One policy, many policies: the spatial allocation of first and second pillar CAP Expenditure

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Summary

The Common Agricultural Policy (CAP) is the most important EU Policy in terms of total expenditure. Nevertheless, its impact on EU-27 regions is rather uneven: actually, some regions have historically received a larger support than others. Territorial imbalances, however, represent only part of the story. The CAP comprises a wide range of agricultural and rural measures, from agricultural market interventions to agro-environmental payments and rural development measures. Due to their underlying objectives, expenditures from different CAP Pillars are allocated according to different territorial patterns at local level. In this paper, CAP real expenditures for years 2007-2011 are analysed at EU-27 NUTS 3 level, by considering expenditure intensity per hectare of utilised agricultural area (UAA). Several CAP expenditure typologies (Direct Payments, Market Intervention Measures and RDP's Axes, i.e., Axis 1, Axis 2 and Axis 3) are considered. Their spatial allocation highlights different territorial patterns and suggests the existence of well defined spatial clusters. They seem to be determined by the nature of CAP itself. Indeed, despite being a single EU policy, the heterogeneous nature of its measures and their spatial allocation make the CAP a combination of several territorial policies.

Keywords: CAP, rural development, regional patterns
JEL Classification codes: O18, Q01, R58

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1. INTRODUCTION

The Common Agricultural Policy (CAP) still represents the most important EU Policy in terms of both total expenditure and share within the EU budget. Since its origin (1962), the CAP has largely supported agricultural sector and farmers' incomes. Over time, this support has undergone major changes and reforms, so most of the original market support measures have been gradually transformed into direct income support measures. More importantly, another major characteristic of the CAP support is that it is not, and has never been, homogeneous throughout the EU space. In particular, some regions have historically received a greater support than other EU areas (Shucksmith *et al.*, 2005; Copus, 2010; Crescenzi *et al.*, 2011; Camaioni *et al.*, 2013). This is due to several causes. Firstly, cross-country differences play an important role: EU Member States still receive differentiated amounts of CAP support. Then, at a lower territorial level, the spatial allocation of CAP expenditures also depends on specific features, such as either the presence of given agricultural activities or the general degree of rurality. Previous studies have already pointed out existing links between CAP expenditure and rural features at the local level (Camaioni *et al.*, 2013).

Nevertheless, these agricultural and rural features just represent part of the story. Indeed, the CAP currently includes a wide range of measures, from agricultural market interventions to environmental measures. Since Agenda 2000, the first pillar of the CAP has been mainly aimed at supporting agricultural activities and farmers' income, while the second pillar has been identified as the Rural Development Policy (RDP). Due to their underlying objectives, the expenditure from the two different CAP pillars is expected to be allocated according to different spatial patterns. Actually, a single EU policy (i.e., the CAP) should be more properly considered as a set of different policies, each of them having its own territorial peculiarities. The main aim of the paper is to highlight these major territorial imbalances by disentangling CAP measures and policies, in order to analyze their spatial and territorial allocation. To pursue this objective, the CAP real expenditures are analysed at NUTS 3 level, i.e., the lowest territorial scale admitted by the available policy data.

According to this general framework the first part of the paper is aimed at describing the distribution of Pillar One and Two funds throughout the EU-27 space. This analysis is performed at this highly disaggregated territorial level (1288 NUTS 3 regions) for years 2007 to 2011 (the last year with available policy data at this level). To take regional size heterogeneity over the EU-27 space into account, CAP expenditure is expressed in intensity terms (CAP expenditure per ha. of utilised agricultural area; per annual work unit employed in agriculture; per thousand Euros of agricultural Gross Value Added), to make regional comparisons feasible. By jointly considering the spatial allocation of agricultural and rural measures, four groups of regions can be eventually identified (section 3): i) *top beneficiaries*: those NUTS 3 regions where both pillars' support intensity is above the EU-27 average; ii) *under supported regions:* those NUTS 3

regions where both pillars' support intensity is below the respective EU-27 average; iii) *agricultural-oriented regions*: those NUTS 3 regions where first pillar's support intensity is above the EU-27 average, while second pillar's support intensity is below; iv) *rural-oriented regions*: those NUTS 3 regions where first pillar's support intensity is below the EU-27 average, while second pillar's support intensity is above.

After this exploratory analysis, the forth section of the paper focuses on the spatial allocation of specific CAP measures. In particular, overall CAP expenditures is disentangled in the following five typologies: Direct Payments and Market Interventions (Pillar One); Axis 1, Axis 2 and Axis 3 measures (Pillar Two). According to this simple taxonomy, the paper describes the geographical distribution of each CAP expenditure typology at NUTS 3 level across the EU-27. According to the observed results (i.e., least and most supported regions), the CAP shows polymorphic features, due to the set of different measures it includes. As a consequence, from a single policy, many spatially targeted policies seem to emerge. Section 5 concludes the paper by suggesting some policy implications of the empirical evidence.

2. POLICY DATA: A GENERAL DESCRIPTION

2.1. The Common Agricultural Policy: Agricultural, Rural and Environmental Measures

The main purpose of the present paper is to provide evidence about spatial allocation of CAP expenditures, focusing on a disaggregated territorial level (NUTS 3) and covering the whole set of EU-27 Member States (Croatia is not considered here). The CAP currently comprises a wide set of measures, ranging from agricultural interventions to environmental ones.

In 1999, Agenda 2000 reformed both the CAP and regional policies. In establishing a new financial framework, it defined two "Pillars" of the CAP. Then following reforms (in particular Council Regulation 1290/2005) created two distinct funds for financing these two pillars. The European Agricultural Guarantee Fund (EAGF) and the European Agricultural Fund for Rural Development (EAFRD) replaced the former European Agricultural Guidance and Guarantee Fund (EAGGF). EAGF, namely the First Pillar, funds both direct payments to farmers and market measures or interventions (e.g., private or public storage, export refunds). EAFRD, namely the Second Pillar, is aimed at financing rural development programmes within single EU Member States.

For the 2007-2013 programming period, overall CAP appropriation for commitment slightly exceeded 400 million €. Despite the latest reforms, Pillar One still represents more than 75% out of this overall 2007-2013 budget. It mainly comprises two types of policies:

- Direct Payments (DP) support farmers' and land managers' incomes conditional on the respect of agro-environmental standards and on keeping the land in good condition. Support is decoupled from production, thus its distortionary market effects are expected to be very limited;

- Market Intervention (MI) measures are still maintained for a number of product. They respond to specific market conditions and consist in a set of pretty conventional measures ranging from private storage aid to export refunds (therefore, under certain conditions, support beneficiaries are, in fact, traders and food industries).

Both DP and MI measures are directly managed by the EU Commission. Nevertheless, either regional or national paying agencies are in charge of payments to direct beneficiaries. DP currently accounts for a large share of the support granted to agriculture through the First Pillar as market policies have steadily

decreased over time, also due to market liberalization implied by international agreements (Henke *et al*., 2010).

According to CAP evolution over time, Rural Development Policy has been designed to complement CAP Pillar One. CAP Second Pillar includes additional measures, aimed at serving broader environmental and rural development objectives. In particular, it aims at supporting EU rural regions, that still represent a vital part of the EU. Nevertheless, they have lately been facing new opportunities and challenges, despite some economic and social weaknesses and other territorial imbalances. Indeed, ongoing transformations of developed EU economies have largely affected EU rural areas and the integration with the urban space (Mantino, 2005; OECD, 2006; Copus *et al.*, 2008; Eurostat, 2010; Esposti, 2011; Sotte *et al.*, 2012).

In 2007-2013 programming period, Regulation 1698/2006 provided a menu of 44 measures from which either Member States or regions may choose, when designing their Rural Development Plans[1]. Programmes are based on common strategic objectives. 2007-2013 RDP focuses on three "thematic axes": i) Axis 1 aims at improving the competitiveness of the agricultural and forestry sector; ii) Axis 2 improves the environment and the countryside; iii) Axis 3 promotes quality of life in rural areas, encouraging diversification of the rural economy. A fourth axis (*Leader initiative*) has been added, too. Following a bottom-up approach, local action groups define their own strategy, i.e. local development programmes, based on the three axes of the RDP.

In order to provide a balanced approach to RDP, Member States and Regions are requested to spread EAFRD financial resources among each thematic axis. Nevertheless, allocation is not even. In 2007-2013 programming period, about 33% of EAFRD financial resources was committed to Axis 1, about 46% of resources to Axis 2, while just 13% out of total EAFRD resources to Axis 3. Copus (2010) already analysed the allocation of RDP expenditure across sectoral and territorial measures and found that the former intervention is rather dominant. The allocation among thematic axes is even more unbalanced when comparing the EU-27 Member States: differences are due to both allocation choices and distinction between convergence and non-convergence regions. Both elements may deeply affect the financial leverage that is generated by national and private co-financing (Camaioni and Sotte, 2010).

