PERCEIVE project - Deliverable D6.1 "Report on causal qualitative model"

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PERCEIVE
Perception and Evaluation of Regional and Cohesion Policies by Europeans and Identification with the Values of Europe

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PERCEIVE

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Deliverable 6.1

'Report on causal qualitative model'

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Table of contents

Executive summary

The scope of the Deliverable 6.1 is to introduce the causal qualitative model developed in the context of the PERCEIVE project, as a part of the Working Package 6. The report begins with a short introduction that highlights the necessity of developing a model for simulating: (*i*) the manner in which the European Cohesion Policy funds are distributed among the regions under study and the factors that affect the related absorption, along with the (*ii*) the diverse streams of communication of the European Cohesion Policy projects and outcomes that influence the citizens awareness. The analysis of the system is focused on the EU structural funds, namely the European Regional Development Fund (ERDF) and the European Social Fund (ESF) during the two previous programming periods (i.e. 2000-2006, 2007-2013). In fact, the ***multi-level nature*** of the system (i.e. EU, regions, beneficiaries), the ***dynamic behaviour*** over the programming periods, as well as the ***complexity*** reflected through the multiple intertwined feedback loops render the System Dynamics methodology as the appropriate approach to map and model the system under study. Thus, we briefly present the basic elements and procedures of System Dynamics technique.

Before the analysis of the qualitative model, we present in time graphs all the collected real data that capture the behaviour of the regional EU structural funds' absorption and the related citizens' awareness. The aim of these graphs is to investigate the dynamic properties of the data under study, as well as the patterns that occur in different regions (or nations), different programming periods and different EU funds. We refer to these time graphs as ***reference modes*** since they represent the reference to the problem issue we want to address with the simulation study.

Concerning absorption, we retrieved the data from internal EU communication and reports. In case no regional data were available, we used regionalised national data. The regions under study demonstrate considerable variations in the absorption efficiency for a specific fund and period, even in the case of regions in the same country (e.g. In Italy, Emilia Romagna exhibits a better absorption rate that Calabria). Of course, in such a comparison, we need to consider that the amount of funds allocated and, thus, the administrative capacity to govern fund allocation, varies considerably among regions. Investigating each region separately, notable disparities are also evident between the programming periods in the same region. In addition, the ERDF absorption rates are slightly higher compared with the ESF ones.

Regarding awareness, we retrieved data from the available EU Eurobarometer reports and the survey performed in the context of the PERCEIVE project (i.e. Deliverable 1.2). National awareness exhibits different behaviours, mainly constant and decreasing ones, unlike the increasing trend that was theoretically expected. Furthermore, the reported figures document significant discrepancies between the

different sources of data, probably due to the different nature of the questions asked to the citizens and different weights used to ponder the regional and national sample of respondents.

Focusing on the causal modelling process, the system under study is divided into two subsystems, namely: (*i*) the ***fund absorption*** system, and (*ii*) the ***general public awareness*** system. The first system describes the mechanisms of EU structural funds management, while the latter focuses on the processes that underpin the building of awareness about the EU role in the cohesion policy projects implemented in their region. Notably, the two systems are interconnected, as the outputs of the one constitute the inputs of the other and vice versa.

The fund absorption system, which reflects the main flow of European Cohesion Policy funds from the EU to the regions, is comprised of four (4) major interrelated feedback loops exist in the system, namely: (*i*) the "local managing authority learning" loop, (*ii*) the "potential applications" loop, (*iii*) the "word of mouth" loop, and (*iv*) the "strategies to increase absorption rate" loop. Each loop illustrates a cycle of causal relationships, meaning that an initial variable has a circular impact on a sequence of other variables leading again to an effect on the initial one. More specifically, loop (*i*) indicates the local managing authorities' ability to improve skills and increase performance in order to deal with the workload of projects submitted. Loop (*ii*) presents the local managing authorities' ability (gained from experience from successful projects' implementation) to write high quality calls attracting more potential beneficiaries to apply. Loop (*iii*) represents the process of increasing the number of applicants through the communication of structural funds opportunity to potential beneficiaries by the beneficiaries already refunded. Finally, loop (*iv*) depicts the two strategies a local managing authority with a significant absorption gap can implement, either by lowering its acceptance standards or by funding projects already funded within the EU framework that are easily selectable for additional funds.

The general public awareness system, which reflects the main streams of information that impact the European citizens' awareness about EU structural funds (i.e. ERDF, ESF). In the context of the PERCEIVE project, a person is considered aware if she/he has heard about any EU co-financed project that improves the area where they live. To the best of our knowledge, this is a first effort to produce a comprehensive map of the factors that influence citizens' awareness. We analysed four main streams of information that affect citizens' awareness. Namely: (*i*) the "EU direct" stream, (*ii*) the "local managing authority" stream, (*iii*) the "media" stream, and (*iv*) the "funded projects implemented" stream. More specifically, stream (*i*) indicates the tools EU directly puts in place to inform citizens: EU Direct local agencies and EU media campaigns. Stream (*ii*) reports the efforts made by local managing authorities to inform citizens through media campaigns. Stream (*iii*) takes into consideration all the people that might be informed by media discussions

on European Cohesion Policy and the relevant funded projects. In the end, stream (*iv*) deconstructs the whole set of possibilities of projects implemented that can foster awareness of EU role in supporting regional development.

1. Introduction

The 1988 reforms of cohesion policies, Yesilkagit and Blom-Hansen suggest (2007: 503-504), brought about a turning point by decentralizing decision-making from the Commission to member states and by introducing the partnership principle, according to which the planning, decision-making and implementation of cohesion policy must be made in close consultation with subnational authorities and interest organizations. To ensure that funds of cohesion policy are spent judiciously, institutional, governance and behavioural issues need to be addressed. Despite the issue of absorption is still relevant, there has been a notable shift in emphasis of discussions within the cohesion policy area away from issues of absorption and towards issues of efficiency and effectiveness (McCann, 2015: 69). Our modelling exercise addresses the issue of "efficiency and effectiveness" in cohesion fund spending. Specifically, we address three challenges.

First, recent evidence suggests that there are still important governance and distributional issues facing the policy that need to be overcome in order to reduce the heterogeneity of the policy impacts at the local level and many of these also relate to multi-level governance challenges (McCann, 2015: 69).

Second, subnational authorities and interest organizations need to collaborate with the Commission and national executives in the design and implementation of cohesion policy (Hooghe 1996; Yesilkagit and Blom-Hansen, 2007).

Third, "…regions with better governance performance and a strong administrative capacity also tend to be those regions in the richer countries" (McCann, 2015: 69) so that allocating additional funds to poorer regions might not lead to an improvement of economic and social problems (Garcilazo and Rodriguez-Pose, 2013). This feedback between fund allocation, administrative capacity and socioeconomic enhancement may trigger a vicious circle in which richer regions have more benefit from fund allocation thereby jeopardising the very intent of cohesion policies.

The three challenges, we believe, call for a research approach able to elicit the web of the many interactions among different decision-makers who are located at different levels in the governance process of cohesion policies.

This deliverable reports the map reproducing the key feedback that connect regional, national and EU decision-making in cohesion policy. We call this map a feedback model. Despite our feedback model connects actors and processes located at different levels of governance, the focus is the web of processes and actors located at the level of Local Managing Authorities (LMAs), that is, the organizations that administrate the process of allocation of funds.

A feedback approach

We assume that the design and the implementation of policies implies anticipating the consequences of the interaction among many variables in the long term. This endeavour requires interpreting the role of positive and negative feedbacks, inertia and time delays. In the analysis of EU integration dynamics, for example, Fligstein adopted a feedback approach to analyse long-term pressures to Euroscepticism (Fligstein, 2008).

Positive feedback

In policy-making and resource allocation, positive feedbacks, which take the forms of autocatalytic processes and self-fulfilling prophecies, are common and force policy-makers to investigate timing of resource allocation. The dynamic interplay of these feedback loops leads to emerging non-linear patterns that are not easily amenable to analysis or explanation by the means of conventional research methodologies. Computer simulation is appropriate for studying, *in vitro*, catastrophic process (or historical unexpected 'accidents' or crises) as the consequences of the working of positive feedbacks.

In our research, the presence of positive feedback is very important because it generates two key features that are relevant for policy-makers:

1) Path-dependency and Historical Inefficiencies

Actions/decisions produce different consequences depending on the time in history in which decisions are conceived of and actions are implemented. The concept of historical inefficiency (Carrol and Harrison 1994) refers to a social process "…with positive feedback (or self-reinforcement) that can generate outcomes that arise from "chance" rather than a systematic force."

2) Irreversibility and Hysteresis

Actions or forces applied to a social system become progressively less effective as the pressure of existing positive feedback unfolds. This feature of social systems is particularly frequent and it is fundamental to enhance quality of policy-making. In our case, these two features are particularly important because they may generate bifurcating patterns among different regions in the capability of managing EU funds. The analysis of these long terms dynamics are central to coordinate accordingly communication policies.

Negative feedback

Differently from positive feedback, negative feedback tend to counteract the jolts that a system receives. Typically, negative feedback are at the core of the functioning of such control devices as servomechanisms or thermostats. They tend to keep a system towards a specific, desired or planned, state. For example, thermostats tend to keep the temperature of a space close to a specific level. In doing so, negative feedback mechanisms work to counteract pressures that would change the state of the system towards an undesired state. Despite their desirable properties, negative feedback produce undesired outcome as well. The most important one is the resistance of systems to policy intervention. This occurs when a specific intervention to modify the state of a system is counterbalanced by the reaction of the system itself, which, consequently, becomes resilient to policy-makers' interference.

Inertia and Accumulation

The key variables that we consider in our theoretical framework evolve because of accumulation and erosion processes that unfold over time. For example, long delays divide resource allocation and policy outcomes. This separation in time between decisions, action and consequences has to be considered to address the formation of perceptions and identification. Communication policies need to be coordinated since it is likely that they are effective in specific windows of time. Using a simulation approach, we would like to observe simultaneously the accumulation of delays and time lags and to explore the effects of such delays on the effects of policies and communication efforts.

2. System dynamics methodology

To approach, unravel and analyse such a complex system under study, PERCEIVE researchers decided to employ System Dynamics (SD) methodology. SD is a simulation-based methodology that provides meaningful insights in real-world problems exhibiting dynamic complexity. SD was originally introduced by Forrester (1961) as a modelling technique for assisting corporations in understanding the long-term impact of management policies. Since then, the SD approach has been extensively applied to several problems within the business sector, such as to business policy (e.g. Georgiadis and Besiou, 2008; Aivazidou *et al*., 2018) and to corporate strategy (e.g. Duran-Encalada and Paucar-Caceres, 2012; Sinha *et al*., 2016). In fact, SD has proven to be a very powerful tool for analysing the non-linear behaviour of complex systems over time (Sterman, 2000).

