EU Cohesion Policy and rural development policies. <https://zenodo.org/record/1318148#.Y4iQ5nZBxPZ>
- Cunico, G., Aivazidou, E., & Mollona, E. (2022). Decision-making traps behind low regional absorption of Cohesion Policy funds. *European Policy Analysis*, 1–28. https://www.researchgate.net/publication/364134131_Decision-making_traps_behind_low_regional_absorption_of_Cohesion_Policy_funds
- Cyburt, A. (2014). The activity of local governments in the absorption of EU funds as a factor in the development of rural communes. *Acta Scientiarum Polonorum. Oeconomia*, 13(4), 31–42. <https://js.wne.sggw.pl/index.php/asp/article/view/4140>
- Domorenok, E., Graziano, P., & Polverari, L. (2021). Policy integration, policy design and administrative capacities. Evidence from EU cohesion policy. *Policy & Society*, 40(1), 58–78.
- Dragoman, D. (2011). Regional Inequalities, Decentralisation and the Performance of Local Governments in Post-Communist Romania. *Local Government Studies* 37(6), 647–669. <https://doi.org/10.1080/03003930.2011.623010>
- ESPON Quality of Life Dashboard (2016). <https://www.espon.eu/programme/projects/espon-2020/applied-research/quality-of-life>
- Eurostat (2018). Glossary: Functional urban area. https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Glossary:Functional_urban_area
- Eurostat (2020). The Degree of urbanisation (DEGURBA) <https://ec.europa.eu/eurostat/web/degree-of-urbanisation/background>
- Eurostat (2023). NUTS – Nomenclature of territorial units for statistics. Local administrative units. <https://ec.europa.eu/eurostat/web/nuts/local-administrative-units>
- Fratesi, U., & Perucca, G. (2014). Territorial capital and the effectiveness of cohesion policies: An assessment for CEE regions. *Investigaciones Regionales, Special Issue 2014*, 165–191. <http://www.aecr.org/images/ImatgesArticles/2014/10/08Fratesi.pdf>
- Gospodarowicz, M., & Chmielinski, P. (2022). What Makes the Difference is the Size and Proximity to the Centre: A Research Approach and Results of Territorial Cohesion Assessment at the Local Level. *Energies*, 15(1), 38. <https://doi.org/10.3390/en15010038>
- Hochholding, N., & Schantl, A. (2021). The Role of EU Structural Funds for Austrian Local Governments and its Contribution to the Urban-Rural Interplay. <https://zenodo.org/record/5711146#.Y4iSFXZBxPZ>
- Incaltarau, C., Pascariu, G., & Şurubaru, C. N. (2020). Evaluating the Determinants of EU Funds Absorption across Old and New Member States – the Role of Administrative Capacity and Political Governance. *Journal of Common Market Studies*, 58(4), 941–961. <https://doi.org/10.1111/jcms.12995>
- Kalfova, E. (2019). Factors for adoption of EU funds in Bulgaria. *Heliyon* 5, e01150. <https://doi.org/10.1016/j.heliyon.2019.e01150>
- Katz, D., & Kahn, R. (1966). *The Social Psychology of Organizations*. John Wiley and Sons.
- Kersan-Škabic, I., & Tjanić, L. (2017). Regional absorption capacity of EU funds, *Economic Research-Ekonomska Istraživanja*, 30(1), 1191–1208. <https://doi.org/10.1080/1331677X.2017.1340174>
- Komorowski, Ł., Mróz, A., & Stanny, M. (2021). The Spatial Pattern of the Absorption of Cohesion Policy Funds in Polish Rural Areas. *Land*, 10, 26. <https://doi.org/10.3390/land10010026>
- Ministry of Agriculture and Rural Development (MADR) (2022): List of Local Action Groups. https://www.madr.ro/docs/dezvoltare-rurala/Axa_LEADER/2014-2020/2022/Lista-cu-Grupurile-de-Actiune-Locala-selectate-de-MADR-si-datele-de-contact-ale-acestora-actualizata-la-data-de-04.11.2022.pdf
- Maier, K., Kabrhel, J., & Dąbrowski, M. (2021). Cross-fertilisation between spatial planning and EU Cohesion Policy in the Czech Republic Case study report. <https://www.espon.eu/sites/default/files/attachments/Cross-fertilisation%20between%20spatial%20planning%20and%20EU%20Cohesion%20Policy%20in%20the%20Czech%20Republic.pdf>
- Maier, D., Remete, A. N., Corda, A. M., Nastasoiu, I. A., Lazăr, P. S., Pop, I. A., & Luca, T. I. (2022). Territorial Distribution of EU Funds Allocation for Developments of Rural Romania during 2014–2020. *Sustainability*, 14(1), 506. <https://doi.org/10.3390/su14010506>
- Marin, M. (2014). The role of fiscal capacity in absorption of European funds. *Calitatea Vieții*, XXV(4), 324–336.