It has to be noticed that the CAP also represents, in terms of expenditure amount, the main EU environmental policy. Actually, within the current CAP design several environmental objectives justify the adopted measures but they are pursued through not specifically-designed interventions and funds[2]. For instance, through cross-compliance (that penalises farmers who infringe EU law on environmental, public and animal health, animal welfare or land management), DP are expected to improve the provision of environmental public goods, by fostering more sustainable farming systems. Among environmental conditions to be followed, the EC strongly recommends: i) prevention of soil erosion; ii) maintaining of soil organic matter and soil structure; iii) avoiding the deterioration of habitats; iv) protecting and managing water. Pillar Two largely supports environmental objectives, but this is done through more targeted

[1] Rural Development Policy is implemented by specific programmes at either national or regional level. Unlike Pillar One, Pillar Two measures are selectively applied to specific areas or categories of beneficiary. Pillar Two differs from Pillar One in its implementation as well. Expenditures are not directly managed by the EU Commission: they are generally managed at national level, while just Spain, Germany and Italy opted for regional implementation. Other exceptions are represented by: Belgium (2 RDP: Flanders and Wallonia); Finland (2 RDP: Mainland and Region of Åland); France (6 RDP: Exagone, Corse, Guadeloupe, Guyane, Martinique, Réunion); Portugal (3 RDP: Mainland, Azores, Madeira); The UK (4 RDP: England, Wales, Scotland and Northern Ireland).

[2] DG-Environment actually manages specific actions, such as the LIFE fund (supporting environmental and nature conservation projects, through grants and call for proposal) and the Eco-Innovation and Competitiveness and Innovation Framework Programme (CIP-EIP).

measures. Axis 2, in particular, is aimed at improving environmental objectives and it represents almost 50% of overall committed expenditures from RDP.

2.2. Disaggregating CAP Expenditures

According to the above-mentioned political framework, this section provides further information about the adopted data sources. Actually, EU policies data availability is rather poor, at least at local level (Shucksmith *et al.*, 2005) as no information on CAP expenditure *ex-ante* allocation is provided below the national level, by DG Agriculture. Reconstructions of real expenditure are available at regional level but they are mostly based on some sample observations (e.g., FADN data) (Esposti, 2007). Nonetheless, data on the real *ex-post* expenditure are public, though they are not collected in any comprehensive dataset. Here, such data on real (*ex-post*) CAP expenditure are directly collected from European Commission (DG Agriculture). According to the main aims of the work, CAP actual expenditures from two different funds (EAGF and EAFRD) have been taken into account[3] and the final dataset gathers EU-27 payments from years 2007 to 2011.

Expenditure data are analysed at NUTS 3 level because it allows for a detailed representation of the allocation of expenditure: actually, NUTS 2 level is a too wide scale to be representative, whereas working at an even smaller scale (e.g., local administrative unit level) is unfeasible. In fact, expenditure data refer to single payments received by beneficiaries throughout the EU-27, on the basis of the declaration of national (or regional) paying agencies. Therefore, a very minute territorial level could be feasible, in principle. In practice, in order to keep their anonymity, data are provided only at level 3 of NUTS (*Nomenclature of territorial units for statistics*). Thus, 1288 NUTS 3 regions are under study here[4].

This expenditure aggregation at NUTS 3 level still poses some critical issues. NUTS 2003 classification was in force in years 2003 to 2007; then, in 2008, NUTS 2006 classification was adopted.[5] Some expenditure from years 2007 and 2008, however, still concerns the previous programming period and in particular both NUTS classifications have to be used in order to univocally identify the beneficiary region in any given year. A major issue to be solved thus deal with univocal allocations of payments. In some cases NUTS codes simply changed when shifting from NUTS 2003 to NUTS 2006 classification, thus not really affecting the allocation of expenditures. Nevertheless, other changes affected territorial divisions as well: some NUTS 3 regions terminated, being split into two or more new NUTS 3 regions; some other NUTS 3 regions were merged; in other cases, boundary shifts occurred. In these cases, CAP expenditures that had been spatially identified according to NUTS 2003 classification had to be reallocated according to the new NUTS 2006 layer. In particular, when either splits or boundary shifts occurred, the following methodology has been adopted: expenditures of previous NUTS 3 regions were apportioned according to the share of total surface of the new NUTS 3 regions. This methodology follows the assumption that expenditure allocation within each NUTS 3 region is spatially homogeneous.

In order to properly assess the spatial allocation of CAP expenditures, weighted values expressing CAP expenditure intensity have to be considered. Support intensity can be expressed by means of different

[3] As the attention here is on allocation of EU expenditure, national co-funding for RDP expenditure is not considered for the purpose of the current analysis.

[4] For the purpose of the analysis, 15 NUTS 3 regions have been dropped out from the original dataset, due to lack of territorial contiguity with the European continent (see, for instance, the French Departements d'outre-Mer, the Canary Islands...).

[5] Even though the NUTS 2010 classification is currently adopted (Commission Regulation (EC) No 105/2007), NUTS 2006 classification (Commission Regulation (EC) No 1059/2003) is adopted here: actually, most of information at sub-regional level included into Eurostat dataset is still provided according to that classification.

dimensions. As the policy under study here mostly deals with agricultural issues, following dimensions have been selected: agricultural area, agricultural labour force, gross value added from agricultural activities[6]. More in detail, the following expenditure intensities were taken as basic units for the analysis:

- Expenditure per hectare of utilised agricultural area (€/UAA)[7]
- Expenditure per annual work unit employed in agriculture (€/AWU)[8]
- Expenditure per thousand Euros of agricultural gross value added (€/.000 €)[9]

Main statistical source for these variables is *Farm Structure Survey* from Eurostat. This is a periodical survey (2000, 2003, 2005 and 2007) that reports data on UAA and AWU employed in agriculture, at NUTS 3 level. When available, latest figures are considered. Data on agricultural GVA (expressed in thousand Euros) come from Eurostat National and Regional Economic Accounts: to take the economic cycle into account, the 2007-2010 yearly average Agricultural GVA is here considered[10].

Some further *caveats* about data used have to be pointed out. Availability of NUTS 3 data on agriculture across Europe is incomplete (Shucksmith *et al.*, 2005), so missing values affect *Farm Structure Survey* data on hectares of UAA and AWU employed in agriculture. Among others, they mostly affected NUTS 3 observations particularly in Germany, the UK and Austria. Firstly, missing values for years 2007-2013 have been replaced by adopting 2005, 2003 and 2000 data respectively, when available (e.g., for NUTS 3 regions in Spain, Italy, Austria). This solution does not apply to most German NUTS 3 regions. Following Shucksmith *et al.* (2005), missing values in those cases have been replaced by considering data available at higher territorial level. In particular, the method chosen for apportionment of higher-level (NUTS 1 or NUTS 2 level) UAA and AWU data to NUTS 3 level is mainly based on the following two core variables: total surface (in square kilometers) and agricultural employment. The former was used to apportion UAA from NUTS 2 to NUTS 3 level; the latter to apportion AWU in agriculture. The methodology relies on the assumption that farming activities in relation to UAA and AWU do not vary significantly within each higher NUTS level (Shucksmith *et al.*, 2005)[11].

A final remark concerns how very high CAP expenditure intensities are treated. When expressing expenditure intensity by means of specific agriculture-related variables, "artificially" high values may be observed in a few cases[12]. In order to get rid of such distortionary cases, regions fulfilling at least one the following criteria have been excluded from the analysis:

- UAA (utilised agricultural area) ≤ 1000 ha.;

[6] The choice partially follows the methodology suggested by Copus (2010). He analysed the intensity of rural development expenditure per hectare of agricultural land (UAA), per agricultural holding, per annual work unit (AWU) and per European size unit (ESU). Nevertheless, patterns of intensity were just analysed at national level. At NUTS 3 level, data on agricultural holdings and European size units are not reliable, showing a great amount of missing values.

[7] UAA refers to areas directly used for farming activities (arable lands, permanent grasslands and crops). Unused agricultural land (e.g., woodland and land occupied by buildings, farmyards, ponds) are not included

[8] One annual work unit corresponds to the total amount of work performed by a single person occupied on a full-time basis on an agricultural holding.

[9] The gross value added from sector A (Agriculture, forestry and fishing) is considered (NACE, Rev. 2).

[10] Years 2007 to 2009 are used for Italy.

[11] Nevertheless, for a few regions within the sample, it was not possible to apportion data from higher territorial level according to the above-mentioned methodology. In particular, three NUTS 3 regions still miss the value for UAA, six regions miss the value for AWU; one region misses the value for the agricultural GVA. Due to their very urban features, it seems plausible to consider them having no agricultural activities at all (i.e., UAA, AWU and agricultural GVA equal to zero).

