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UNDERSTANDING THE CAP PILLAR II COMPONENT "LEADER": A COUNTERFACTUAL IMPACT ANALYSIS OF THE RURAL DEVELOPMENT MEASURE BETWEEN 2011-2015 – MEASURING IMPACT ON TOURISM

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Abstract

The Common Agricultural Policy is one of the EU's largest and most important policies. LEADER, a part of the CAP located in Pillar II, is a bottom-up rural development program based on local stakeholder engagement. The effects of LEADER have been analyzed using a counterfactual impact evaluation employing the CBPS method and propensity score matching. Results are diverse, but in many cases, a significant impact of LEADER can be found. The outcome variables studied range from economic in nature to agritourism, voting behavior and demographics. Their relevance, especially in rural areas, is ever increasing and relevant for the EU's future.

Keywords: Public Policy, CAP, Territorial Development, Rural Development, Pillar 2, LEADER, Covariate Balanced Propensity Score

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List of abbreviations

ARDECO	Annual Regional Database of the European Commission
ATE	Average Treatment Effect
CAP	Common Agricultural Policy
CATS	Clearance Audit Trials System
CBPS	Covariate Balanced Propensity Score
CCR	Close-to-City Remoteness
CF	Cohesion Fund
CLLD	Community-Led Local Development
CMEF	Common Monitoring and Evaluation Framework
EAFRD	European Agricultural Fund for Rural Development
EAGF	European Agriculture Guarantee Fund
EEC	European Economic Community
EMFF	European Maritime and Fisheries Fund
ERDF	European Regional Development Fund
ESF	European Social Fund
ESIF	European Structural and Investment Funds
EU	European Union
EP	European Parliament
GDP	Gross Domestic Product
IQR	Interquartile Range
JRC	Joint Research Centre
FLAG	Fisheries Local Action Groups
GPS	Generalized Propensity Score
GVA	Gross Value Added
LAG	Local Action Group
LDS	Local Development Strategy
LEADER	Liaison Entre Actions de Développement de l'Économie Rurale
MAUP	Modifiable Areal Unit Problem
MA	Managing Authorities
MS	Member State
NACE	Nomenclature of Economic Activities
NMS	New Member State
NUTS	Nomenclature of Territorial Units for Statistics
PA	Payment Agencies
PDR	Programa de Desenvolvimento Rural 2014-2020
PPS	Purchasing Power Standard
PSM	Propensity Score Matching
Q1	First Quartile
RCT	Randomized Controlled Trial
RDP	Rural Development Program
SPS	Single Payment Scheme

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Group Part

1. Introduction

The Common Agriculture Policy (CAP) is a core focus of the workings of the European Union (EU). More than a third of the total Union's budget is allocated to the CAP, highlighting its pan-European importance. The CAP is made up of multiple policies and its focus has drastically shifted from a narrow farming and agriculture scope to a far broader array of areas, including rural development, food security, and climate change among many others. This diverse scope results in an increasingly complex policy that has become difficult to evaluate. Due to its extensive scope, however, the policy is expected to have a substantial impact on the economic, environmental as well as social aspects of farming, but also on rural development and the economic convergence of rural and urban regions.

This thesis aims to perform a counterfactual impact evaluation of the LEADER policy - a local bottom-up development process aimed at promoting interaction between several stakeholders - on economic outcomes, such as employment and GVA (gross value added). In addition to this jointly explored project scope, this research evaluates the impact of LEADER on demographics (young- and old-dependency-ratio & net migration), political indicators (EP elections' participation rates and pro/anti EU votes for the EP) and performance of agritourism companies. The necessity to focus on LEADER as a highly specific measure in Pillar II arises because of the aforementioned complexity of the CAP. There is no singular policy that the CAP refers to, it is made up of many policies that drastically differ in scope and focus. Hence, it is difficult to analyze the impact of the whole CAP, as it is a summation of many small impacts. To further improve this policy, draw conclusions and learn lessons, the components need to be understood independently. Furthermore, the literature on LEADER and its impact within the CAP is scarce.

The method employed for this thesis is Propensity Score Matching (Imbens 2000), amid the absence of an RCT with a proper control group. This method mimics a control group based on the assumption that the differences between the control and treatment groups are solely based on observable characteristics before the treatment. As an extension, we employ the Covariate Balancing Propensity Score Method (CBPS) (Imai and Ratkovic 2014) to ensure proper balancing.

As previously explained, the main goal of this thesis is to understand the impact of LEADER as a singled-out part of Pillar II. Hence, we look at different outcome variables to properly understand and evaluate the importance of this feature within the CAP. The first research question that is analyzed jointly is:

Question 1: *Does LEADER have significant effects on economic outcomes such as GVA and employment?*

The economic outcomes are not by chance the most studied ones, they are potentially the most important to understand from both the perspectives of member states and the EU. Hence, this joint part receives the largest part of our attention in this thesis. Following this, we will look at other outcomes that, in our humble opinion, are also of high importance for society and the EU.

Firstly, tourism will be analyzed. The question of interest is:

Question 2: *Does LEADER have significant effects on agritourism?*

Consecutively, the analysis will focus on political data. For this, the question of interest is:

Question 3: *Does LEADER have significant effects on EU Parliament elections voter turnout or on the voting shares in pro/anti EU parties?*

For the last individual part, the effect of LEADER on demographics will be investigated. The question to be evaluated is:

Question 4: *Does LEADER have significant effects on demographic outcome variables such as young and old dependency ratio or net migration rate?*

The findings of this collective research will be beneficial to further understanding the CAP and especially the importance that LEADER measures have for countries and NUTS3 regions. It will add to the existing base of research and enhance knowledge on this complex matter.

The thesis for this policy analysis project is jointly conducted by three students and thus made up of three individual parts with different foci, preceded by a joint analysis. The joint analysis builds on previous work conducted by the JRC on the effectiveness of the CAP on employment and Gross Value Added (GVA) with a specific focus on the Pillar II component LEADER. This joint part first addresses the CAP and explains LEADER as well as its fund distribution, followed by an analysis of the historical context. Furthermore, previous literature and its main findings are analyzed, focusing on the CAP's and LEADER's impact. This theoretical background is then followed by a description of the used methodology and the empirical analysis. Lastly, the results are discussed, which enables the discussion of the assumptions, potential implications, and future research. The individual analyses that follow will be equally focused on LEADER, however considering other outcome variables. We will look at voter turnout, agritourism, and demographic outcomes, respectively. All these outcomes can be related to the CAP objective of Balanced Territorial Development (Objective 3). The promotion of social inclusion and economic development, as well as local development in rural areas, are specifically mentioned as goals of Pillar II measures, which is why these outcome variables were chosen for the sake of this thesis.

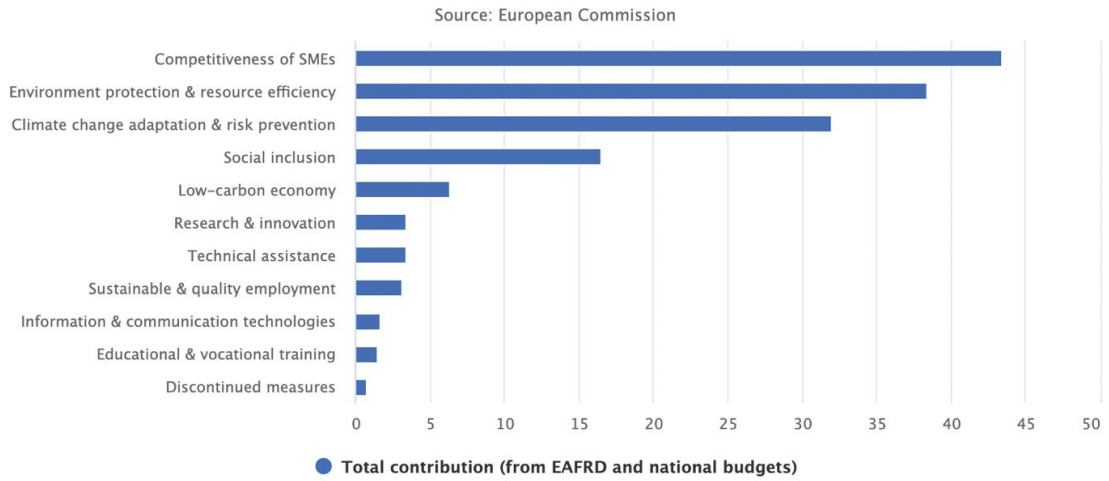
2. CAP and LEADER – Overview and History

2022 marks the 60-year anniversary of the Common Agricultural Policy, which continues to be one of the EU's key policies as indicated by its vast fund allocation – amounting to more than a third of the total Union budget (European Commission 2022b). Over the years, the CAP has evolved from merely being a support of farmers to a full-on cohesion policy with a growingly dominant focus on tackling climate change and ensuring food security. As such, it has undergone many reforms and changes, with many yet to come, especially to ensure alignment with the international climate goals set in the Paris Agreement (Heyl et al. 2021). For this goal, 40% of the CAP funds will be specifically targeting climate goals. This is a higher share than for other EU expenditures, which normally amounts to 30% (Farm Europe 2020).

The CAP is divided into two pillars. Pillar I is funded by EAGF (European Agriculture Guarantee Fund) and receives roughly 75% of the overall CAP budget. This pillar is made up of income support in the form of direct payments, which aim at minimizing overproduction by being based on the amount of land a farmer owns as opposed to production quantities. These payments can be coupled with certain types of production (e.g., sugar or cotton) and they are linked to green regulations, to have farmers comply with environmental requirements (Pe'er et al. 2020). Previous analyses of direct payments have often found them to be inefficient. Direct payments have, for example, been found to have limited power to help stabilize farmers' income (Severini, Tantari, and di Tommaso (2016) and Bojnec and Fertő (2019), and fail to act as a redistributing instrument between farmers (Allanson 2006 and Trnková and Malá 2012). In some cases, direct payments were also associated with negative effects such as high land prices, decreasing diversification of cultivated crops, land degradation or financial indebtedness of farmers (Morkunas and Labukas 2020). Further included in Pillar I is the common organization of markets. Market measures provide a framework for market support schemes aimed at stabilizing the market through disturbances, to ensure European Food Security.

Pillar II, on the other hand, is funded by the EAFRD (European Agriculture Fund for Rural Development) within the ESIF (European Structural and Investment Fund). This Pillar is co-financed by EU funds and regional or national funds. As a region-specific program, it mainly aims at the sustainable development of rural areas and is implemented through programs designed by the member states to ensure personalization and local knowledge, so-called regional development programs (RDPs). LEADER is one of these, it is a bottom-up local development approach promoting interaction between several stakeholders to design and implement tailor-made rural development plans. Its primary goal is to engage local people and organizations as actors of development, not as mere beneficiaries. The main method of achieving this is through Local Action Groups (LAGs) comprising the public, private, and civil sectors as will be further elaborated in subsequent chapters. To better understand the actions that Pillar II includes, Figure 1 represents in which the EAFRD and national budgets for rural development are depicted.

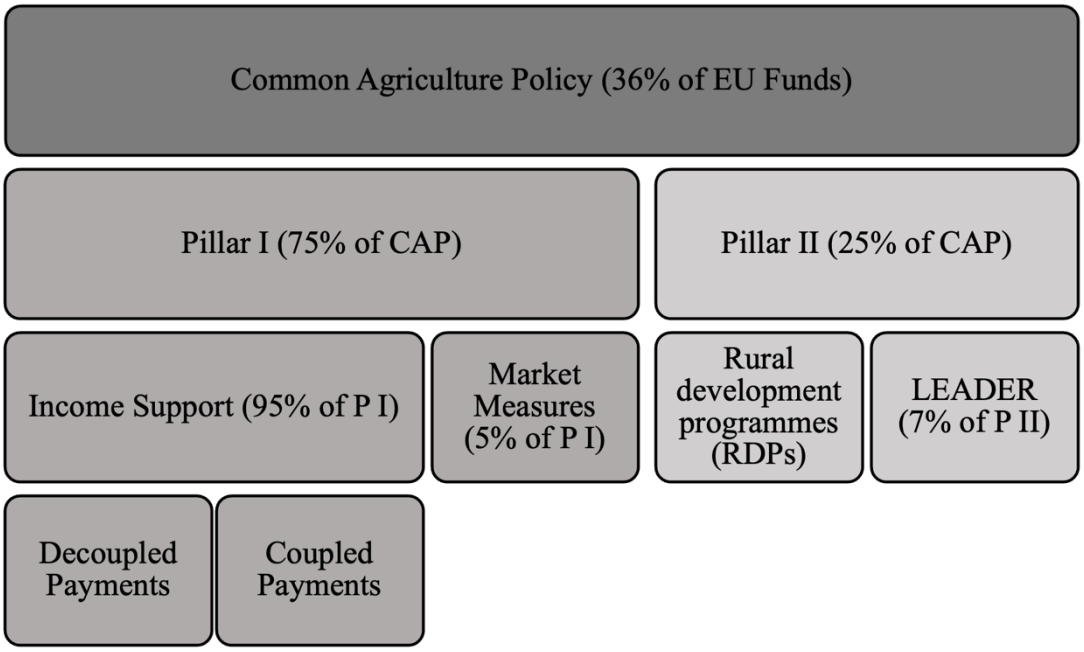
Figure 1 - Rural Development Spending 2014-2020



The management of the CAP and its funds is diverse. While 99.1% of the CAP budget are jointly managed between the Commission and the member states, only 0.9% are directly managed by the Commission, mostly related to administrative and technical support as well as promotional activities. Under the shared management, the role of countries is to set up compliant

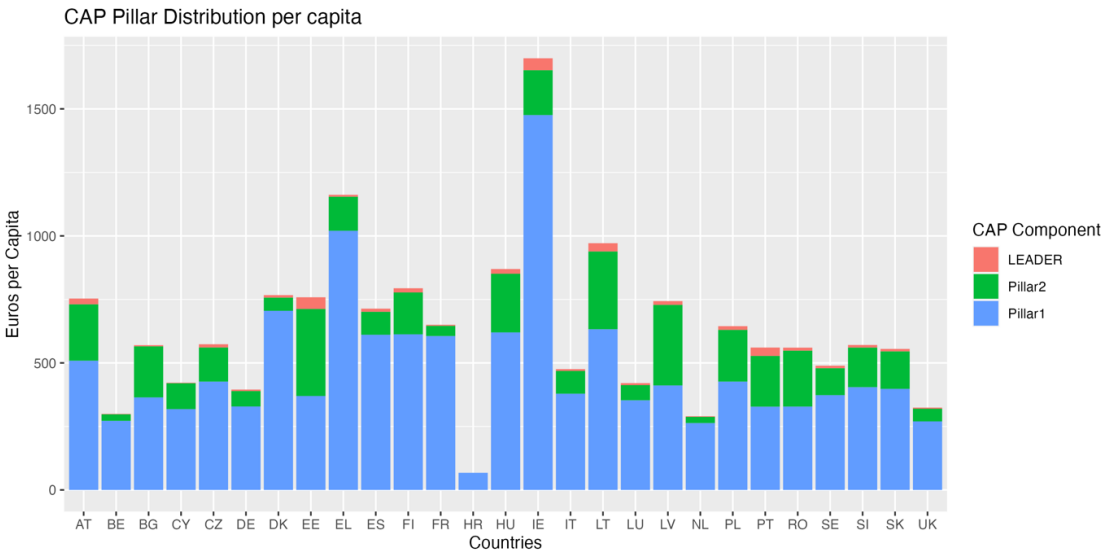
management and control systems, while the Commission holds a supervisory role. An overview of the two pillars and their structure is depicted in Figure 2.

Figure 2 - CAP Structure



To better understand the concrete magnitude of these Pillars, Figure 3 shows the two Pillars in euro per capita. LEADER, the component of interest for of this thesis, is shown separately to Pillar II in red. The data used refers to aggregated data from 2011 to 2015.

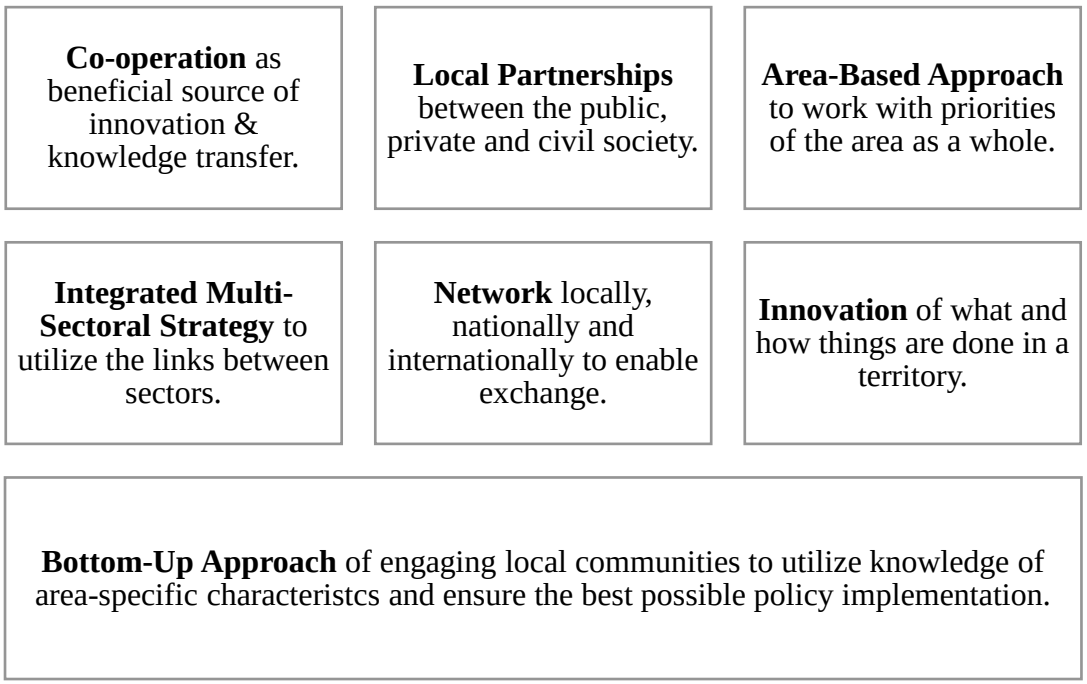
Figure 3 - CAP Pillar distribution per capita



2.1. LEADER

LEADER stands for the French acronym of *Liasison Entre Action de Développement de l'Économie Rurale* which can be translated as "links between activities for the development of the rural economy". The main aim of LEADER is to support the inclusiveness and development of EU regions (initially merely rural ones, but the scope has been enlarged to include all types) through the knowledgeable action of each region's main actors, whether they be public entities, private enterprises, or civic actors. When comparing LEADER to other kinds of EU support mechanisms, both regional and national, the approach in question has quite distinct characteristics and features: LEADER is a bottom-up and an area-based approach simultaneously. Furthermore, it is rooted in local partnerships, developed by integrated and multi-sectoral strategies and it involves a great deal of networking, innovation, and cooperation. Figure 4 gives an overview of the seven features of LEADER.

Figure 4 - LEADER features



Contrary to the classical funding selection approach, the LEADER methodology assumes that the best evaluators to assess each regions' necessities, capabilities and expectations

are their local actors. What is also different from previous funding procedures is that the concrete idea for a region's development and the project selection criteria are proposed by the beneficiaries themselves. These must be compliant with key commitments, such as innovation or green energy, for example. The communities' strategies are envisioned for and by themselves through active dialogue between its public, private, and civic entities collaboration. Social capital, fairness, democracy, transparency, and community trust are thus key ideas for LEADER's bottom-up approach.

The LEADER feature revolving around being an "area-based approach" is crucial for the community's engagement. The projects funded by LEADER are not only developed and proposed by a multi-agent consensus in each area, as the projects are targeting the development of those same areas as a whole. Unlike other types of measures, such as Pillar I initiatives, LEADER also supports each area's priorities, instead of specific actors or objectives. Each area may be subject to some Member State's specific criteria, but overall, their population must be between 10,000 and 150,000 people and their geography does not need to coincide with administrative borders. The LEADER approach, hence, is not limited by predefined boundaries, only by its own local identity, physical resources, know-how and specific set of skills, its human resources, and its internal and external relations. The required unity makes these areas consist of small, homogenous, socially, and functionally cohesive territories. Because they are focused on each area's shared vision of its own future, the strategies developed often include many synergies and "win-win" situations for their actors.

The areas' participating actors are represented through so-called LAGs (Local Action Groups). Each LAG is composed of public, private and civic actors, such as municipalities, voluntary platforms, private enterprises, agricultural cooperatives, civic associations, and groups of driven individuals, among potentially many others. The LAGs all have a legal basis that differs between countries but tendentially assume the form of a non-profit registered

organization. In order to guarantee the LAG's area-priority focus, each of the LAG's constituents must not inhibit more than 49% of the voting. This condition not only fosters dialogue, consensus, and the legitimacy of the partnership, but also furthers the construction of a local network of relations as well as a broader and jointly constructed view of the area's future.

Each LAG is responsible to design a Local Development Strategy (LDS) in a process that must involve representatives across the community as actively as possible. Public participation, hence, must be encouraged by the LAG. An LDS consists of a "coherent set of operations (…) to meet local objectives and needs, and which contributes to meeting the Union strategy for smart, sustainable and inclusive growth" (in European Network for Rural Development 2016). Each LDS must include the LAG's business plan, setting out the mechanisms and procedures through which it will operate, as well as a SWOT analysis of the development needs. This plan must also include responsibility delegation, management, and monitoring arrangements, as well as set out the application process and the project/operation selection criteria upfront. Member States shall also define criteria for the selection of community-led local development strategies (European Parliament 2013b).

The LEADER approach also seeks for LAGs to innovate in their LDSs. It seeks out pilot-nature strategies, looking to create new services and products, combine resources, create synergies and links between sectors, and involve or organize communities. Networking is also a key feature in every LEADER cycle, supported mainly by the European Network for Rural Development (ENRD) and the European LEADER Association for Rural Development (ELARD). These networks also seek to promote inter-territorial and international cooperation.

2.2. Historical context of the Common Agricultural Policy

LEADER is an EU program developed within the framework of the CAP. Although LEADER's first edition started only in 1991 (which will be further analyzed below), the CAP was already pioneered in 1962 after the signing of the Treaties of Paris (1951) and Rome (1957) in a time of

consolidation for the European Economic Community (EEC). It soon became evident that agriculture was a fundamental aspect of the European recovery after the Second World War. Agriculture became a source of political disentanglements (Milward 2000) between many EEC member states based on several failed attempts at large trade arrangements and integration of agricultural commodities. The first European Law mentioning CAP was officially declared in the Treaty of Rome (1957). Thus, although in a vague and highly underdeveloped way, a general "blueprint" (objectives and measures that might be used) of what the European Common Agricultural Policy would look like was created (Ludlow 2005). The EEC faced different challenges: low food production, low income for farmers compared to other sectors, non-harmonized farming policies among member states and lack of easy access to food, among others (European Council 2022). Therefore, the initial primary CAP objectives were to raise agricultural productivity, ensure a fairer life standard for farmers, guarantee the availability of supplies at a fair price and stabilize the agricultural markets across the EEC. From its beginning until 1992 (the time of the MacSharry reforms that will be explained in depth below), these CAP objectives were pursued by maintaining high prices for agricultural goods, namely, through the application of a protective system of guaranteed prices for the farmers' products, the application of tariffs on external products, exporting subsidies, target prices and market interventions (Lillemets, Fertő, and Viira 2022). With the onset of the CAP, food productivity and availability increased, but the EEC's farmers' income became stagnant, leading to the necessity for the first CAP reform: the Mansholt Plan of 1971. Sicco Mansholt, the European Commissioner for Agriculture between 1958 and 1972, proposed a wide-scale modernization of the agricultural sector, targeting two policies: firstly, the area of land under cultivation should be optimized; secondly, merging farms was a key objective. The Mansholt Plan was insufficient in preventing overproduction throughout the 1970s and 80s, which led to the introduction of production quotas for some agricultural commodities in 1984. Right from its beginning, the CAP represented the

largest part of the EU's total policy budget for decades, amounting to more than 50% of the EU's annual budget until 1994.

It was only in the early 90s that the EU started looking at alternative measures to the traditional top-down approach in CAP policies and instruments while reducing the overall budget and moving away from unlimited guaranteed prices. During the MacSharry reforms, in 1992, the EU CAP support moved away from the markets to the farmers, introducing the direct payments that can be found in Pillar I until today. These payments are based on the area of land farmed rather than on products or quantities produced. The reforms further included obligations to protect the environment and improve food quality in order to receive support. The CAP's structure at the beginning of the twentieth century was marked by the "Agenda 2000" package of reforms, adopted by the 15 member states at the time during the 1999 Berlin Summit (European Parliament 2022). In this EU strategic document, relating to the 2004 enlargement yet to come and the growing importance of rural areas for the European project cohesion, the EEC proposed the creation of a second CAP Pillar dedicated specifically to rural development, where LEADER-type initiatives as we still find them today were included. The Agenda 2000 gradually introduced lower guaranteed prices for farmers, but also strictly defined food safety and quality, as well as included animal welfare as an important policy objective for the future of the CAP (European Commission 1999a). Finally, and especially important when having this thesis' focus on LEADER in mind, the Agenda 2000 introduced a "horizontal regulation", a modulation of direct aid. This policy mechanism allowed a member state's funding to be partially transferred from Pillar I to Pillar II to further support rural development.