- Marin, M. (2015). Absorbția fondurilor europene pentru comunele din România: rolul capacității administrative. Editura Lumen.
- Marin, M. (2016). Primăriile și competiția fondurilor europene: cazul „punctelor albe”. *Sociologie Românească*, 2–3, 35–49. https://revistasociologieromaneasca.ro/sr/issue/view/2016_2_3
- Marin, M. (2021). Assessing PNDL: Romanian Leaders in Quest for State-Budget Funds. Springer.
- Marin, M., Glăvan, E., Chiș, A., & Corad, B. (2022a). EU FAR Project: Description of Database EU Funds absorbed by Romanian Municipalities 2016–2021 (Version v1). Zenodo. <https://doi.org/10.5281/zenodo.7460012>
- Marin, M., Glăvan, E., Chiș, A., & Corad, B. (2022b). EU FAR Database: EU Funds absorbed by Romanian Municipalities 2016–2021 (Version 1) [Data set]. Zenodo. <https://doi.org/10.5281/zenodo.7408376>
- Marin, M., Glăvan, E., Chiș, A., & Corad, B. (2022c). The Richer and the Poorer facing EU funds in Romania: the case of white spots. The 9th International Conference Economic Scientific Research – Theoretical, Empirical and Practical Approaches. „Constraints and opportunities in shaping the future. New approaches to economics and policy making“ (ESPERA 2022), Bucharest. Zenodo.
- Marinas, L. E., & Prioteasa, E. (2016). Spotlight on Factors Influencing the Absorption Rate of EU Funds in Romania. *Journal of Eastern Europe Research in Business & Economics*. <https://doi.org/10.1080/00343404.2022.2083593>
- Mendez, C., & Bachtler, J. (2022). The quality of government and administrative performance: explaining Cohesion Policy compliance, absorption and achievements across EU regions. *Regional Studies*, 1–14. <https://doi.org/10.1080/00343404.2022.2083593>
- Moynihan, D., & Pandey, S. (2005). Testing how management matters in an era of government by performance management. *Journal of Public Administration Research and Theory*, 15(3), 421–439. <https://doi.org/10.1093/jopart/mui016>
- Milio, S. (2007). Explaining differences in regional performance: Administrative capacity and political factors: The case of Structural Funds implementation in Italian Objective 1 regions. [Doctoral dissertation, London School of Economics and Political Science]. <http://etheses.lse.ac.uk/54/>
- Ministry of Agriculture and Rural Development (2022). List of Local Action Groups. https://www.madr.ro/docs/dezvoltare-rurala/Axa_LEADER/2014-2020/2022/Lista-cu-Grupurile-de-Actiune-Locala-selectate-de-MADR-si-datele-de-contact-ale-acestora-actualizata-la-data-de-04.11.2022.pdf
- Ministry of Development, Public Works and Administration (2018). Administration data for PNDL II (Stage of implementation as of May 1, 2018). <http://www.mdrap.ro/lucrari-publice/pndl>
- Ministry of Development, Public Works and Administration (2021). Situation of income and expenditure of administrative-territorial units in the period 1999–2019. http://www.dpfb.mdrap.ro/sit_ven_si_chelt_uat.html
- Ministry of Development, Public Works and Administration (2022). Situation of revenues and expenditure of territorial administrative units. http://www.dpfb.mdrap.ro/sit_ven_si_chelt_uat.html
- Ministry of European Investment and Projects (2022). Regional Programme 2021–2027. <https://mfe.gov.ro/programe-regionale-21-27>
- Ministry of Public Finance (2019). Fiscal Budgetary Policy for the period of 2020–2022. mfinante.gov.ro.
- Mirska, A. (2021). Investment Expenditure of Local Governments. The Role of European Funds in the Financial Strategies of Rural gminas. <https://zenodo.org/record/5556072#.Y4iWC3ZBxPZ>
- Nicholas, K. N., Vilemoe, F., Lehsten, E. A., Brady, M. V., & Scown, M. (2021). A harmonized and spatially explicit dataset from 16 million payments from the European Union's Common Agricultural Policy for 2015. *Patterns*. <https://doi.org/10.1016/j.patter.2021.100236>
- Opreșcu, G. (coord.), Constantin, D. L., Ilie, F., & Pîslaru, D. (2006). Analiza capacității de absorbție a fondurilor comunitare în România. Institutul European din România. Studii de impact III, Studiul nr. 1. http://www.ier.ro/documente/studiideimpactPaisIII_ro/Pais3_studiu_1_ro.pdf
- ROHub (2022). <https://reliance.rohub.org/overview?ro=941ecf90-82ba-4c56-961b-2f727da5df78&activetab=overview>
- Sandu, D. (2022). Challenge and Response of Regional Disparities: Romania in a Comparative Perspective. https://link.springer.com/chapter/10.1007/978-3-658-36343-7_13.