[12] They refer to urban areas whose values for UAA, AWU and agricultural GVA are quite small. Nevertheless, the same regions may account for some share of CAP beneficiaries and of CAP expenditure as well. Some beneficiaries, indeed, may be located in urban regions, although managing their agricultural activities in other regions. This situation may imply "artificially" (i.e. misleading) high levels of expenditure intensity for some urban regions.

- Agricultural AWU (annual work units) ≤ 10;
- Gross value added from agriculture ≤ 100,000.00 €.

According to these criteria, 30 regions have been excluded. They mostly are capital cities (e.g., Bruxelles, Copenhagen, Paris, Dublin, Riga, London) and other city regions, mainly located in the UK. These exclusions do not really affect the overall dataset. The number of total observations under investigation becomes 1258 but excluded regions account for a negligible share on overall CAP expenditure: although representing 2.33% of the total number of EU-27 NUTS 3 regions, they account for less than 0.4% of total CAP expenditure.

3. AN EXPLORATORY ANALYSIS OF THE SPATIAL ALLOCATION OF EU FUNDS

According to the major characteristics of CAP, territorial imbalances in both EAGF and EAFRD expenditures allocation are expected to occur, due to large socio-economic and environmental differences throughout the EU, at first. Referring to our sample of 1258 observations, Table 1 reports some descriptive statistics for CAP expenditure intensity in terms of land, labour and agricultural GVA, respectively. Mean and standard deviation, as well as quartiles from the cumulative distribution function, are shown. On average, overall 2007-2011 CAP support per NUTS 3 region was about 1,800 € per hectare of UAA, 47,600 € per AWU employed in agriculture, 1,800€ per thousand Euros of agricultural GVA[13].

According to the quartile distributions provided in the lower part of Table 1, Table 2 reports the cumulative shares of total CAP expenditure for each interval of the distribution. The lower interval in terms of CAP expenditure intensity accounts for less than 17% of total raw expenditure. When considering the CAP expenditure intensity per thousand Euros of agricultural GVA, such a share is just 12.7%. Conversely, the 3rd interval is the largest one as it accounts for more than 40% of total CAP expenditure, while the upper interval accounts for about 25-35% of total CAP. A possible explanation of these results may be the fact that regions showing the highest expenditure intensity are generally smaller (and mostly more urban) than other NUTS 3 regions, thus accounting for a lower share on overall raw expenditure.

Picture emerging from these statistics, however, reveals just part of the story about the uneven distribution of the CAP expenditure. What is more interesting is the spatial quartile distributions across the EU-27 as mapped in the Annex. Remarkable heterogeneity and specific territorial patterns emerge. Firstly, it has to be noticed that the overall picture significantly changes with three indicators. This issue has been already pointed out in previous studies (see for instance, Camaioni *et al.*, 2013). When considering intensity of total CAP expenditure per UAA, regions in Eastern EU Member States mostly belong to the lower interval of the distribution (low expenditure intensity). Conversely, urban regions and other NUTS 3 regions in the Netherlands and Belgium show highest CAP expenditure values throughout the EU. Figures about the allocation of CAP expenditure in terms of agricultural AWU follow a fairly similar territorial pattern: regions in Northern and Western Member States tend to show large CAP expenditure intensity. On the contrary, when focusing on CAP support per thousand Euros of agricultural GVA, results are pretty different. Whilst previous indices suggested the existence of a major Eastern-Western divide in the allocation of overall CAP expenditure, such a divide definitely vanishes according to this indicator.

Nevertheless, analysing spatial divide only focusing on the overall CAP expenditure may be partially misleading. Different measures within the CAP are expected to be affected by very different territorial

[13] In following tables, all data refer to 5-years expenditures: in particular, years 2007-2011 are take into account.

patterns. Differences between EAGF (Pillar One) and EAFRD (Pillar Two) expenditures clearly emerge. On average, in years 2007 to 2011, NUTS 3 regions received about 163 million Euros as Pillar One expenditure and just 30.5 million Euros as Rural Development Policy expenditure. Average support per hectare of UAA was thus equal to 1,541€ and 304€ respectively (Table 3). Standard deviation is very large in both cases, even after having removed regions with "extreme" urban features. Actually, some regions received a really reduced support, while other regions were highly supported (e.g., more than 1,000€ per hectare of UAA).

Table 1. CAP expenditure intensity descriptive statistics, 2007-2011 (number of observations: 1258).

	Expenditure per UAA (€ / UAA)	Expenditure per AWU (€ / AWU)	Expenditure per GVA (€ / .000 €)
Mean	1,844.13	47,582.58	1,800.29
Standard Deviation	2,140.31	62,315.10	2,303.33
Minimum	128.09	546.28	28.77
1st Quartile	1,092.33	15,266.28	903.35
Median	1,598.41	36,075.91	1,453.07
3rd Quartile	2,135.53	61,463.14	2,079.99
Maximum	47,215.59	950,650.32	36,024.24

Source: own elaboration

Table 2. Cumulative shares (%) of CAP expenditures (2007-2011) by quartiles of expenditure intensity (number of observations: 1258)

	CAP Expenditure per UAA (€ / UAA)	CAP Expenditure per AWU (€ / AWU)	CAP Expenditure per GVA (€ / .000 €)
1st Quartile	16.76	16.06	12.72
Median	27.60	20.97	24.41
3rd Quartile	73.73	67.16	64.88
4th Quartile	100.00	100.00	100.00

Source: own elaboration

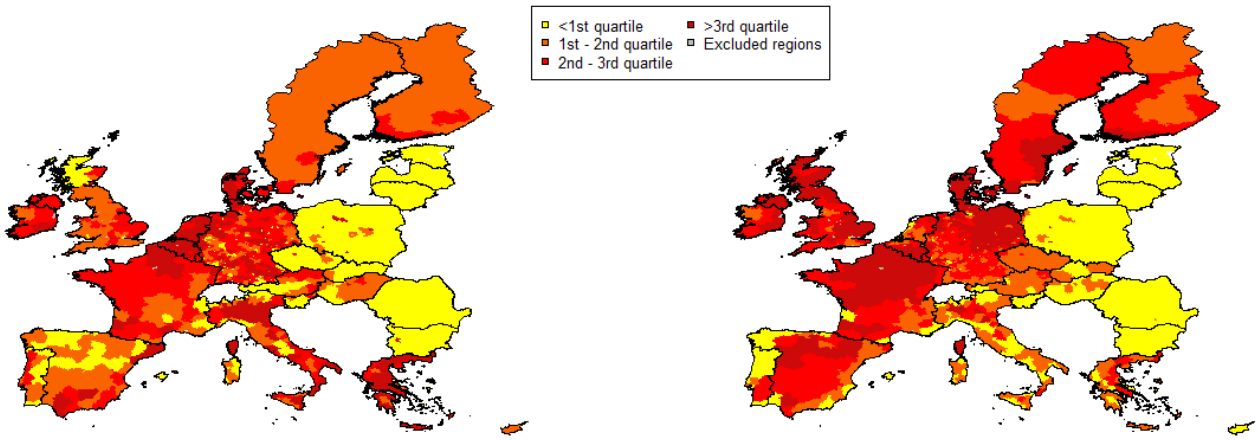
Table 3. Pillar One and Two expenditure intensity (€ / UAA) descriptive statistics, 2007-2011 (number of observations: 1258)

	Pillar One expenditure (€ / UAA)	Pillar Two expenditure (€ / UAA)
Mean	1,540.48	303.65
Standard Deviation	1,967.47	460.08
Minimum	33.99	4.78
1st Quartile	799.64	122.68
Median	1,305.97	207.96
3rd Quartile	1,872.27	355.36
4th Quartile (maximum)	45,472.59	8,905.23

Source: own elaboration

Focusing on spatial allocation of funds, Pillar One expenditure, as obvious, follows the general allocation characterising overall CAP expenditure. Considering expenditure per hectare of UAA and per agricultural AWU, intensity of Pillar One expenditure largely follows the spatial allocation of major agricultural activities throughout the EU-27. Nevertheless, some interesting findings can be pointed out. Very low values affect all Eastern EU Member States regions, with a few exceptions. Conversely, many regions belonging to Northern France, Belgium, the Netherlands and Germany (as well as most regions in Northern Italy) belong to the 4th range of the distribution: they are actually characterised by the highest Pillar One expenditure intensity throughout the EU. Expenditure intensity is above the median value also in some Spanish and Greek regions (Figure 1).