Since the early beginning of its introduction, apart from the business sector, SD has been applied in social, economic technological and ecological systems. For instance, Forrester (1969) utilised the SD approach to capture the life cycle dynamics of urban growth and decay, considering the city environment as a complex system that undergoes drastic changes over time. Another well-known example of SD application outside the business environment is the worldwide bestseller Limits to Growth (Meadows *et al*., 1972), in which a team of researchers studied what could happen to the global population and to the environment if development is sustained by uncontrolled use of resources. Additionally, SD has been also used to analyse and to improve our understanding of social systems (Reppening, 2003; Mollona, 2015). Such issues as the impact of social change initiatives on society (Hirsch *et al*., 2007) or the effect of workforce policies on a health and social care system (Cave and Willis, 2016) have been addresses with SD.

In line with these streams of research, the major objective of PERCEIVE Working Package 6 is to establish the use of SD methodology for capturing the complex dynamics of social-economic systems related to EU Cohesion policy. In fact, although the European funding to the regions through the cohesion policy follows a linear pattern, the effects of the local stakeholders' administrative capacity and the knowledge about the funds, as well as that of the projects' application quality, on the projects' acceptance rate generate non-linear interrelations within the system. Furthermore, taking into consideration the time-dependent behaviour of the European funding, the complexity and the dynamics of the problem under study render SD the appropriate modelling method for the analysis.

Following the typical steps of the SD approach, a causal loop (influence) diagram captures the conceptual structure of a system in a ***qualitative*** manner. A causal loop diagram is a representation of the system's major hypotheses and feedback mechanisms. A feedback is a sequence of causes and effects such

as that a change in a given variable circulates through the loop and finally ends up further influencing the same variable (Georgiadis and Vlachos, 2004). These mechanisms are rather balancing (negative) or reinforcing (positive) feedback loops (Forrester, 1969; Sterman, 2000). If an initial increase in a variable leads to an eventual decrease (or increase) in the same variable, then the feedback loop is considered as balancing (or reinforcing). Specifically, a balancing feedback loop demonstrates a goal-seeking behaviour overtime; after an initial disturbance, the system seeks to return to an equilibrium situation. In a reinforcing feedback loop, an initial disturbance causes further change leading to an exponential growth or decay, indicating the presence of an unstable equilibrium. Figure 2.1 represents two indicative examples of a balancing and a reinforcing loop using the case of population. In fact, an increase in population raises deaths, which in turn decrease the population (balancing loop); while, a growth of population increases births, which in turn augment population (reinforcing loop).

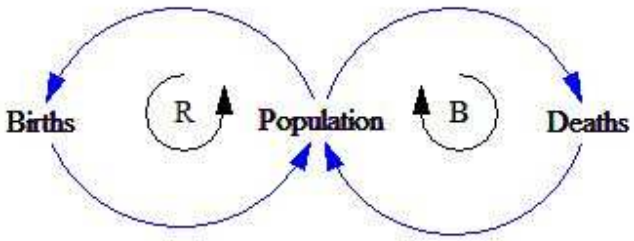


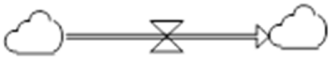
Figure 2.1. Examples of balancing and reinforcing loops in the population case.

The second phase of the SD approach is the ***quantification***, that is, the conversion of the causal loop diagram into a dynamic simulation model, namely the stock and flow diagram. A stock and flow diagram is an elaborate mathematical representation of the system's structure and the interrelationships among all variables. These variables can be stock (i.e. state) and flow (i.e. rate) variables, time delays, auxiliary variables and constants (Sterman, 2000). Specifically, stock variables (symbolised by rectangles) are states that represent accumulations within the system, while flow variables (symbolised by valves) are rates that fill or empty the stock variables (Table 2.1). Mathematically, a SD model constitutes a system of differential equations with: (*i*) integral equations that express the integration of flows into stock variables, and (*ii*) supplementary equations that connect the model's variables through mathematical functions. Overall, the combination of different and multiple feedback loops, with delays stocks and rates appear to be able to describe and reproduce many of systems' behaviour we can appreciate in our life.

The behavior of the resulting system of differential equations is numerically analyzed by simulating the behavior of a system of difference equations that approximates the behavior of the original system. A variety

of simulation software exist to implement the SD approach such as Stella®, Vensim® and Powersim®. In the context of the PERCEIVE project, we utilised the Vensim® software for our analysis.

Table 2.1. Symbols of the stock and flow diagram.

Symbol	Variable description
	Stock (State)
	Flow (Rate)
	Auxiliary
	Constant
	Information flow
	Delay

After the simulation process, validation follows to control the robustness of the model developed. However, while model validation has an important role in any simulation study providing a basis for consistency in the outputs (Swisher *et al*., 2001), it often constitutes a challenging topic that is poorly addressed (Bellomo and Gibelli, 2016), limiting the reliability of the provided study outputs. In SD methodology, validation tests are divided into two groups, namely the "structural" tests and the "behaviour" tests (Forrester and Senge, 1980; Barlas, 1989). Behaviour validity tests check whether the model is capable of reproducing an acceptable pattern observed in the analysis while structural validity tests investigate if the model is an adequate representation of the real system, namely they assess if the model reproduces the desired behaviour overtime for the 'right reasons'. According to Barlas (1989), a model should pass first the structural tests and then the behaviour ones, given that, unless a SD model is structurally sound, it is meaningless to test it for pattern prediction ability. All model validation techniques are elaborately presented by Forrester and Senge (1980).

3. Reference modes

When adopting a systemic approach for mapping a problem, or a complex environment, a key step is to capture the characteristics feature of the system's behaviour over time. Thus, collecting time series data available that capture system's state over time and plotting this relevant knowledge into time graphs is a crucial phase of our analysis. By eliciting recurrent trends and tendencies, this preliminary step is important as it allows for the investigation of the distinguishing dynamic properties complex systems.

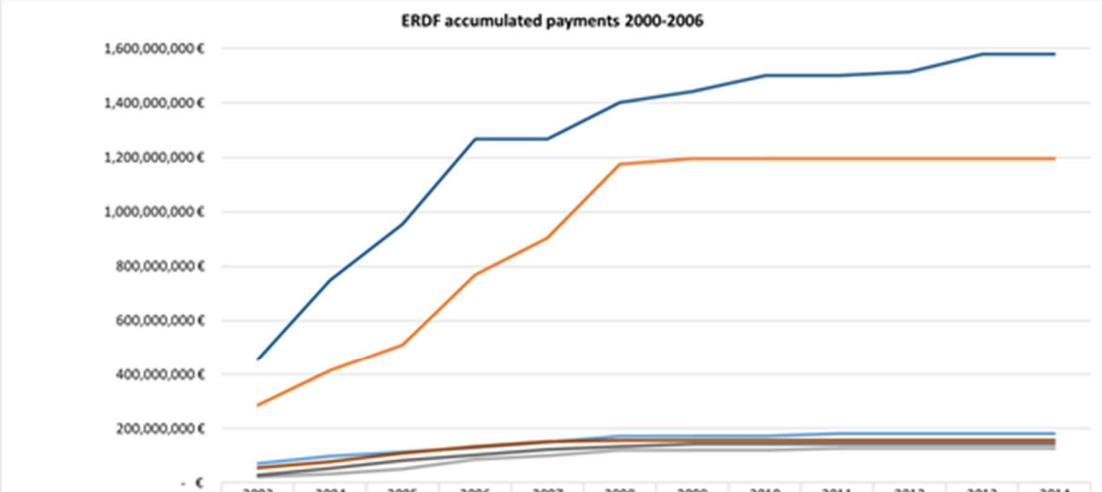
To this end, to investigate the robustness of the modelling procedure and the consistency of the relevant results, comparisons with the available real-world data is necessary. In the context of PERCEIVE project, this approach has been utilized to investigate the European Structural Fund (SF) regional absorption, including the European Regional Development Fund (ERDF) and the European Social Fund (ESF), as well as the related citizens' awareness. The aforementioned data regarding the regional EU funds and the related awareness are explored for nine regions with diverse characteristics in seven EU countries, namely: (1) Burgenland, Austria, (2) Calabria, Italy, (3) Emilia-Romagna, Italy, (4) Dolnośląskie, Poland, (5) Warmińsko-mazurskie, Poland, (6) Sud-Est, Romania, (7) Extremadura, Spain, (8) Norra Mellansverige, Sweden, and (9) Essex, United Kingdom. The funding data are analysed for each region during the latest completed programming periods 2000-2006 and 2007-2013. The awareness data are provided mainly at a national level beginning from 1992 up to 2017 but not in an annual time step. All data are presented analytically in tables in the Appendix A. In addition, meaningful insights on the data are discussed on each separate subsection.

3.1. Regional operational plan payments

In subsection 3.1, real data referring to the regional operational plan (ROP) payments, which are directly managed by the local managing authorities (LMAs) of the regions, are presented. We retrieved these data were from the official European Union (EU) annual reports for each fund and period (Equey, 2003-2017)[1]. The data were meticulously collected and clustered in complete databases for each region, presented as time series by fund and period. It should be mentioned that for all ROP data for the first programming period, payments begin in 2003 and for some regions finish even eight years after the end of the period, namely in 2014. Regarding the second programming period, payments begin in 2007 and may finish even in 2018. Notably, for specific regions the funding is still open (please refer to subsection 3.3).