Started by the process of the Agenda 2000 mid-term review, the 2003 CAP reform introduced significant changes. First, it decoupled aid from volumes produced and introduced the single payment scheme (SPS). This SPS substituted all previous CAP price supports. The SPS's logic was to allow farmers more freedom to produce what the market demands (both

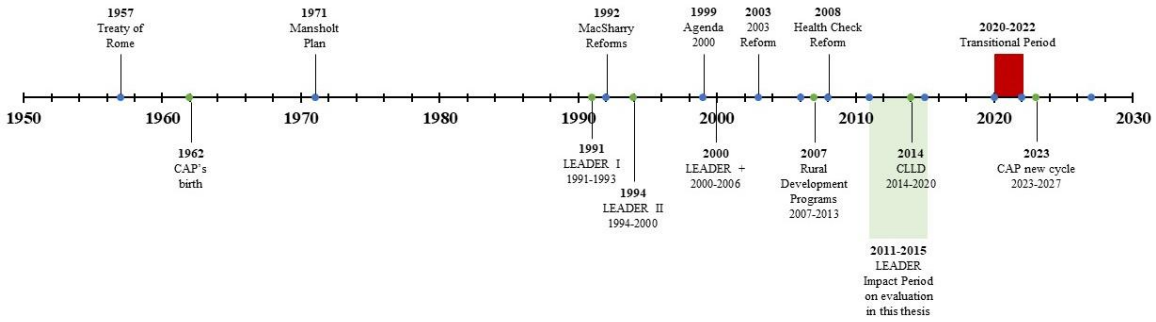
regarding EU and global markets), to guarantee farmers' income stability and simultaneously promote environmental, healthy, and economically sustainable farming. Second, cross-compliance criteria for aid attribution now included environmental and public health clauses. Third, modulation became a compulsory policy mechanism for all EU15 member states to implement (Nowicki, Hart, and van Meijl 2011) which forced member states (MS) to transfer a limited share of funding from direct payments to Pillar II to reinforce rural development with specific measures (the share would be increasing from 3% in 2005 to 5% in 2012). This reform was also motivated by wanting to respond to the criticism of "ultra-protectionism" in the EU's agricultural sector in comparison to the rest of the world, as well as to respond to the growing demand for agricultural commodities and export opportunities in the global markets. This adoption of the SPS would strengthen, for example, the EU's position in WTO agricultural trade negotiations (DG for Agriculture and Rural Development 2005). Because of the 2004 EU enlargement, the shift towards full SPS was further delayed to late 2008 / early 2009, where the CAP was re-evaluated through the big so-called *Health Check* reform.

The Health Check was launched by the Council on November 20th, 2008 and revised a long list of measures implemented through the CAP reform of 2003. It was designed to consolidate the 2003 reform goals: generalize the decoupling of direct payments, while performing a case-by-case analysis of the remaining partial coupling arrangements in place in each MS; eliminate most of the remaining production limitations and abolishment of volume control instruments; adjust the farmers' payments away from the historic base of the reference years and towards a flat payment on every hectare in the country; degressive ceilings of payments to very large farms; and progressive rates (from year to year) for modulation of direct aid. The Health Check reform defined the regulatory framework for EU agricultural policies up to 2013. Because of its importance, the focus of this thesis will lie on the post-Health Check period to fully evaluate the changes brought upon by this crucial adaptation of the CAP.

The 2013 reform defined the general blueprints for the 2014-2020 CAP period. For this period, the three objectives of the CAP regarding rural development maintained its focus on "fostering the competitiveness of agriculture" but set as clear objectives to ensure the "sustainable management of natural resources and climate action" and also to achieve "a balanced territorial development of rural economies and communities including the creation and maintenance of employment" (European Parliament 2013a).

2.3. Birth and origins of LEADER

Figure 5 - Timeline CAP and LEADER



The timeline of both the history of the CAP and the birth of LEADER is represented in Figure 5. Launched on March 15th, 1991 by the European Commission, LEADER's originating purpose was to serve as a model for rural development. The Commission wanted to implement an alternative method to its top-down approach regarding rural development and structural support that could bring rural areas closer to the goals of the European integration process. Anticipating the 1992 MacSharry Reforms (European Council 2022) that moved the CAP policies strongly from market support and unlimited guaranteed prices to a more limited-budget policy based on direct income supports, the Commission allocated a budget of 400 million euro to fund this new initiative (European Commission 1991) for the period between 1991 and 1993.

LEADER was built to establish a network of local rural development action groups enjoying a substantial degree of flexibility in the definition and implementation of each local

rural region's ideas for development. Three types of measures were defined in 1991: (i.) measures for agricultural and rural development, (ii.) measures concerning local development groups, and, finally, (iii.) measures concerning a transnational network for groups. In other words, with the LEADER initiative, the Commission wanted to test a bottom-up, multi-sectoral and highly participatory approach within the existing framework of its CAP policies, based strongly on local public-private decision-making partnerships.

The second generation of LEADER was called the *LEADER II initiative* (1994-1999). It was established to supplement and reinforce the measures started during the first phase of the program. This second stage led to a further territorial expansion of the program (from 217 to 906 LAGs (European Network for Rural Development 2019)) as well as to a significant increase of the initiative's budget: from 400 million to 1,400 million euros (European Commission 1994). The LEADER II period mainly focused on problems affecting rural areas characterized by weak economies (often those which suffered the most in the aftermath of the 1992 CAP reforms[1]) and assumed as its priorities the acquisition of the necessary skills to initiate an integrated development process (Commission of the European Communities 1994). This second period also incorporated the Commission's reactions to LEADER's first edition, making the LEADER initiative "one of the more locally appreciated elements of the Community's structural interventions" among a few others (European Commission 1993). In contrast to its predecessor, the second LEADER phase was highly decentralized, with the Commission no longer intervening directly in the selection of projects and beneficiaries. This task was delegated to the planning and decision-making partnerships, formed by regional or national entities which provided part of the financing for the totality of each member state's program.

[1] Weaker agricultural economies suffered the most in the 1992 reforms because of the end of guaranteed prices for producers (which had made overproduction a reasonable way to generate more profits). From 1992 onwards, since the EU was not paying for the overproduction, the least developed agricultural regions suffered the most.

Following LEADER II, the Commission of the European Communities launched LEADER+ for the period between 2000 and 2006. While maintaining the main structure of the previous stages, the LEADER+ initiative expanded its geographical range (from 1,375,144 km^2 to 1,577,386 km^2), including now all types of rural areas (to be limited only by the will of the MS themselves) in the initiative's reach. Whereas the previous second generation of the initiative *favored* programs focused on innovation, LEADER+ declared innovation as a *requirement*. The Commission also pointed out in its communication to the Member States on April 14th, 2000 that the renewed LEADER+ program would require adjustments to socioeconomic structures, considering challenges from the then brand-new awareness of environmental concerns, closer integration of the world economy and the rapid spread and use of new technologies (Commission of the European Communities 2000). Differently from the "skills" priority in LEADER II, LEADER+ highlighted as its primary action the funding of strategies with a pilot nature and horizontal partnerships in its support for an integrated territorial rural development. The period of LEADER+ was also an important period for the EU as an international organization, namely because of 2004 when the EU had the biggest enlargement in its history. Ten countries (Czech Republic, Estonia, Cyprus, Latvia, Lithuania, Hungary, Malta, Poland, Slovakia and Slovenia) entered the Union, many of them post-soviet republics still with a highly centralized political culture, which was a crucial consideration for the CAP.

The fourth cycle of the LEADER program took place between the years of 2007 and 2013. This time, LEADER became a mandatory component of all national/regional rural development programs, with a varying minimum budget allocation between 2,5%, for the 2004's new member states and 5%, for the old member states (Council of the European Union 2005). The 2007-2013 period was also when LEADER extended its policy scope to fisheries policy, including over 300 Fisheries Local Action Groups (FLAGs) in 21 Member States.

From 2014 up to 2020, by decision of the European Parliament and the European Council, (European Parliament 2013b), the LEADER approach was integrated into the EU policy map as a Community-Led Local Development (CLLD) (European Network for Rural Development 2019). LEADER became the CLLD initiative connected to the EAFRD (with the mandatory application within this fund's framework and with its focus on rural areas). Since then, other ESIF funds (further explained in the next section) became open to support local development strategies (and if needed simultaneously with other EU funds) which pursued each fund's local development goals, while following the LEADER approach.

2.4. How does LEADER work in practice?

Due to the COVID-19 pandemic and as a result of negotiations between the three EU institutions that started in November 2020, the implementation of the legislative proposals for the CAP period of 2021-2027 (presented in 2018) that predicted a CAP reform in 2020 was suspended in June 2021. Transitional regulations were then implemented for the period of 2021-2022 (European Parliament 2020). This way, the 2014-2020 CAP framework was further applied to the period between 2021-2022, until the application of the new legal framework, starting in January 2023. As of now, it takes a long time until the funds reach each LAG. First, the European Parliament and the European Councill define the priorities for each CAP cycle, in which LEADER is included. After that, each MS designs a national CAP strategic plan in accordance with the EU's defined priorities, scheming the funding for income support, rural development (LEADER and CLLD), and market measures. For the LEADER approaches under the EAFDR, EU regulation requires the existence of Managing Authorities (MA) and Payment Agencies (PA) which are defined for and by each MS, together with their powers and functions (within a mandatory framework). Other structures have been created, such as National Rural Networks, LEADER coordination groups, among others, but their existence is not mandatory and depends solely on the will of each MS. The only mandatory components remain MAs and PAs.

Each LAG must be formed by a collective of agents of a community. The method in which a LAG is brought formally into existence is to be defined by each MS. After the involvement of potentially interested local actors, each LAG group may start the consultation and development of their LDS. The LDS must include a description of the LAG's management and monitoring system as well as demonstrate the capacity of the LAGs to implement its strategy. Member states ensure that each LAG has either selected one partner within the group to be the administrative and financial representative of the LAG or that the group has a legally constituted common structure (able to represent the LAG). Each LAG must show its organic and functional structure in its statues and strategy. The LAG's existence and function are subject to the MS's recognition (through their MAs), yet the LAGs have significant freedom to define their governance structures and member constitutions (as openly as possible). Furthermore, each LDS must explain the proposed selection criteria (both the required projects' goals and the LAG's decision-making process, such as consensus, simple majority or other) as well as the occurrence of the project selection (from publicity and opening calls to the eventual project application submission). When developed, each LAG must present its LDS to the MA of the MS which will define the respective roles of the LAGs and the authorities responsible for the implementation of the programs and the tasks relating to the strategy (European Parliament 2013b).

Portugal's last CAP strategic plan (Presidência do Conselho de Ministros 2014) envisioned the EAFDR fund application through three operational structures: PDR 2020 (for the continental part of Portugal); PRORURAL+ (for the Autonomous Region of the Azores); and PRODERAM 2020 (for the Autonomous Region of Madeira). The MA created for the 2014-2020 period was called *Comissão Interministerial de Coordenação*. *DLBC Rural Alto Oeste* (commonly known as *Associação Leader Oeste*) is a Portuguese LAG created in 1994 that is nowadays inserted in the PDR 2020 framework. It is constituted by 79 public, private, and civic

entities such as municipalities, parish councils, solidarity NPOs, agricultural associations, educational institutions and commercial, business, or industrial entities.

It has been responsible for some open calls such as *10.2.1.6-Renovação de Aldeias* (2021). One of the most recent opened calls by *DLBC Rural Alto Oeste* (May 2022) was for investments in agricultural exploration (Associação Leader Oeste 2022a). For this call, a technical guidance note was published (Associação Leader Oeste 2022b) detailing which types of project promotors were admitted, the type of actions to be supported, as well as the documents required for the application.

2.5. LEADER's fund distribution

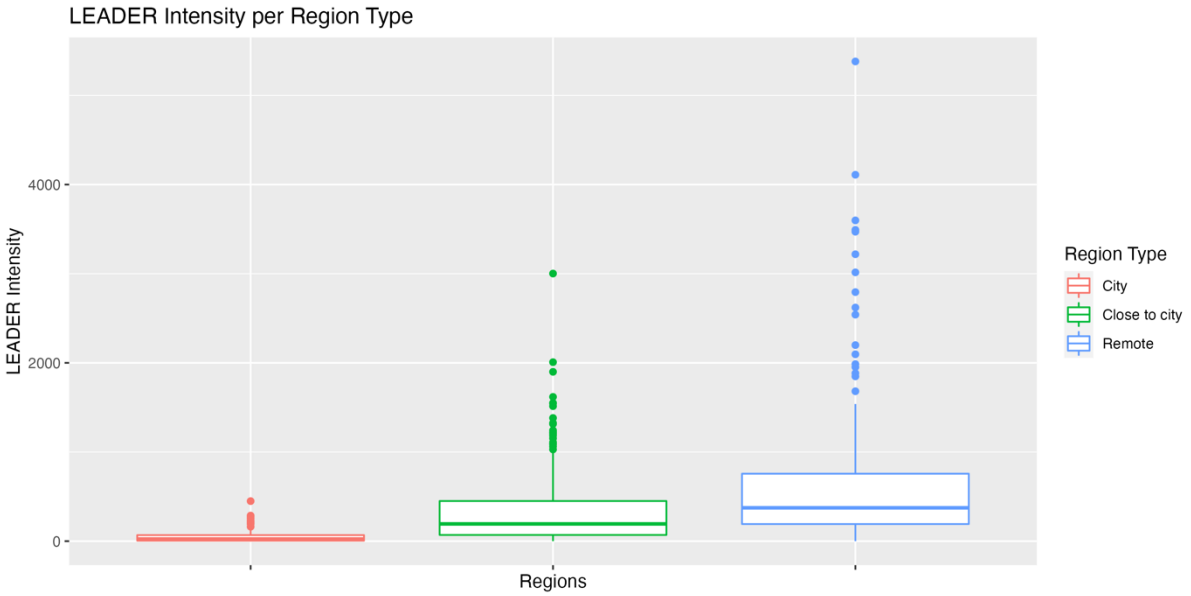
EARFD is one of the five funds included under the framework of the European Structural Investment Funds (ESIF). ESIF supports economic development, and its purpose is to invest in job creation and a sustainable and healthy European economy and environment. Beyond the European Agricultural Fund for Rural Development (EAFRD) which is the main responsible fund for LEADER, four other funds are part of ESIF: the European Regional Development Fund (ERDF), European social funds (ESF), the Cohesion Fund (CF), the European Maritime and Fisheries Fund (EMFF; contrary to the other ESIF funds, the EMFF is open to the LEADER approach since the 2007-2013 period). The ESIF has 5 areas of focus: research and innovation, digital technologies, supporting a low-carbon economy, sustainable management of natural resources, and small businesses. The focus of the EAFRD is to finance RDPs, such as LEADER. The EU28 countries manage the fund by imposing partnership agreements; thus each country sets a commitment on how the fund will be used during a certain period (European Commission 2019; European Commission n.d.).

In 2005, the EU decided that at least 5% of the EAFRD's total contribution should be dedicated exclusively to its fourth axis: LEADER. This share was reduced for the EU's recent MS (Czech Republic, Estonia, Cyprus, Latvia, Lithuania, Hungary, Malta, Poland, Slovenia,

and Slovakia). This set of countries was allowed a smaller mandatory reserve for LEADER, amounting to 2.5%. After Bulgaria and Romania's entrance in the EU in January 2007, both countries were also included in this 2.5% regime for the period between 2010-2013. From 2013 onwards, all countries were subject to the 5% rule, meaning that 5% of the total EAFRD contribution to RDPs shall be reserved for LEADER, except for the case of Croatia (which entered the EU in that same year), for which the 2.5% was still applicable.

LEADER usage is not equally distributed for rural and urban areas. As the core focus of Pillar II (and with that LEADER) lies on rural development, it is logical to assume that rural areas use LEADER more intensely than urban areas. Figure 6 below shows this quite clearly: the LEADER intensity is higher in rural remote areas than in urban areas. To further deepen the understanding of the fund distribution across the EU, we looked at these regions per country and found that this is generally observable for all countries included in the analysis: Rural remote areas spend higher amounts of LEADER than urban areas. For a deeper understanding of this idea, please refer to Appendix Figures 1 to 5.

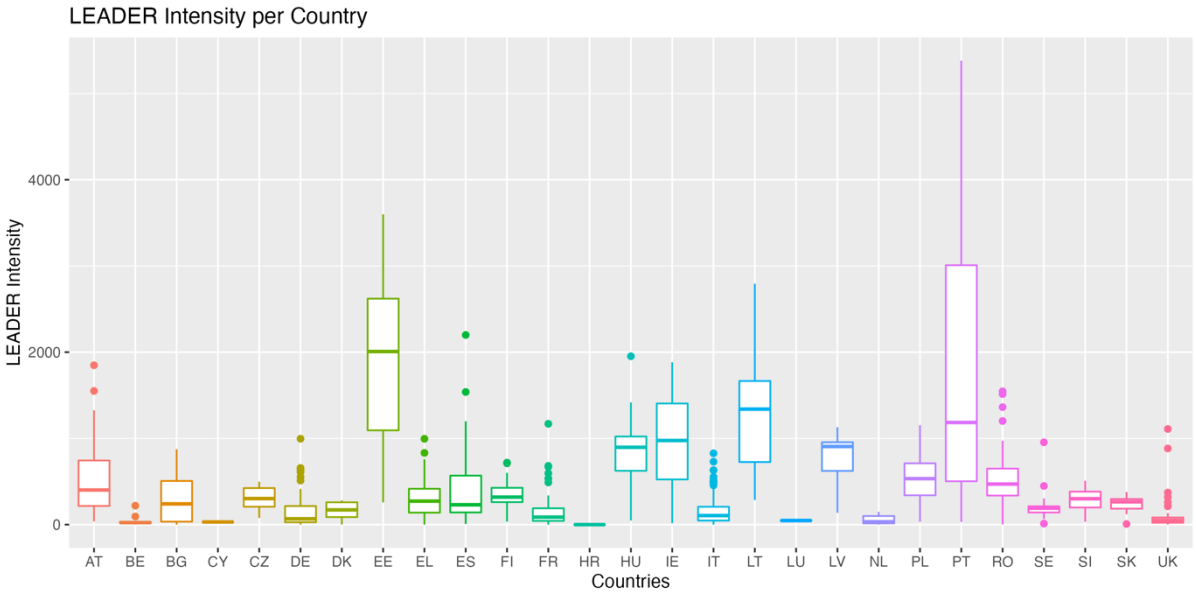
Figure 6 - LEADER intensity per Region Type*



** LEADER intensity measured as total LEADER spendings divided by the sum of total GVA of three years pre policy*

The crucial observation to be made here is that in comparison to remote areas, cities and urban areas receive much less LEADER and the intensity of usage amounts to almost 0 in a large proportion of these types of regions. What can also be observed when analyzing the LEADER fund distributions is that the intensities significantly vary from country to country. In the Figure 7, this variation becomes quite apparent. While some countries like Belgium, Luxemburg or the Netherlands barely use LEADER, others such as Estonia, Lithuania and Portugal show high intensities. This is true not only for the mean, but especially also for outliers in some regions that are significantly higher than in other countries.

Figure 7 - LEADER Intensity per country*

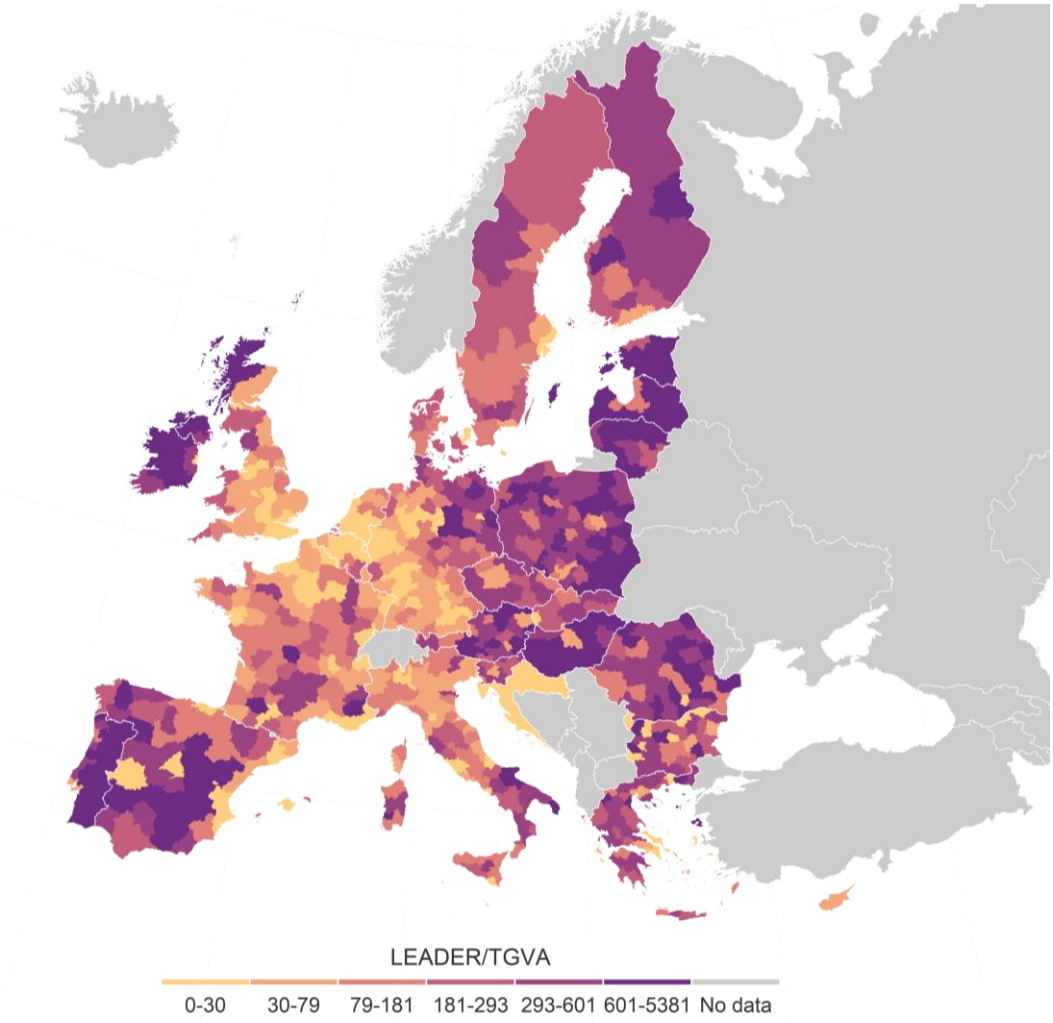


** LEADER intensity measured as total LEADER spendings divided by the sum of total GVA of three years pre policy*

To better visualize the distribution of LEADER, Figure 8 shows a heatmap based on LEADER intensities across NUTS3 regions. It clearly indicates that Eastern Europe countries collect higher amounts of LEADER intensity compared to Western European countries (with the exception of Portugal, Spain and Ireland). This phenomenon is assumed to be explained by the level of development across countries, considering that LEADER aims at enhancing rural development. Furthermore, the Scandinavian countries also seem to receive a higher amount of

LEADER fund intensity. Appendices 9-11 confirm the high intensity of LEADER funds in remote areas, contrary to cities that receive a very small LEADER fund intensity. Differently from the spatial LEADER fund distribution, the Pillar I funds (Appendix 13) are more concentrated in Western European countries, thus not in Eastern Europa. Furthermore, the spatial distribution of Pillar II (Appendix 14) does not differ significantly from the LEADER fund distribution, except the central regions of France seem to receive a strong amount of Pillar II, but their LEADER intensity is modest. Appendix 12 includes the heatmap for the total CAP intensity per NUTS3 region. Especially the Finland and Sweden seem to receive a high amount of LEADER intensity compared to a rather low amount of total CAP funds when compared with all of Europe.

Figure 8 - Heatmap LEADER intensity per NUTS3 region*



** LEADER intensity measured as total LEADER spendings divided by the sum of total GVA of three years pre policy*

3. Previous research on the effects of CAP and LEADER on economic outcomes

The goal of every analysis of the CAP as a whole or any of its components is assumed to be the effectiveness of this large and important policy. As a core policy of the EU, it naturally costs a lot of money for the union, which is why evaluation and fundamental understanding are crucial. Furthermore, it is crucial to accurately measure the effects to ensure a reduction of the rural-urban gap, which remains to be a key goal of the CAP. As of now, however, it seems to be relatively hard to fully understand the CAP and its impacts. There have been many studies to shed light on the general effects of the CAP, but to the best of our knowledge, no previous counterfactual impact evaluation of this form has been conducted to understand the specific impact of LEADER on a multitude of outcome variables. Even though the CAP is one of the longest-standing, most important, and without doubt a highly complex EU policy, little research has in general been conducted on its socioeconomic impact, for example on population, generational change, employment, and civil participation, among other topics.