- Salageanu, R. (2012). The challenge of regionalization for the Romanian administration: Strengthening vs. Hindrance. *L'Europe en Formation*, 2, 364, 181-194. <https://doi.org/10.3917/eufor.364.0181>
- Sharfman, M., & Dean, J. W. (1991). Conceptualizing and measuring the organizational environment: a multidimensional approach. *Journal of Management*, 17(4), 681–700. <https://doi.org/10.1177/014920639101700403>
- Spychala, M. (2020). The Absorption of EU funds and the socio-economic development in the subregional dimension in Poland. *Research Papers of Wroclaw University of Economics and Business*. 64(3), 78–91. <https://doi.org/10.15611/pn.2020.3.07>
- Standar, A. (2010). Determinants Influencing Obtaining of the EU Funds by Communes of the Wielkopolska Province. *Journal of Agribusiness and Rural Development*, 18(4), 97–105. <https://www1.up.poznan.pl/jard/index.php/jard/article/view/845>
- Šumpíková, M., Pavel, J., & Klazar, S. (2006). EU Funds: Absorption Capacity and Effectiveness of Their Use, with Focus on Regional Level in the Czech Republic. Paper based on an original research for the Grant Agency of the Czech Republic, via the project No. 402/03/1221. <http://unpan1.un.org/intradoc/groups/public/documents/nispacee/unpan018547.pdf>
- Tempo online database (2022). <http://statistici.insse.ro:8077/tempo-online/#/pages/tables/insse-table>
- Teşliuc, E., Stănculescu, M. S., & Grigoraş, V. (2016). The Atlas of Rural Marginalized Areas and of Local Human Development in Romania. Bucharest. <https://documents1.worldbank.org/curated/en/847151467202306122/pdf/106653-WP-P159257-PUBLIC.pdf>
- Țigănașu, R., Încălțărău, C., & Pascariu, G. C. (2018). Administrative Capacity, Structural Funds Absorption and Development. Evidence from Central and Eastern European Countries. *Romanian Journal of European Affairs*. 18(1), 39-59.
- Tosun, J. (2014). Absorption of Regional Funds: A Comparative Analysis. *Journal of Common Market Studies*. 52(2), 371–387.
- Yuchtman, E., & Seashore, S. (1967). A System Resource Approach to Organizational Effectiveness. *American Sociological Review*, 32(6), 891–903. <https://www.jstor.org/stable/2092843>
- Weber, R., Moodie, J., & Löfving, L. (2020). ESCAPE European Shrinking Rural Areas: Challenges, Actions and Perspectives for Territorial Governance. Applied Research Final Report – Annex 15 EU, National and Regional Policy Reporting. <https://www.espon.eu/sites/default/files/attachments/ESPON%20ESCAPE%20Final%20Report%20Annex%2015%20-%20EU%20Policy.pdf>
- World Bank (2016). Investment Guide for Local Projects: Communal Roads and Social Infrastructure. <https://www.mdlna.ro/userfiles/smis48659/ghid2.pdf>