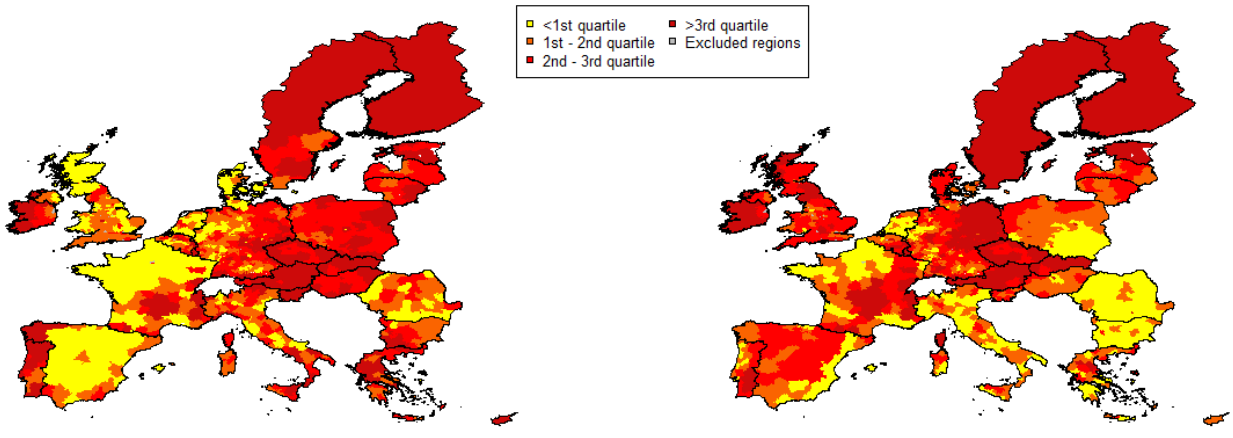
Figure 1. Spatial quartile distribution for Pillar One expenditure intensity per hectare of UAA (€/UAA) (left) and per agricultural AWU (€/AWU) (right) at NUTS 3 level (2007-2011 values)



Source: own elaboration

The spatial allocation of Pillar Two expenditures follows rather different territorial patterns. RDP expenditure intensity per hectare of UAA is low in flatlands throughout Northern France and Spain. Regions in Scotland, Spain and Northern France are below the 1st quartile, too. On the other extreme of the distribution, many Eastern EU Member States are highly supported (above either 2nd or 3rd quartile of the distribution) and also many mountain regions throughout the Alps and the Pyrenees belong to the upper intervals (Figure 2). When considering RDP expenditure per agricultural AWU, however, lowest values are observed in most Eastern Countries (e.g., Romania and Bulgaria) as well as in some Italian and French regions. Conversely, expenditure intensity is high in most regions throughout Scandinavian Countries.

Figure 2. Spatial quartile distribution for Pillar Two expenditure intensity per hectare of UAA (€/UAA) (left) and per agricultural AWU (€/AWU) (right) at NUTS 3 level (2007-2011 values)



Source: own elaboration

According to these findings, it emerges a sort of compensatory effect (or substitutability) between the two pillars of the CAP: regions that are little supported in terms of Pillar One expenditure are highly supported in terms of Rural Development expenditure and vice versa. Indeed, when jointly analysing the territorial distribution and spatial allocation of both Pillars of the CAP, more complex patterns are observed

throughout the EU. Territorial imbalances can be better highlighted by identifying NUTS 3 regions where both Pillar One and Pillar Two support per hectare of UAA[14] is above (below) the EU-27 value[15]. Taking the EU-27 value as a benchmark, each region can be positioned on a Cartesian plane where the *x*-axis refers to Pillar One support intensity and the *y*-axis to Pillar Two support intensity. The origin of the plane (0,0) is positioned in the respective EU-27 values. This representation thus splits EU-27 NUTS regions into four groups:

- High-High cases (NUTS 3 regions where both pillars' support intensity is above the EU-27 average): *top beneficiaries*;
- Low-Low cases (NUTS 3 regions where both pillars' support intensity is below the respective EU-27 average): *under supported regions*;
- High-Low cases (NUTS 3 regions where Pillar One's support intensity is above the EU-27 average, while Pillar Two's support intensity is below it): *agriculture-oriented beneficiaries*;
- Low-High cases (NUTS 3 regions where Pillar One's support intensity is below the EU-27 average, while Pillar Two's support intensity is above it): *rural-oriented beneficiaries*.

Following this rough classification, Figure 3 maps the four groups of regions when support intensity is expressed per hectare of UAA. There are 288 High-High regions, mostly located in Eastern Germany, Southern Italy, Greece and Ireland. Many Western EU regions are High-Low cases while, conversely, NUTS 3 regions in Eastern Member States and in Scandinavia generally fall in the Low-High case. Lastly, 282 regions are Low-Low cases: areas of Scotland and Wales, the majority of Spain, Romania and Bulgaria and some Italian regions fall in this group. As shown in Table 4, High-High cases represent 13% of the total EU-27 UAA. On the opposite, Low-Low regions represent 30% of total UAA. Nevertheless, it is confirmed that for more than a half of EU-27 NUTS 3 regions we observe a sort of substitutability between the two Pillars.

Though just providing a rough picture about EU allocation of CAP expenditures, as it focuses on overall expenditure intensity from Pillar One and Pillar Two, Figure 3 still highlights the clear Eastern-Western divide: most of EU Western regions show a larger Pillar One's support, while RDP support is larger in Eastern ones. Furthermore, some Country specific patterns emerge as well. To better investigate this allocation patterns, however, a further decomposition of the CAP is needed.

Table 4. Classes of joint support per UAA: number of NUTS 3 regions and share on total EU-27 UAA

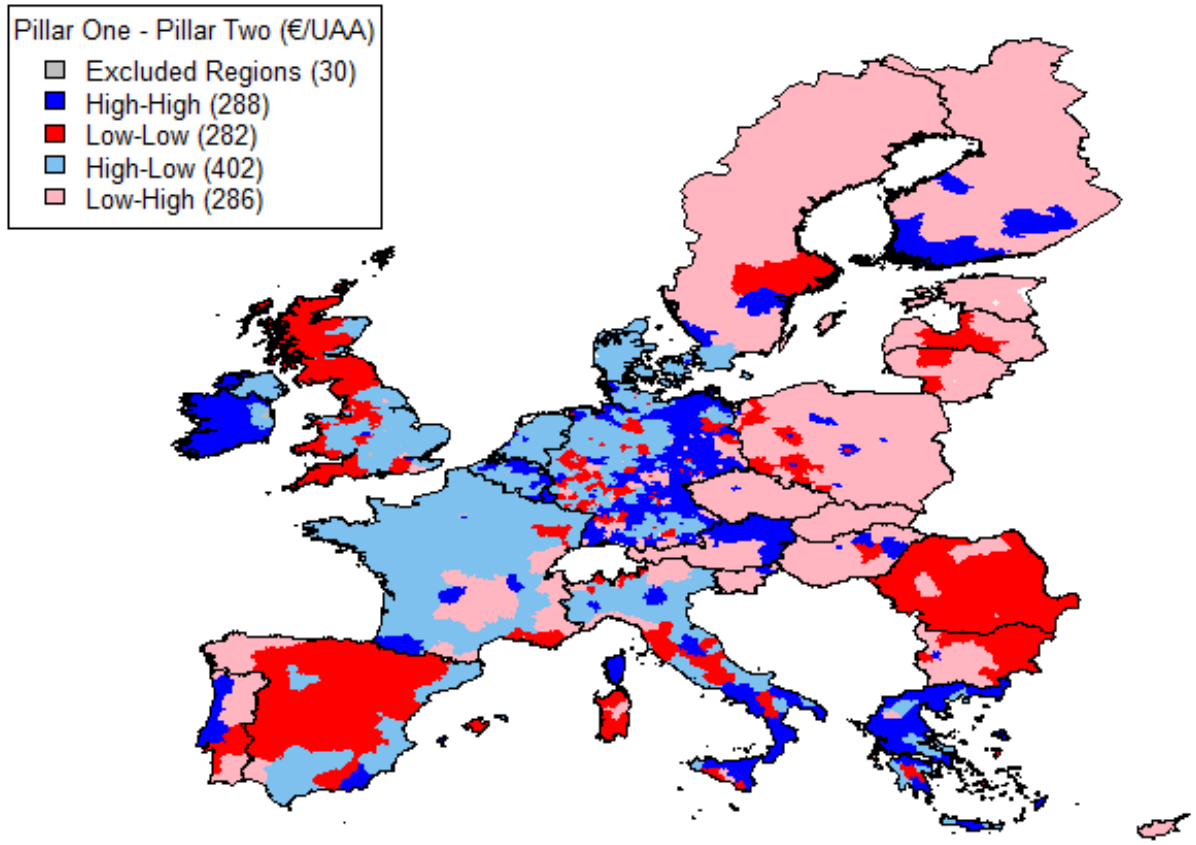
	No. of regions	Share (%) out of total UAA
Top beneficiaries	288	13.24
Agriculture-oriented beneficiaries	402	31.81
Rural-oriented beneficiaries	286	24.91
Under supported regions	282	30.02
Excluded regions	30	0.03
Total	1288	100.00

Source: own elaboration

[14] We consider here this expenditure intensity index because it is more robust than other indices and currently represents the major criterion for funds redistribution, according to 2014-2020 CAP reforms.