There have been, however, many studies on the CAP's impact on economic performance. Previous research has, for example, proven a connection between various CAP measures and the increase of regional output (see for example Psaltopoulos, Balamou, and Thomson 2006, Loizou et al. 2014 or Bednaříková 2015). Analyzing the extensive literature review performed by Lillemets, Fertő, and Viira (2022), it can be seen that many studies do report an overall positive impact of the CAP on economic output. However, when analyzing on a case-by-case basis the studies which report a positive impact of CAP on economic output, one can see that the identified impacts are neither strictly linear nor always positive across regions or time periods – Compare, for example, the analyses from Psaltopoulos, Balamou, and Thomson (2006) for Greece during the period of 1988-1998, or of Loizou et al. (2014) for the Greek region of Dytiki Makedonia between the years of 2007-2013 and of Bednaříková (2015) for the case of a region in the Czech Republic, during the same time period. One can see that

the CAP's impact on regional economic output in Greece varied between 0.01% and 1% between regions for the 1988-1998 time period; and for the time between 2007 and 2013, the CAP's impact on a Greek region was estimated to amount to 0.32%, compared to a Czech region between 0.09% and 0.39%. The same last two studies also indicate different values for the CAP's impact on regional income and employment rates. A study (Michalek 2012) using PSM-DID impact analysis presented the effects of the Slovakian RDP program SAPARD on farm profits and other economic indicators: the farms supported by the SAPARD program (between 2003-2005) presented lower growth rates in their total profits per company as compared to the non-supported groups. For further relevant and successful effects of the CAP, we can look to Italy, where some studies reported a positive impact of Pillar II measures on the GDP (Gross Domestic Product) (Felici et al. (2008) or Salvioni et al. (2011)). In connection to the GVA, which is a core component of this thesis as well, recent studies on the impact of RDPs in Latvia (Ozoliņš, Vēveris, and Benga 2015) for the period between 2008-2012 showed a positive impact of RDP Axis 3 measures on the GVA. Castaño, Blanco, and Martinez (2019) also studied the effects of RDPs in Scotland, Ireland and Portugal for the 2007-2013 period and have shown its positive impact on the countries' GVA (associated with measures related to Axis 1, in the case of Portugal, and also to Axis 2, for Scotland and Ireland) with estimated impacts ranging from 1536M€ (Portugal) to 2800M£ (Scotland) for the period of the study. The CAP has been also connected to the diversification of rural economic activities, namely the growth of tourism in CAP supported areas. This relation has been analyzed in Italy (Galluzzo et al. (2017b) or Giaccio et al. (2018) and in Romania (Galluzzo 2021).

Regarding employment, the CAP overall seems to have positive effects, as studied by Loizou et al. (2019) in Greece or Juvancic et al. (2005) in Slovenia. Specifically, direct payments are often connected to an increase in employment. This can be seen, for example in Poland from 2004 through 2008 (Zawalinska and Katarzyna 2009) or in Portugal (Martinho 2015). Quite on

the contrary, however, direct payments have been negatively correlated with employment in Italy, according to Mantino (2017). What can be seen by these rather ambiguous previous findings is that further research is important and that effects may not be entirely homogeneous or robust across regions, countries and methodologies.

There is not much research regarding the effects of CAP on the rural population. In theory, income support should be a clear incentive for people to stay in rural areas and develop agricultural activities. As Daugbjerg et al. (2005) report, even though indirect support mechanisms may not be visible as an incentive, at least direct aid payments do inform farmers about the extent to which they are subsidized. May et al. (2019) also report that payments to young farmers positively affect their willingness to stay on their farms. However, studies have also reported contrasting conclusions. Lasanta and Marín-Yaseli (2007) posit that although CAP support did help farmers in the central Pyrenees to maintain their agricultural activities, these supports (combined with regional funds, with a total value of 170 million euros for the period between 1986-2001) had a negative correlation with indicators like the number of inhabitants, farms, and employees in the primary and secondary sectors. No significant results were found also for cases of CAP rural development programs analyzed in Poland and the Czech Republic (Stolbova and Niewęgłowska 2007), Romania (Galluzzo and Nicola 2018), and Hungary (Bakucs, Ferto, and Benedek 2019). Concerning generational effects, CAP measures have been reported to increase the share of young farmers and decrease the share of old ones in Poland (Rogoźnicki et al. 2018). More specifically, Pillar 2 measures were connected to an increase in the transfers of land to young farmers in Italy (Bournaris, Moulogianni, and Manos 2014).

The impact of CAP on rural development has been evaluated through several indicators or indexes (composed of multiple indicators). One analysis on the effect of Rural Development Programs on rural development used a set of 17 and 21 indicators, respectively, and reported positive effects of an RDP in Poland but negative effects in Slovakia.

These ambiguous findings are assumed to be partly explained by the similarly ambiguous nature of subsidies on regional agriculture. This results from the different potential use cases of subsidies: On the one hand, subsidies could be used to finance activities that are less productive (in order, for example, to simply capture high subsidies (Martinho 2015), or the incentive to optimize costs might be diminished, which can be characterized as inefficient resource usage. On the other hand, the money gained could help farmers to overcome budget constraints, which could mitigate risks of all kinds and lead to investment in more productive activities. This is especially true for decoupled payments (meaning payments that are not only paid out for a certain type of resource that is fostered through agricultural activity, for example, cotton) because they increase flexibility and local decision-making. It should also be mentioned that payments, especially those focused on rural development as a whole and not restricted to agriculture, such as LEADER, could also lead to a loss of agricultural employment, value-added or productivity because people leave for other newly established jobs in their areas (such as tourism, which is why this is a key component of our analysis).

Apart from the aforementioned studies, there has also been research on LEADER specifically, for example by Tirado Ballesteros and Hernández Hernández (2016). This recent study evaluated literature regarding LEADER's impact on tourism and highlighted the importance of including initiatives with the distinction between local private agents and foreign investors in the composition of the LAGs in the evaluation of LEADER, as well as of collecting sufficient data in order to perform *ex-ante* evaluations capable of applying quasi-experimental statistical methods with measures to be applied before and after the evaluation. Another case study with a qualitative approach to LEADER's impact on Austria and Ireland found that LEADER still lacks the reach it could have due to oftentimes rigid coordination structures and hierarchical mindsets in the administration throughout the whole policy process, as well as centralized control and audit mechanisms (Dax et al. 2013). A study on the LEADER

implementation in Poland underlined the positive effect LEADER has had since its onset with the exponential growth of the Polish third sector, even though its institutional character remains (Furmankiewicz, Janc, and Macken-Walsh 2016). On the LEADER structure itself, this study posits that the active involvement of the third sector in the LAG composition has a positive impact on the LAG's engagement with local habitants while composing local development strategies (which lies at the core of LEADER's objectives).

4. Methodological approach: GPS and CBPS Matching

To understand the causal effects of LEADER measures, a counterfactual impact analysis is conducted. This approach was chosen to address the concern of selection bias, which is common in policies like these and one of the biggest drawbacks of previously conducted studies on the CAP and its effectiveness. This is since the implementation mix of the many available CAP measures is region-specific and based on pre-treatment characteristics such as employment, development goals, or output. Especially for Pillar II measures such as LEADER, whose intensity is strongly determined by such socio-economic regional factors, it can be said that treatment is strictly not random; hence there is no randomized controlled trial (RCT) that ensures a given probability of (random) treatment assignment. Randomization of treatment is the cornerstone of analyses that employ comparisons between treatment and control groups and compares average treatment effects (ATEs) between the two, which is impossible here. It would be straightforward to analyze the NUTS3 regions like this, if the treatment allocation were random, as the CAP is blind to borders and hence all regions in theory have the same likelihood of receiving treatment. As has been established before, however, the intensity with which regions receive funds from either Pillar I or Pillar II, and especially for LEADER, is highly diverse and based on observable pre-treatment characteristics. This means that the outcomes of regions endogenously determine the funds used. Hence, what we are faced with is an observational setting that is reliant upon the assumption of unconfoundedness, meaning that

there are differences between the LEADER treatment, $T_i \in T = \{0, 1\}$ in region i , can be fully explained by differences in the pre-treatment variables vector X_i, the covariates. Chapter 5.3 and the supporting code file give more information on how the covariates have been found and which variables were chosen.

The conditional probability of receiving the binary treatment given the pre-treatment variables is defined as the generalized propensity score , $r(T, X_i)$. This propensity score is estimated and bounded away from 0 and 1, $0 < Pr(T = 1 \mid X_i = x) < 1$. We employ the General Propensity Score (GPS) method by Imbens (2000), which estimates the impact of LEADER on various outcomes under the unconfoundedness assumption of no unobservable pre-treatment differences that influence the above-mentioned choice of implementation-mix made by the regions, as well as the outcomes we analyze. The propensity score is an estimation, this generates potential problems since a slight misspecification of the propensity score can lead to large bias in the analysis and hence can significantly taint results. Mostly, the search for an appropriate propensity score is an iterative procedure in which the covariate balance is checked, and model changes are implemented. To avoid this propensity score tautology, we further employ the CBPS as introduced by Imai and Ratkovic (2014). This method uses propensity scores in a way to maximize the covariate balance and the predicted treatment assignment, meaning that the propensity scores are estimated in such a way that both the covariate balance and the treatment assignment prediction are maximized. This is done by setting conditions that imply a covariate balancing propensity score, while not excluding the standard estimation procedure (i.e., making sure the estimated propensity score predicts the treatment well by maximizing the log-likelihood function). The covariate balancing property is implemented by using inverse propensity score weighting:

$$\mathbb{E}\left\{\frac{T_i \tilde{X}_i}{\pi_\beta(X_i)} - \frac{(1 - T_i)\tilde{X}_i}{1 - \pi_\beta(X_i)}\right\} = 0$$

Where $\tilde{X}_i = f(X_i)$ is the dimensional vector-valued measurable formula of the defined covariates X_i and $\pi_\beta(X_i)$ is a parametric propensity score model, with β as a dimensional column vector of unknown parameters. This property must hold for any model, and thus this implies that even when the model might be misspecified, the covariate balance will still hold. Imai and Ratkovic (2014) empirically test the CBPS methodology and find that it indeed improves the poor performance of propensity score models by estimating the probability of receiving the treatment in a different way. Regarding the matching procedure, the nearest neighbor algorithm is used. This matching method goes through the optimal matches and selects the closest option to match each time. A restriction in the number of times a control region can be matched with a treated region, namely 20 times, is built into the analysis. The balancing will be perceived as successful if the majority of standardized mean differences of the matched data is below 0.1 and the remaining differences below the 0.25 threshold. Afterwards, the ATEs are derived by running Weighted Least Squares Regressions. Those weights represent how heavily used a control region is, since this highly differs among regions.

5. Empirical Analysis

5.1. Data

The European Commission's science and knowledge service, the Joint Research Centre (JRC) provided the dataset that was worked with throughout this thesis. The dataset has been used for previous JRC research conducted by Dumangane and Freo (2022). The aim of this preceding work was to analyze the effectiveness of CAP, its diverse policies, their impact, and how to improve the mix of policies. The authors looked at GVA and employment as outcome variables of interest and found that all forms of CAP diminish job loss and the declining trend of GVA in the agricultural sector. Furthermore, all the measures analyzed seemed to support overall employment. Especially interesting were the findings relating to rural development. The authors found significant positive impacts on economic outcomes and in rural areas they found a

specifically positive effect on jobs. Furthermore, the convergence of the rural to the overall economy seemed to be positively influenced. Differing from research conducted by Dumangane and Freo (2022), this thesis solely focuses on the singular treatment variable of LEADER as it aims to deepen the understanding of the CAP's rural development aspect, which is implemented through Pillar II.

Just like Dumangane and Freo (2022), this thesis works with a regional classification that aggregates some of the original NUTS3 regions, such that the sample is a more homogenous territorial representation of the EU28 countries. By aggregating certain NUTS3 regions, this classification addresses the risk of the so-called *modifiable area unit problem* (MAUP) that arises based on borders for geographical areas being set according to historical reasons or administrative rules as opposed to being flexible to organic changes and economically coherent regions (Dark and Bram 2007). MAUP occurs when making use of spatially aggregated data and can significantly impact the results of a statistical hypothesis (Wong 2009). The aggregation was applied for regions in Belgium, The Netherlands, the United Kingdom and Germany, resulting in a dataset containing 796 reclassified regions instead of 1332 NUTS3 regions.

The timeframe of the analysis spans relates to LEADER from 2011 to 2015 and investigates outcomes until 2018. During this so-called *post Health-Check period* (see chapter 2.2 for details), direct payments in Pillar I have been decoupled and, for the sake of this thesis more importantly, Pillar II expenditures have been increased, which is why the period is suitable to analyze related effects. Hence, the period of 2011-2015 presents a reform-based perspective to assess the effectiveness of LEADER after the Health-Check reform. The treatment variable (LEADER intensity) refers to aggregated data from these policy years 2011 to 2015, to enable an analysis over the whole policy period. The LEADER intensity is measured as a ratio to the average total GVA in purchasing power standard (PPS). The choice for a ratio to the average

total GVA instead of the average *agricultural* GVA is made because of LEADER's extensive contribution to rural development beyond the agricultural sector.

Furthermore, the dataset enables a policy outcome analysis based on the post-policy years. These are 2016, 2017 and 2018. The outcome variables, hence, are computed as growth rates comparing the beginning of the policy period (2011) with the post-policy years (2016, 2017, and 2018). The growth rate calculated from 2011 to 2016 is used to measure immediate effect, whereas growth rates between 2011 and 2017 or 2018 provide information on potential lagged results. Additionally, these work as a robustness checks. This joint analysis focuses on the economic outcomes GVA and employment, both considered as growth rates from 2011 to 2016, 2017 and 2018, respectively. The GVA in PPS as is used in this analysis is part of the CMEF (Common Monitoring and Evaluation Framework) as one of the key impact indicators for RDPs in Pillar II, which is why it is deemed suitable for this analysis. Both growth rates for agricultural and total GVA are being investigated, likewise this research looks at total and agricultural employment growth rates.

The sources for datasets as reported by the JRC are fourfold: The treatment stems from the European Commission's Clearance Audit Trial System (CATS); the socio-economic variables included in the analyses are from the Annual Regional Database of the European Commission (ARDECO) and Eurostat; and lastly the region-specific indicators relating to remoteness and land-use are from CORINE Land Cover and ESPON.

5.2. Binary treatment design

As previously mentioned, the data used in this analysis is of a nature that does not include a randomized control trial experimental setting in which treatment and control group are easily identifiable. To mimic a proper treatment and control group, we decided to split the observations we have in two groups based on their LEADER intensity, indicating whether they received no LEADER funds ($T_i = 0$) or whether they did ($T_i = 1$). The cutoff was not established strictly

at zero LEADER funds, as only 33 regions would have been in the artificial control group when applying this cut-off. As is known from the descriptive analysis, these regions are mostly urban. Furthermore, it can be seen that many regions barely receive LEADER funds, even if more than zero, still negligible amounts. Hence, the cut-off for this analysis was based on the first quartile of the LEADER intensity. This amounts to a value of 52.13 in LEADER intensity and leads to almost 200 observations in the control group, which highlights again that many regions barely receive LEADER. To give a feeling for the range of the variable, it can be said that the largest values captured range up until more than 5,000 in LEADER intensity. The median amounts to 190 and the mean to 350, which is why the chosen cutoff at the first quartile (Q1) with lower Q1 ($T_i = 0, N = 198$) and larger than Q1 ($T_i = 1, N = 598$) is justified. Appendix 15 gives an overview of the thresholds and number of regions per control and treatment group.

5.3. Outcome Variables, Controls and Pre-treatment Covariates

As explained in the methodology approach (chapter 4), the control variables are of high importance to satisfy the unconfoundedness assumption. To understand the pre-policy differences (the year 2010) that determine both the possible outcome effects (GVA & employment) and the probability of being treated (LEADER intensity), three categories of control variables are included.

The first category is related to descriptive regional factors and includes *population density* (assuming a higher degree of rurality in less populated areas and hence higher LEADER intensity with lower GDP per capita outcomes); *closeness to city* (directly analyzing the degree of rurality with the three categories city, close to city and remote); and *new EU membership of the state* (making a distinction between old and new member states for states who joined the Union during a time at which direct payment schemes to farmers had features that were not reproduced).

The second category relates to the local economic structure of the regions, including the *share of agricultural gross value added* (to understand the importance of the agricultural sector in the regions); and the *labor productivity in the agricultural sector* (to understand efficiency and potential applications of the LEADER funds in the regions).

The third category of covariates relates to the economic success of the regions and includes the *gross domestic product* (per capita in purchase power standard), as well as lagged pre-treatment outcome variables to understand the pre-policy situation of the respective regions, which include the *agricultural GVA growth rate* as well as the *total employment growth rate* from 2009 to 2010.

To add checks on robustness, all covariates that are neither dummies nor lagged pre-treatment outcomes have been included as squares in an additional analysis. As the balancing results were comparably worse, however, these are not included in the final analysis and the results presented below[2]. Lastly, controls for Pillar I and Pillar II (sans LEADER) intensity have been included where appropriate. Please refer to the supporting code file for the analysis of all covariates and their effects on both the binary treatment (LEADER intensity) and outcomes (GVA, employment) as identified by employing a regression analysis.

6. Results

6.1. Pre-matching Differences

Before diving into the propensity score matching, we performed difference in means t-test analyses for our outcome variables of interest comparing the treated and untreated regions at the cut-off previously established. Table 1 gives an overview of the results for each outcome variable per period of interest. The growth rate of the total GVA is on average higher in treated regions, however only the growth from 2011 to 2018 is significant (+2% growth rate). When

[2] Please refer to the code that is attached to this thesis should you be interested in looking at the results for included squared covariates. They can be found under CBPS Fit 2 and all related matching algorithms.

focusing on the agricultural sector, however, the growth rate of the specific agricultural GVA is lower in treated regions than in non-treated regions, with no significance in the results. When investigating employment, it can be said that on average, treated regions have a lower growth rate than non-treated. For two of these employment growth rates, the results are significant: 2011 to 2017 (-1.2% growth rate) and 2011 to 2018 (-1.7% growth rate). For the agricultural sector, the opposite direction of results was found: Treated regions have a higher growth rate of agricultural employment than non-treated regions, however with no significance. These findings may vary in magnitude between the years, but the general direction is coherent, which is a reasonable check. These findings are also in line with some general trends that can be studied between urban and rural regions: while rural regions often grow more based on larger potential, the growth of employment is slower than in urban regions. Interestingly, the average growth of agricultural employment is negative in both treated and untreated regions. The observed loss of agricultural jobs has been discussed at length in literature. What is important for our purpose is that treated regions experience fewer losses than untreated regions when it comes to agricultural employment. This is in line with LEADER's objectives and goals, which leads to the assumption of at least a certain success of this measure based on these simple average treatment effect comparisons. The same analysis as is found in the text above and the table below has been performed for the pre-treatment covariates used and can be found in Appendix 16.

Table 1 - Differences in Means t-test pre matching

Variable	Treatment Group	Control Group	Difference	P-value	
Total GVA 2011 - 2016	0.113	0.107	0.006	0.45	
	0.005	*0.006*			
Total GVA 2011 - 2017	0.149	0.134	0.015	0.08	
	0.005	*0.006*			
Total GVA 2011 - 2018	0.188	0.168	**0.020**	**0.04**	*
	0.006	*0.007*			
Agricultural GVA 2011 - 2016	0.047	0.054	-0.006	0.74	
	0.009	*0.018*			
Agricultural GVA 2011 - 2017	0.060	0.104	-0.044	0.06	
	0.010	*0.021*			
Agricultural GVA 2011 - 2018	0.079	0.118	-0.040	0.17	
	0.013	*0.026*			
Total Employment 2011 - 2016	0.006	0.016	-0.010	0.07	
	0.003	*0.004*			
Total Employment 2011 - 2017	0.020	0.032	**-0.012**	**0.03**	*
	0.003	*0.005*			
Total Employment 2011 - 2018	0.029	0.046	**-0.017**	**0.01**	*
	0.004	*0.005*			
Agricultural Employment 2011 - 2016	-0.062	-0.080	0.018	0.19	
	0.006	*0.012*			
Agricultural Employment 2011 - 2017	-0.061	-0.071	0.010	0.51	
	0.006	*0.013*			
Agricultural Employment 2011 - 2018	-0.072	-0.040	-0.032	0.45	
	0.007	*0.041*			

(standard errors in italics, significance levels 0 "***", 0,001 "**", 0,01 "*", 0,05 ".")

6.2. CBPS and Matching Results

6.2.1. Propensity Score Estimation and Common Support

When determining the propensity score, the CBPS method solely aims at balancing the covariates. Hence, the estimates are not to be interpreted as they would in the normal GPS matching process. Nevertheless, the results might be interesting, which is why they are presented in the Table 2. What can be concluded from literature findings, descriptive statistics and previous analyses (see supporting code file) is that the direction of influence of the variables investigated is nevertheless supported by this analysis. It seems, for example, that the further away from a city one goes, the higher the probability of receiving LEADER. Furthermore, it seems that being a new member state reduces the amount of LEADER received, which is surprising. The contribution of agriculture to the GVA also seems to influence LEADER, but it is interesting that the higher this share is, the lower is the likelihood of treatment, which would

be an interesting point for further studies as it seems counterintuitive. Higher agricultural labor productivity also seems to reduce the likelihood of receiving high amounts of LEADER, which at first sight might seem odd as well, but which could potentially be explained by the higher necessity for unproductive regions with higher potential to receive more LEADER shares and use them to increase exactly this lack of productivity. GDP seems to have a negligibly small effect. While these are not proven by this CBPS analysis, the coefficients might serve as nice indication of these influences as studied before.

Table 2 - CBPS results

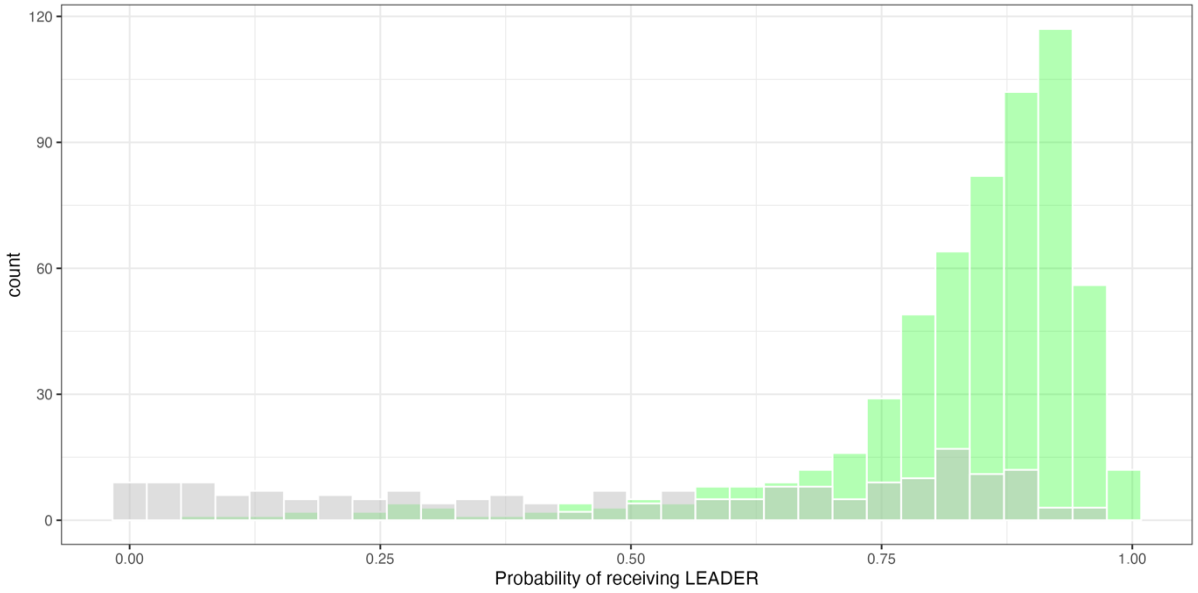
Variable	Estimate *Standard Error*	P-Value	
(Intercept)	3.37	0.000	***
	0.00		
Population Density	0.00	0.994	
	0.19		
Close to City	1.33	0.000	***
	0.00		
Remote	1.46	0.000	***
	0.00		
New Member State	-1.05	0.000	***
	0.00		
Share of Agriculture in GVA	-2.84	0.000	***
	0.00		
Agricultural Labor Productivity	-0.65	0.000	***
	0.00		
GDP per capita	0.00	0.999	
	0.06		
Lagged Agri GVA growth rate pre policy	3.50	0.000	***
	0.00		
Lagged Total Emplyoment growth rate pre policy	12.10	0.000	***
	0.000		

(standard errors in italics, significance levels 0 “***”, 0,001 “**”, 0,01 “*”, 0,05 “.”)

Apart from balancing covariates, another key component of the CBPS analysis is finding the region of common support to understand which observations must be dropped from the analysis. The common support requirement rules out the perfect predictability phenomenon. The overlapped histograms (Figure 9) impressively show the broad area of common support. Many

non-treated areas (grey) have a high probability of receiving LEADER, which is why the overlap with the treated areas (green) is quite large – hence the matching algorithm will look for similar propensity scores with different treatment statuses within this region of common support. The larger it is, the better the analysis.