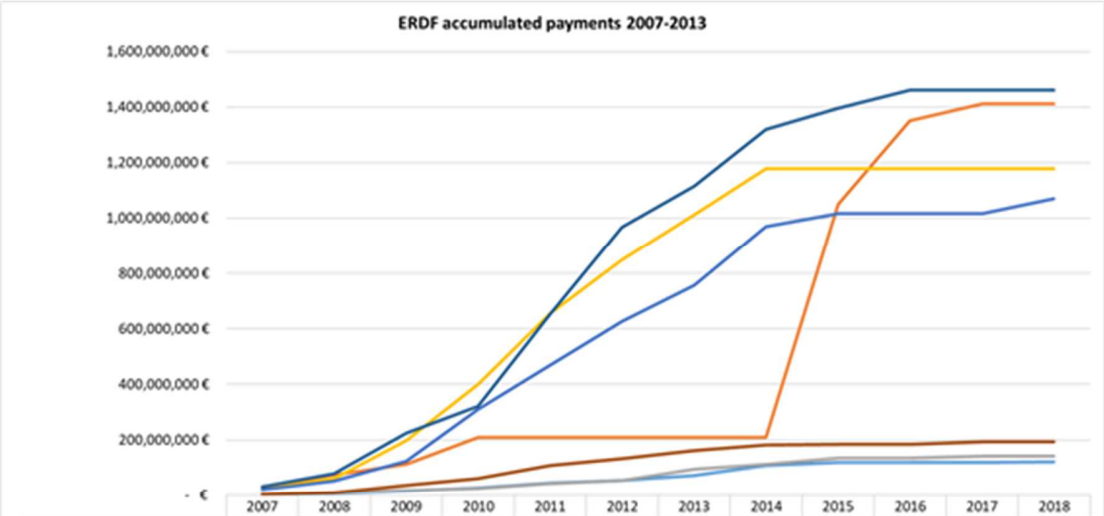
[1] It should be noted that the annual EU reports for the evolution of payments of the Structural Funds constitute an internal communication of the EU and do not are available publicly on the web. They were sent to the PERCEIVE researchers by EU officers via e-mail communication.

Figures 3.1 and 3.2 illustrate the accumulation of the ERDF payments to the regions under study for the programming periods 2000-2006 and 2007-2013 respectively. Analysing Figure 3.1, no ROP funding regarding the ERDF scheme is identified for the two Polish regions, while Romania was not yet a member of the EU community during the 2000-2006 period. Moreover, the graphs show that Calabria, in Italy, and Extremadura, in Spain, received approximately ten times more funding than the rest regions under study. Based on the graph, all regions exhibit a regular accumulation of the ERDF payments. As shown in Figure 3.2, no ROP funding regarding the ERDF scheme is identified for Sud-Est, in Romania, and Essex, in United Kingdom. With respect to the rest regions, Calabria, in Italy, and Extremadura, in Spain, along with the two Polish regions, receive significant amounts of the ERDF fund. Notably, all regions follow a regular distribution of the cumulative payments, except for Calabria, in Italy, which demonstrates an abrupt increase of payments' absorption in 2015.



	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Burgenland (AT)	72,139,36	98,027,15	115,263,7	129,753,0	150,582,6	172,443,1	172,443,1	172,443,1	181,519,0	181,519,0	181,519,0	181,519,0
Calabria (IT)	287,185,2	415,372,4	512,237,5	769,575,0	903,163,8	1,176,147	1,195,804	1,195,804	1,195,804	1,195,804	1,195,804	1,195,804
Emilia Romagna (IT)	22,705,90	34,065,46	51,410,83	86,229,72	99,981,59	121,631,7	121,631,7	121,631,7	128,033,3	128,033,3	128,033,3	128,033,3
Dolnośląskie (PL)												
Warmińsko-mazurskie (PL)												
Sud-Est (RO)												
Extremadura (ES)	458,433,3	748,359,1	955,236,1	1,267,137	1,267,137	1,402,533	1,443,048	1,500,163	1,500,163	1,513,657	1,579,118	1,579,118
Norra Mellansverige (SE)	55,286,42	77,622,95	110,139,7	133,701,4	153,403,2	156,390,2	156,390,2	156,390,2	156,390,2	156,390,2	156,390,2	156,390,2
Essex (UK)	28,649,96	53,621,72	82,380,26	104,104,1	122,460,0	135,270,9	142,647,5	142,647,5	142,647,5	142,647,5	142,647,5	142,647,5

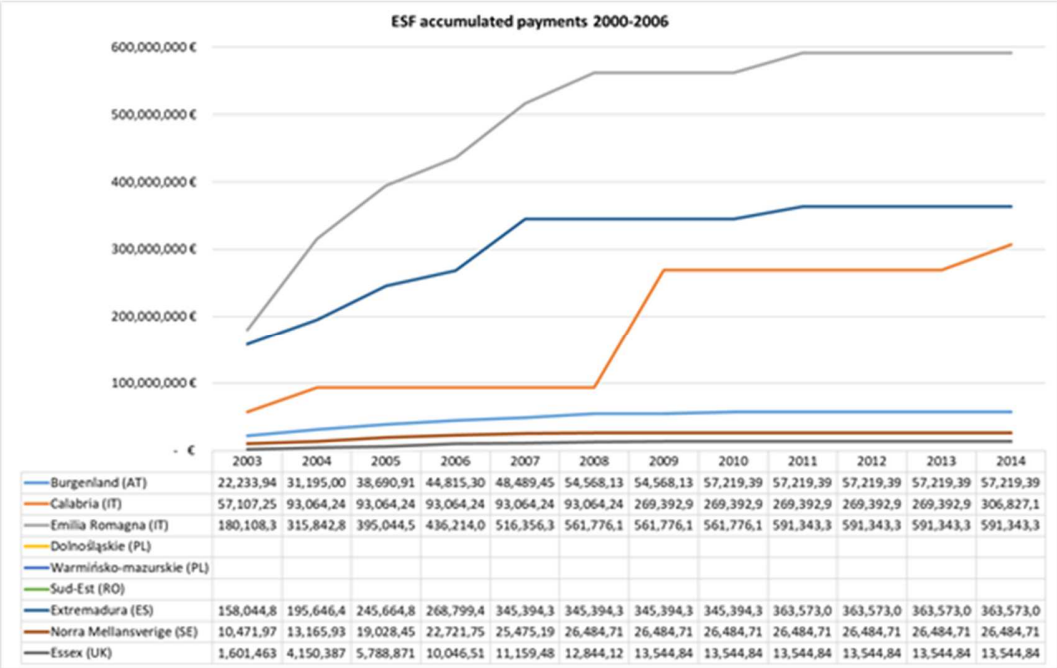
Figure 3.1. Accumulation of ROP payments regarding ERDF fund during 2000-2006 period (Own elaboration based on EU reports).



	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Burgenland (AT)	2,500,539	6,251,348	16,698,68	28,691,52	46,540,01	53,954,58	72,985,02	107,219,8	118,775,6	118,775,6	118,775,6	120,895,6
Calabria (IT)	29,982,40	74,956,00	112,434,0	210,039,9	210,039,9	210,039,9	210,039,9	210,039,9	1,049,533	1,351,965	1,410,714	1,410,714
Emilia Romagna (IT)	2,562,158	6,405,394	17,740,45	25,507,84	43,573,13	54,410,47	93,854,81	113,555,5	134,759,1	135,597,0	142,733,7	142,733,7
Dolnośląskie (PL)	24,262,89	60,657,24	198,574,7	399,971,5	655,914,8	849,566,6	1,013,303	1,178,174	1,178,174	1,178,174	1,178,174	1,178,174
Warmińsko-mazurskie (PL)	20,730,84	51,827,10	123,597,4	310,692,7	470,402,3	627,035,9	756,715,9	970,696,4	1,017,022	1,017,022	1,017,022	1,070,550
Sud-Est (RO)												
Extremadura (ES)	31,603,75	79,009,39	223,962,7	321,448,1	653,977,0	966,826,0	1,115,888	1,319,691	1,395,015	1,460,035	1,460,035	1,460,035
Norra Mellansverige (SE)	3,899,757	9,749,392	36,911,73	62,238,87	108,817,2	134,083,9	163,207,7	183,244,8	185,238,4	185,238,4	192,841,5	192,841,5
Essex (UK)												

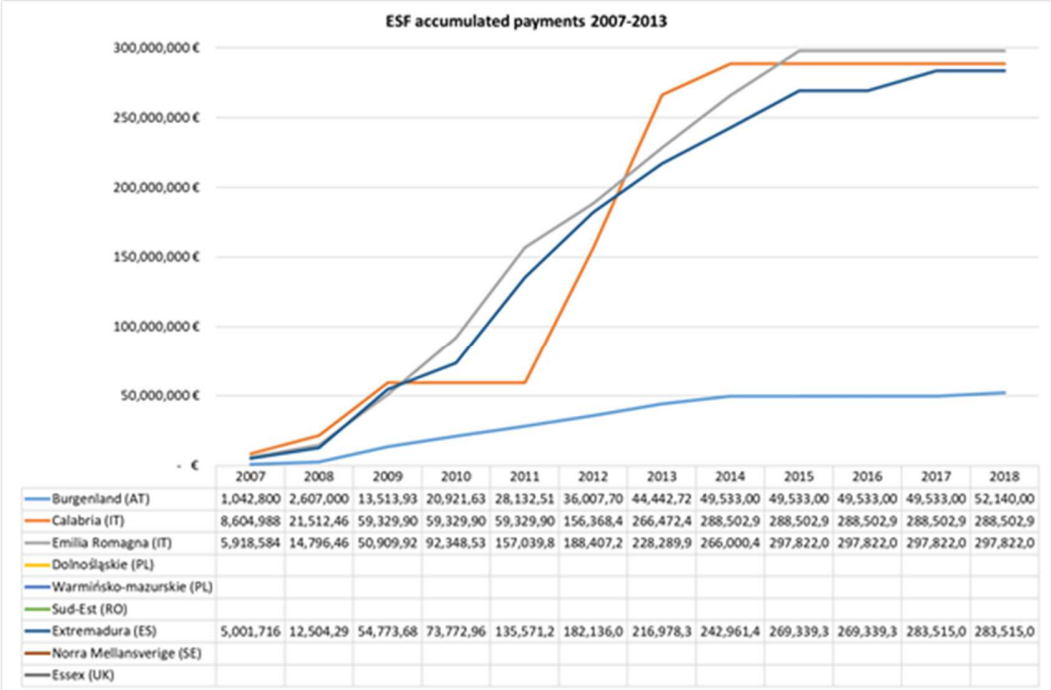
Figure 3.2. Accumulation of ROP payments regarding ERDF fund during 2007-2013 period (Own elaboration based on EU reports).

Figures 3.3 and 3.4 depict the accumulation of the ESF payments to the regions under study for the programming periods 2000-2006 and 2007-2013 respectively. In line with ERDF funds, no ROP funding regarding the ERDF scheme is identified for the two Polish regions, as well as Sud-Est, in Romania for the programming period 2000-2006 (Figure 3.3). Based on the data, Emilia Romagna, in Italy, receives the largest amount of ESF funding among the regions under study, followed by Extremadura, in Spain, and Calabria, in Italy. Burgenland, in Austria, Norra Mellansverige, in Sweden, and Essex, in United Kingdom, receive much less ESF funding as in the ERDF case. In addition, Calabria, in Italy, exhibits again an abrupt increase of payments in 2009. Observing Figure 3.4, only four of the nine regions receive ESF funding in the context of ROP. The payments to Italian regions, as well as to Extremadura, in Spain, are considerably more than those reported in Burgenland, in Austria are. Again, Calabria, in Italy, exhibits sudden growth of payments in 2012.