[15] With "EU-27 value", here it is meant the support intensity computed over the whole EU-27 (i.e., total EU-27 support divided by total EU-27 UAA). The value differs from the EU-27 average as shown previously (i.e., the average computed over all the observed EU-27 NUTS 3 regions). The reference to this expenditure intensity index is due to the fact that it is more robust than other indices: furthermore, it currently represents the major criterion to funds redistribution, according to 2014-2020 CAP reforms.

Figure 3. Pillar One and Pillar Two support per hectare of UAA: joint analysis



Source: own elaboration

4. ONE POLICY, MANY POLICIES: DISENTANGLING CAP EXPENDITURES

In order to stress the complex nature of CAP, the following CAP expenditures typologies are here identified. Pillar One expenditures are split into Direct Payment (DP) and Market Intervention (MI) measures. Both are directly aimed at supporting agricultural activities throughout Europe. Expenditures from Rural Development Policy (Pillar Two) are split into 2007-2013 axes: Axis 1 (improving the competitiveness of the agricultural and forestry sector), Axis 2 (improving the quality of the environment and the countryside) and Axis 3 (promoting quality of life in rural areas). While Axis 1 still prevalently concerns the farming activity, expenditures from Axis 2 are mostly aimed at protecting and promoting environmental public goods and Axis 3 more generally concerns rural activities and communities. The following sections will focus on the spatial allocation throughout the EU-27 of these disentangled expenditures. For the sake of simplicity, in this analysis the expenditure intensity is expressed per hectare of UAA.[16]

4.1. Direct Payments and Market Interventions

In the following figures, the spatial allocation of expenditure is illustrated by highlighting extreme regional values: within each distribution, regions below the 1st decile and above the 9th decile are mapped[17]. Figure 4 represents DP expenditure intensity per hectare of UAA. Least supported regions mostly fall in Eastern Countries (e.g., Romania, Bulgaria and the Baltic Countries). Nevertheless, some Scottish regions

[16] Results for the other two expenditure intensity indicators (on AWU and agricultural GVA) are available upon request.
[17] Both 1st and 10th ranges of each distribution include 126 observations (i.e., NUTS 3 regions).

and some Alpine NUTS 3 regions are also included in this group. On the opposite side, we find Greek NUTS 3 regions and some regions in Northern Italy, in the Netherlands and in Germany among the most supported ones.

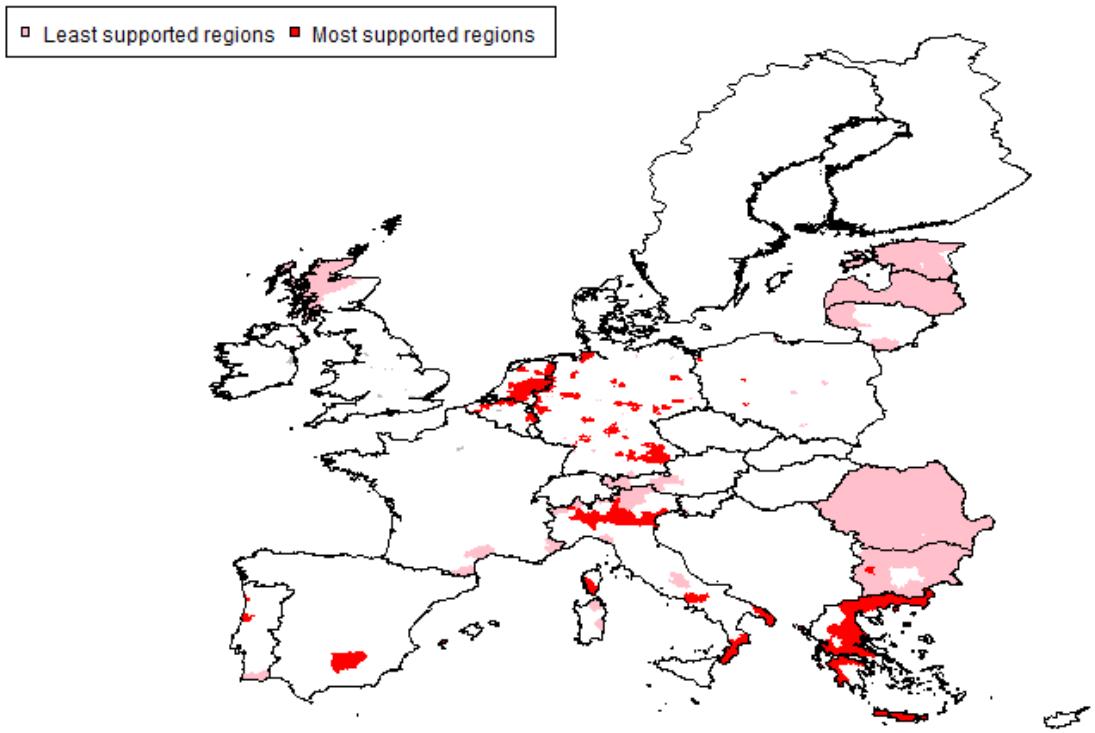
In the case of MI measures, the extreme cases are more geographically scattered (Figure 5). This is due to the specific nature of this typology of agricultural support. In particular, some Finnish and Baltic NUTS 3 regions fall among the least supported ones (below the first decile); the same for some French, British and Irish regions. Conversely, many Mediterranean regions are included in the upper interval of the cumulative distribution (i.e., some Spanish and Italian regions and Cyprus). It can be noticed that some EU Countries present both extreme regions. It is also worth noticing that, at EU level, not only extreme cases of DP expenditure are more spatially concentrated than MI expenditure; regions belonging to the last interval of the DP expenditure intensity are also smaller (just 5% of total UAA) than those in the last interval of MI expenditure intensity (8.4% of total UAA).

Table 5. Pillar One expenditure intensity: share of least supported (<1st decile) and most supported (>9th decile) regions on total UAA

	DP	MI
<1st decile: Least supported regions	14.02	11.10
>9th decile: Most supported regions	4.96	8.41

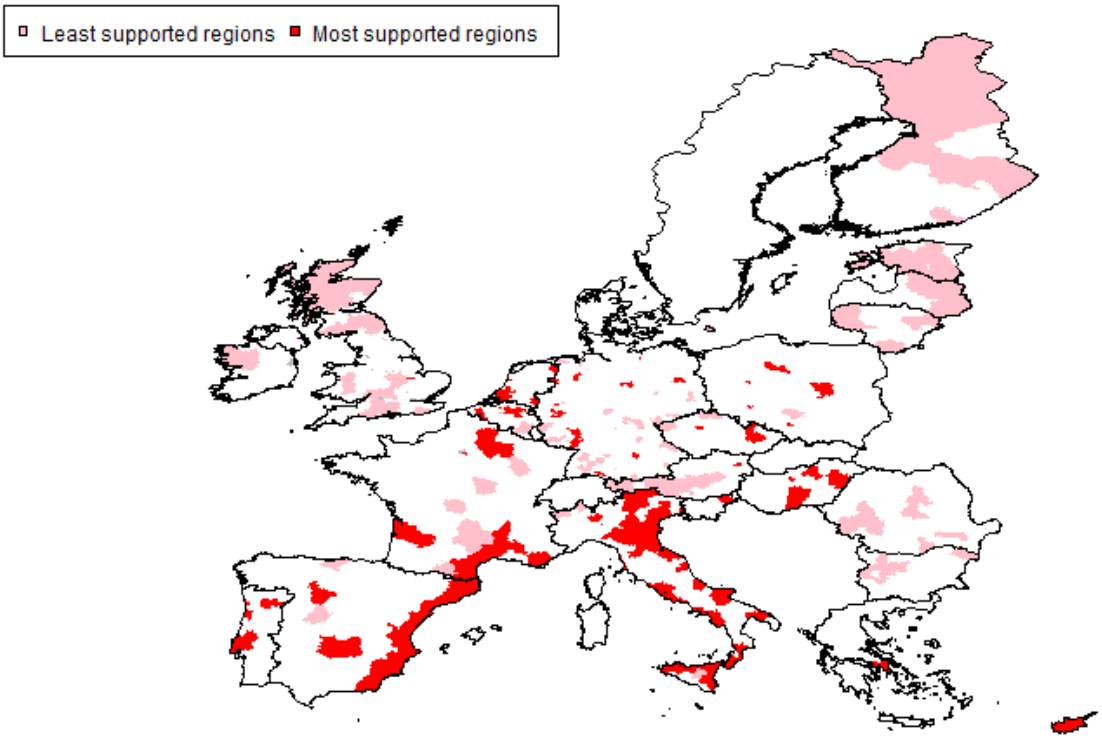
Source: own elaboration

Figure 4. Direct Payment expenditure intensity: least supported (<1st decile) and most supported (>9th decile) regions per hectare of UAA