Figure 9 - Common Support*



**green bars representing treated regions, grey bars control regions*

6.2.2. Matching Results

In total, 709 out of the 796 regions are being matched. Due to the large area of common support as depicted above, not many regions had to be discarded in the process. The matching is done by making use of 111 of the 198 control regions. An overview of the reuses in the matching process is shown in Table 3. The control regions were often paired multiple times, which was the case for 74 regions, with 12 of those control regions being paired with the allowed maximum of 20 treated regions. Without the upper boundary of 20 reuses, some control regions would have been used up to 58 times, which is why this threshold was applied.

Table 3 - Control group reuses in the matching process

Reuses	1	2	3	4	5	6	7	8	9	10	11	13	17	18	20
Occurances	37	16	12	5	9	3	3	4	2	4	1	1	1	1	12

When analyzing the balance of the matched data, we first look at the maximum standardized mean difference, a variable frequently used to measure a distance between two groups of the mean (i.e., the mean differences divided by their respective standard deviations). Table 4 represents the standard mean difference for each pre-treatment covariate. It can be seen that out of eleven variables, seven show a maximum standard mean difference below 0.1, showing a successful balancing of the means and covariates variances. The remaining four differences that are above 0.1 are all below 0.25, which is the approximate highest level acceptable (Imbens and Rubin 2015).

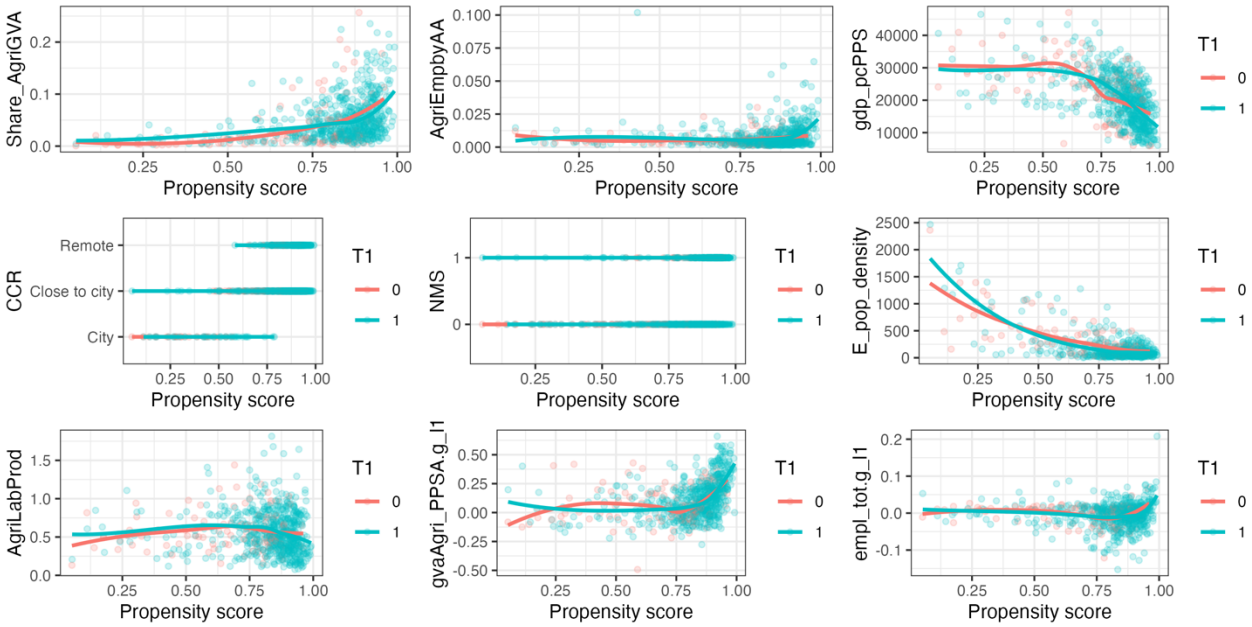
Table 4 - Balance for matched data

Variable	Treatment Group Means	Control Group Means	Std. Mean Difference
Distance	0.8273	0.8227	0.0322
Population Density	143.6738	187.9897	-0.1954
City	0.0569	0.0452	0.0505
Close to City	0.6538	0.7695	-0.2355
Remote	0.2893	0.1890	0.2213
New Member State	0.3211	0.3161	0.0107
Share of Agriculture in GVA	0.0502	0.0554	-0.1301
Agricultural Labor Productivity	0.5572	0.5817	-0.0899
GDP per capita	20075.6759	20372.8182	-0.0404
Lagged Agri GVA growth rate pre policy	0.1238	0.1274	-0.0218
Lagged Total Employment growth rate pre policy	-0.0049	-0.0025	-0.0743

As a visual representation of the quality of matching and the balance of covariates, Figure 10 represents the propensity score distribution for each covariate per treatment group.

The closer the means of both groups (red and blue lines), the better the matching for the respective value of the propensity score.

Figure 10 - Propensity Score Distribution



For the share of agricultural GVA, especially in the lower PS values, the means are very similar. Around 0.5, the curves deviate slightly, before re-joining in higher values. For Agricultural Employment, the curves are similar. For the GDP per capita, there again is a slight parting in the middle of the values – which seems quite intuitive when considering that low propensity scores indicate low likelihood of treatment and high ones a high likelihood – this, per definition, makes the middle values the hardest to match and thus allocate. At the top of the GDP curve, there is another slight parting but all in all, the matching seems to be well balanced and properly executed. The CCR panel with the distinction between cities, close to city and remote areas shows again what we already saw in the descriptive analysis: urban areas receive very little LEADER and also have a very small likelihood to. Regarding EU membership, it can be said that almost all untreated areas are in old member states, which also does not come as a big surprise. In terms of population density, the curves are parting at the lower values, but are

similar in higher values. When looking at agricultural labor productivity, the middle values are very well balances with slight deviations at the top and bottom of the curve. For the lagged agricultural GVA, balancing is the worst in comparison: the curves are quite different at almost all values of the propensity scores. The lagged variable for total employment shows good balancing again.

6.3. Average Treatment Effects post matching

Table 5 represents the average treatment estimates for the binary treatment in the entire sample. The ATEs represented in column two are obtained by running weighted least squared regression with two additional variables to enhance efficiency: Pillar I intensity (ratio of aggregated Pillar I funds over agricultural GVA) and Pillar II intensity (from which the LEADER intensity is excluded). Weights are given to every region through the matching algorithm. Some control regions are matched with more than one treated region as indicated in Table 3; consequently these regions receive higher weights. By adding controls, only the pure treatment effect of LEADER should be measured, and the effects of other policies within Pillar I or II should be eliminated. It is feasible to argue that both Pillar I and II would influence the outcome variables, nevertheless this effect lies outside the interests of this thesis. As the Pearson correlation between both intensities is negligible (0.052), both intensities are added. By implementing the control, we ensure that the ATE solely captures the impact of our binary treatment.

The first three rows of Table 5 indicate that treated regions experienced a significant increase in their total GVA growth rate for the three time periods compared to the control regions. For treated regions, the aggregated total GVA growth rate over five years (2011-2016) is found to be 3.2 percentage points higher than in control regions. Additionally, the ATEs get larger when enlarging the time period of the outcome variable, meaning that outcomes get more important with time – a crucial finding. Thus, the LEADER program does influence regions, as it stimulates a larger growth total GVA growth rate over different periods.

Contrary to the total GVA growth rate, the LEADER treatment seems to not have a significant influence on the agricultural GVA growth rate for any investigated time period. This finding strengthens the hypothesis that the LEADER policy extends its influence beyond agriculture as a broad rural development program. Moreover, LEADER is a multi-stakeholder initiative, meaning that different non-agricultural players are also influenced.

Similarly, for the results on employment, LEADER has a significant impact on the total employment growth rates, although this effect does not hold for the agricultural employment growth rates. Results shown in row seven of Table 5 indicate that treated regions experienced a 2.6 percentage point higher growth in total employment compared to control regions for the 2011-2016 time period. These ATEs hold and even get slightly larger for the longer time spans investigated, since row nine indicates an ATE of 0.025, implying that the increase in employment growth rates increased is 2.5 percentage points larger in treated regions compared to control regions. As discussed before, LEADER had no significant effect on the growth rates of agricultural employment. This once more highlights the fact that LEADER is a broad rural development program and has an influence on the total local economy variables in a region, rather than merely stimulating growth in the agricultural sectors of regions. When comparing these findings to the difference in means t-test results discussed in chapter 6.1, no surprising differences appear. Just like the ATE, the differences in the means t-test solely indicate significant differences between control and treatment groups for total employment and total GVA growth rates. An important remark should be added, namely the R-squared of the weighted least squared regressions predicting the ATEs never exceeds 5%. Thus, our treatment only explains a small proportion of the variance of the assessed outcome variables. Nevertheless, it can be said that significant effects of LEADER are picked up, while a lot of variation across regions is not explained, most likely because there are a lot of random factors across regions.

Table 5 - Average treatment effects via weighted least squared regressions

Variable	Estimate *Standard Error*	P-Value	
Total GVA 2011 - 2016	0.032	0.004	**
	0.011		
Total GVA 2011 - 2017	0.037	0.004	**
	0.013		
Total GVA 2011 - 2018	0.041	0.007	**
	0.015		
Agricultural GVA 2011 - 2016	0.028	0.223	
	0.023		
Agricultural GVA 2011 - 2017	0.006	0.832	
	0.026		
Agricultural GVA 2011 - 2018	0.009	0.766	
	0.033		
Total Employment 2011 - 2016	0.023	0.000	***
	0.007		
Total Employment 2011 - 2017	0.023	0.002	**
	0.007		
Total Employment 2011 - 2018	0.025	0.004	**
	0.009		
Agricultural Employment 2011 - 2016	0.026	0.104	
	0.016		
Agricultural Employment 2011 - 2017	0.013	0.419	
	0.163		
Agricultural Employment 2011 - 2018	0.003	0.882	
	0.023		

(standard errors in italics, *significance levels 0 "***", 0,001 "**", 0,01 "*", 0,05 ".")*

7. Discussion and Conclusion

7.1. Conclusion

Throughout the past decades, the CAP shifted from being a solely agricultural policy to a policy with a broad economic and socioeconomic scope. LEADER, a rural development program, situated within the second Pillar of the CAP, contributes to this change. LEADER does this by making use of innovative strategies that contain seven specific features. Especially the LAGs play a crucial role to ensure that the bottom-up approach is executed efficiently and effectively. Characterization of the LEADER fund spatial distribution indicates two main points. First, Eastern European countries collect a higher intensity of LEADER than Western European countries. Second, remote and rural NUTS3 regions attain more LEADER than urban regions. Making use of a binary treatment relating to the amount of LEADER intensity used, the potential effect of this policy on a set of outcome variables (total GVA, agricultural GVA, total employment, and agricultural employment) are assessed for 796 aggregated NUTS3 regions. To avoid selection bias and construct a well-balanced dataset, the CBPS method is employed, consequently regressions report the ATEs. The results as described in Chapter 6 confirm that LEADER is much more than a policy aimed at agriculture: its influence on the total outcome values (total employment and total GVA) is higher than for the agricultural sector (agricultural employment and agricultural GVA), leading to the assumption that LEADER is, indeed, a rural development program, and as such highly important. The research question can thus be answered with "Yes – LEADER does have significant impacts on economic outcome variables".

7.2. Limitations and Recommendations for future research

For future research, we firstly recommend including more pre-treatment covariates in the analysis. This thesis analyzed the usage of covariates based on regressions to see the impact both on treatment and actual outcomes, assuming the same for potential outcomes. This limits our analysis, thus we recommend a re-evaluation in a second step. To do so, we propose adding

two more variables (lagged total GVA and agricultural employment growth-rates measured pre-policy) used by the JRC in previous research (Dumangane and Freo 2022). Additionally, also including a new category of pre-treatment covariates, namely lagged outcome variables adjusted by country averages could increase the statistical correctness of the model.

Second, we recommend to re-do the analysis with Pillar I and the remainder of Pillar II (sans LEADER) as pre-treatment covariates as well. The given dataset did not allow us to do so, since data on Pillar I and II in the years before treatment were not included. For now, Pillar I and the remainder of Pillar II intensities measured between 2011-2015 have solely been included as an efficiency measure in the weighted regression that determines the average treatment effects. Nonetheless, their inclusion in the previous step could yield valuable insights. The statistical model used assumes that LEADER is neither correlated with Pillar I nor the rest of Pillar II. This is the core of a tough question on the policy mix implementation that the JRC aims at understanding. In the future, it might be desirable to also investigate the correlations of Pillar I and Pillar II on LEADER, given the estimated propensity scores.

Third, we believe it to be valuable to repeat the analysis performed in this thesis with a caliper approach to ensure the closeness of matches within a certain radius. It would be interesting to see how or if the results change.

Fourth, it might be worth trying to drop the urban regions and treat them as outliers. Excluding them from the analysis would indicate whether the results still hold for a constructed control group that is closer in nature to the treatment. Especially since these regions are mostly receiving none or only very little LEADER funds, it could be a good procedure to check the robustness of current findings. Moreover, a strict binary treatment is conducted, which implies the LEADER intensity regions close to the threshold received might be very small. Nevertheless, based on this difference in LEADER intensity, these regions are assigned to a control or treatment group, which has a severe impact on the statistical analysis.

Fifth, it might be interesting to re-evaluate the model and search for more explanations to enlarge the R-squared of the final post-matching regression, to see what else influences these outcome variables. We believe this might be a tough job, as many influences are most likely the time, political situations and general economic trends, but controlling for such variables and understanding the real influence of LEADER itself without distortion might be worth further research.

8. Impact on Tourism

This part of the thesis aims to assess the role of LEADER in promoting rural development. Thus an analysis of the agritourism sector in NUTS3 regions and the performance of agritourism firms is conducted. As discussed before, LEADER does not mainly focus on the agricultural sector. For example, a LEADER project in Romania funded by the EAFRD has the goal to establish a short supply chain between an agritourism guesthouse and fruit farmers with the guidance of a LAG (European Network for Rural Development, 2022). A LEADER program in Lesvos creates a network of trails through rural areas, mainly to re-connect villages and increase rural tourism in the area (European Network for Rural Development 2020). Tirado & Hernández (2016) address the fact that the largest rural tourism promoting program, namely LEADER, is only little discussed within literature and indicates the lack of impact assessment of LEADER on the tourism sector.

8.1. Literature Review

8.1.1. The evolution of tourism as a policy instrument within the CAP

The literature review performed by Marzewski & Zawistowska (2013) dug deeper into the place tourism has been through the years of the CAP implementation. It indicates that not only the role of tourism has changed over the years but also the way tourism was used to achieve specific CAP milestones. During the early period, tourism was not at all perceived as a differentiating source of income for the agricultural sector. After the implementation of the Mansholt plan, more attention was given to tourism as a tool for the attainment of the CAP objectives. New instruments were implemented that both direct and indirectly created effects on tourism development in rural areas. For example, the creation of economic and organisational conditions for equal educational opportunities for rural youth has an indirect effect, on the contrary, conservation rules of nature can directly influence the development of

rural tourism. The importance of tourism enlarged during the period between the Green Paper (1985) and the MacSharry reform (1992). Tourism services claimed to help in facilitating growth in rural areas, preventing depopulation, environmental protection, and diversification of rural employment. It is mainly due to the emergence of rural development programs that the importance of tourism got pushed (European Commission., 1999b).

The LEADER I program aims to promote tourism in mainly rural areas by injecting public funds into LAGs. LEADER II, implemented in 1994, contained new impact measures also connected to tourism, for example, the implementation of booking centres, promotion of tourism products, and the development of new trails in rural areas. The LEADER plus program, between 2000 – 2006, contained all the previous measures, additionally, it also focussed on sustainable development programs. It for instance included new ways of enhancing cultural and natural heritage. During these reforms, the European Commission provided guides to the LAGs which needed to help them to develop an effective and efficient strategy for rural development (Tirado Ballesteros and Hernández Hernández 2017). A recent report from the European Commission states that a key tactic of LEADER to stimulate local economic development in rural areas is strengthening the tourism sector by several instruments. First, it should promote local areas that are less well-known as tourism destinations. Second, it aims to improve the networks of tourism providers and the provision of education that stimulate the development of managerial and entrepreneurial. Last, new services should be established, ranging from new facilities for tourists to the renewal of rural villages (CCRI, ADE S.A, and OIR 2021).

8.1.2. The impact of agritourism

Agritourism diversifies the activities of farms and generates additional income for rural households (Colton and Bissix 2005; Lobo et al. 1999). Quantitative studies indicated the crucial importance of the CAP in the mitigation of rural emigration by stimulating

diversification in the agricultural sector (Galluzzo 2020). This diversification was the crucial and necessary response to the decrease in the income of farms due to the fall in prices of the main agricultural commodities (Galluzzo 2020). The economic benefits of agritourism may incentive farmers to keep their land in agriculture (Lobo et al. 1999). Moreover, diversification can play an predominant role in the protection of rural areas and has the potential to solve the issue of permanent emigration to urban areas. Agritourism can positively impact the sustainable environmental fingerprint, as it could help the restoration and recovery of old buildings on obsolete farms (Galluzzo, 2020). Henceforth such restoration projects can in its turn increase the attractiveness of agritourism firms (Barbieri, Mahoney, and Butler 2008). Agritourism is arguably an effective tool to educate the visitor on local agriculture and its contribution to the economy or even the human well-being (Lobo et al. 1999). Agritourism farms tend to use more environmentally friendly methodologies compared to farms without agritourism. Those methods have a positive effect on natural resources, landscapes, and biodiversity (Mastronardi et al. 2015). Research by Naidoo and Sharpley (2016) recognizes that agritourism can positively strengthen the cultural and social aspects of the society as it supports entrepreneurship.

8.1.3. Previous research investigating the impact of CAP on tourism

Lillemets, Fertő, and Viira (2022) indicate that several studies have investigated the provision of tourism services by farms as an outcome of participation in CAP policies. Galluzzo (2017b) investigated the impact of Pillar II on the growth of agritourism in Italy during 2000 - 2011. Multiple regression analysis points out that the development of agritourism directly correlates with the total amount of Pillar II subsidies. Other research by Galluzzo (2020) finds that the decoupled payments situated under Pillar I have a stronger influence than the financial subsidies allocated under Pillar II of the CAP on the growth of agritourism in Romania over the 2007-2016 time period. Thus it seems to be crucial for the effectiveness of LEADER that

the subsidies are provided to farms with a multi-purpose, consequently, the program should mainly target small rural villages. An Italian case study performed by Giaccio et al. (2018) analyses the effect of both Pillars I and II on agritourism. This by making use of statistical hypothesis testing between farms with and without tourism during the 2007 – 2013 time period. The results indicate that Pillar II has mainly supported small and medium-sized farms with tourism activities located in disadvantaged regions. It highlights the link between the fund distribution and the locations of the farms thus the link between diversification and territorial factors. Furthermore, it seems that agritourism farms react the most to rural policy incentives related to sustainability. Kouřilová & Pělucha (2017) investigated if the RDP part of the CAP for the period of 2007-2013 created economic and social impacts in the Czech Republic. By making use of surveys it was found that the impact on tourism development was very limited. Impact evaluation of LEADER 2014-2020 in rural Scotland was done by gathering qualitative data on four specific LAGs. Findings suggest that LEADER has an economic impact since it helped to create new employment and training opportunities by investing in tourism, farm diversification, and small businesses (Kleinert 2018). The report by European Commission gives a summary of evidence literature on the LEADER contribution to local development. Within the literature, some links are found on the impact of LEADER on tourism, but more importantly case study findings report very strong links between LEADER and tourism support and promotion (CCRI, ADE S.A, and OIR 2021).

8.2. Data, Variables, and Methodology

8.2.1. Data

This research aims to see if LEADER has a positive significant effect on agritourism. There is a lack of NUTS3 regional data characterizing the tourism sector during the research period, namely 2011-2016. Therefore, firm-level data was gathered, enabling me to perform analysis on the individual firm level but also the regional level when aggregating it. The Orbis database

provides firm data in a standardized way that allows drawing a comparison between companies situated all over Europe (Bureau van Dijk 2011). Appendix 17 gives an overview of all the steps taken to clean the dataset of 193 947 companies that were obtained from Orbis. As this thesis assesses the impact of LEADER on the performance of agritourism firms, a specific procedure to gather those has been constructed. More specifically, the NACE Rev. 2 statistical classification of economic activities in the European Community is used to define agritourism firms. The Nomenclature of Economic Activities (NACE) designs an integrated classification system for products and economic activities, that consists of a hierarchical structure (Eurostat 2008). For each company, the NACE primary key and NACE secondary key I, II, III, and IV, a four-digit numerical code are given, which indicates the class of the economic activity of the company. The sections of interest are "A": agriculture, forestry, and fishing and "I": accommodation and food service activities. Appendix 19 contains a detailed description of the NACE rev. 2 sections A and I. Agritourism firms are defined as all firms that have the following characteristics:

i. Primary key "A" and one or more secondary keys "I"
ii. Primary key "I" and one or more secondary keys "A"
iii. One or more secondary keys "A" and one or more secondary keys "I"

In total 4887 companies are defined as agritourism firms, Appendix 21 indicates that the main economic activity of agritourism firms is indeed situated in the agriculture (NACE Rev. 2 section A) or accommodation and food sector (NACE Rev. 2 Section I). Appendix 20 gives an overview of the number of firms per country and shows that Spain, Croatia, Sweden, and Latvia only have a limited amount of agritourism companies reported on Orbis. It would be very hard to assume that those agritourism firms well represent the agritourism sector. Consequently, these countries are dropped and the scope is restricted to three countries: Belgium, Portugal, and Romania. In total 4576 agritourism firms are being used in the statistical analysis. Two separate analyses are performed; one at the firm level and one at the regional level. For the analysis on

the regional level, the data of the agritourism firms are aggregated to the regional reclassified NUTS3 level, additional information on this procedure can be found in Appendix 22.

8.2.2. Outcome variables

Orbis gathers information on different firm-specific variables for each year. Similarly, the common part of the period of interest is between 2011 – 2018. Four different outcome variables are used to assess the impact of LEADER on the performance of agritourism firms on three different topics; performance core business, employment, and the total value of the firms. For each outcome variable, the growth rates are calculated for three time periods (2011-2016, 2011-2017, and 2011-2018). This is only for the agritourism firms that have data available for both years (2011 and 2016 or 2017 or 2018). First, the sales that may be driven by the agricultural activity reported on the company's balance sheet is as an indicator of *the performance of the company's core business*. The first hypothesis is defined; as LEADER is rural development policy aiming to strengthen agritourism, the regions receiving high LEADER or the agritourism companies situated in treated regions experience a significantly larger increase in the performance of the core business. The cost of employees and the number of employees that may be driven by agricultural activity for each agritourism firm provide inside into the *size of the agritourism sector.* This leads to the second hypothesis; regions receiving high LEADER or firms situated in NUTS3 regions treated by LEADER should experience a significant increase in the number of employees, moreover, an increase in the cost of employees would be desired, as this would indicate a growth in the size of agritourism firms. Last, total assets represent *the economic value* of all the items that are reported on the balance sheet. The last hypothesis; agritourism firms located in treated NUTS3 regions undergo a significant increase in the total assets of the firms compared to the control group since LEADER is a multi-stakeholder approach that potentially can increase the scope of activities of firms. Also, regions receiving high LEADER intensity should experience a significantly higher growth rate in the

aggregated total assets of all the agritourism firms located within the region, compared to the control regions.

8.2.3. Methodology

Both regional and firm-level data can be used to assess the potential impact of LEADER on agritourism, moreover, the analysis can be done with two different samples; the first sample includes Belgium, Portugal, and Romania; the second sample solely includes Portugal. The choice for Portugal is made as the data available for Portugal can be perceived as the most complete, Thus 4 different statistical analyses are performed:

1. Regional NUTS3 level analysis
   - Belgium, Portugal, and Romania
   - Portugal
2. Firm-level analysis
   - Belgium, Portugal, and Romania
   - Portugal

Likewise the common part, a binary treatment is made by creating a threshold for LEADER intensity. This threshold differs, when investigating the effect by taking into account Belgium, Portugal and Romania compared to solely focussing on Portugal. The thresholds for both cases are based on the first quartile, Appendix 23 gives an overview of the thresholds and the number of regions in respectively the control and treatment groups. CBPS is performed, to create balance in the pre-treatment covariates. Nearest-neighbour algorithm with no allowance for replacement is applied, this is due to the little amount of NUTS3 regions (75 NUTS3 regions for sample 1 and 23 NUTS3 regions for sample 2). Regarding the firm-level analysis, the agritourism firms located in a treated region get assigned as a treated (Ti = 1), and those located in the control region are perceived as control (Ti = 0), additionally, agritourism firms located in regions dropped in the matching algorithm are dropped as well. Weighted least squared regressions run with two control variables (Pillar II without LEADER intensity and Pillar I intensity) give the ATEs.

8.3. Descriptive statistics

Appendix 24 includes maps of the LEADER fund distribution among Belgium, Portugal, and Romania. Belgian NUTS3 regions receive less LEADER than Portugal or Romania. Portugal collects the largest intensity of LEADER funds, especially in the inland regions, contrary the coastal regions receive less. In the case of Romania, it seems that the fund distribution is more scattered. Still, all the city regions receive less LEADER compared to the close to city or remote areas. The country-specific heatmap of Portugal (Appendix 25) indicates that coastal areas indeed receive less LEADER support, and remote regions are characterized by large LEADER.