Please cite this article as:

Marin, A. M., Glăvan, A. C., & Corad, B. (2023). Spatial patterns of EU funds absorption in Romanian rural municipalities. *Moravian Geographical Reports*, 31(2), 73–83. <https://doi.org/10.2478/mgr-2023-0007>

Appendix

| Variable name | Variable description | Measurement unit | Data Source | Reference date/year | Source for data access |
|---|---|---|--|---------------------|---|
| EU funds absorbed by each municipality | Sum of EU funds absorbed by each municipality in 2016–2021 | Euro at constant 2010 prices per inhabitant | EU FAR database | 2016–2021 | Marin et al. (2022c) or ROHub (2022) |
| Fiscal capacity | Fiscal capacity computed by the author based on the average of own revenues – average value for 2016, 2017 and 2018 | Euro at constant 2010 prices per inhabitant | MDLPA Annex 24 Local budgets execution | 2018–2020 | Ministry of Development, Public Works and Administration (2022) |
| EU funding in the previous programming period of 2007–2013 | Information on implementation of EU funding from the previous programming period computed by the author based on local budgets execution database (if they reported or not expenditures under this budgetary chapter) | Binary variable (1-yes, 0-no) | MDLPA Annex 24 Local budgets execution | 2016–2021 | Ministry of Development, Public Works and Administration (2022) |
| Affiliation to a Functional Urban Area | Part of a Functional Urban Area. Recoded by the authors based on Eurostat data (Correspondence table LAU – NUTS 2021, EU-27 and EFTA / available Candidate Countries) | Binary variable (1-yes, 0-no) | Eurostat | 2021 | Eurostat (2023) |
| Presence of marginalised community at local level | Binary variable, based on The Atlas of Rural Marginalized Areas and of Local Human Development in Romania | Binary variable (1-yes, 0-no) | Teşliuc et al. (2016) | 2011 | Teşliuc et al. (2016) |
| State-Budget Funding | Information on State Budgets Funds in reference to PNDL2 allocations from 2018, as published by the Ministry of Development, Public Works and Administration | Binary variable (1-yes, 0-no) | MDLPA data | 2018 | Ministry of Development, Public Works and Administration (2018) |
| Population Dynamics in 2021 compared to 2014 | Population dynamics as computed by the authors, based on the data from the National Institute of Statistics, Tempo online database | Several categories available ^a | National Institute of Statistics | | Tempo online database (2022) |
| Level of development | Level of locality development as computed by professor Dumitru Sandu, open data available on citadini.ro | Several development categories available ^b | Citadini.ro | | Citadini.ro |
| Development region (NUTS 2) and county (NUTS 3) affiliation | Affiliation of each locality to statistical development region or county | – | National Institute of Statistics | – | National Statistical Yearbook ^c |

Appendix 1: List of variables

Notes: ^a Available categories: (i) decrease of more than 10%, (ii) decrease of less than 10%, (iii) no change or increase; ^b Available categories: (i) developed, (ii) getting out of poverty, (iii) in stagnating poverty, (iv) dynamic average developed, (v) stagnating average development, (vi) higher average dynamic development, (vii) missing information; ^c The source presents the grouping of localities into NUTS 3 and NUTS 2 in Romania and across Europe. “To meet the demand for statistics at a local level, Eurostat maintains a system of Local Administrative Units (LAUs) compatible with NUTS. These LAUs are the building blocks of the NUTS, and comprise the municipalities and communes of the European Union” (see: <https://ec.europa.eu/eurostat/web/nuts/local-administrative-units>)