	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Burgenland (AT)	22,233,94	31,195,00	38,690,91	44,815,30	48,489,45	54,568,13	54,568,13	57,219,39	57,219,39	57,219,39	57,219,39	57,219,39
Calabria (IT)	57,107,25	93,064,24	93,064,24	93,064,24	93,064,24	93,064,24	269,392,9	269,392,9	269,392,9	269,392,9	269,392,9	306,827,1
Emilia Romagna (IT)	180,108,3	315,842,8	395,044,5	436,214,0	516,356,3	561,776,1	561,776,1	561,776,1	591,343,3	591,343,3	591,343,3	591,343,3
Dolnośląskie (PL)												
Warmińsko-mazurskie (PL)												
Sud-Est (RO)												
Extremadura (ES)	158,044,8	195,646,4	245,664,8	268,799,4	345,394,3	345,394,3	345,394,3	345,394,3	363,573,0	363,573,0	363,573,0	363,573,0
Norra Mellansverige (SE)	10,471,97	13,165,93	19,028,45	22,721,75	25,475,19	26,484,71	26,484,71	26,484,71	26,484,71	26,484,71	26,484,71	26,484,71
Essex (UK)	1,601,463	4,150,387	5,788,871	10,046,51	11,159,48	12,844,12	13,544,84	13,544,84	13,544,84	13,544,84	13,544,84	13,544,84

Figure 3.3. Accumulation of ROP payments regarding ESF fund during 2000-2006 period (Own elaboration based on EU reports).



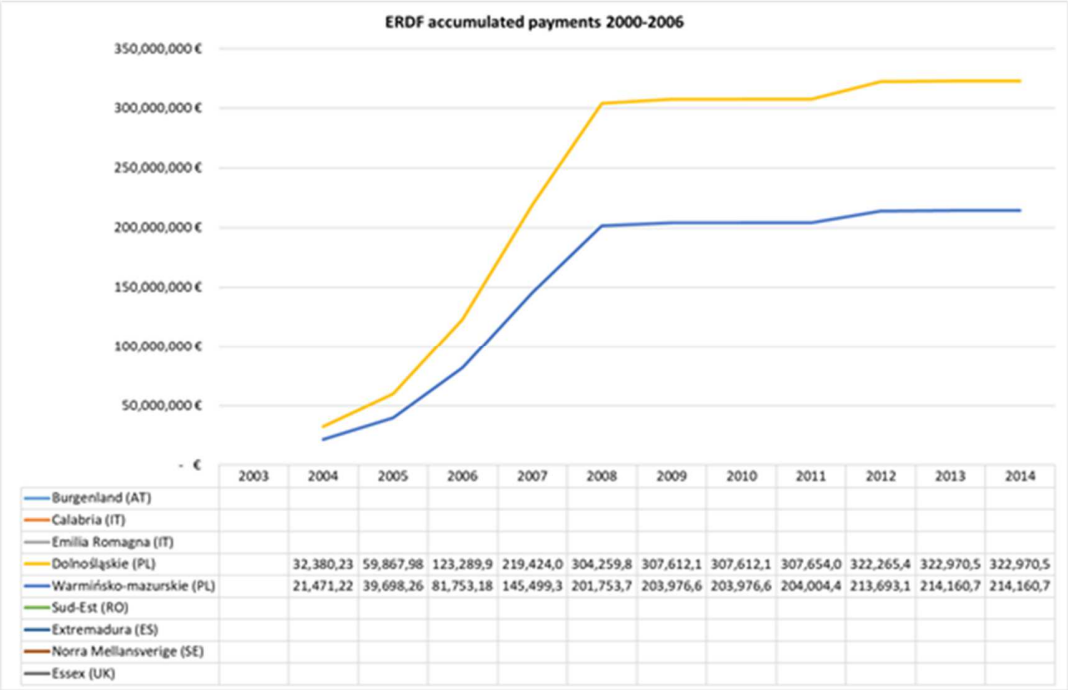
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Burgenland (AT)	1,042,800	2,607,000	13,513,93	20,921,63	28,132,51	36,007,70	44,442,72	49,533,00	49,533,00	49,533,00	49,533,00	52,140,00
Calabria (IT)	8,604,988	21,512,46	59,329,90	59,329,90	59,329,90	156,368,4	266,472,4	288,502,9	288,502,9	288,502,9	288,502,9	288,502,9
Emilia Romagna (IT)	5,918,584	14,796,46	50,909,92	92,348,53	157,039,8	188,407,2	228,289,9	266,000,4	297,822,0	297,822,0	297,822,0	297,822,0
Dolnośląskie (PL)												
Warmińsko-mazurskie (PL)												
Sud-Est (RO)												
Extremadura (ES)	5,001,716	12,504,29	54,773,68	73,772,96	135,571,2	182,136,0	216,978,3	242,961,4	269,339,3	269,339,3	283,515,0	283,515,0
Norra Mellansverige (SE)												
Essex (UK)												

Figure 3.4. Accumulation of ROP payments regarding ESF fund during 2007-2013 period (Own elaboration based on EU reports).

3.2. Regionalized national operational plan payments

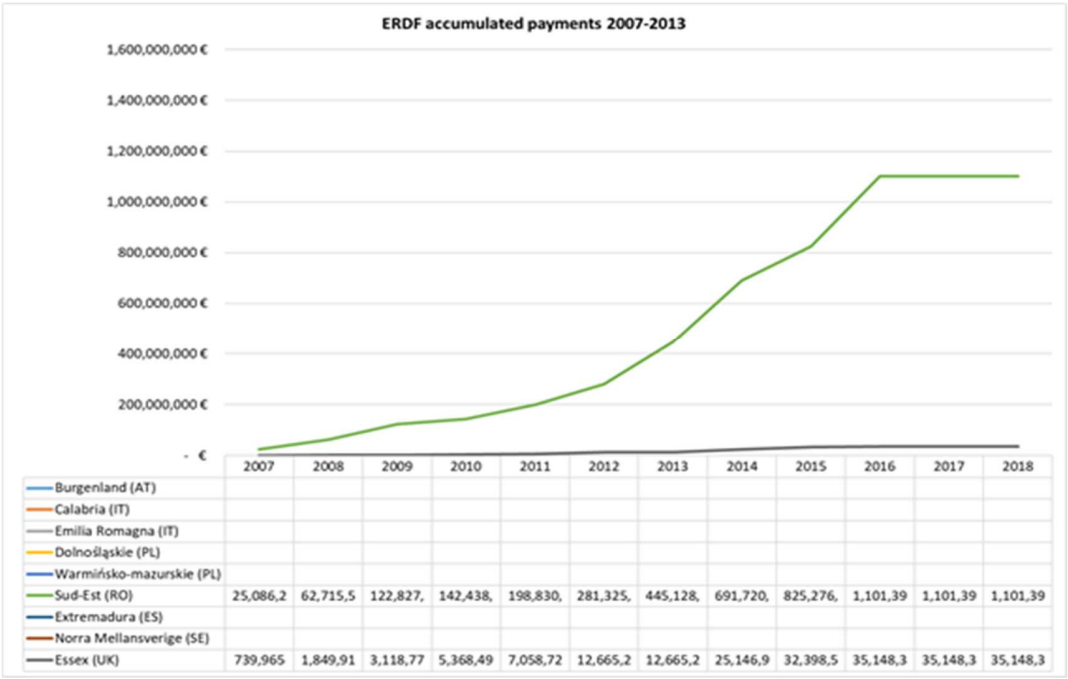
Given that the PERCEIVE project focuses on EU funding allocated to the regions, data about regional payments are required for the purpose of this research. However, as it is already seen in subsection 3.1, some of the regions under study lack ROP programmes. In these cases, regionalised national operational plan (r-NOP) data were used. In fact, the historical r-NOP payments during the two programming periods constitute estimations calculated and provided by the European Commission (2018a). Although these funds might be partially or totally managed by national authorities and not just by LMAs, these data were used as an approximation for a comprehensive analysis of all regions participating in the PERCEIVE project. It should be mentioned that for all r-NOP data for the first period, payments begin in 2004 and for specific regions finish even seven years after the end of the period, namely in 2013. Regarding the second period, payments begin in 2007 and may finish even in 2016. Notably, for some regions the funding is still open (please refer to subsection 3.3).

Figures 3.5 and 3.6 illustrate the accumulation of the national ERDF payments to the regions under study for the programming periods 2000-2006 and 2007-2013 respectively. Considering that Romania was not yet a member of the EU community during the 2000-2006 period, r-NOP data were used for the Polish regions that do not receive ROP funding. As shown in Figure 3.5, the two distributions exhibit the same behaviour according to the payment estimations, while Dolnośląskie, in Poland, seems to absorb higher amounts of ERDF funding compared to Warmińsko-mazurskie, again in Poland. In Figure 3.6, the regionalised estimated cumulative payments for Sud-Est, in Romania, and Essex, in United Kingdom, are presented. Although both distributions can be considered as regular, the Romania region seems to receive a considerably higher amount of funding compared to the British one.