8.4. Results

8.4.1. Pre-matching Differences

Appendix 26 gives the differences in mean t-test results before matching is conducted on a regional level. Results for the largest sample indicate a significant difference in the sales growth rate of the latter two time periods. More precisely, the growth rates of the treated region are found the be significantly higher than the control regions. In the case of Portugal, no significant effects are found. Appendix 27 presents the differences in mean t-test results before matching calculated with the firm-level dataset. Likewise, findings for sample 1 indicate a significant effect on the sales growth rates. Furthermore, the LEADER treatment also has a significant effect on the growth rate of total assets. All these effects should be interpreted with caution, as no matching is yet performed and the self-selection assumption does not hold, consequently, the results could be biased.

8.4.2. CBPS and matching

CBPS models for both samples can be consulted in Appendix 28. Due to the limited amount of NUTS3 region, it is hard to find balance in the model of the matched data. Desirable, a sample size of 200 observations should be used (Howarter et al. 2015). Plot for both samples (Appendices 30 and 31) indicate that the common support assumption does not hold; no overlap

is examined. Appendix 29 indicates the standardized means differences, especially the lack of balance in the population density covariate is high but not surprising as the population density of Belgium which contains the control regions is highly divergent from both Portugal and Romania. Thus although the balance is not found in this model, it is very likely that no model explaining the LEADER treatment would find sufficient balance, since a limited amount of observations is available, moreover, the observation does strongly differ among the pre-treatment covariates. The characterization of the matched dataset both for the regional and firm level is represented in Appendices 32 and 33.

8.4.3. Average Treatments Effects post matching

Appendix 34 shows the ATEs for the regional level analysis. Results for sample 1 (Belgium, Portugal, and Romania) show significant effects. More specifically, LEADER created a significantly larger growth rate for sales in the agritourism sector of treated regions compared to control areas for each period. The regional growth rates in sales are respectively 4.4, 6.4, and 8.2 percentage points larger for LEADER intense regions. Thus LEADER does affect the sales of the agritourism sector. When enlarging the period, the effect gets stronger and more significant. No effects are found on the cost of employees or total assets. The sectoral growth rate of the number of employees in treated regions is significantly 3.2 percentage points higher compared to the control region. Considering that these regressions are performed on an aggregated dataset that does not precisely capture the agritourism sector per region, and the lack of balance in the model, cautious interpretation is advised. Zooming into the country-specific case of Portugal, no significant effects are observed.

Appendix 35 indicates the ATEs measured on the firm level, it represents the difference in the growth rates of firms located in treated areas contrary to control regions. Surprisingly, the firm-level sale growth rates did not experience a significant effect on LEADER for the first two periods. However, a small significant effect on the growth rate for sales is found for the 2011-

2018 period. Regarding growth rates for employees, the table indicates that treated agritourism firms have a significantly higher growth rate of respectively 43.3, 30.3, and 59.8 percentage points for the three time periods compared to control regions. Similar to the regional analysis, no significant effects are shown for the country-specific analysis of Portugal.

8.5. Discussion & conclusion

This analysis fills a research gap indicated in literature by making use of simple binary treatment, CBPS, and matching algorithm to assess the impact of LEADER on agritourism given by weighted regressions. Results show some significant effects both for the regional and firm-level analysis on the growth rate of sales, number of employees, and total assets considering Belgium, Portugal, and Romania. Country-specific analysis for Portugal did not show any significance, arguably LEADER creates more long-term effects. Though, this analysis should be seen as a first step in the impact assessment of LEADER on tourism. Future studies can address the following limitations. First, all the limitations discussed in the common part do also hold for this part. Second, the lack of data generates a possible bias in the results. The firm-level data was aggregated although this might exacerbate the lack of representativeness of Orbis. Additionally, this analysis could also be performed with the universe of firms in the accommodation and food sector regardless of executing agricultural activities. Such an analysis would count less on the correctness of the reported NACE Rev. 2 codes per firm. Third, the statistical model is based on the probability of receiving LEADER characterized by looking at all European countries, but within this thesis, only agritourism in Belgium, Portugal, and Romania is investigated. A better fitting model could be established by adding more pre-treatment covariates that better characterize regions for these countries, moreover, firm level covariates could be added, such that the matching happens on the firm-level rather than the regional level.

9. Joint Conclusion

This thesis evaluated the effects of LEADER on four distinct categories of outcome variables: (i.) economic; relating to GVA and employment, both for the total economy and the agricultural sector; (ii.) political outcomes, relating to EP election participation and voting direction; (iii.) economic outcomes of agritourism firms, relating to sales, cost of employees, number of employees and total assets; and (iv.) demographic outcomes, relating to migration, young- and old-dependency. In conclusion, it can be said that LEADER has shown some significant impacts on the different outcome variables discussed. An important finding of this thesis is also that there are large observable differences between regions that do and do not receive high amounts of LEADER, which can be seen as a great opportunity for LEADER to have strong, lasting, and meaningful impacts. What has to be considered is that many of the effects found are especially relevant and strong in the short term. Being a planning tool, it is clear that LEADER requires thorough implementation. Maybe then in the medium term, impacts will be seen more strongly and directly. Hence, future research might be able to shed more light on the effects and influences that LEADER can have on regions. From a policy perspective, research in this field is crucial to understand how to better the CAP as a whole, and LEADER as a specific component. The implications discussed in this thesis are relevant for policymakers in all countries and regions of the EU, as it has been shown that rural development and the involvement of the member states and their communities in EU actions, especially the ones more detached from the European integration process, are crucial components of a bright European future.

References

Allanson, Paul. 2006. "The Redistributive Effects of Agricultural Policy on Scottish Farm Incomes." *Journal of Agricultural Economics* 57 (1): 117–28. https://doi.org/10.1111/J.1477-9552.2006.00035.X.

Associação Leader Oeste. 2022a. "Candidaturas a Decorrer Ao PDR2020 - Leader Oeste." 2022. http://www.quadranteoeste.com/leader/index.php/47-candidaturas-a-decorrer.

———. 2022b. "Orientação Técnica Específica - PDR 2020 - Operação 10.2.1.1 - Pequenos Investimentos Nas Explorações Agrícolas." 2022. http://www.pdr-2020.pt/site/LEADER,.

Bakucs, Zoltán, Imre Ferto, and Zsófia Benedek. 2019. "Success or Waste of Taxpayer Money? Impact Assessment of Rural Development Programs in Hungary." *Sustainability 2019, Vol. 11, Page 2158* 11 (7): 2158. https://doi.org/10.3390/SU11072158.

Barbieri, Carla, Edward Mahoney, and Larry Butler. 2008. "Understanding the Nature and Extent of Farm and Ranch Diversification in North America*." *Rural Sociology*. Vol. 73.

Bednaříková, Zuzana. 2015. "Evaluation of the Impacts of Rural Development Policy Measures on the Local Economy in the Czech Republic." *PRAGUE ECONOMIC PAPERS* 24 (4): 416–33. https://doi.org/10.18267/j.pep.545.

Bojnec, Štefan, and Imre Fertő. 2019. "Do CAP Subsidies Stabilise Farm Income in Hungary and Slovenia?" *Agricultural Economics* 65 (2019) (No. 3): 103–11. https://doi.org/10.17221/190/2018-AGRICECON.

Bournaris, Thomas, Christina Moulogianni, and Basil Manos. 2014. "A Multicriteria Model for the Assessment of Rural Development Plans in Greece." *Land Use Policy* 38 (May): 1–8. https://doi.org/10.1016/J.LANDUSEPOL.2013.10.008.

Bureau van Dijk. 2011. "Orbis User Guide."

Carbone, Anna, and Giovanna Subioli. 2008. "The Generational Turnover in Agriculture: The Ageing Dynamics and the EU Support Policies to Young Farmers."

Castaño, Javier, Maria Blanco, and Pilar Martinez. 2019. "Reviewing Counterfactual Analyses to Assess Impacts of EU Rural Development Programmes: What Lessons Can Be Learned from the 2007–2013 Ex-Post Evaluations?" *Sustainability 2019, Vol. 11, Page 1105* 11 (4): 1105. https://doi.org/10.3390/SU11041105.

CCRI, ADE S.A, and OIR. 2021. "Evaluation Support Study on the Impact of LEADER on Balanced Territorial Development."

Collantes, Fernando, Vicente Pinilla, Luis Antonio Sáez, and Javier Silvestre. 2014. "Reducing Depopulation in Rural Spain: The Impact of Immigration." *Population, Space and Place* 20 (7): 606–21. https://doi.org/10.1002/PSP.1797.

Colton, John W., and Glyn Bissix. 2005. “Developing Agritourism in Nova Scotia: Issues and Challenges.” *Journal of Sustainable Agriculture* 27 (1): 91–112. https://doi.org/10.1300/J064v27n01_06.

Commission of the European Communities. 1994. “The Future of Community Initiatives under the Structural Funds.”

———. 2000. *Commission Notice to the Member States of 14 April 2000 Laying down Guidelines for the Community Initiative for Rural Development (Leader+) (2000/C 139/05)*.

Council of the European Union. 2005. *Regulation 1698/2005*. *Official Journal of the European Union*. URL: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32005R1698&from=EN.

Dark, Shawna J., and Danielle Bram. 2007. “The Modifiable Areal Unit Problem (MAUP) in Physical Geography.” *Progress in Physical Geography* 31 (5): 471–79. https://doi.org/10.1177/0309133307083294.

Daugbjerg, Carsten, Richard Tranter, Philip Jones, Jonathan Little, Leonardo Costa, Thomas Knapp, Miguel Sottomayor, and Alan Swinbank. 2005. “The Visibility of Agricultural Subsidies and Market Illusions in the Common Agricultural Policy: Some Evidence from Farmers’ Views in Germany, Portugal and the United Kingdom.” *European Journal of Political Research* 44 (6): 749–66. https://doi.org/10.1111/J.1475-6765.2005.00246.X.

Dax, Thomas, Wibke Strahl, James Kirwan, and Damian Maye. 2013. “The Leader Programme 2007–2013: Enabling or Disabling Social Innovation and Neo-Endogenous Development? Insights from Austria and Ireland:” *Http://Dx.Doi.Org/10.1177/0969776413490425* 23 (1): 56–68. https://doi.org/10.1177/0969776413490425.

DG for Agriculture and Rural Development. 2005. “The 2003 CAP Reform - Information Sheets.” https://op.europa.eu/en/publication-detail/-/publication/724f1d6c-1151-4ecb-924b-e394d660328c.

Dumangane, Montezuma, and Marzia Freo. 2022. “An Evaluation of the CAP: A Multivalued Policy Mix Approach.”

European Commission. 1991. “Community Initiative for Rural Development, 1991-1993.” 1991. https://cordis.europa.eu/programme/id/REG-LEADER-1.

———. 1993. “The Future of Community Initiatives under the Structural Funds - Green Paper. COM (93) 282 Final.”

———. 1994. “Community Initiative for Rural Development, 1994-1999.” 1994. https://cordis.europa.eu/programme/id/REG-LEADER-2.

———. 1999a. *ESDP, European Spatial Development Perspective : Towards Balanced and Sustainable Development of the Territory of the European Union.* Office for Official Publications of the European Communities.

———. 1999b. “Europe’s Agenda 2000: Strengthening and Widening the European Union,” 1999. http://aei.pitt.edu/15088/1/MOVE-EUROPESAGENDA2000-1999_1.pdf.

———. 2019. “European Structural and Investment Funds.” European Commission. 2019. https://ec.europa.eu/info/funding-tenders/funding-opportunities/funding-programmes/overview-funding-programmes/european-structural-and-investment-funds_en.

———. n.d. “Rural Development.” Agriculture.ec.europa.eu. 2022. https://agriculture.ec.europa.eu/common-agricultural-policy/rural-development_en.

———. 2022a. “EU Rural Areas in Numbers .” 2022. https://ec.europa.eu/info/strategy/priorities-2019-2024/new-push-european-democracy/long-term-vision-rural-areas/eu-rural-areas-numbers_en.

———. 2022b. “The Common Agricultural Policy at a Glance.” 2022. https://ec.europa.eu/info/food-farming-fisheries/key-policies/common-agricultural-policy/cap-glance_en.

European Council. 2022. “Timeline - History of the CAP - Consilium.” 2022. https://www.consilium.europa.eu/en/policies/cap-introduction/timeline-history/.

European Network for Rural Development. 2016. “LEADER Local Development Strategies (LDS): Guidance on Design and Implementation.” URL: https://enrd.ec.europa.eu/sites/default/files/enrd-guidance_lds.pdf.

———. 2019. “LEADER Toolkit.” 2019. https://enrd.ec.europa.eu/sites/default/files/leader_clld-explained_en.pdf.

———. 2020. “Network of Paths and Trails through the Nature and Culture of Lesvos.”

———. 2022. “Cooperation for the Development of a Fresh Fruit Short Supply Chain.” May 7, 2022. https://enrd.ec.europa.eu/projects-practice/cooperation-development-fresh-fruit-short-supply-chain_en.

European Parliament. 2013a. *Regulation 1305/2013*. *Official Journal of the European Union*.

———. 2013b. “Regulation 1303/2013.” *Official Journal of the European Union* , December. URL: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32013R1303&from=EN.

———. 2020. *Regulation 2020/2220*. Office Journal of the European Union. URL: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32020R2220&from=EN.

———. 2022. “The Common Agricultural Policy – Instruments and Reforms | Fact Sheets on the European Union | European Parliament.” 2022. https://www.europarl.europa.eu/factsheets/en/sheet/107/the-common-agricultural-policy-instruments-and-reforms.

Eurostat. 2008. “NACE Rev. 2 Statistical Classification of Economic Activities in the European Community.” *Eurostat Methodologies and Working Papers*.

Farm Europe. 2020. “CAP Budget 2021-2027: In Response to the Crisis, Meet More Challenges with Less Budget.” 2020. https://www.farm-europe.eu/our-works/resilience-en/cap-budget-2021-2027-in-response-to-the-crisis-meet-more-challenges-with-less-budget/.

Felici, F., R. Paniccia, Benedetto Rocchi, F. Felici, R. Paniccia, and Benedetto Rocchi. 2008. “Economic Impact of Rural Development Plan 2007 2013 in Tuscany.” https://doi.org/10.22004/AG.ECON.44256.

Furmankiewicz, Marek, Krzysztof Janc, and Áine Macken-Walsh. 2016. “The Impact of EU Governance and Rural Development Policy on the Development of the Third Sector in Rural Poland: A Nation-Wide Analysis.” *Journal of Rural Studies* 43 (February): 225–34. https://doi.org/10.1016/J.JRURSTUD.2015.12.011.

Galluzzo, Nicola. 2017a. “The Common Agricultural Policy and Employment Opportunities in Romanion Rural Areas: The Role of Agritourism.” *Bulgarian Journal of Agricultural Science* 23 (1): 14–21. www.insse.ro/cms/en.

———. 2017b. “The Impact of the Common Agricultural Policy on the Agritourism Growth in Italy.” *Bulgarian Journal of Agricultural Science* 23 (5): 698–703.

———. 2018. “A Quantitative Analysis of the CAP towards Rural Romanian Areas.” *162nd Seminar, April 26-27, 2018, Budapest, Hungary*, April. https://doi.org/10.22004/AG.ECON.271963.

———. 2020. “The Evolution of Romanian Agritourism and the Role of European Union Subsidies in Rural Areas.” *Open Agriculture* 5 (1): 159–65. https://doi.org/10.1515/opag-2020-0017.

———. 2021. “A Quantitative Analysis on Romanian Rural Areas, Agritourism and the Impacts of European Union’s Financial Subsidies.” *Journal of Rural Studies* 82 (February): 458–67. https://doi.org/10.1016/J.JRURSTUD.2021.01.025.

———. 2017. Associazione Studi, Geografi Co-Economici, and Aree Rurali. “Agricultural Academy.” *Bulgarian Journal of Agricultural Science* 23 (5): 698–703.

Giaccio, Vincenzo, Luigi Mastronardi, Davide Marino, Agostino Giannelli, and Alfonso Scardera. 2018. “Do Rural Policies Impact on Tourism Development in Italy? A Case Study of Agritourism.” *Sustainability 2018, Vol. 10, Page 2938* 10 (8): 2938. https://doi.org/10.3390/SU10082938.

Heyl, Katharine, Tobias Döring, Beatrice Garske, Jessica Stubenrauch, and Felix Ekardt. 2021. "The Common Agricultural Policy beyond 2020: A Critical Review in Light of Global Environmental Goals." *Review of European, Comparative & International Environmental Law* 30 (1): 95–106. https://doi.org/10.1111/REEL.12351.

Howarter, Stephani, Chairperson Vicki Peyton, Co-Chairperson William Skorupski, Bruce Frey, Neal Kingston, and Barbara Phipps. 2015. "The Efficacy of Propensity Score Matching in Bias Reduction with Limited Sample Sizes."

Imai, Kosuke, and Marc Ratkovic. 2014. "Covariate Balancing Propensity Score." *Journal of the Royal Statistical Society: Series B (Statistical Methodology)* 76 (1): 243–63. https://doi.org/10.1111/RSSB.12027.

Imbens, Guido. 2000. "Efficient Estimation of Average Treatment Effects Using the Estimated Propensity Score," March. https://doi.org/10.3386/T0251.

Imbens, Guido, and Donald Rubin. 2015. *Causal Inference in Statistics, Social, and Biomedical Sciences - Guido W. Imbens, Donald B. Rubin - Google Books*. New York: Cambridge University Press. https://books.google.at/books?hl=de&lr=&id=Bf1tBwAAQBAJ&oi=fnd&pg=PR17&dq=+Imbens,+G.+W.+and+D.+B.+Rubin+(2015,+apr).+Causal+inference+for+statistics,+social,+and+biomed-+ical+sciences.+Cambridge+University+Press.&ots=je-E9d2UAD&sig=kxlIFnVvPQxQYrUske0gFtAzkvw#v=onepage&q&f=false.

Juvancic, Luka, Ales Kuhar, Urban Sila, Emil Erjavec, Luka Juvancic, Ales Kuhar, Urban Sila, and Emil Erjavec. 2005. "The Impact of CAP and EU Cohesion Support on Growth and Convergence of the Eastern Slovenia Region in the Period 2007-2013." https://doi.org/10.22004/AG.ECON.24766.

Kleinert, Eva. 2018. "Process Evaluation of LEADER 2014-2020."

Kouřilová, Jana, and Martin Pělucha. 2017. "Economic and Social Impacts of Promoting Cultural Heritage Protection by the Czech Rural Development Programme 2007-2013." *European Countryside*. Walter de Gruyter GmbH. https://doi.org/10.1515/euco-2017-0029.

Lasanta, Teodoro, and María Laguna Marín-Yaseli. 2007. "Effects of European Common Agricultural Policy and Regional Policy on the Socioeconomic Development of the Central Pyrenees, Spain." *Https://Doi.Org/10.1659/Mrd.0840* 27 (2): 130–37. https://doi.org/10.1659/MRD.0840.

Lillemets, Jüri, Imre Fertő, and Ants Hannes Viira. 2022. "The Socioeconomic Impacts of the CAP: Systematic Literature Review." *Land Use Policy* 114 (March). https://doi.org/10.1016/j.landusepol.2021.105968.

Lobo, Ramiro E., George E. Goldman, Desmond A. Jolly, B. Diane Wallace, Wayne L. Schrader, and Scott A. Parker. 1999. “Agritourism Benefits Agriculture in San Diego County.” *California Agriculture* 53 (6): 20–24. https://doi.org/10.3733/ca.v053n06p20.

Loizou, Efstratios, Fotis Chatzitheodoridis, Anastasios Michailidis, and Achilleas Kontogeorgos. 2014. “Leader Approach Performance Assessment in a Greek Rural Region.” In . https://www.researchgate.net/publication/265139727_Leader_Approach_Performance_Assessment_in_a_Greek_Rural_Region.

Loizou, Efstratios, Christos Karelakis, Konstantinos Galanopoulos, and Konstadinos Mattas. 2019. “The Role of Agriculture as a Development Tool for a Regional Economy.” *Agricultural Systems* 173 (July): 482–90. https://doi.org/10.1016/J.AGSY.2019.04.002.

Ludlow, N. Piers. 2005. “The Making of the CAP: Towards a Historical Analysis of the EU’s First Major Policy.” *Contemporary European History* 14 (3): 347–71. https://doi.org/10.1017/S0960777305002493.

Mantino, Francesco. 2017. “Employment Effects of the CAP in Italian Agriculture: Territorial Diversity and Policy Effectiveness.” *EuroChoices* 16 (3): 12–17. https://doi.org/10.1111/1746-692X.12175.

Martínez-Abraín, Alejandro, Juan Jiménez, Ignacio Jiménez, Xavier Ferrer, Luis Llaneza, Miguel Ferrer, Guillermo Palomero, Fernando Ballesteros, Pedro Galán, and Daniel Oro. 2020. “Ecological Consequences of Human Depopulation of Rural Areas on Wildlife: A Unifying Perspective.” *Biological Conservation* 252 (December): 108860. https://doi.org/10.1016/J.BIOCON.2020.108860.

Martinho, Vítor João Pereira Domingues. 2015. “Output Impacts of the Single Payment Scheme in Portugal: A Regression with Spatial Effects.” *Http://Dx.Doi.Org/10.5367/Oa.2015.0203* 44 (2): 109–18. https://doi.org/10.5367/OA.2015.0203.

Marzewski, Tomasz, and Hannah Zawistowska. 2013. “The Place of Tourism in the Implementation of Agricultural Policy.” Warsaw School of Economics.

Mastronardi, Luigi, Vincenzo Giaccio, Agostino Giannelli, and Alfonso Scardera. 2015. “Is Agritourism Eco-Friendly? A Comparison between Agritourisms and Other Farms in Italy Using Farm Accountancy Data Network Dataset.” *SpringerPlus* 4 (1): 1–12. https://doi.org/10.1186/s40064-015-1353-4.

May, Daniel, Sara Arancibia, Karl Behrendt, and John Adams. 2019. “Preventing Young Farmers from Leaving the Farm: Investigating the Effectiveness of the Young Farmer Payment Using a Behavioural Approach.” *Land Use Policy* 82 (March): 317–27. https://doi.org/10.1016/J.LANDUSEPOL.2018.12.019.

Michalek, Jerzy. 2012. “Counterfactual Impact Evaluation of EU Rural Development Programmes - Propensity Score Matching Methodology Applied to Selected EU Member States. Volume 1: A Micro-Level Approach.” https://doi.org/10.2791/82592.

Milward, Alan S. 2000. *The European Rescue of the Nation-State*. Routledge. https://www.routledge.com/The-European-Rescue-of-the-Nation-State/Milward/p/book/9780415216296.

Ministerio de Politica Territorial y Funcion Pública. 2019. “Diagnóstico Estrategia Nacional Frente al Reto Demográfico.”

Morkunas, Mangirdas, and Povilas Labukas. 2020. “The Evaluation of Negative Factors of Direct Payments under Common Agricultural Policy from a Viewpoint of Sustainability of Rural Regions of the New EU Member States: Evidence from Lithuania.” *Agriculture 2020, Vol. 10, Page 228* 10 (6): 228. https://doi.org/10.3390/AGRICULTURE10060228.

Naidoo, Perunjodi, and Richard Sharpley. 2016. “Local Perceptions of the Relative Contributions of Enclave Tourism and Agritourism to Community Well-Being: The Case of Mauritius.” *Journal of Destination Marketing and Management* 5 (1): 16–25. https://doi.org/10.1016/j.jdmm.2015.11.002.

Nowicki, Peter, Kaley Hart, and Hans van Meijl. 2011. “The Impact of Modulation as a Policy Instrument.” In *Disaggregated Impacts of CAP Reforms: Proceedings of an OECD Workshop*, 265–84. OECD. https://doi.org/10.1787/9789264097070-18-EN.

Ozoliņš, Jānis, Armands Vēveris, and Elita Benga. 2015. “The Role of EU Funds in Diversification of Rural Economy in Latvia.”

Pe’er, Guy, Aletta Bonn, Helge Bruelheide, Petra Dieker, Nico Eisenhauer, Peter H. Feindt, Gregor Hagedorn, et al. 2020. “Action Needed for the EU Common Agricultural Policy to Address Sustainability Challenges.” *People and Nature* 2 (2): 305–16. https://doi.org/10.1002/PAN3.10080/SUPPINFO.

Presidência do Conselho de Ministros. 2014. *Decreto-Lei n.º 137/2014*. *Diário Da República*. https://dre.pt/dre/detalhe/decreto-lei/137-2014-56747378.

Psaltopoulos, Demetrios, Eudokia Balamou, and Kenneth J. Thomson. 2006. “Rural–Urban Impacts of CAP Measures in Greece: An Inter-Regional SAM Approach.” *Journal of Agricultural Economics* 57 (3): 441–58. https://doi.org/10.1111/J.1477-9552.2006.00059.X.

Rodríguez-Pose, Andrés, and Lewis Dijkstra. 2020. “Does Cohesion Policy Reduce EU Discontent and Euroscepticism?” https://doi.org/10.1080/00343404.2020.1826040.

Rogoźnicki, Daniel, Stanisław Kondracki, Alicja Baranowska, and Eng Phd. 2018. “Common Agricultural Policy as a Determinant of Transformation in Polish Agriculture.” In

Proceedings of the International Scientific Conference "Economic Sciences for Agribusiness and Rural Economy." https://doi.org/10.22630/ESARE.2018.1.23.