Source: own elaboration

Figure 5. Market Intervention expenditure intensity: least supported (<1st decile) and most supported (>9th decile) regions per hectare of UAA



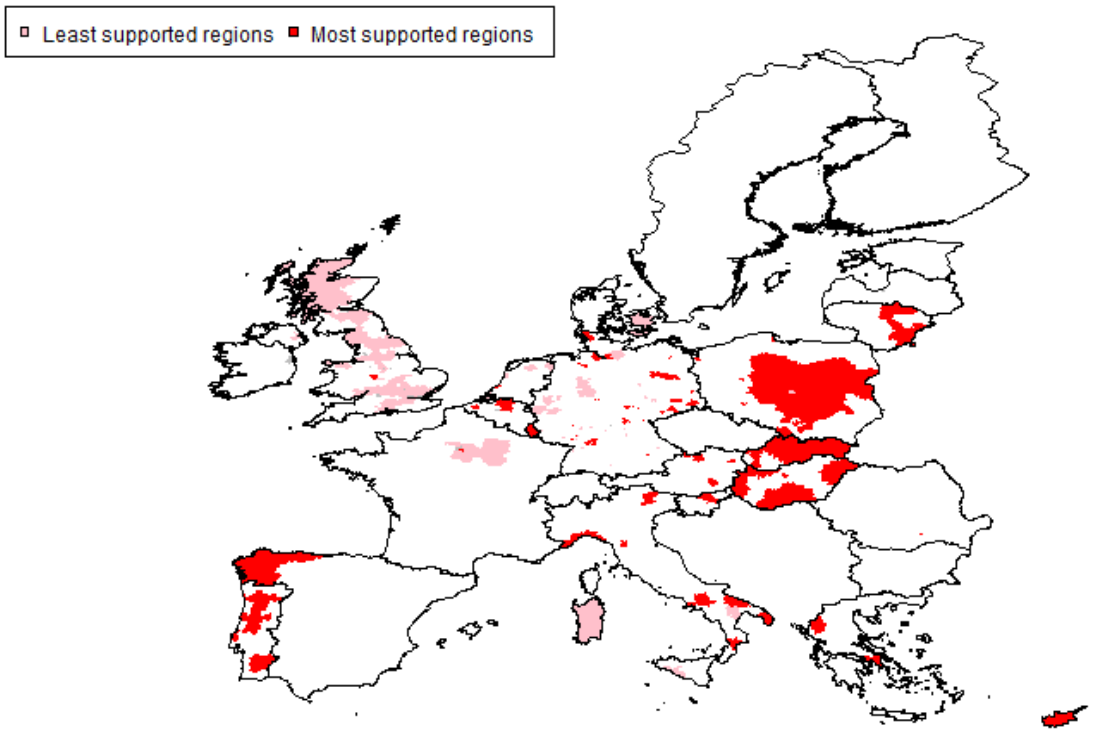
Source: own elaboration

4.2. RDP axes

Pillar Two expenditure results show rather different patterns. In fact, expenditure intensity per single Axis distributes across the EU NUTS 3 regions in differentiated ways. Axis 1 expenditure intensity concentrates (>9th decile) in Eastern Europe NUTS 3 regions (Poland, Slovakia, Hungary and Cyprus). Other regions in the upper interval of the cumulative distribution are from Portugal and North Western Spain. Conversely, most of the UK as well as some urban regions in Germany share lowest expenditure intensity values (<1st decile) (Figure 6).

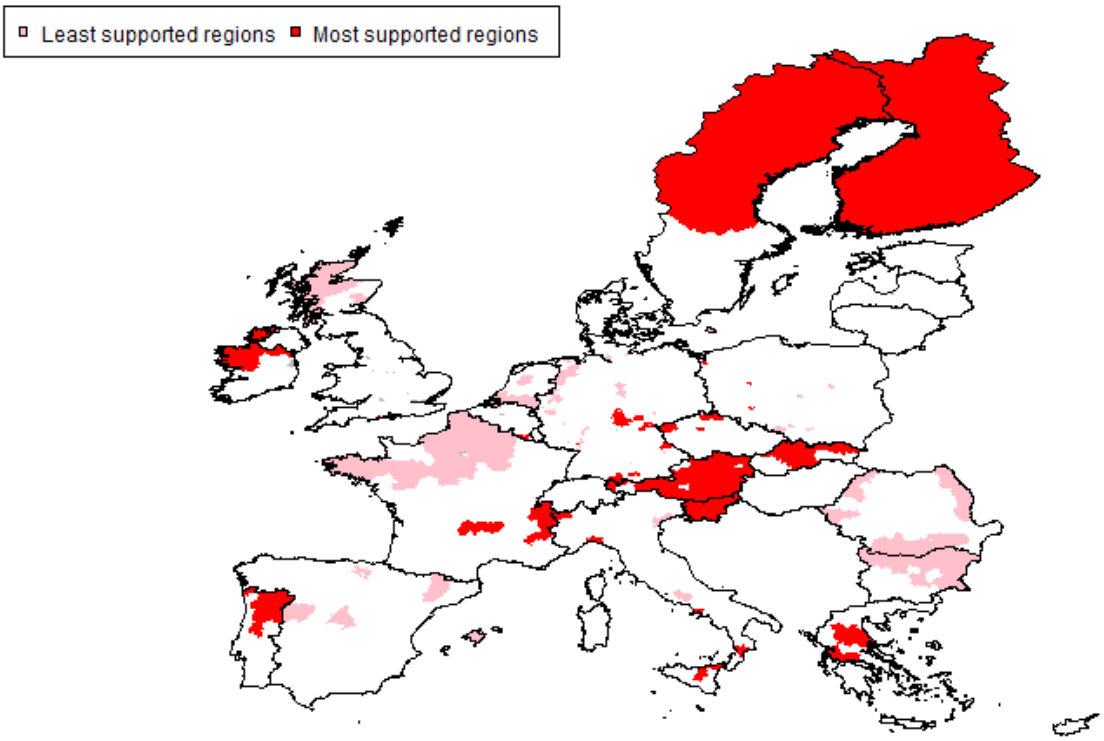
Expenditure intensity from Second Pillar's Axis 2 is coherently targeted to high nature-quality regions as well as less urbanised areas. Actually, many Scandinavian NUTS 3 regions, Irish regions and Alpine regions (e.g. regions from Austria and Slovenia) are above the 9th decile of the cumulative distribution, thus showing the highest support intensity across the EU-27. Conversely, flatlands across Northern France as well as many NUTS 3 regions in Bulgaria, Romania and Scotland fall below the 1st decile of the distribution (Figure 7). Finally, expenditure targeted to the improvement of quality of life in rural areas (Axis 3) shows, once again, a sharp North Eastern – South Western divide. Although geographically scattered, most NUTS 3 regions in the 10th interval of the cumulative distribution belong to Eastern Countries. Some exceptions are represented by Northern Sweden and some regions in Germany and Austria. On the opposite side, Ireland, Portugal and Southern Spain share the lowest values of Axis 3 expenditure intensity per hectare of UAA (Figure 8).

Figure 6. RDP Axis 1 expenditure intensity: least supported (<1st decile) and most supported (>9th decile) regions per hectare of UAA