	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Burgenland (AT)												
Calabria (IT)												
Emilia Romagna (IT)												
Dolnośląskie (PL)		32,380,23	59,867,98	123,289,9	219,424,0	304,259,8	307,612,1	307,612,1	307,654,0	322,265,4	322,970,5	322,970,5
Warmińsko-mazurskie (PL)		21,471,22	39,698,26	81,753,18	145,499,3	201,753,7	203,976,6	203,976,6	204,004,4	213,693,1	214,160,7	214,160,7
Sud-Est (RO)												
Extremadura (ES)												
Norra Mellansverige (SE)												
Essex (UK)												

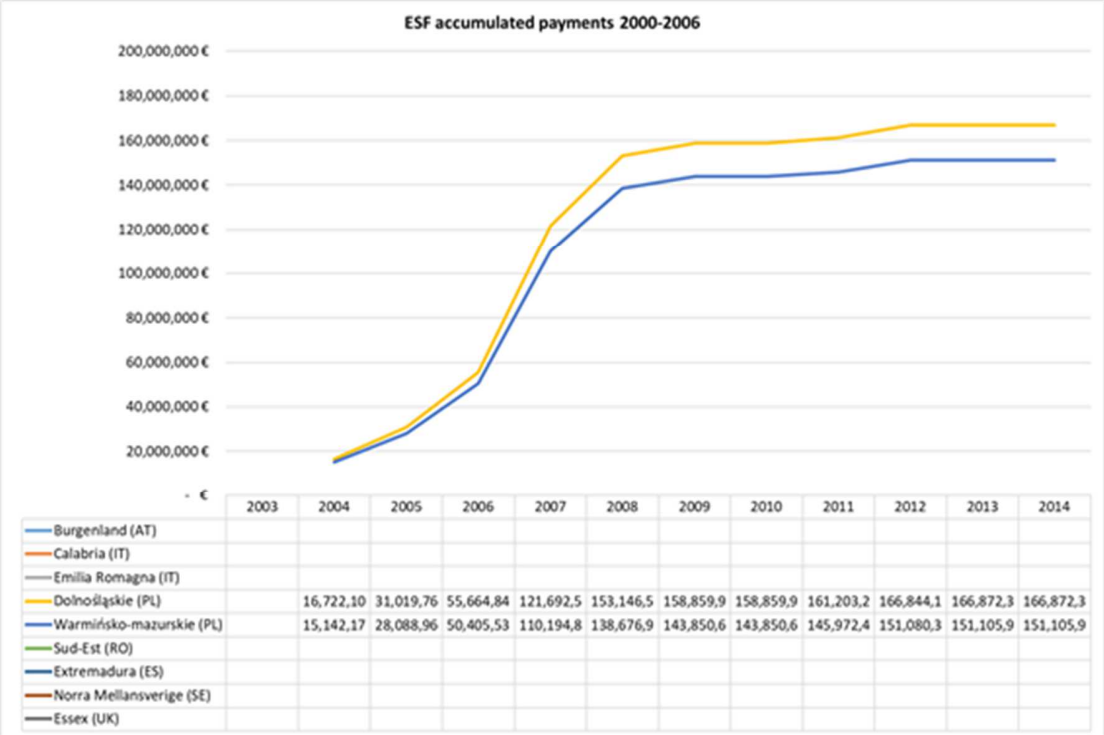
Figure 3.5. Accumulation of r-NOP payments regarding ERDF fund during 2000-2006 period (Own elaboration based on EU reports).



	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Burgenland (AT)												
Calabria (IT)												
Emilia Romagna (IT)												
Dolnośląskie (PL)												
Warmińsko-mazurskie (PL)												
Sud-Est (RO)	25,086,2	62,715,5	122,827,	142,438,	198,830,	281,325,	445,128,	691,720,	825,276,	1,101,39	1,101,39	1,101,39
Extremadura (ES)												
Norra Mellansverige (SE)												
Essex (UK)	739,965	1,849,91	3,118,77	5,368,49	7,058,72	12,665,2	12,665,2	25,146,9	32,398,5	35,148,3	35,148,3	35,148,3

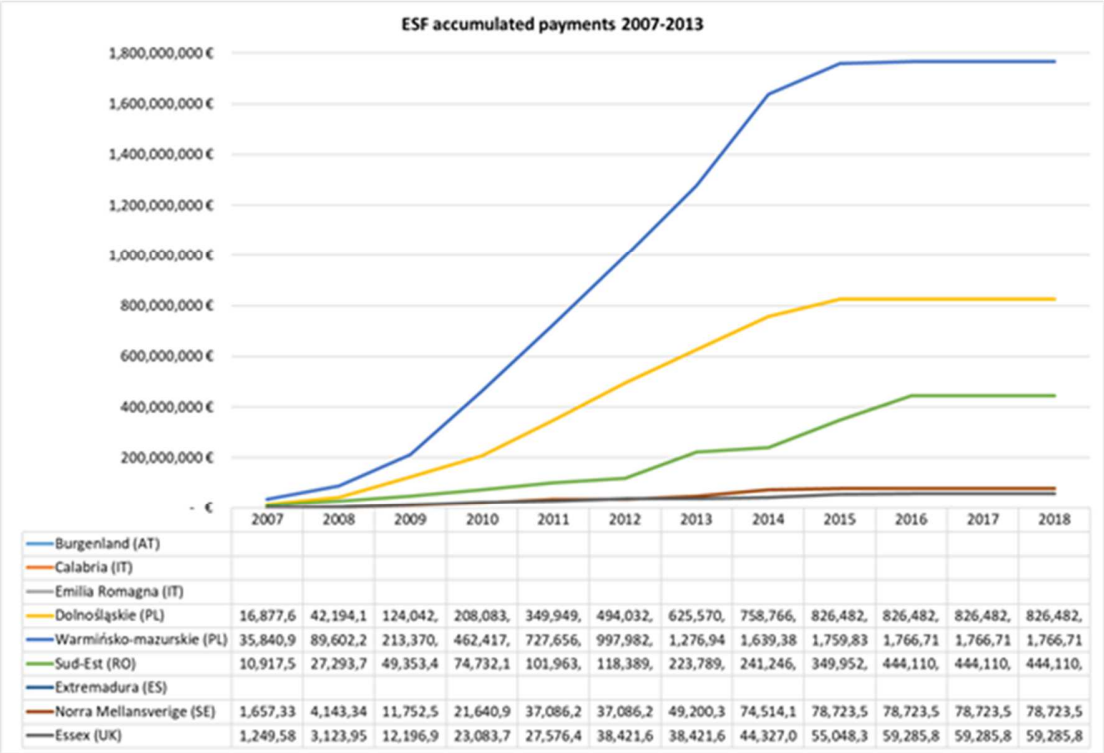
Figure 3.6. Accumulation of r-NOP payments regarding ERDF fund during 2007-2013 period (Own elaboration based on EU reports).

Figures 3.7 and 3.8 illustrate the accumulation of the national ESF payments to the regions under study for the programming periods 2000-2006 and 2007-2013 respectively. As for ERDF scheme, given that Romania was not yet a member of the EU community during the 2000-2006 period, r-NOP data were used only for the Polish regions. Although the two distributions follow again the same regular pattern, Dolnośląskie, Poland, seems to receive greater amounts of ESF funding than Warmińsko-mazurskie, Poland (Figure 3.7). However, the difference between the funding of the two regions compared to the ERFD funds is lower. During the following period, estimates indicate that the Polish regions get the highest ESF financial support among the regions without ROP funding, followed by Sud-Est, in Romania (Figure 3.8). On the other hand, Norra Mellansverige, in Sweden, and Essex, in United Kingdom, seem to receive rather low amounts of regionalised ESF funds. However, all distributions seem to follow a regular pattern.



	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Burgenland (AT)												
Calabria (IT)												
Emilia Romagna (IT)												
Dolnośląskie (PL)		16,722,10	31,019,76	55,664,84	121,692,5	153,146,5	158,859,9	158,859,9	161,203,2	166,844,1	166,872,3	166,872,3
Warmińsko-mazurskie (PL)		15,142,17	28,088,96	50,405,53	110,194,8	138,676,9	143,850,6	143,850,6	145,972,4	151,080,3	151,105,9	151,105,9
Sud-Est (RO)												
Extremadura (ES)												
Norra Mellansverige (SE)												
Essex (UK)												

Figure 3.7. Accumulation of r-NOP payments regarding ESF fund during 2000-2006 period (Own elaboration based on EU reports).



	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Burgenland (AT)												
Calabria (IT)												
Emilia Romagna (IT)												
Dolnośląskie (PL)	16,877,6	42,194,1	124,042,	208,083,	349,949,	494,032,	625,570,	758,766,	826,482,	826,482,	826,482,	826,482,
Warmińsko-mazurskie (PL)	35,840,9	89,602,2	213,370,	462,417,	727,656,	997,982,	1,276,94	1,639,38	1,759,83	1,766,71	1,766,71	1,766,71
Sud-Est (RO)	10,917,5	27,293,7	49,353,4	74,732,1	101,963,	118,389,	223,789,	241,246,	349,952,	444,110,	444,110,	444,110,
Extremadura (ES)												
Norra Mellansverige (SE)	1,657,33	4,143,34	11,752,5	21,640,9	37,086,2	37,086,2	49,200,3	74,514,1	78,723,5	78,723,5	78,723,5	78,723,5
Essex (UK)	1,249,58	3,123,95	12,196,9	23,083,7	27,576,4	38,421,6	38,421,6	44,327,0	55,048,3	59,285,8	59,285,8	59,285,8

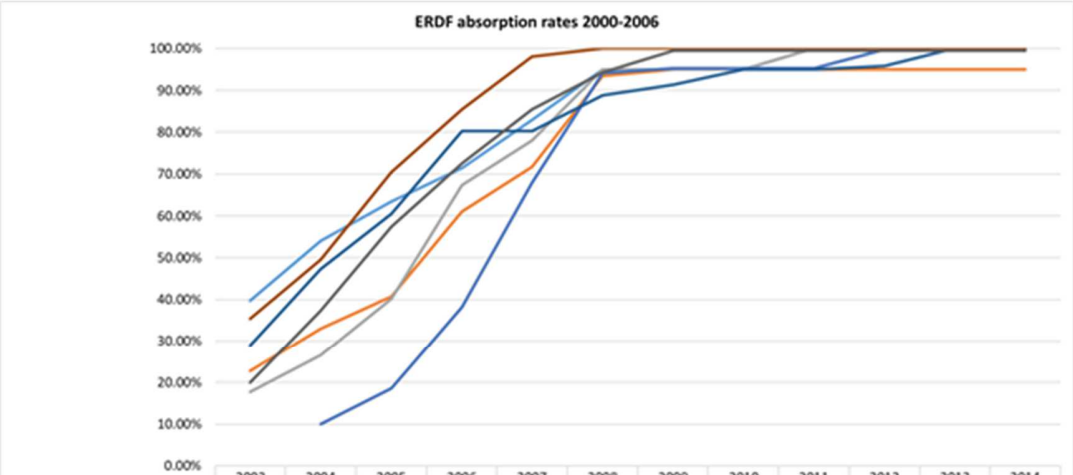
Figure 3.8. Accumulation of r-NOP payments regarding ESF fund during 2007-2013 period (Own elaboration based on EU reports).