Schäfer, Constantin, and Marc Debus. 2017. "No Participation without Representation." *Https://Doi.Org/10.1080/13501763.2017.1363806* 25 (12): 1835–54. https://doi.org/10.1080/13501763.2017.1363806.

Schraff, Dominik. 2019. "Regional Redistribution and Eurosceptic Voting." *Journal of European Public Policy* 26 (1): 83–105. https://doi.org/10.1080/13501763.2017.1394901/SUPPL_FILE/RJPP_A_1394901_SM8316.DOCX.

Severini, S, A Tantari, and G di Tommaso. 2016. "Do CAP Direct Payments Stabilise Farm Income? Empirical Evidences from a Constant Sample of Italian Farms." *Agricultural and Food Economics*. https://doi.org/10.1186/s40100-016-0050-0.

Stolbova, Marie, and Grażyna Niewęgłowska. 2007. "The Impact of LFA Payments in Different Rural Structures - an Example of the Czech Republic and Poland." *Rural Areas and Development* 05: 1–16. https://doi.org/10.22004/AG.ECON.173102.

Tirado Ballesteros, Juan Gabriel, and María Hernández Hernández. 2016. "Assessing the Impact of EU Rural Development Programs on Tourism." *Http://Dx.Doi.Org/10.1080/21568316.2016.1192059* 14 (2): 149–66. https://doi.org/10.1080/21568316.2016.1192059.

Trnková, G, and Z Malá. 2012. "Analysis of Distribution Impact of Subsidies within the Common Agricultural Policy on Field Production Businesses in the Czech Republic." https://acta.mendelu.cz/pdfs/acu/2012/07/44.pdf.

Viñas, Carmen Delgado. 2019. "Depopulation Processes in European Rural Areas: A Case Study of Cantabria (Spain)." *European Countryside* 11 (3): 341–69. https://doi.org/10.2478/EUCO-2019-0021.

WHO. 2018. "Imbalances in Rural Primary Care: A Scoping Literature Review with an Emphasis on the WHO European Region."

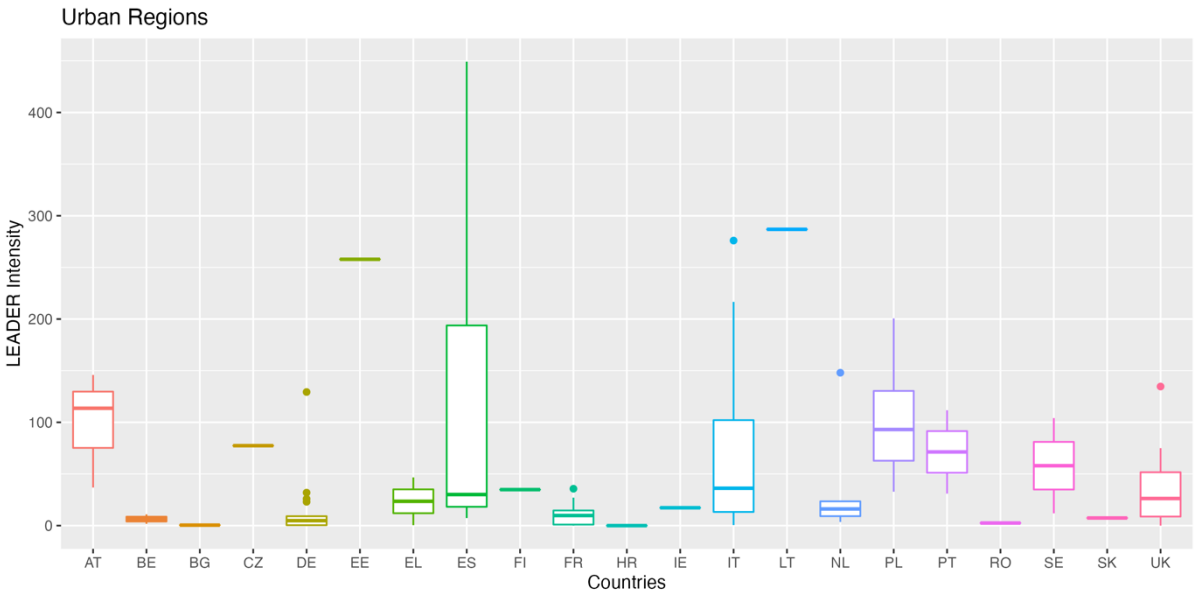
Wong, D.W. 2009. "Modifiable Areal Unit Problem." In *International Encyclopedia of Human Geography,* 169–74. Elsevier. https://doi.org/10.1016/B978-008044910-4.00475-2.

Zawalinska, and Katarzyna. 2009. "Evaluation of Rural Development Programs after Poland's Accession to the EU: Regional CGE Approach." *2009 Conference, August 16-22, 2009, Beijing, China,* June. https://doi.org/10.22004/AG.ECON.51342.

10. Appendix

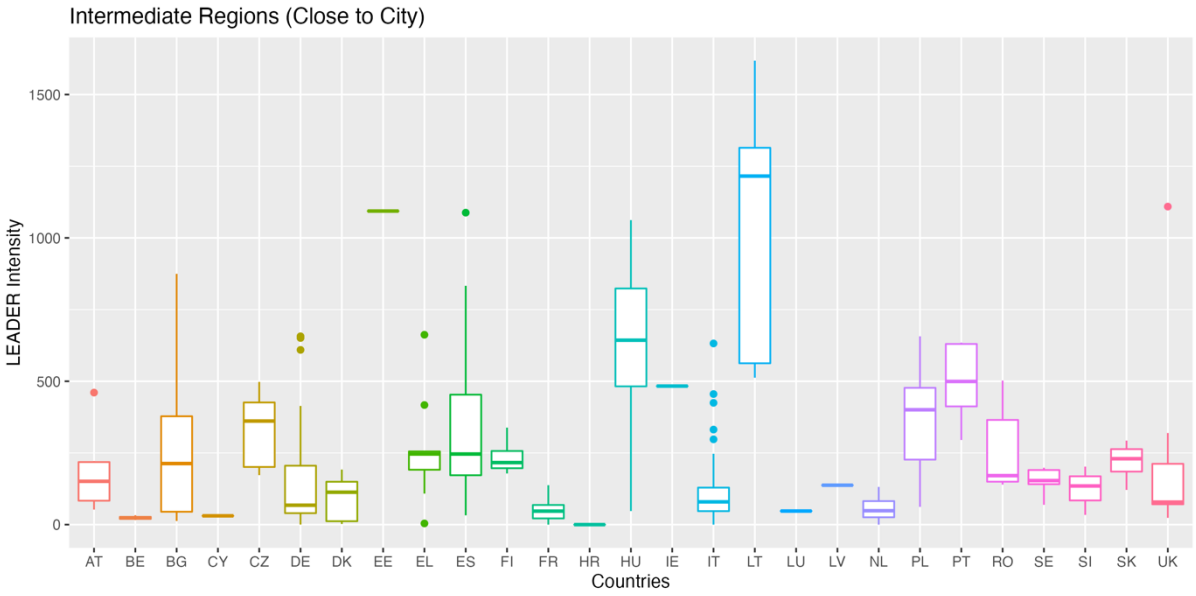
10.1. Appendix Group Part

Appendix 1 - LEADER intensity for Urban NUTS 3 Regions per country*



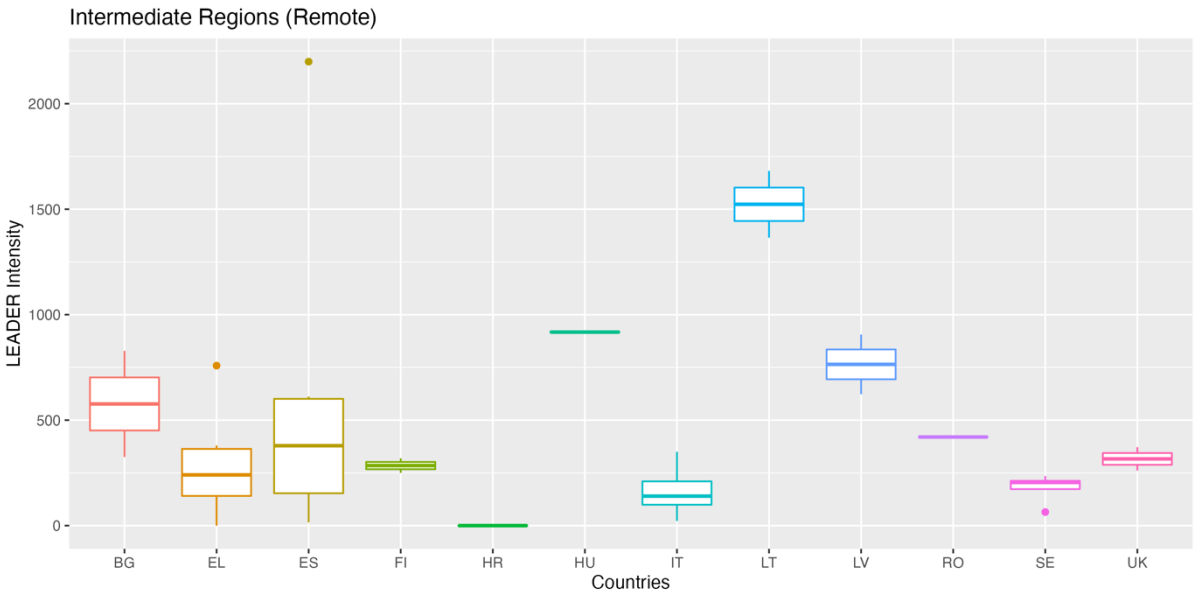
** LEADER intensity measured as total LEADER spendings divided by the sum of total GVA of three years pre policy*

Appendix 2 - LEADER intensity for Intermediate NUTS 3 Regions (Close to City) per country*



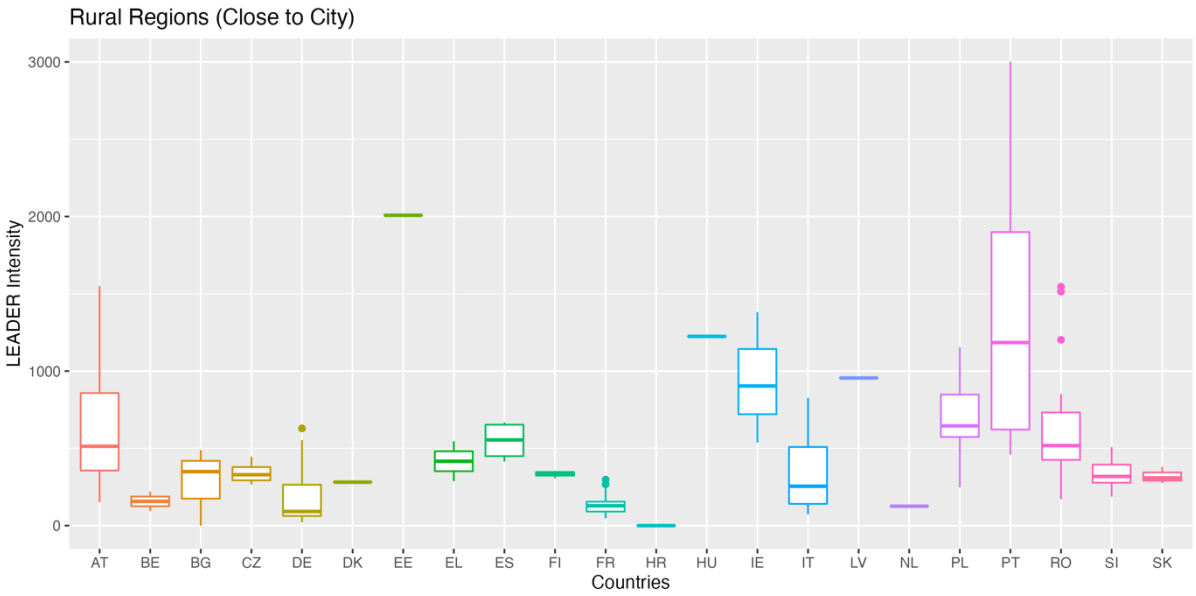
** LEADER intensity measured as total LEADER spendings divided by the sum of total GVA of three years pre policy*

Appendix 3 - LEADER Intensity for Intermediate NUTS 3 Regions (Remote) per country*



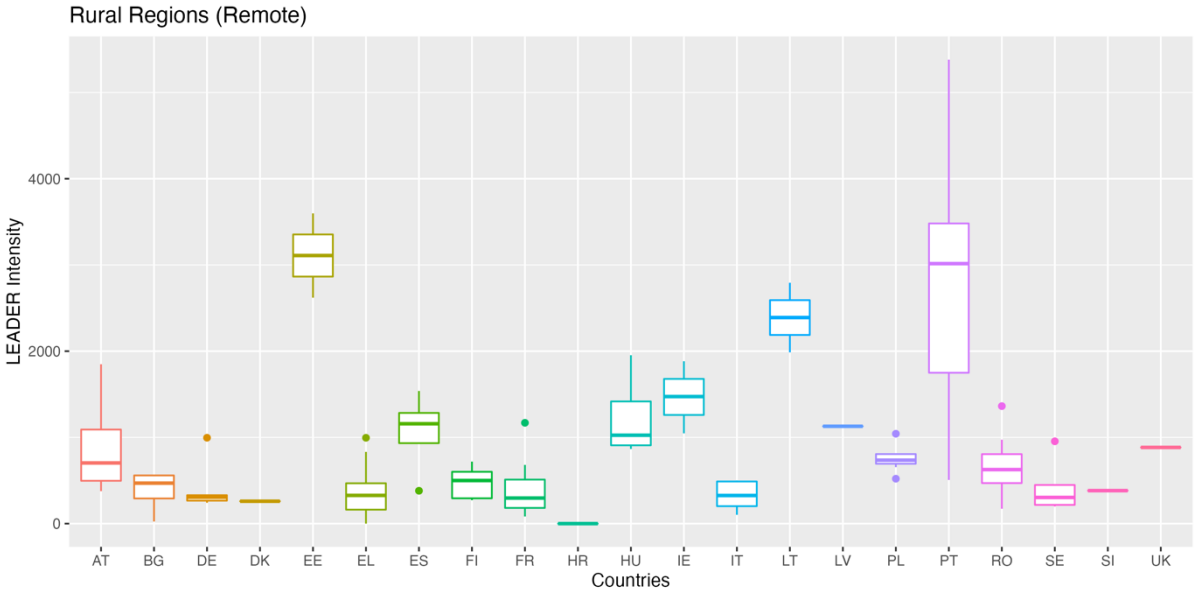
** LEADER intensity measured as total LEADER spendings divided by the sum of total GVA of three years pre policy*

Appendix 4 - LEADER Intensity for Rural NUTS 3 Regions (Close to City) per country



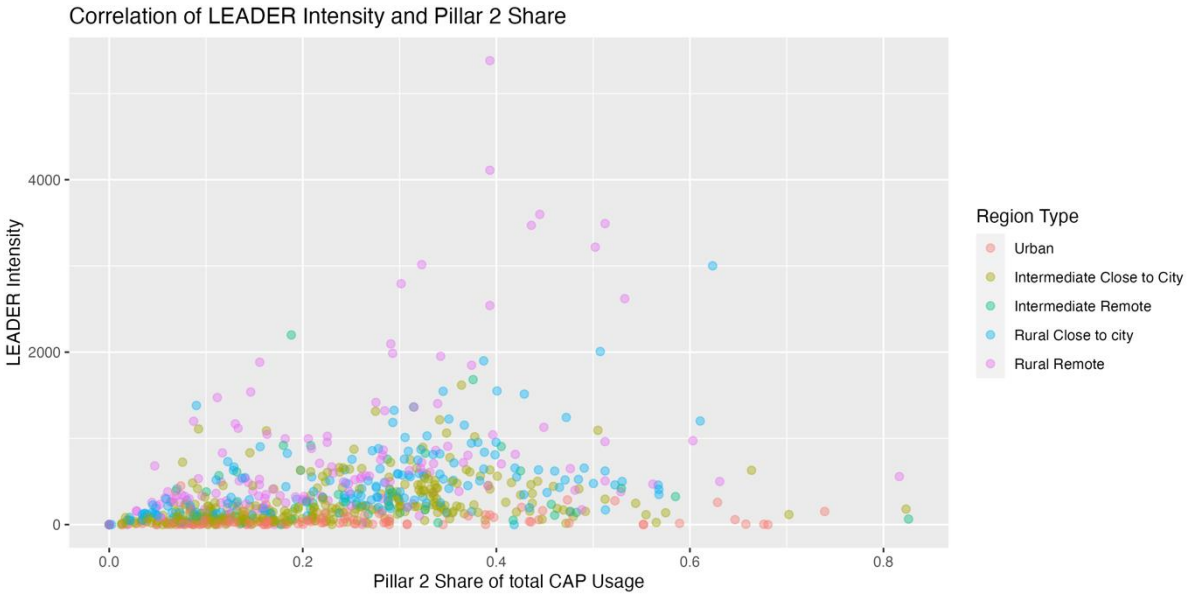
** LEADER intensity measured as total LEADER spendings divided by the sum of total GVA of three years pre policy*

Appendix 5 - LEADER Intensity for Rural NUTS 3 Regions (Remote) per country



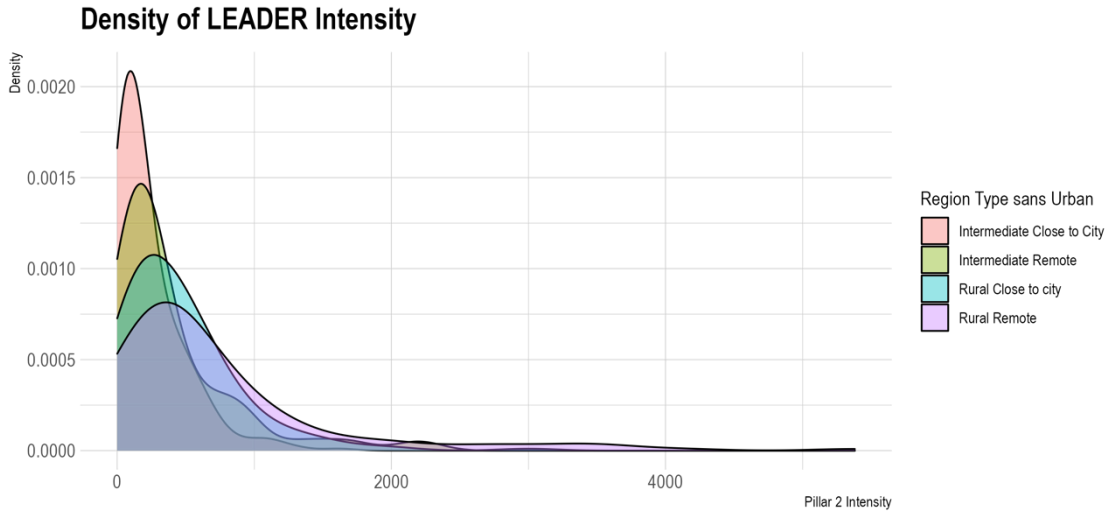
** LEADER intensity measured as total LEADER spendings divided by the sum of total GVA of three years pre policy*

Appendix 6 - Correlation Analysis between LEADER Intensity and Pillar II Share of Total CAP*



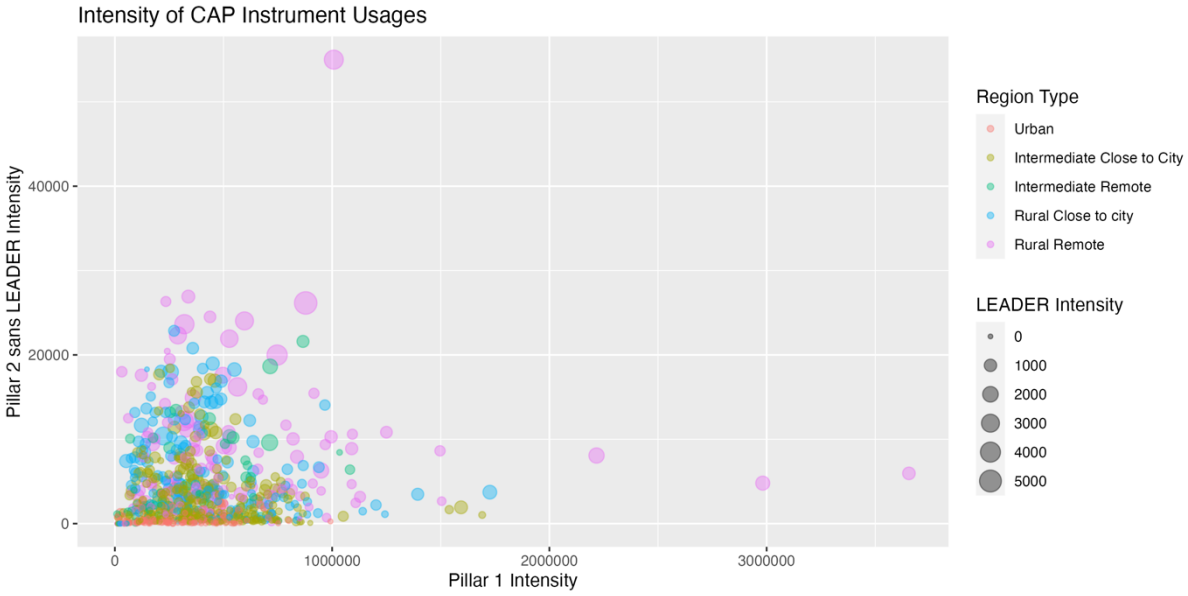
** LEADER intensity measured as total LEADER spendings divided by the sum of total GVA of three years pre policy*

Appendix 7 - Density Analysis of LEADER Intensity per Region Type



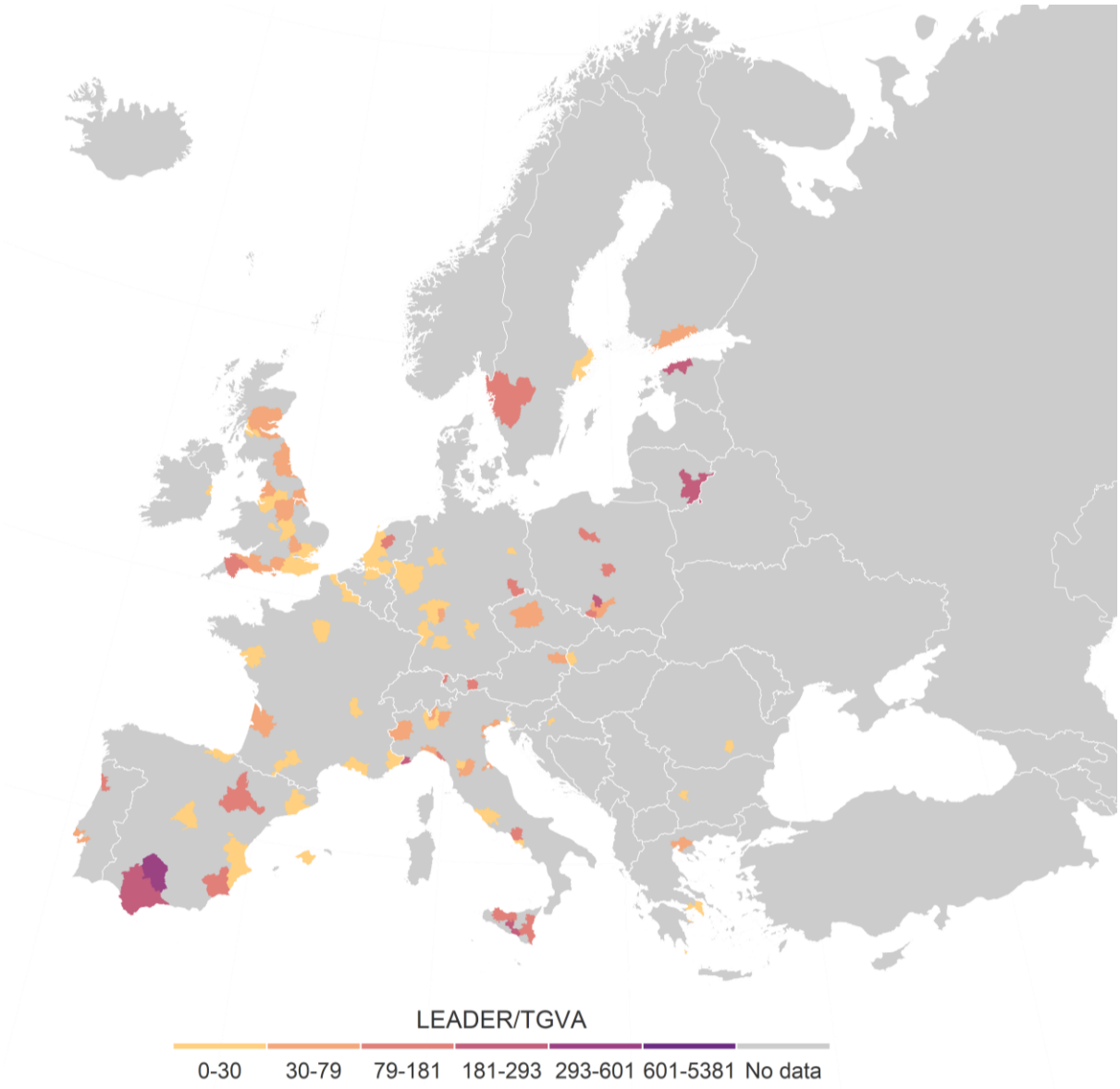
** LEADER intensity measured as total LEADER spendings divided by the sum of total GVA of three years pre policy (Note: omitted category "Urban" due to high distortion based on extremely high density at 0)*