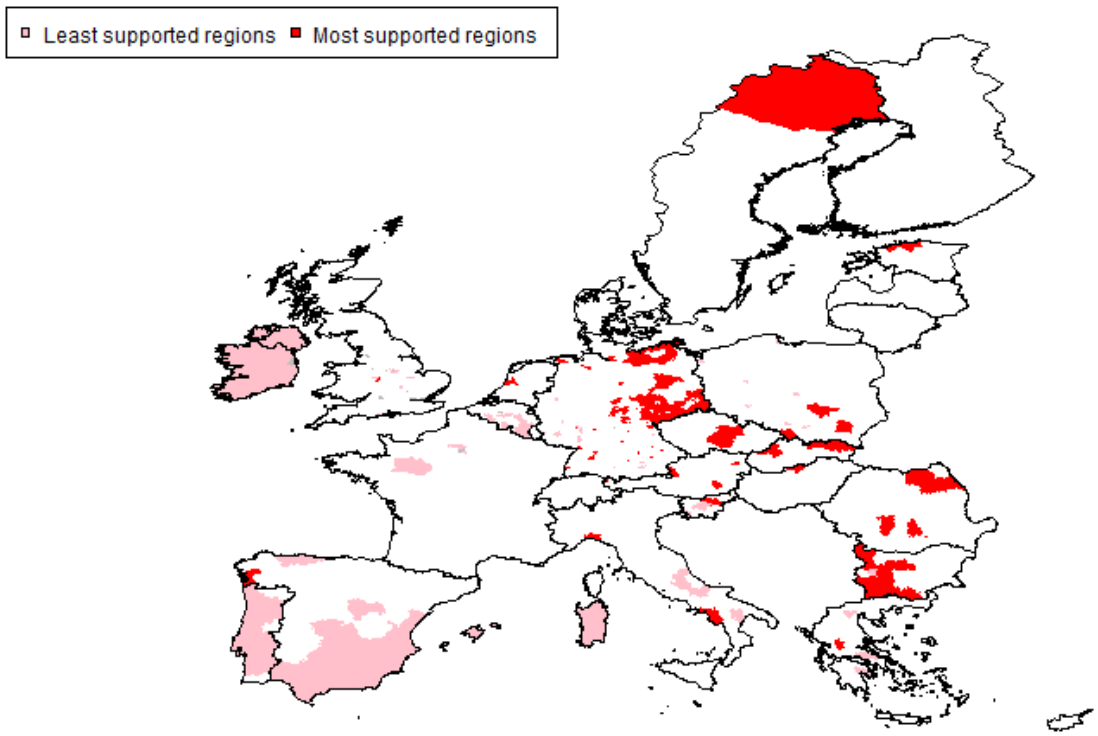
Source: own elaboration

Figure 7. RDP Axis 2 expenditure intensity: least least supported (<1st decile) and most supported (>9th decile) regions per hectare of UAA



Source: own elaboration

Figure 8. RDP Axis 3 expenditure intensity: least supported (<1st decile) and most supported (>9th decile) regions per hectare of UAA



Source: own elaboration

With respect to RDP's axes, Table 6 shows the share of least and most supported regions on total EU-27 UAA. NUTS 3 regions in the highest interval of Axis 3 expenditure intensity distribution represent 4% on total UAA. Conversely, regions in the highest interval of Axis 1 expenditure intensity cumulative distribution represent 9% out of total EU-27 UAA.

Table 6. Pillar Two expenditure intensity: share of least supported (<1st decile) and most supported (>9th decile) regions on total UAA

	Axis 1	Axis 2	Axis 3
<1st decile: Least supported regions	6.31	13.24	12.39
>9th decile: Most supported regions	9.30	7.05	4.13

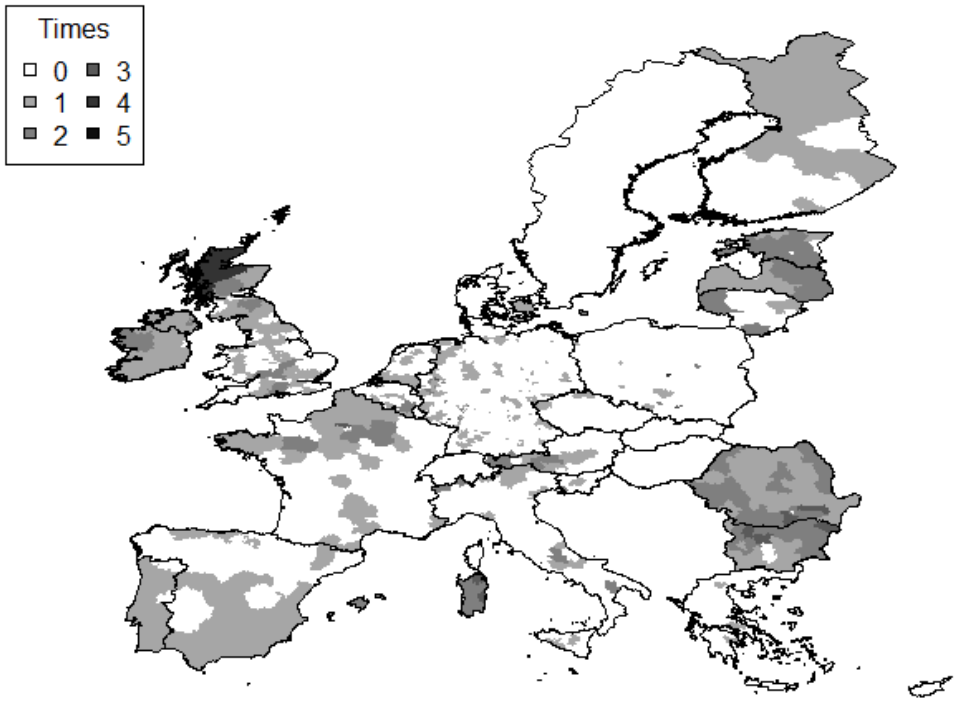
Source: own elaboration

All these results confirm that the uneven distribution of CAP expenditure intensity throughout the EU-27, when considering specific CAP measures, becomes a sort of multiform territorial policy. In order to stress these territorial patterns, for each NUTS 3 regions we can map the number of expenditure typologies ranking in lowest and highest intervals. Figure 9 maps how many times each region falls in the 1st interval (i.e., lowest expenditure intensity) for the five CAP expenditure typologies; Figure 10 does the same for the 10th interval (i.e., highest expenditure intensity).

Several EU peripheral regions fall in the 1st interval for more than one CAP expenditure typology. In particular, Scottish NUTS 3 regions seem particularly under supported. Conversely, when focusing on the 10th interval, a different picture emerges. Again, some peripheral regions are among those falling in more

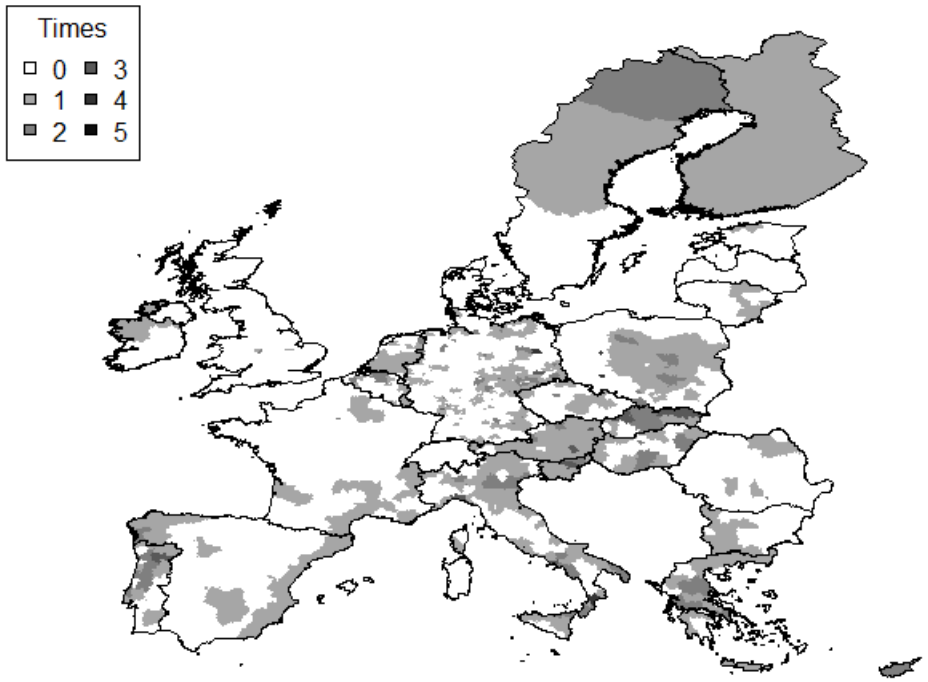
than one 10th interval. This result clearly confirms the existence of a sort of substitutability among CAP different measures. However, only a few regions in Eastern countries rank in the highest interval of the distribution for more than one CAP expenditure typology (Figure 10).

Figure 9. Number of times regions fall in the 1st interval for the five expenditure typologies



Source: own elaboration

Figure 10. Number of times regions fall in the 10th interval for the five expenditure typologies



Source: own elaboration

5. CONCLUSIONS

The analysis of the spatial allocation of CAP expenditure provides some insightful findings and raises important policy implications with reference to the current debate about the redistributive effects of latest CAP reform (2014-2020). The intensity of CAP support (in particular, per unit of agricultural land) shows major territorial imbalances across the EU-27 space. These imbalances mainly refer to both urban-rural dichotomy and long-term cross-country differences. Indeed, support intensity received by urban and central regions tends to be higher than that received by more rural and peripheral ones. Moreover, CAP expenditures show large concentrations across flatlands in North-Western EU. Though support intensity is lower than the average in most regions of Eastern Europe, here a greater amount of Pillar Two expenditure (compared to Western Countries regions) is generally observed. These findings have been stylized by identifying NUTS 3 regions whose both CAP First and Second Pillar support per hectare of UAA is above or below the EU-27 values. Under supported regions actually represent about 30% of total UAA while top beneficiaries cover just 13% of total UAA. In fact, more than a half of NUTS 3 regions actually shows a sort of substitutability between Pillars' expenditures. In general, Western EU regions show Pillar One's support above and Pillar Two's support below the EU-27 average. The opposite occurs in NUTS 3 regions across Eastern Member States as well as across Scandinavia.