3.3. Regional absorption rates

To compare the funds' absorption efficiency of all regions, the annual absorption rates (ARs) were investigated. In fact, the annual AR of a region constitutes the ratio of the annual accumulated payments to the total commitments allocated to the region for the whole programming period, calculated for each fund type separately. In other words, the annual AR provides a normalisation of the cumulative payments, offering a comparison of the related efficiency among the regions. To provide a holistic analysis, ARs were calculated both for ROP and r-NOP regions under study. For ROP regions, annual ARs were easily computed given that annual cumulative payments, as well as total commitments, were provided by the related EU reports (please refer to subsection 1). For the rest r-NOP regions, there was an absence of estimations for the total commitments for each region. Therefore, the final absorption rates at the closing date of the related national funding programmes were utilised (as communicated via e-mail by the EU officers), assuming that they remain constant for all regions of each country and equal to the r-NOP absorption rate. Then, the total commitments were easily calculated as the ratio of the total estimated payments to the respective final rates. As a next step, the annual absorption rates were estimated as the ratio of the annual cumulative

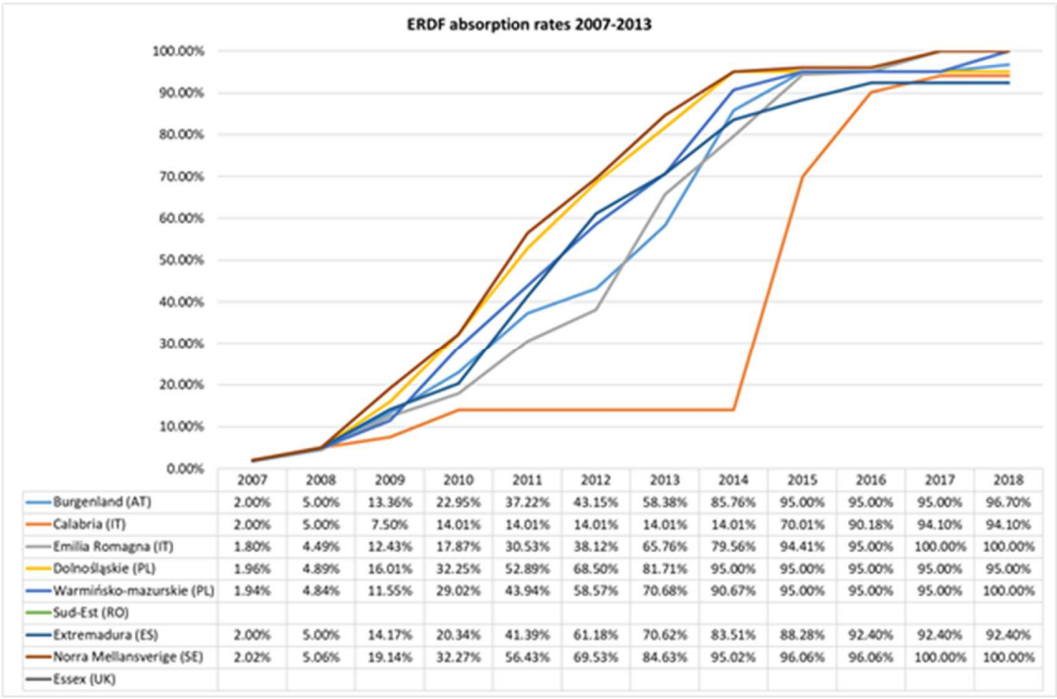
payments to the aforementioned total commitments. Unfortunately, for some regions no final absorption rates were provided, thus the calculation of the total allocations and the annual absorption rates wasn't feasible.

Figures 3.9 and 3.10 depict the distribution of the absorption rates of the national ERDF payments to the regions under study for the programming periods 2000-2006 and 2007-2013 respectively. As shown in Figure 3.9, all regions apart from Calabria, in Italy, and Essex, in United Kingdom, demonstrate a 100% absorption of the ERDF funds during the first period. Specifically, the funding of the British region closed with a 99,5% absorption, while notably for the Italian region the funding is still open reaching in 2014 an absorption of 95%. Comparing the slopes of the distributions, Norra Mellansverige, Sweden, exhibits the most efficient absorption of the ERDF funds (based on the real ROP data), while the Polish regions the least efficient (based on the estimated r-NOP data). In addition, although Extremadura, Spain, starts with a rather quick absorption, after 2006 there is a deceleration of rate. Burgenland, Austria, and Essex, United Kingdom, demonstrate a regular absorption, while the two Italian regions exhibit a slightly unbalanced rate between 2004 and 2008. In Figure 3.10, only Emilia Romagna, in Italy, Warmińsko-mazurskie, in Poland, and Norra Mellansverige, in Sweden, exhibit a 100% absorption of the ERDF funds during the period 2007-2013. Burgenland, Austria, has a final absorption of 96,5%, while for the rest regions the funding is still open. Unfortunately, no data were available for Sud-Est, Romania, and Essex, United Kingdom. Concerning the performance of the regions, Burgenland, Austria, and Norra Mellansverige, Sweden, demonstrate the best absorption efficiency of ERDF funds, while Calabria, Italy, the worst efficiency. In addition, except for Calabria, Italy, that demonstrates an abrupt increase of absorption in 2015, the rest regions follow a rather regular sigmoid-shaped absorption pattern.



	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Burgenland (AT)	39.74%	54.00%	63.50%	71.48%	82.96%	95.00%	95.00%	95.00%	100.00%	100.00%	100.00%	100.00%
Calabria (IT)	22.82%	33.00%	40.69%	61.14%	71.75%	93.44%	95.00%	95.00%	95.00%	95.00%	95.00%	95.00%
Emilia Romagna (IT)	17.73%	26.61%	40.15%	67.35%	78.09%	95.00%	95.00%	95.00%	100.00%	100.00%	100.00%	100.00%
Dolnośląskie (PL)		10.03%	18.54%	38.17%	67.94%	94.21%	95.24%	95.24%	95.26%	99.78%	100.00%	100.00%
Warmińsko-mazurskie (PL)		10.03%	18.54%	38.17%	67.94%	94.21%	95.24%	95.24%	95.26%	99.78%	100.00%	100.00%
Sud-Est (RO)												
Extremadura (ES)	29.03%	47.39%	60.49%	80.24%	80.24%	88.82%	91.38%	95.00%	95.00%	95.85%	100.00%	100.00%
Norra Mellansverige (SE)	35.35%	49.63%	70.43%	85.49%	98.09%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Essex (UK)	19.99%	37.41%	57.47%	72.63%	85.43%	94.37%	99.51%	99.51%	99.51%	99.51%	99.51%	99.51%

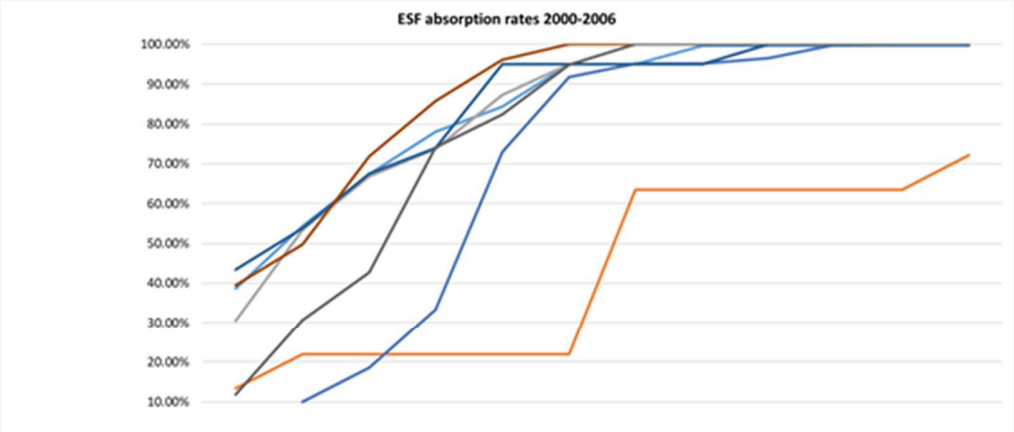
Figure 3.9. Absorption rates for ERDF fund during 2000-2006 period (Own elaboration based on EU reports).



	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Burgenland (AT)	2.00%	5.00%	13.36%	22.95%	37.22%	43.15%	58.38%	85.76%	95.00%	95.00%	95.00%	96.70%
Calabria (IT)	2.00%	5.00%	7.50%	14.01%	14.01%	14.01%	14.01%	14.01%	70.01%	90.18%	94.10%	94.10%
Emilia Romagna (IT)	1.80%	4.49%	12.43%	17.87%	30.53%	38.12%	65.76%	79.56%	94.41%	95.00%	100.00%	100.00%
Dolnośląskie (PL)	1.96%	4.89%	16.01%	32.25%	52.89%	68.50%	81.71%	95.00%	95.00%	95.00%	95.00%	95.00%
Warmińsko-mazurskie (PL)	1.94%	4.84%	11.55%	29.02%	43.94%	58.57%	70.68%	90.67%	95.00%	95.00%	95.00%	100.00%
Sud-Est (RO)												
Extremadura (ES)	2.00%	5.00%	14.17%	20.34%	41.39%	61.18%	70.62%	83.51%	88.28%	92.40%	92.40%	92.40%
Norra Mellansverige (SE)	2.02%	5.06%	19.14%	32.27%	56.43%	69.53%	84.63%	95.02%	96.06%	96.06%	100.00%	100.00%
Essex (UK)												

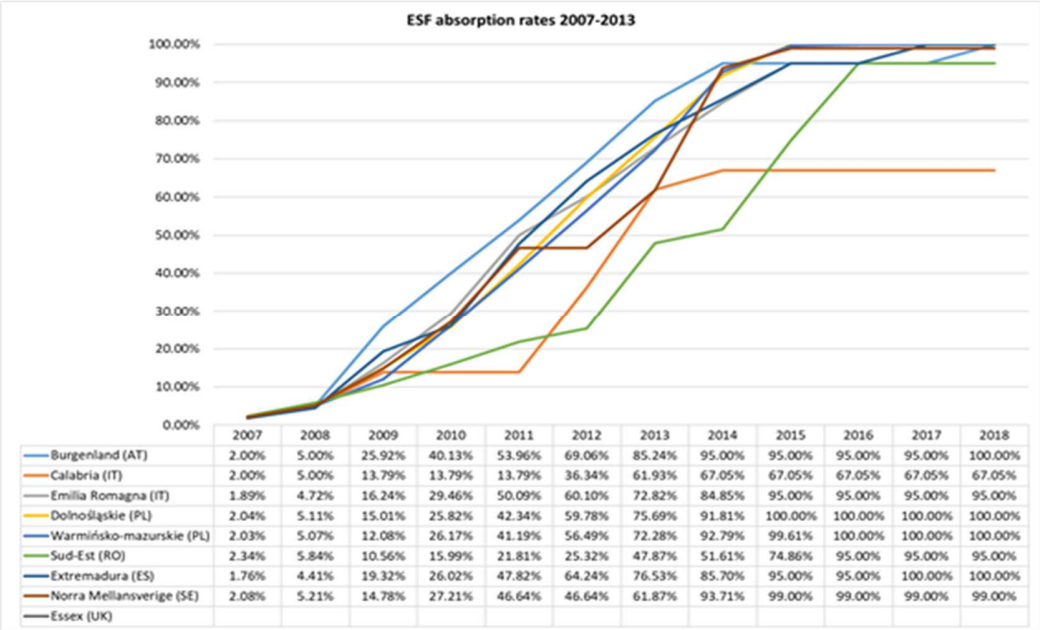
Figure 3.10. Absorption rates for ERDF fund during 2007-2013 period (Own elaboration based on EU reports).