Appendix 8 - CAP Instrument Analysis with LEADER intensity as bubble size



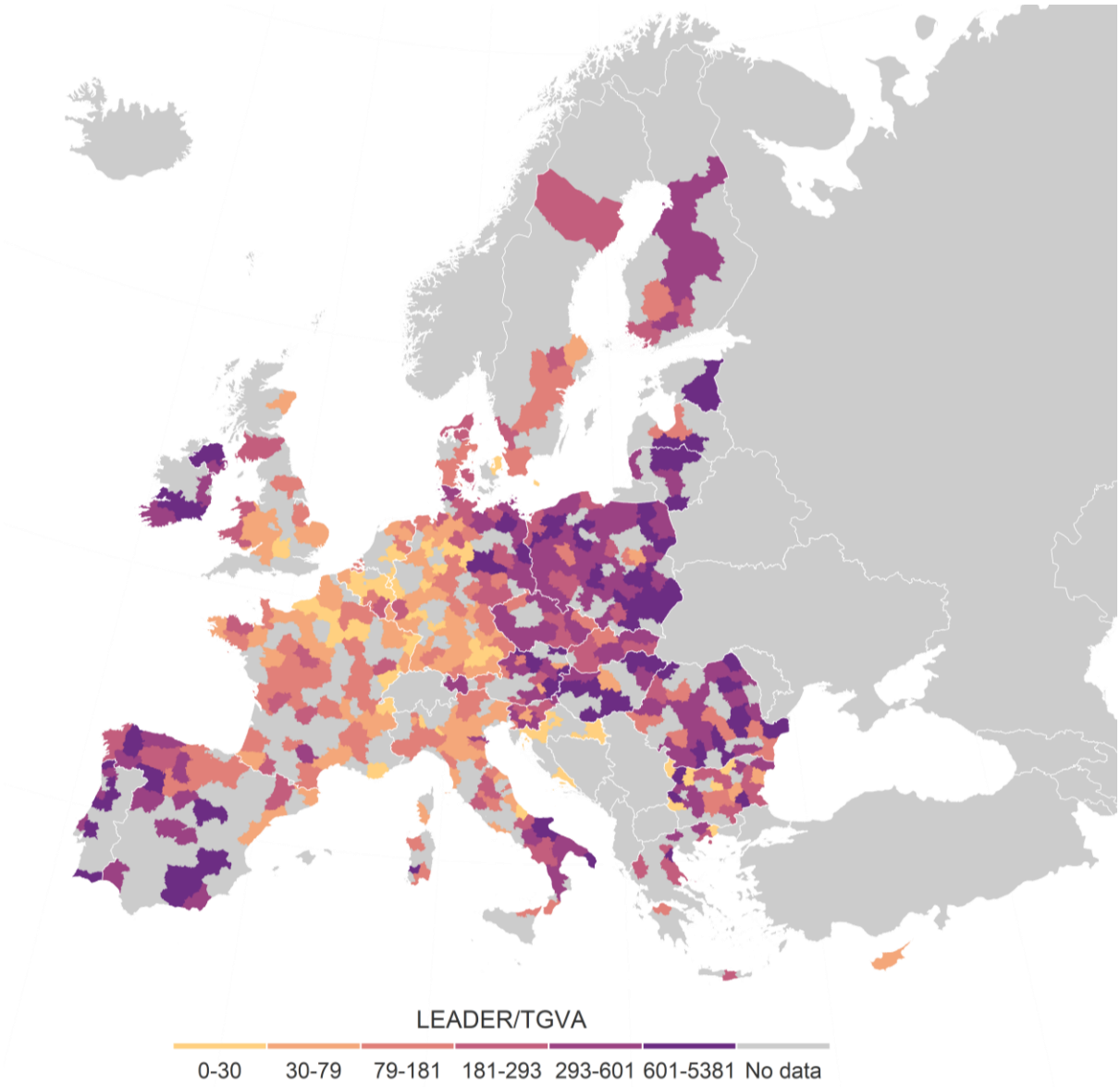
** LEADER intensity measured as total LEADER spendings divided by the sum of total GVA of three years pre policy*

Appendix 9 - Heatmap: LEADER intensity for cities*



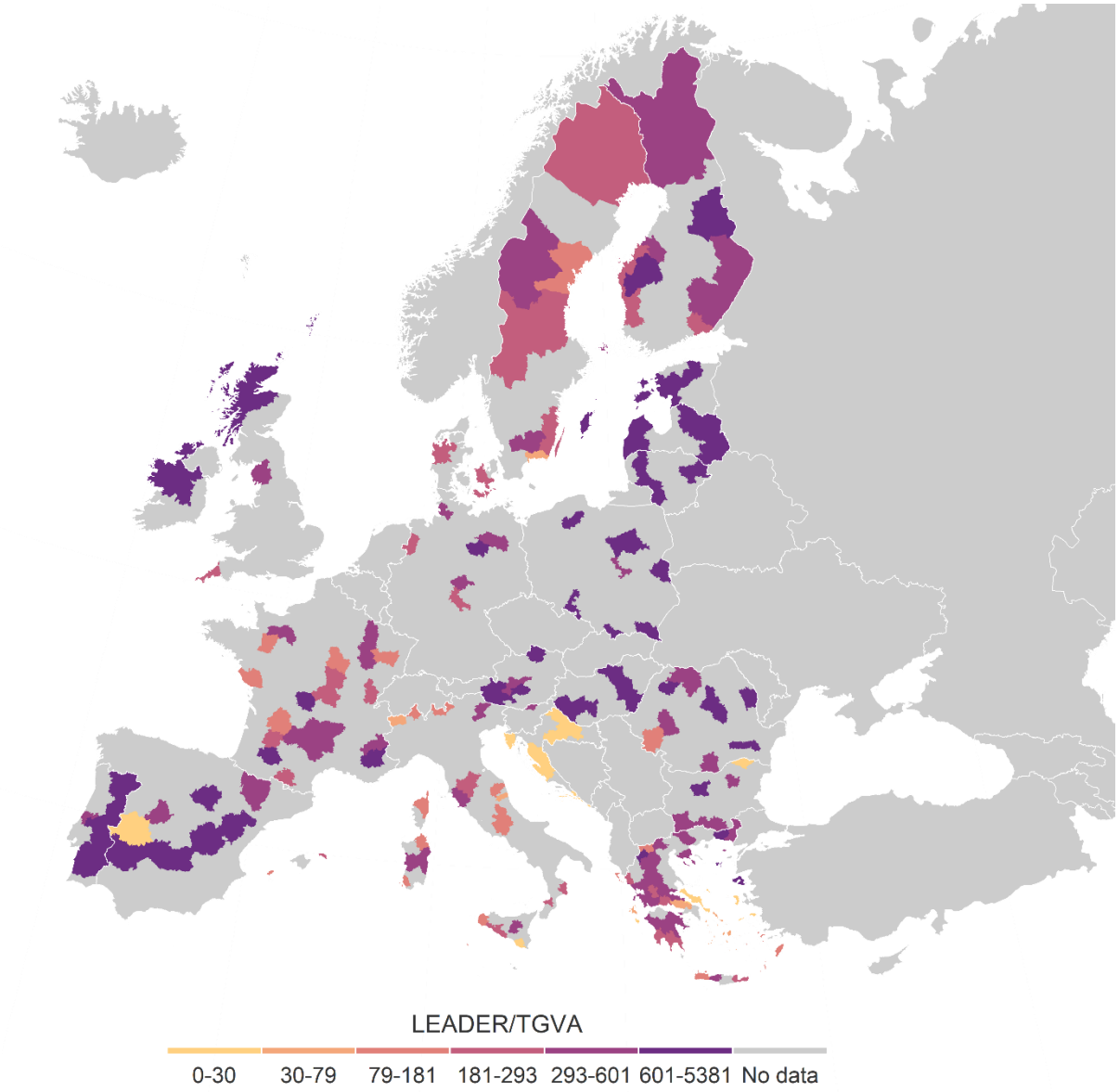
** LEADER intensity measured as total LEADER spendings divided by the sum of total GVA of three years pre policy*

Appendix 10 - Heatmap: LEADER intensity for regions close to cities*



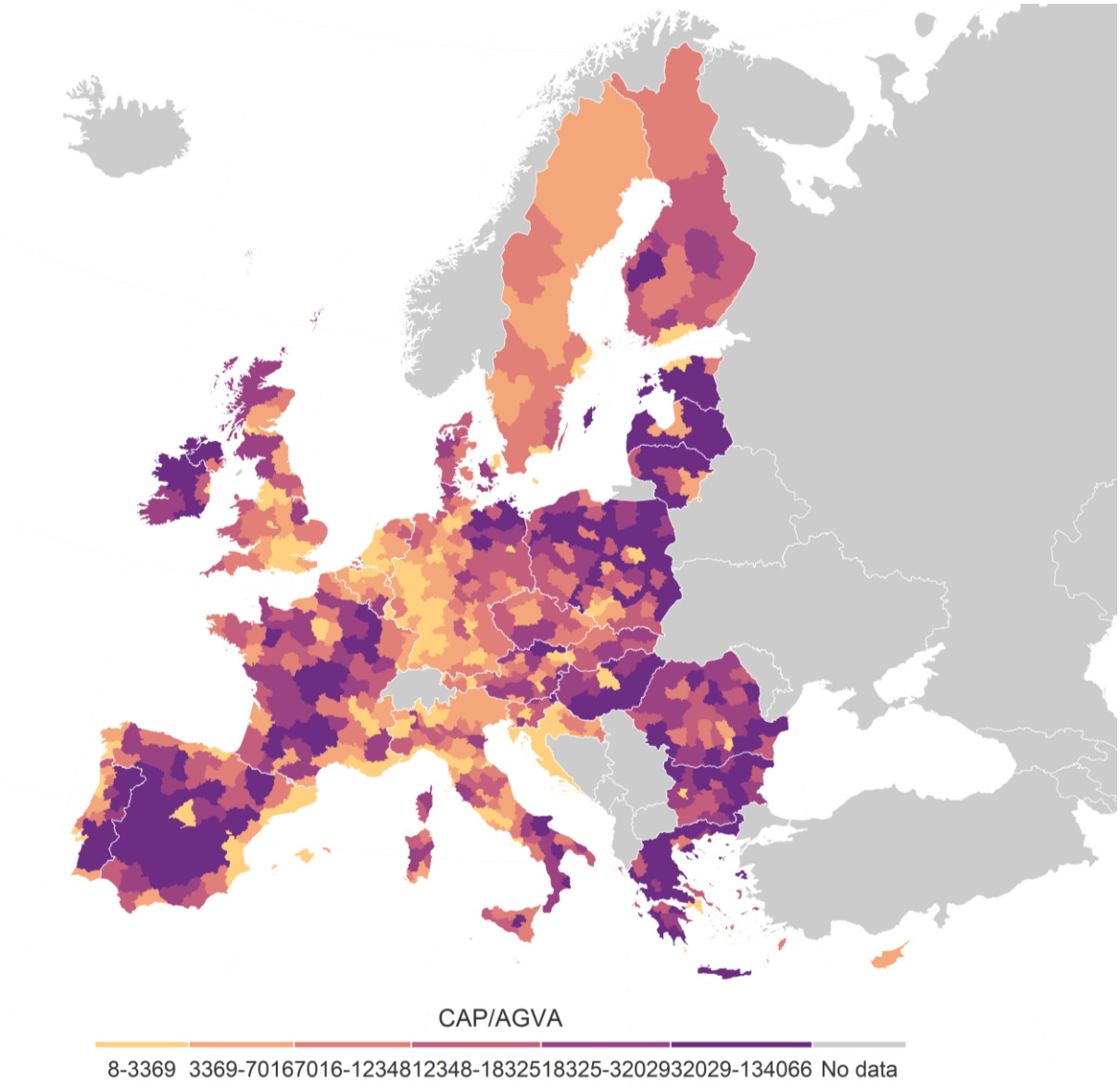
** LEADER intensity measured as total LEADER spendings divided by the sum of total GVA of three years pre policy*

Appendix 11 - Heatmap: LEADER intensity for remote regions



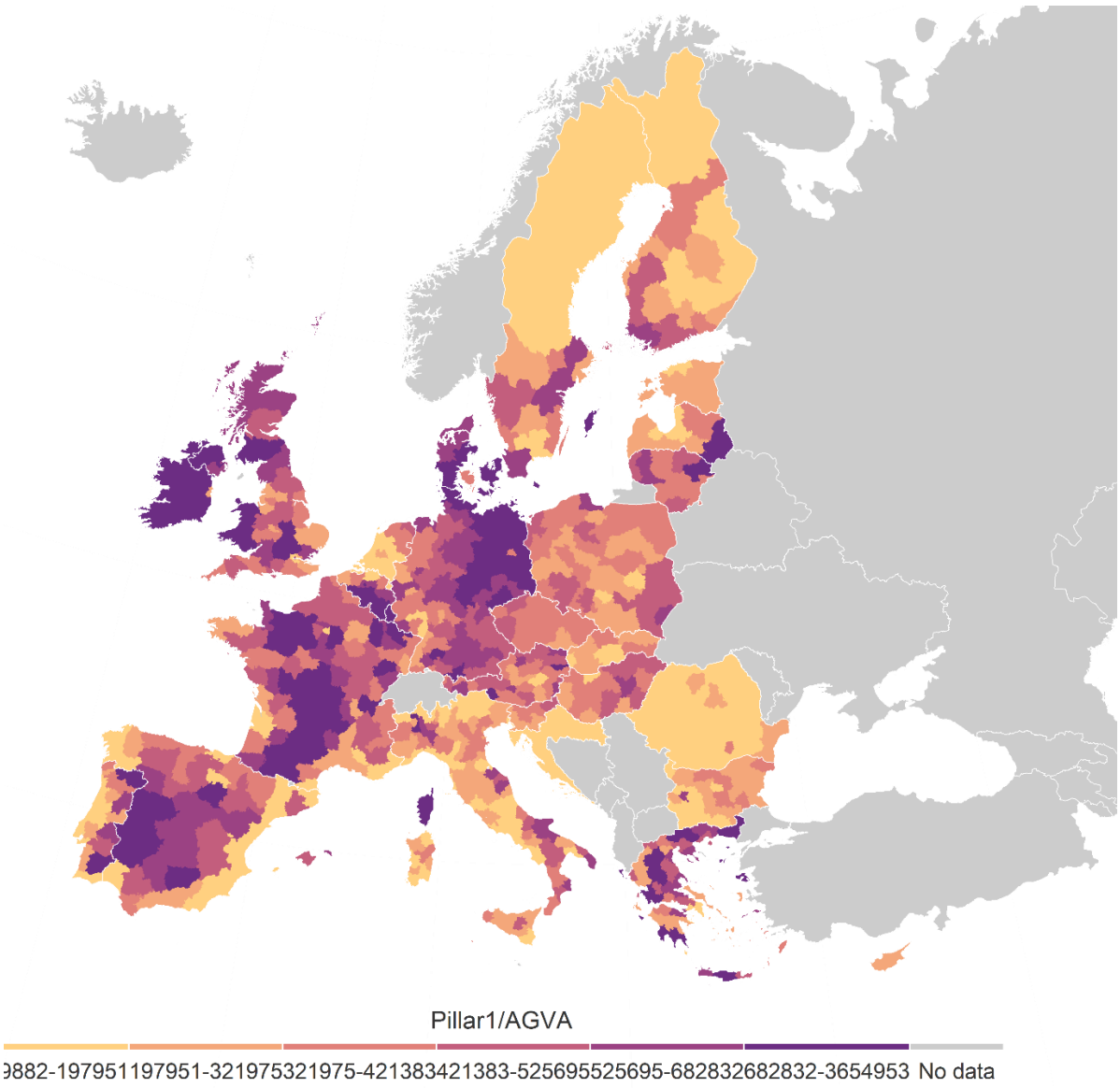
** LEADER intensity measured as total LEADER spendings divided by the sum of total GVA of three years pre policy*

Appendix 12 - Heatmap: CAP intensity for all NUTS3 regions*



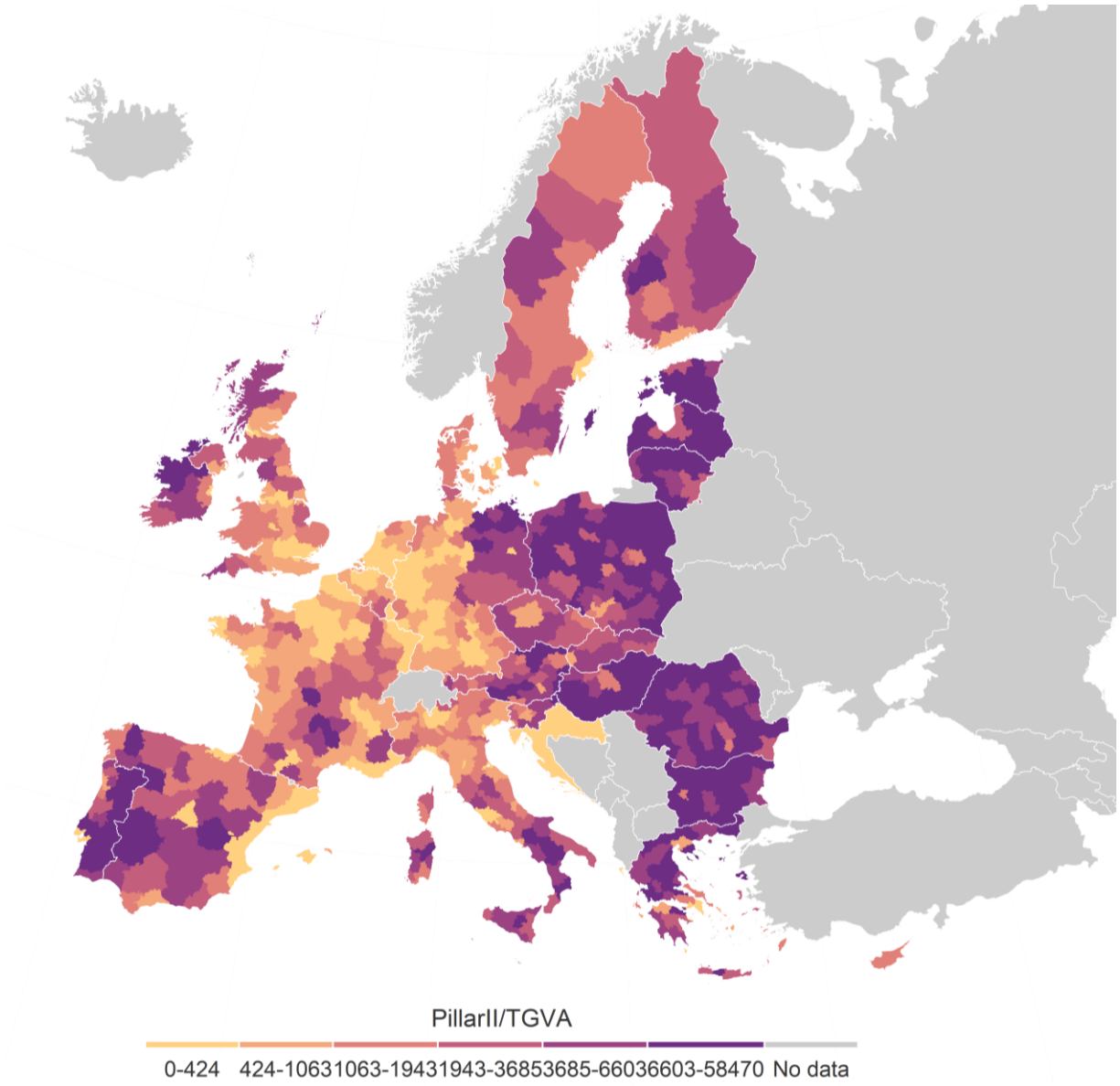
** LEADER intensity measured as total LEADER spendings divided by the sum of agricultural GVA of three years pre policy*

Appendix 13 - Heatmap: Pillar I intensity for all NUTS3 regions*



** LEADER intensity measured as total LEADER spendings divided by the sum of agricultural GVA of three years pre policy*

Appendix 14 - Heatmap: Pillar II intensity for all NUTS3 regions*



** LEADER intensity measured as total LEADER spendings divided by the sum of total GVA of three years pre policy*

Appendix 15 - Characterization binary treatment

Dataset	Threshold (LEADER/TGVA)	N	
		Treated	Control
796 NUTS3 regions	0	33	736
796 NUTS3 regions	52.13	198	598

** LEADER intensity measured as total LEADER spendings divided by the sum of total GVA of three years pre policy*

Appendix 16 - Covariates Difference in Means pre matching*

Pre-treatment covariate	Treatment Group	Control Group	Difference	P-value	
Population Density	144	770	**-627**	**0.00**	***
	9.275	*95.201*			
Share Agricultural GVA	0.050	0.025	**0.026**	**0.00**	***
	0.002	*0.003*			
Agricultural Labor Productivity	0.557	0.546	0.011	0.62	
	0.011	*0.019*			
GDP per capita	20075	27438	**-7363**	**0.00**	***
	302	*735*			
Lagged Agri GVA growth rate pre policy	0.124	0.059	**0.065**	**0.00**	***
	0.007	*0.011*			
Lagged Total Emplyoment growth rate pre policy	-0.005	-0.003	-0.002	0.35	
	0.001	*0.002*			

* (*standard errors in italics, significance levels 0 "***", 0,001 "**", 0,01 "*", 0,05 "."), *(standard errors in italics)*

10.2. Appendix Hannah Wille

Appendix 17 - Cleaning dataset

The quality of the obtained firm-level data is highly dependent on the origin country of the company, for most countries the variables of interest (sales, cost of employees, number of employees, and total assets) are poorly reported. Only seven countries (Belgium, Portugal, Romania, Latvia, Sweden, Spain, and Croatia) contain data that can be used in the statistical analysis. Resulting in a dataset with 34 506 companies, Table underneath provides an overview of the number of companies per country. In the next step, the entity type of the companies was controlled. Resulting in a dataset with 31 195 companies, since all firms without an entity type given, or the entity type being a foundation, insurance company, pension fund, and public authority were eliminated. Additionally, the NUTS3 location must be available for the company, and in the case of Portugal companies must be situated on the mainland, consequently, 1 094 companies were deleted resulting in a dataset of 30101 companies.