Whenever more disentangled CAP expenditures (i.e., DP, MI measures, RDP Axis 1, Axis 2 and Axis 3) are taken into account, a puzzling picture emerges, by focusing on the least and the most supported regions for each expenditure typology. Due to different policy objectives, each CAP expenditure typology shows rather different territorial patterns. For instance, when considering DP support (EAGF), regions from Bulgaria and Romania as well as Baltic Countries are found among the lowest supported areas. Conversely, when focusing on environmental measures (i.e., expenditures from RDP Axis 2), Scandinavian and Alpine regions show the highest support intensity throughout the EU-27.

In general terms, when mapping these results at the EU scale, the impression is that the large territorial imbalances of one major EU policy, the CAP, is actually the consequence of the combination of a set of alternative policies and measures often behaving, in their territorial allocation, as substitutes.

ACKNOWLEDGMENTS

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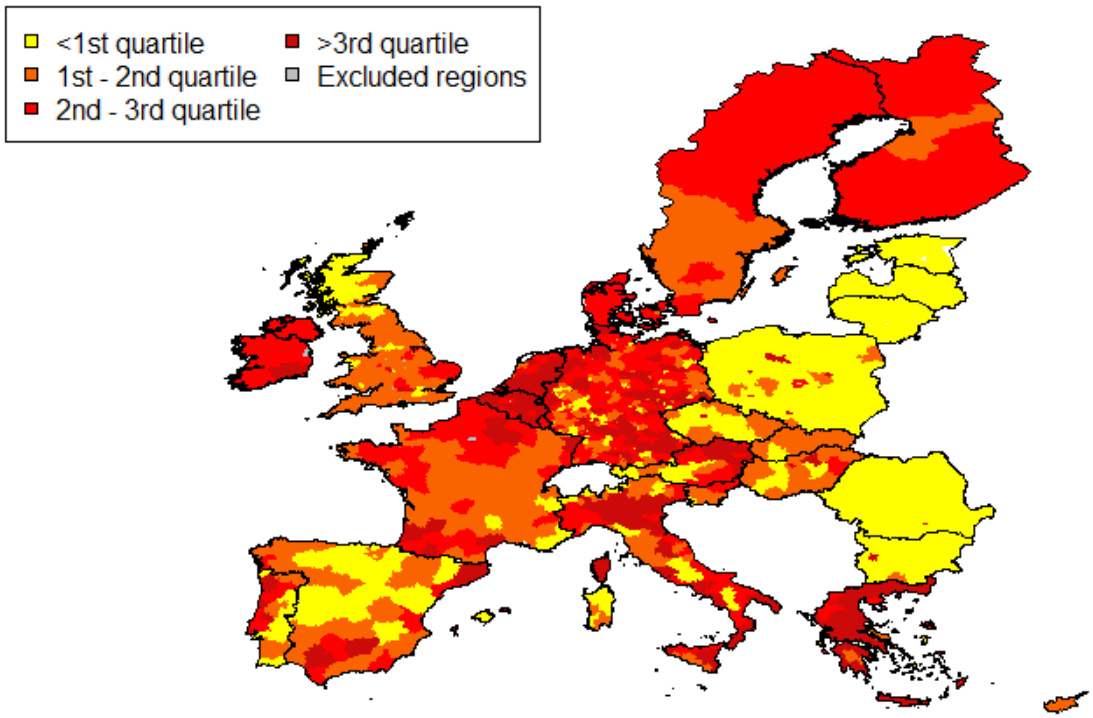
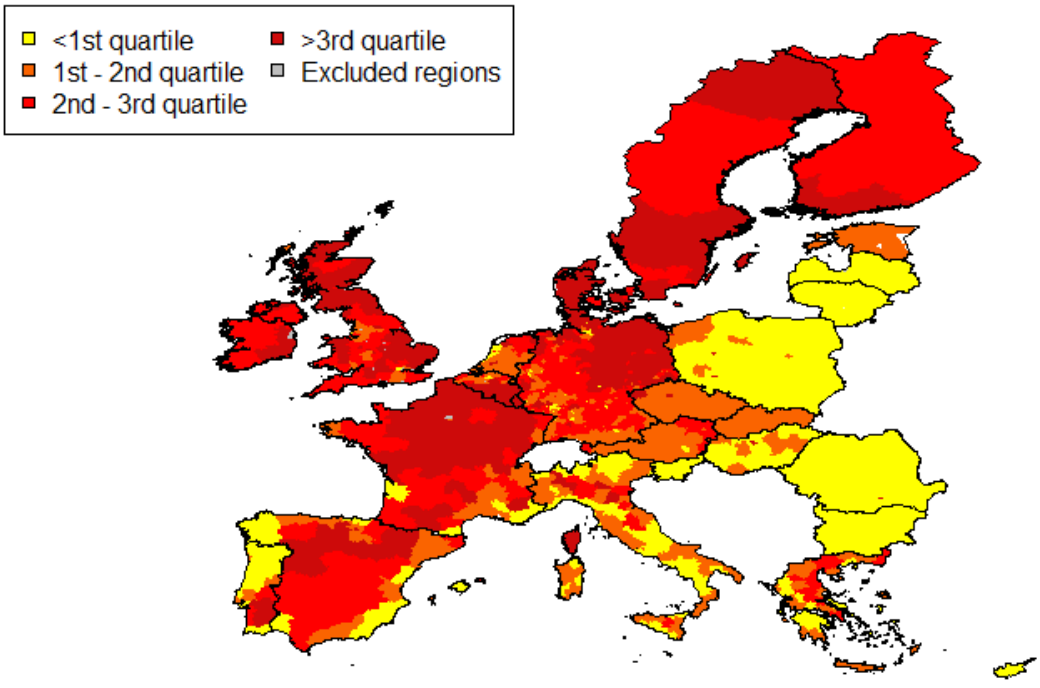
ANNEX

Figure A1. Spatial quartile distribution for CAP expenditure intensity per hectare of UAA (€/UAA) at NUTS 3 level (2007-2011 values)



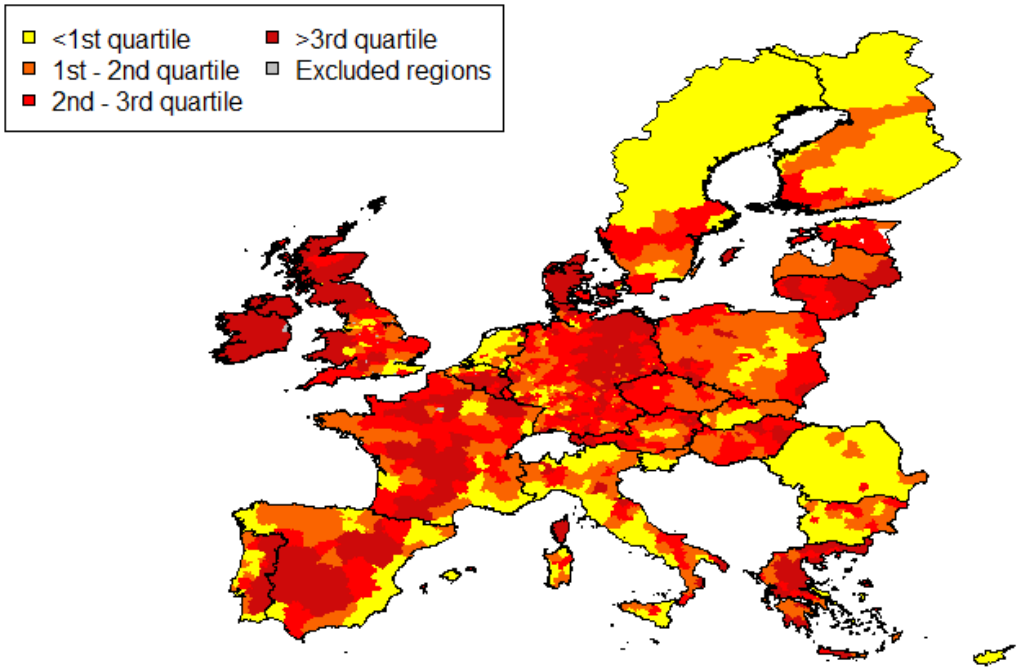
Source: own elaboration

Figure A2. Spatial quartile distribution for CAP expenditure intensity per agricultural AWU (€/AWU) at NUTS 3 level (2007-2011 values)



Source: own elaboration

Figure A3. Spatial quartile distribution for CAP expenditure intensity per thousand Euros of agricultural GVA(€ /.000 €)



Source: own elaboration