Figures 3.11 and 3.12 present the distribution of the absorption rates of the national ESF payments to the regions under study for the programming periods 2000-2006 and 2007-2013 respectively. Analysing Figure 3.11, all regions except for Burgenland, Austria, and Calabria, Italy, absorb the total amount ESF funds committed for the first period. Specifically, the funding of the Austrian region closed with a 99,62% absorption, while notably that of the Italian region with a rather low rate of only 72,21%. Comparing the slopes of the distributions, Norra Mellansverige, Sweden, exhibits the most efficient absorption of the ESF funds, followed by Emilia Romagna, Italy, and Dolnośląskie, Poland. Once again, Calabria, Italy, has the least efficient and most irregular absorption rate, as the ESF funds in the latter region are absorbed in three phases. In the rest regions, the absorption of the payments seems to follow a rather regular sigmoid-shaped pattern. Observing Figure 3.12, only Burgenland, Austria, the two Polish regions and Extremadura, Spain, demonstrate an absorption of 100% regarding the ESF payments during the period 2007-2013. Sud-Est, Romania, and Norra Mellansverige, Sweden, have a final absorption rate of 95% and 99% respectively, while notably for the two Italian regions the program is still open. Unfortunately, no data were available for Essex, United Kingdom. Regarding the efficiency of the regions, Burgenland, Austria, is the most efficient in terms of ESF funds' absorption, while Calabria, Italy, and Sud-Est, Romania, the least efficient. In addition, Calabria, Italy, Sud-Est, Romania, and Norra Mellansverige, Sweden, exhibit rather uneven absorption rates, in contrast to the rest regions that follow a more balanced and regular pattern.



	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Burgenland (AT)	38.71%	54.31%	67.36%	78.02%	84.42%	95.00%	95.00%	99.62%	99.62%	99.62%	99.62%	99.62%
Calabria (IT)	13.44%	21.90%	21.90%	21.90%	21.90%	21.90%	63.40%	63.40%	63.40%	63.40%	63.40%	72.21%
Emilia Romagna (IT)	30.46%	53.41%	66.80%	73.77%	87.32%	95.00%	95.00%	95.00%	100.00%	100.00%	100.00%	100.00%
Dolnośląskie (PL)		10.02%	18.59%	33.36%	72.93%	91.77%	95.20%	95.20%	96.60%	99.98%	100.00%	100.00%
Warmińsko-mazurskie (PL)		10.02%	18.59%	33.36%	72.93%	91.77%	95.20%	95.20%	96.60%	99.98%	100.00%	100.00%
Sud-Est (RO)												
Extremadura (ES)	43.47%	53.81%	67.57%	73.93%	95.00%	95.00%	95.00%	95.00%	100.00%	100.00%	100.00%	100.00%
Norra Mellansverige (SE)	39.54%	49.71%	71.85%	85.79%	96.19%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Essex (UK)	11.82%	30.64%	42.74%	74.17%	82.39%	94.83%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Figure 3.11. Absorption rates for ESF fund during 2000-2006 period (Own elaboration based on EU reports).



	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Burgenland (AT)	2.00%	5.00%	25.92%	40.13%	53.96%	69.06%	85.24%	95.00%	95.00%	95.00%	95.00%	100.00%
Calabria (IT)	2.00%	5.00%	13.79%	13.79%	13.79%	36.34%	61.93%	67.05%	67.05%	67.05%	67.05%	67.05%
Emilia Romagna (IT)	1.89%	4.72%	16.24%	29.46%	50.09%	60.10%	72.82%	84.85%	95.00%	95.00%	95.00%	95.00%
Dolnośląskie (PL)	2.04%	5.11%	15.01%	25.82%	42.34%	59.78%	75.69%	91.81%	100.00%	100.00%	100.00%	100.00%
Warmińsko-mazurskie (PL)	2.03%	5.07%	12.08%	26.17%	41.19%	56.49%	72.28%	92.79%	99.61%	100.00%	100.00%	100.00%
Sud-Est (RO)	2.34%	5.84%	10.56%	15.99%	21.81%	25.32%	47.87%	51.61%	74.86%	95.00%	95.00%	95.00%
Extremadura (ES)	1.76%	4.41%	19.32%	26.02%	47.82%	64.24%	76.53%	85.70%	95.00%	95.00%	100.00%	100.00%
Norra Mellansverige (SE)	2.08%	5.21%	14.78%	27.21%	46.64%	46.64%	61.87%	93.71%	99.00%	99.00%	99.00%	99.00%
Essex (UK)												

Figure 3.12. Absorption rates for ESF fund during 2007-2013 period (Own elaboration based on EU reports).

3.4. Programming period comparisons

In addition to comparing the absorption rates among the regions for each fund and period, it may be also interesting to investigate and compare the absorption for each region and fund between the two programming periods. This analysis can provide meaningful insights about the impact of the first period's absorption on that of the second period, as well as about the differences in the absorption behaviour between the two periods. In this subsection, an analysis for the Italian regions is provided, while all relevant graphs for the rest regions are presented in the Appendix A.

Figures 3.13 and 3.14 depict the ERDF absorption rate for Calabria, Italy, and Emilia Romagna, Italy, respectively along the two programming periods. Figures 3.15 and 3.16 illustrate the ESF absorption rate for Calabria, Italy, and Emilia Romagna, Italy, respectively. It is notable in all graphs that in Calabria, Italy, for some years there is almost no absorption (those years almost coincide in both programs and policy cycles approximately between 2009 and 2013) and then there is an abrupt growth of the absorption. Oppositely in Emilia Romagna, Italy, absorption rates are very regular and almost always reach 100% (except for the ESF scheme during the 2007-2013 period), in contrast to Calabria, Italy, that never reach 100%. However, here it is visible that when the new policy cycle begins, in 2007, the absorption in the

previous one stops for a couple of years and then it starts over and reaches the complete absorption or in any case higher values.

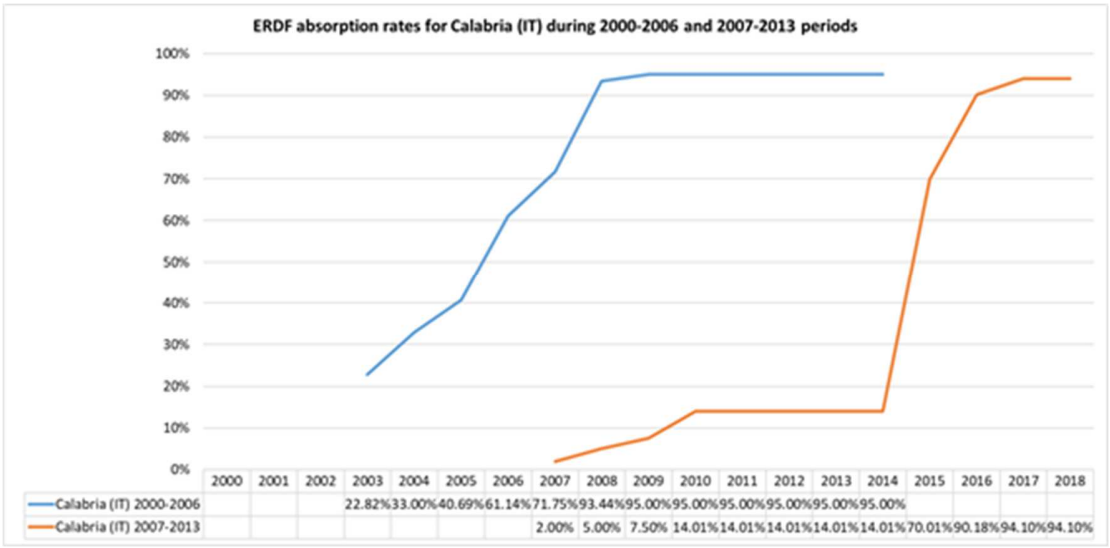


Figure 3.13. Comparison of absorption rates for ERDF fund in Calabria, Italy (Own elaboration based on EU reports).

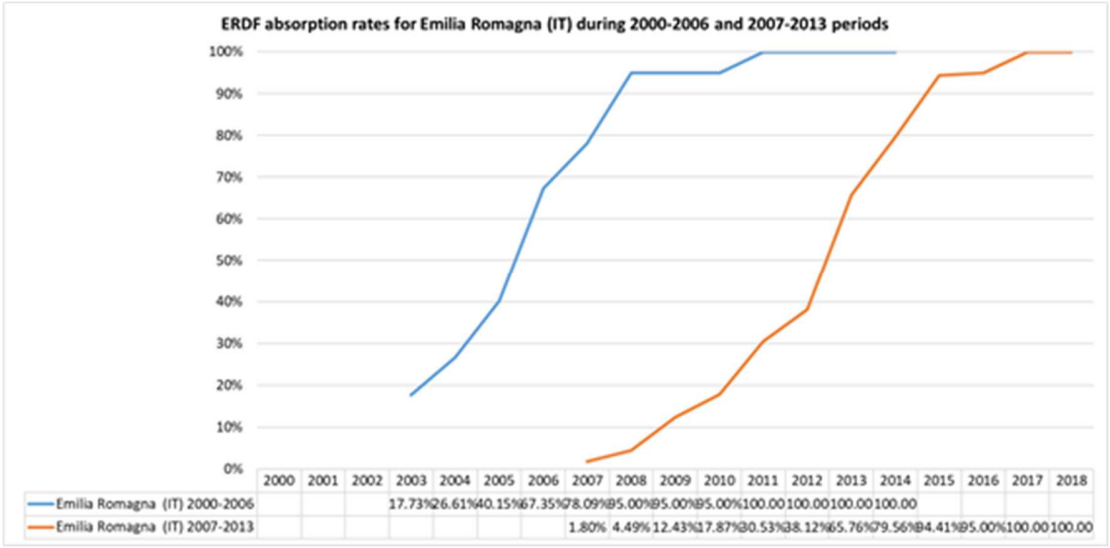


Figure 3.14. Comparison of absorption rates for ERDF fund in Emilia Romagna, Italy (Own elaboration based on EU reports).