Country	**Amount of companies**
Belgium	10763
Spain	2240
Croatia	105
Latvia	381
Portugal	11738
Romania	7976
Sweden	1303
Total	34506

Appendix 18 - Overview NACE rev. 2 sections

Section	**Title**
A	Agriculture, forestry and fishing
B	Mining and quarrying
C	Manufacturing
D	Electricity, gas, steam and air conditioning supply
E	Water supply; sewerage, waste management and remediation activities
F	Construction
G	Wholesale and retail trade; repair of motor vehicles and motorcycles
H	Transportation and storage
I	Accommodation and food service activities
J	Information and communication
K	Financial and insurance activities
L	Real estate activities
M	Professional, scientific and technical activities
N	Administrative and support service activities
O	Public administration and defence; compulsory social security
P	Education
Q	Human health and social work activities
R	Arts, entertainment and recreation
S	Other service activities
T	Activities of households as employers undifferentiated goods- and services-producing activities of household for own use
U	Activities of extraterritorial organisations and bodies

Appendix 19 - Overview NACE rev. 2 classification section A and I

SECTION A: AGRICULTURE, FORESTRYAND FISHING

	Group	Class	
1			Crop and animal production, hunting and related service activities
	01.1		Growing of non-perennial crops
		01.11	Growing of cereals (except rice), leguminous crops and oil seeds
		01.12	Growing of rice
		01.13	Growing of vegetables and melons, roots and tubers
		01.14	Growing of sugar cane
		01.15	Growing of tobacco
		01.16	Growing of fibre crops
		01.19	Growing of other non-perennial crops
	01.2		Growing of perennial crops
		01.21	Growing of grapes
		01.22	Growing of tropical and subtropical fruits
		01.23	Growing of citrus fruits
		01.24	Growing of pome fruits and stone fruits
		01.25	Growing of other tree and bush fruits and nuts
		01.26	Growing of oleaginous fruits
		01.27	Growing of beverage crops
		01.28	Growing of spices, aromatic, drug and pharmaceutical crops
		01.29	Growing of other perennial crops
	01.3		Plant propagation
		01.30	Plant propagation
	01.4		Animal production
		01.41	Raising of dairycattle
		01.42	Raising of other cattle and buffaloes
		01.43	Raising of horses and other equines
		01.44	Raising of camels and camelids
		01.45	Raising of sheep and goats
		01.46	Raising of swine/pigs
		01.47	Raising of poultry
		01.49	Raising of other animals
	01.5		Mixed farming
		01.50	Mixed farming
	01.6		Support activities to agriculture and post-harvest crop activities
		01.61	Support activities for crop production
		01.62	Support activities for animal production
		01.63	Post-harvest crop activities
		01.64	Seed processing for propagation
	01.7		Hunting, trapping and related service activities
		01.70	Hunting, trapping and related service activities
2			Forestry and logging
	02.1		Silviculture and other forestry activities

		02.10	Silviculture and other forestry activities
	02.2		Logging
		02.20	Logging
	02.3		Gathering of wild growing non-wood products
		02.30	Gathering of wild growing non-wood products
	02.4		Support services to forestry
		02.40	Support services to forestry
3			Fishing and aquaculture
	03.1		Fishing
		03.11	Marine fishing
		03.12	Freshwater fishing
	03.2		Aquaculture
		03.21	Marine aquaculture
		03.22	Freshwater aquaculture

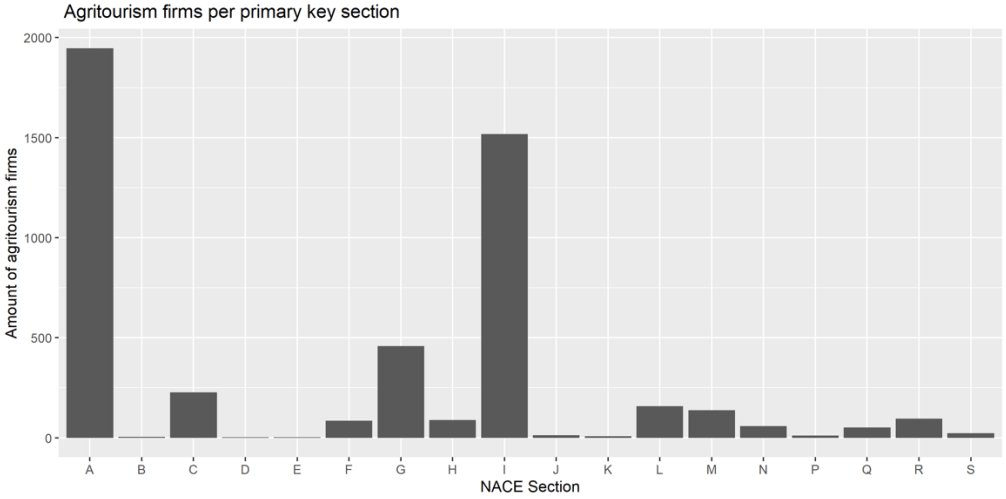
SECTION I: ACCOMMODATION AND FOOD SERVICE ACTIVITIES

	Group	**Class**	
55			Accommodation
	55.1		Hotels and similar accommodation
		55.10	Hotels and similar accommodation
	55.2		Holiday and other short-stay accommodation
		55.20	Holiday and other short-stay accommodation
	55.3		Camping grounds, recreational vehicle parks and trailer parks
		55.30	Camping grounds, recreational vehicle parks and trailer parks
	55.9		Other accommodation
		55.90	Other accommodation
56			Food and beverage service activities
	56.1		Restaurants and mobile food service activities
		56.10	Restaurants and mobile food service activities
	56.2		Event catering and other food service activities
		56.21	Event catering activities
		56.29	Other food service activities
	56.3		Beverage serving activities
		56.30	Beverage serving activities

Appendix 20 - Amount of agritourism firms per country

Country	Amount of agritourism companies
Belgium	705
Spain	145
Croatia	29
Latvia	113
Portugal	2994
Romania	877
Sweden	24
Total	4887

Appendix 21 - Agritourism firms per primary key section



Appendix 22 - Aggregation of the firm-level dataset to regional level

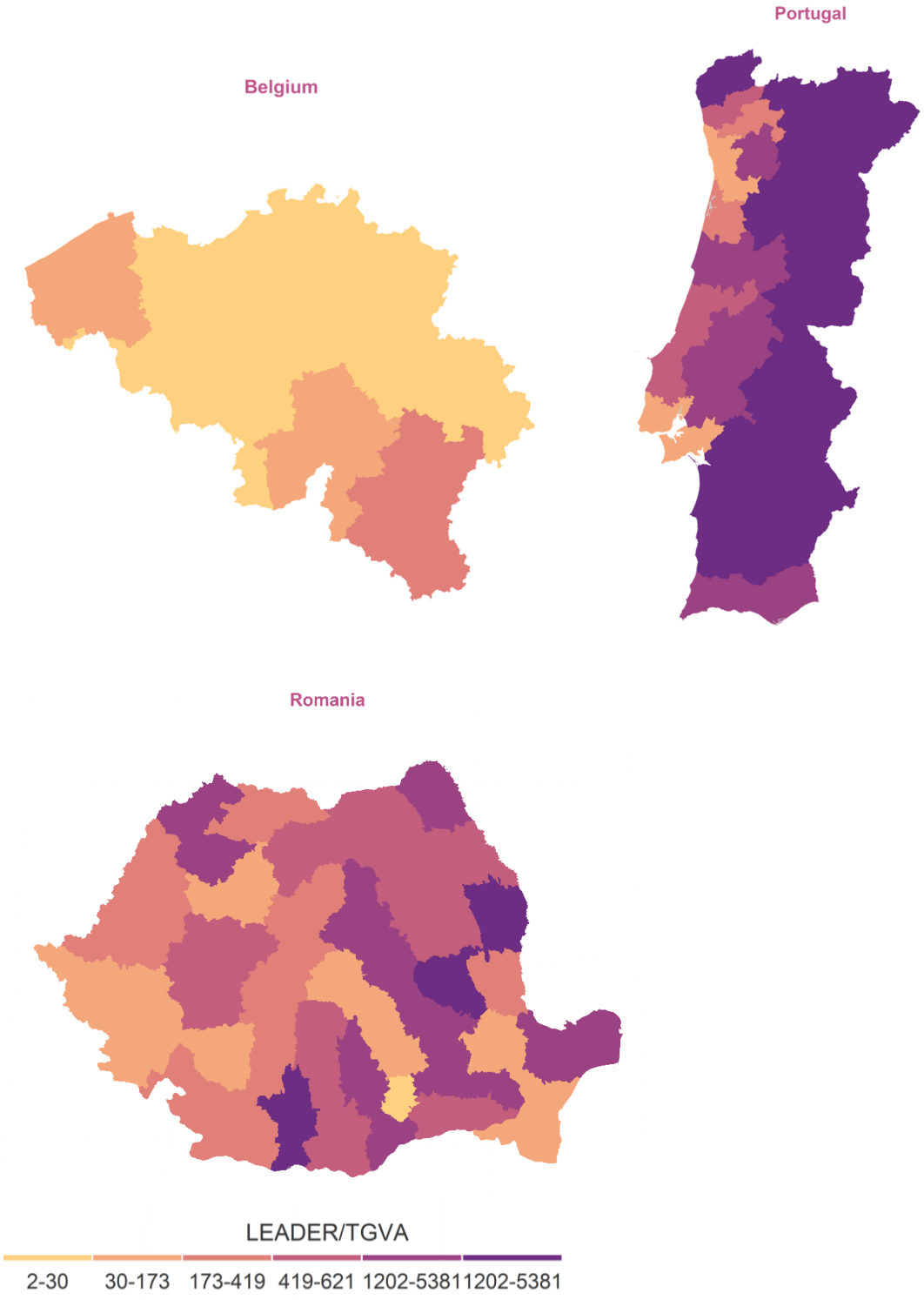
The 4576 companies are located in 107 different NUTS3 regions within Belgium, Portugal, and Romania but aggregating the data for these regions would not make sense. This is since the provided database of JRC combined some regions due to the MAUP, and only contains data for 75 NUTS3 regions. So, first, each company is being allocated to one of those 75 NUTS regions, by making use of the reclass data provided by JRC. For each outcome variable, the data is summed per region, this is only for firms that have data for both years needed to calculate the growth rates. Thus for the period 2011-2016, only firms containing data in 2011 and 2016 were used. So, for each period of interest and outcome variable, a different amount of firms were used to aggregate the level to the NUTS3 regions. The table represents the number of firms used. Afterward, the growth rates for the different periods of interest were calculated.

Variable	**N (# agritourism firms)**
Sales 2011- 2016	1167
Sales 2011 - 2017	1163
Sales 2011 - 2018	1149
Cost of employees 2011- 2016	1044
Cost of employees 2011 - 2017	1036
Cost of employees 2011 - 2018	1019
Employees 2011- 2016	1184
Employees 2011 - 2017	1175
Employees 2011 - 2018	1173
Total assets 2011- 2016	1713
Total assets 2011 - 2017	1700
Total assets 2011 - 2018	1675

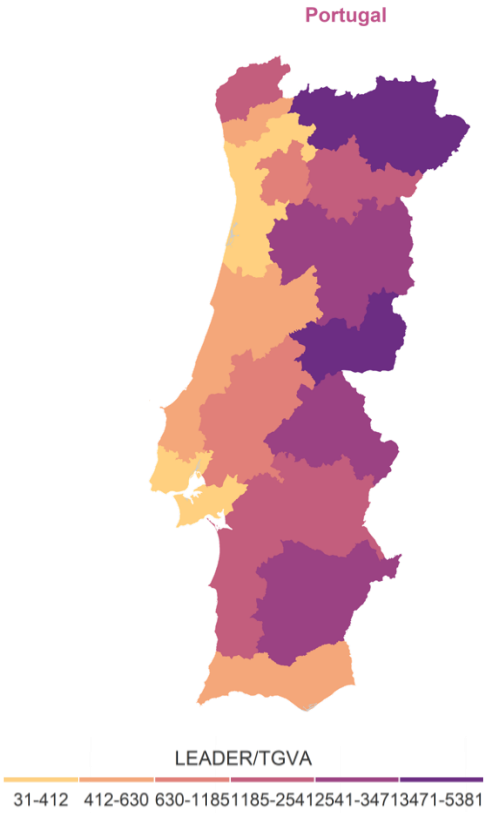
Appendix 23 - Binary treatment thresholds for both samples

Dataset	**Threshold (LEADER/TGVA)**	**N**	
		Treated	**Control**
Belgium & Portugal & Romania	170.68	56	19
Portugal	502.96	17	6

Appendix 24 - Heatmaps LEADER intensity sample 1



Appendix 25 - Heatmap LEADER intensity sample 2



Appendix 26 - Difference in means t-test regional level

	Belgium & Portugal & Romania					Portugal				
	Binary treatment					Binary treatment				
Variable	Ti = 1	Ti = 0	Δ	P-value	N	Ti = 1	Ti = 0	Δ	P-value	N
Sales 2011- 2016	50.389	21.749	28.640	0.131	73	46.968	50.758	-3.790	0.904	23
	11.867	*6.217*				*13.706*	*13.362*			
Sales 2011 - 2017	82.622	30.82	**82.591**	0.057 .	72	76.388	74.892	1.496	0.967	23
	30.820	*5.832*				*17.136*	*15.128*			
Sales 2011 - 2018	106.184	27.759	**78.425**	0.041 *	71	82.797	104.963	-22.166	0.687	23
	31.848	*4.938*				*19.295*	*24.486*			
Cost of employees 2011- 2016	104.607	54.579	50.028	0.374	71	30.559	26.056	4.503	0.795	23
	42.696	*12.802*				*5.474*	*3.715*			
Cost of employees 2011 - 2017	128.578	53.657	74.921	0.2199	71	51.786	40.754	11.032	0.577	23
	50.238	*7.333*				*5.907*	*4.353*			
Cost of employees 2011 - 2018	154.272	66.371	87.901	0.188	71	64.454	65.343	-0.889	0.976	23
	62.507	*12.136*				*13.819*	*24.580*			
Employees 2011- 2016	10.978	34.183	-23.205	0.395	71	18.315	28.414	-10.099	0.528	23
	7.260	*25.627*				*8.441*	*14.592*			
Employees 2011 - 2017	10.649	25.361	-14.712	0.356	71	30.698	32.731	-2.033	0.906	23
	6.778	*13.976*				*9.372*	*13.888*			
Employees 2011 - 2018	13.721	18.170	-4.449	0.734	71	41.621	38.640	2.981	0.8627	23
	7.086	*10.651*				*10.345*	*13.308*			
Total assets 2011- 2016	28.524	34.458	-5.934	0.664	75	37.932	59.690	-21.758	0.316	23
	6.431	*11.903*				*8.546*	*18.330*			
Total assets 2011 - 2017	65.075	41.445	23.630	0.465	75	42.037	77.127	-35.090	0.207	23
	28.773	*13.829*				*9.257*	*23.327*			
Total assets 2011 - 2018	84.412	56.690	27.722	0.45	75	50.861	100.730	-49.869	0.169	23
	32.631	*15.690*				*10.273*	*30.349*			

Appendix 27 - Difference in means t-test firm-level

	Belgium & Portugal & Romania					Portugal				
	Binary treatment					Binary treatment				
Variable	Ti = 1	Ti = 0	Δ	P-value	N	Ti = 1	Ti = 0	Δ	P-value	N
Sales 2011- 2016	982.4	179.54	**802.86**	**0.08 .**	1122	870.67	1818.99	-948.32	0.545	788
	399.58	*20.76*				*350.690*	*785,462*			
Sales 2011 - 2017	1233.83	219.87	**1013.96**	**0.04 ***	1120	1174.69	2046.36	-871.67	0.613	783
	440.61	*24.17*				*856.871*	*400.369*			
Sales 2011 - 2018	1217.19	218.96	**998.23**	**0.06 .**	1108	1469.96	1352.84	117.12	0.921	776
	471.04	*23.11*				*397.808*	*533.785*			
Cost of employees 2011- 2016	877.54	435.15	442.39	0.38	1044	1053.06	633.742	419.318	0.559	716
	352.67	*147.1*				*499.462*	*216.274*			
Cost of employees 2011 - 2017	946.37	8143.35	-7197	0.35	1036	1080.65	11814.76	-10734.11	0.334	712
	318.28	*3974.4*				*438.6*	*5779.52*			
Cost of employees 2011 - 2018	1049.55	13393.6	-12344	0.34	1019	1104.78	19267.44	-18162.66	0.331	713
	312.24	*6749.53*				*397.008*	*9673.78*			
Employees 2011- 2016	45.76	34.48	11.28	0.56	1076	58.286	56.844	1.442	0.931	745
	5.83	*9.28*				*6.996*	*7.681*			
Employees 2011 - 2017	53.82	46.45	7.37	0.64	1068	73.685	72.806	0.879	0.965	737
	7.06	*6.96*				*9.391*	*8.783*			
Employees 2011 - 2018	70.47	44.34	26.13	0.13	1069	87.063	100.493	-13.430	0.65	739
	8.63	*7.22*				*9.848*	*14.274*			
Total assets 2011- 2016	604.21	177.25	**426.96**	**0.02**	1713	670.221	341.757	328.464	0.222	1058
	144.28	*44.75*				*206.481*	*60.292*			
Total assets 2011 - 2017	886.04	206.53	**679.51**	**0.03**	1697	826.863	379.445	447.418	0.212	1044
	240.37	*52.49*				*288.527*	*60.592*			
Total assets 2011 - 2018	1353.12	704.47	648.65	0.31	1672	980.895	539.034	441.861	0.368	1029
	431.5	*212.03*				*385.813*	*97.849*			

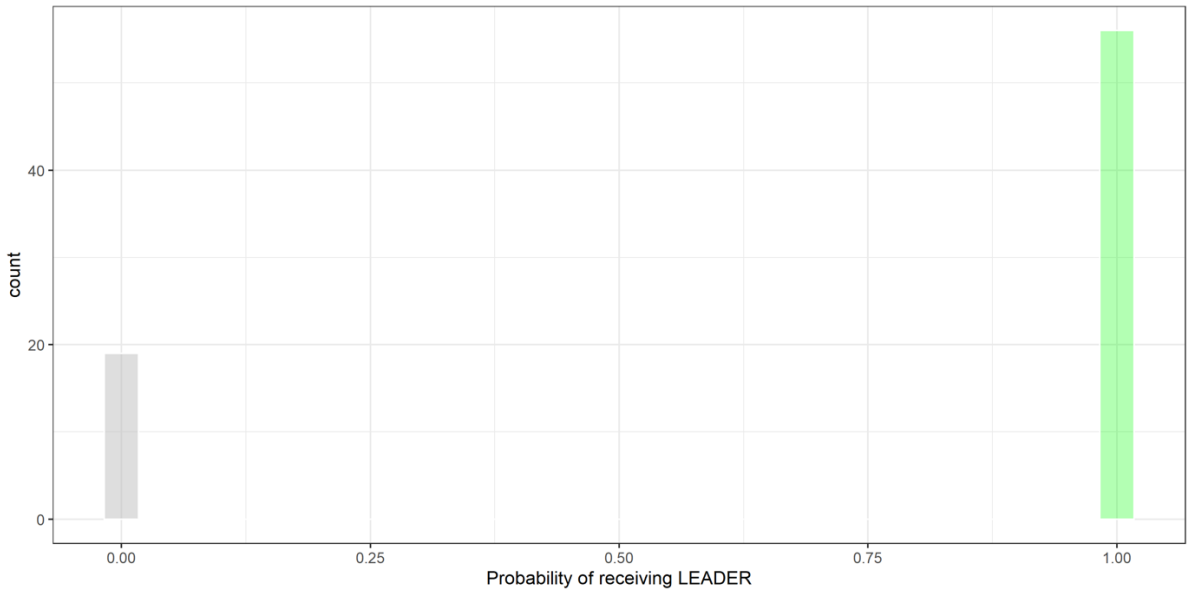
Appendix 28 - CBPS models

Variables	Belgium & Portugal & Romania Estimate / *Standard error*	P-Value		Portugal Estimate / *Standard error*	P-Value	
(Intercept)	1210	0	***	446	0	***
	0.066			*1.3*		
Population Density	-0.432	1		-0.508	1	
	301000			*1220000*		
Close to City	-222	0	***	-324	0	***
	0.034			*0.07*		
Remote	135	0	***	-316	0	***
	0.016			*0.016*		
New Member State	-249	0	***			
	0.013					
Share of Agriculture in GVA	-2070	0	***	-1530	0	***
	0			*0.012*		
Agricultural Labor Productivity	177	0	***	189	0	***
	0			*0.215*		
GDP per capita	-0.046	1		-0.003	1	
	131000			*134000*		
Lagged Agri GVA growth rate pre policy	189	0	***	-684	0	***
	0			*0.004*		
Lagged Total Emplyoment growth rate pre policy	132	0	***	2130	0	***
	0			*0*		

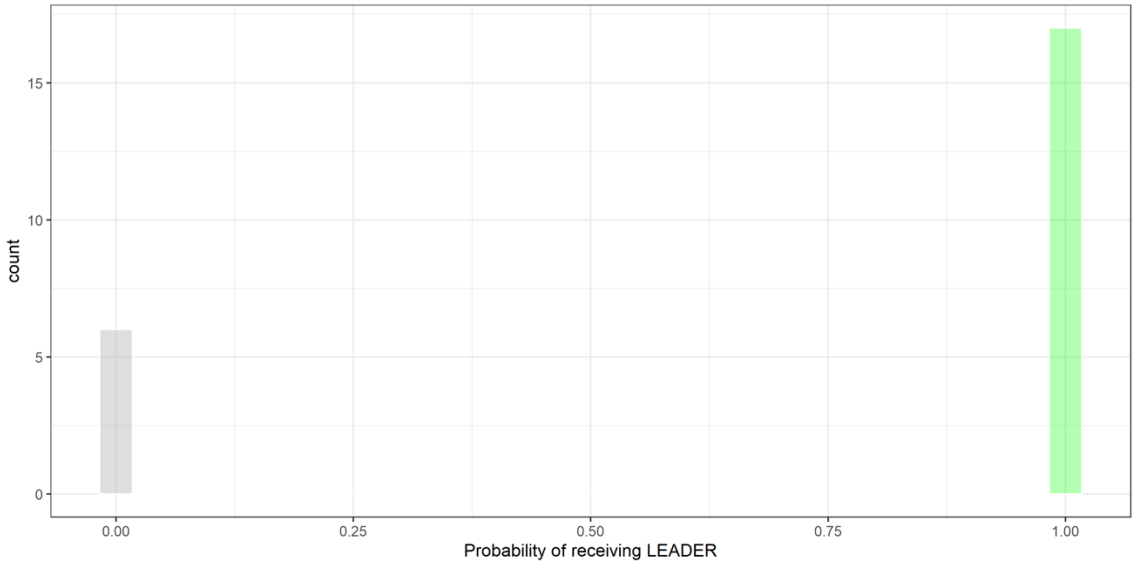
Appendix 29 - Balance for matched datasets

Variables	Belgium & Portugal & Romania Treatment Group Means	Control Group Means	Std. Mean Difference	Portugal Treatment Group Means	Control Group Means	Std. Mean Difference
Distance	1.000	0	2.284	1.000	0	2.227
Population Density	110.661	1063,358	-15.471	90.323	467392.00	-6.619
City	0	0.263	-1.055	0	0.333	-1.183
Close to City	0.526	0.737	-0.435	0.5	0.737	-0.348
Remote	0.474	0	0.978	0.5	0	0.978
New Member State	0	0.3684	-0.754			
Share of Agriculture in GVA	0.0373	0.029	0.151	0.0379	0.02	0.687
Agricultural Labor Productivity	0.216	0.461	-1.349	0.216	0.461	0
GDP per capita	16949.32	25296.46	-1.949	15008.35	18716.00	-1.104
Lagged Agri GVA growth rate pre policy	-0.085	0.046	-0.579	-0.097	-0.079	-0.516
Lagged Total Emplyoment growth rate pre policy	0.014	-0.002	-0.267	-0.018	-0.018	0.036

Appendix 30 - Common support sample 1



Appendix 31 - Common support sample 2



Appendix 32 - Characterization matching datasets sample 1

NUTS3 level	Control	Treated
All	19	56
Matched	19	19
Unmatched	0	37

Firm level	Control	Treated	Total
All	1465	3111	4576
Matched	1465	2022	3487
Unmatched	0	1089	

Appendix 33 - Characterization matching datasets sample 2

NUTS3 level	Control	Treated
All	6	17
Matched	6	6
Unmatched	0	11

Firm level	Control	Treated	Total
All	890	2104	2994
Matched	890	881	1771
Unmatched	0	1223	

Appendix 34 - Average treatment effect regional level

	Belgium & Portugal & Romania			**Portugal**	
Variable (% growth rates)	Estimate *Standard Error*	P-Value		Estimate *Standard Error*	P-Value
Sales 2011- 2016	0.448 *0.2334*	**0.064**	.	45.780 *49.937*	0.386
Sales 2011 - 2017	0.645 *0.257*	**0.0172**	*	0.383 *0.522*	0.485
Sales 2011 - 2018	0.823 *0.28*	**0.006**	**	0.361 *0.724*	0.631
Cost of employees 2011- 2016	-6.854 *0.306*	0.823		34.534 *34.172*	0.342
Cost of employees 2011 - 2017	4.734 *0.208*	0.822		57.115 *34.919*	0.141
Cost of employees 2011 - 2018	7.446 *0.208*	0.722		63.520 *47.967*	0.22
Employees 2011- 2016	6.124 *0.304*	0.842		0.110 *0.278*	0.703
Employees 2011 - 2017	0.174 *0.190*	0.366		0.258 *0.264*	0.357
Employees 2011 - 2018	0.326 *0.159*	**0.048**	*	0.39 *0.275*	0.194
Total assets 2011- 2016	0.209 *0.172*	0.232		-0.159 *0.312*	0.623
Total assets 2011 - 2017	0.241 *0.201*	0.238		-0.298 *0.388*	0.465
Total assets 2011 - 2018	0.214 *0.235*	0.37		-0.384 *0.48*	0.447

Appendix 35 - Average treatment effect firm-level

	Belgium & Portugal & Romania			**Portugal**	
Variable (% growth rates)	Estimate *Standard Error*	P-Value		Estimate *Standard Error*	P-Value
Sales 2011- 2016	1163.24 *1031*	0.26		-2093.57 *1840.48*	0.256
Sales 2011 - 2017	1603.53 *1161.17*	0.167		-1626.47 *2080.79*	0.435
Sales 2011 - 2018	1090.48 *646.065*	**0.091**	.	-1485.34 *1124.33*	0.187
Cost of employees 2011- 2016	1321.52 *1013.82*	0.193		-605.033 *603.596*	0.317
Cost of employees 2011 - 2017	-6940.82 *6886.51*	0.314		-9728.44 *13674.6*	0.477
Cost of employees 2011 - 2018	-12334.1 *11503.49*	0.284		-16111.82 *22968.34*	0.483
Employees 2011- 2016	43.300 *20.444*	**0.034**	*	0.665 *22.375*	0.976
Employees 2011 - 2017	30.502 *17745.000*	**0.086**	.	5.468 *256.42*	0.831
Employees 2011 - 2018	59.839 *22.788*	**0.008**	**	-8.400 *38.388*	0.827
Total assets 2011- 2016	796.518 *356.542*	**0.025**	*	764.412 *756.463*	0.313
Total assets 2011 - 2017	1001.34 *489.206*	**0.041**	*	1200.76 *1075.38*	0.265
Total assets 2011 - 2018	1039.71 *746.204*	0.164		1562.03 *1442.01*	0.279