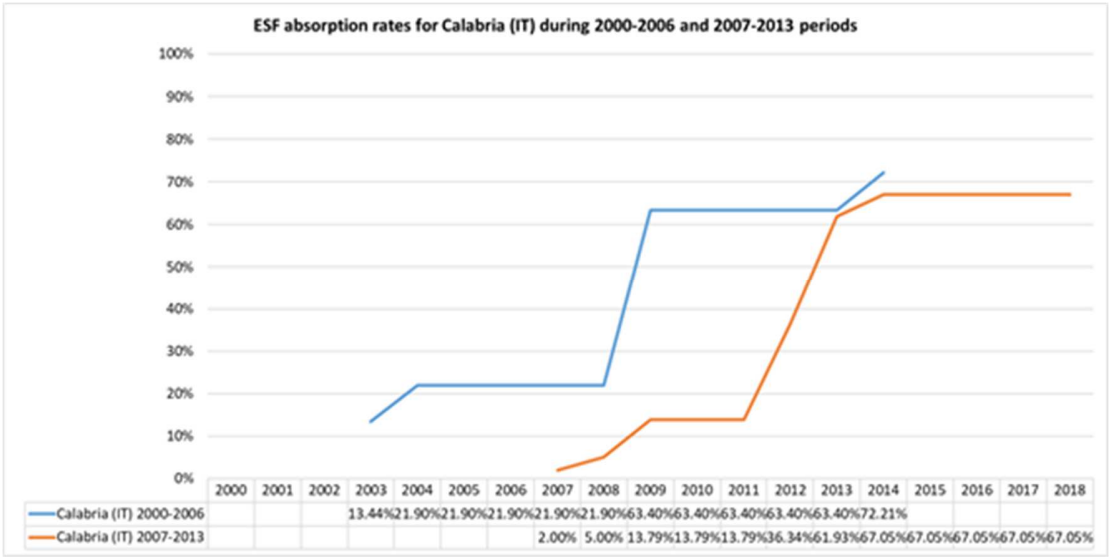


Figure 3.15. Comparison of absorption rates for ESF fund in Calabria, Italy (Own elaboration based on EU reports).

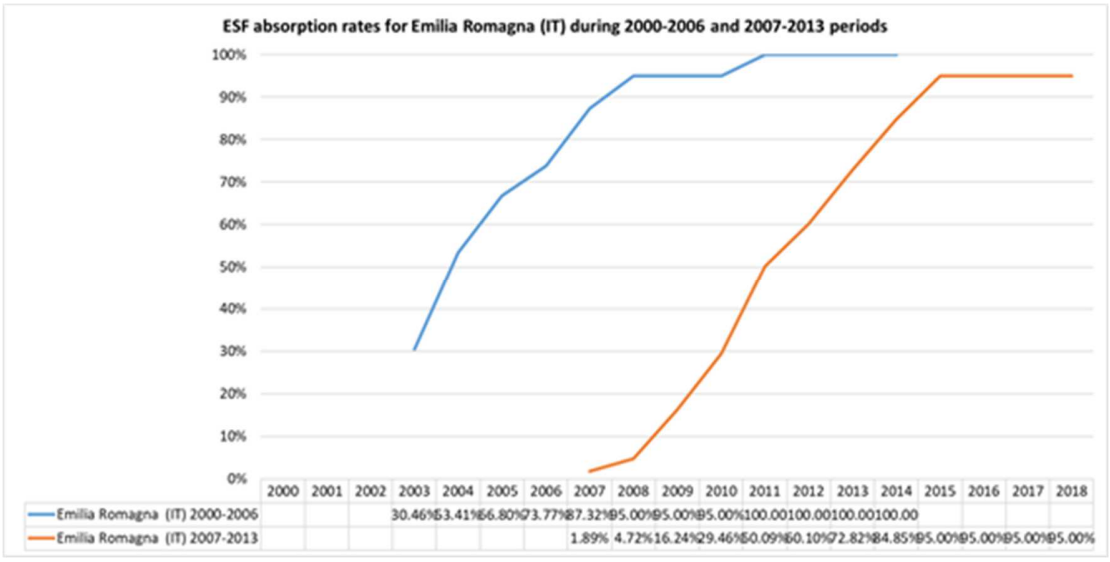
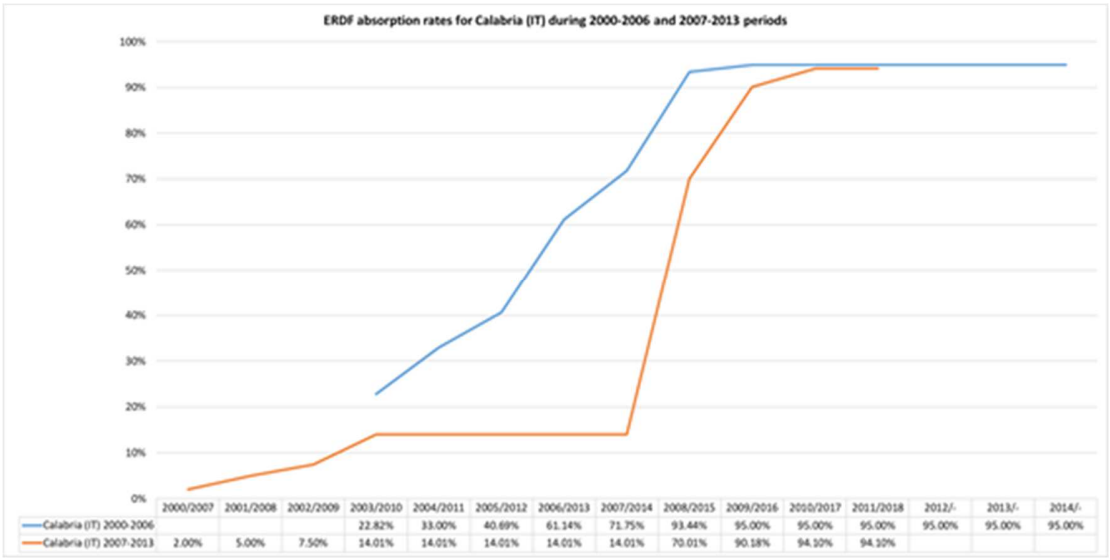


Figure 3.16. Comparison of absorption rates for ESF fund in Emilia Romagna, Italy (Own elaboration based on EU reports).

To provide a more comprehensive analysis, Figures 3.17 and 3.18 present the ERDF absorption rate for Calabria, Italy, and Emilia Romagna, Italy, respectively from a period overlap perspective. Comparing the absorption between the two periods, in Calabria, Italy, the ERDF rate is smoother in the first period than the second one thus the two slopes do not seem to match, while in Emilia Romagna, Italy, the slopes of the rates almost overlap perfectly indicating a regular and constant performance over the periods. In the same

vein, Figures 3.19 and 3.20 show the ESF absorption rate for Calabria, Italy, and Emilia Romagna, Italy, respectively from a period overlap perspective. Once again, while in Calabria, Italy, the absorption lines seem to oppose each other, in Emilia Romagna, Italy, the two distributions exhibit the same regular behaviour showing an almost perfect match. Notably, in Calabria, Italy, there is a more balanced absorption in the first period of the ERDF funding, while in the ESF funding this behaviour is observed (yet slightly) in the second period.



	2000/2007	2001/2008	2002/2009	2003/2010	2004/2011	2005/2012	2006/2013	2007/2014	2008/2015	2009/2016	2010/2017	2011/2018	2012/-	2013/-	2014/-
Calabria (IT) 2000-2006				22.82%	33.00%	40.69%	61.14%	71.75%	93.44%	95.00%	95.00%	95.00%	95.00%	95.00%	95.00%
Calabria (IT) 2007-2013	2.00%	5.00%	7.50%	14.01%	14.01%	14.01%	14.01%	14.01%	70.01%	90.18%	94.10%	94.10%			

Figure 3.17. Comparison of absorption rates for ERDF fund in Calabria, Italy, with programming period overlap (Own elaboration based on EU reports).

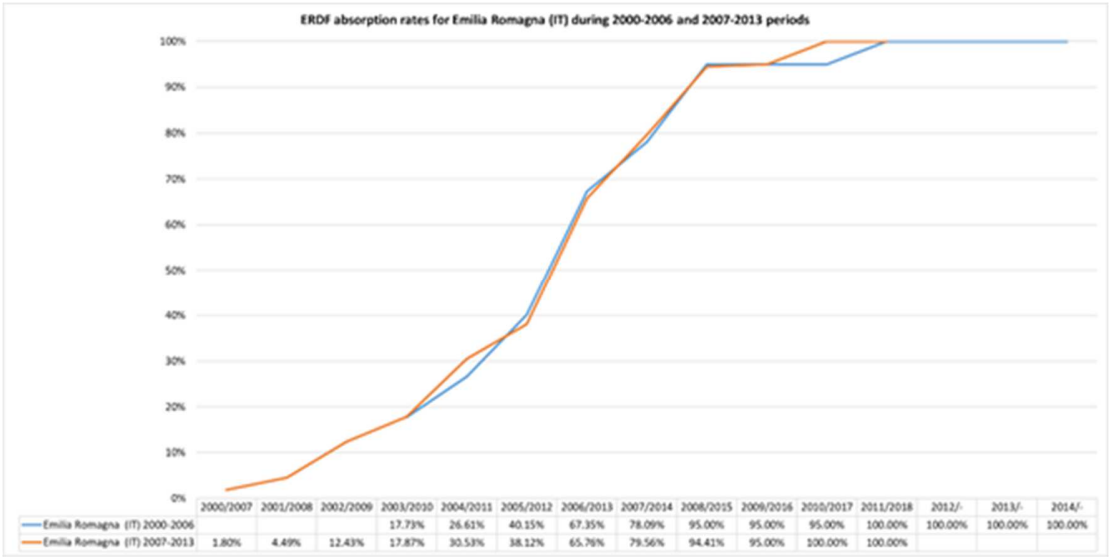


Figure 3.18. Comparison of absorption rates for ERDF fund in Emilia Romagna, Italy, with programming period overlap (Own elaboration based on EU reports).

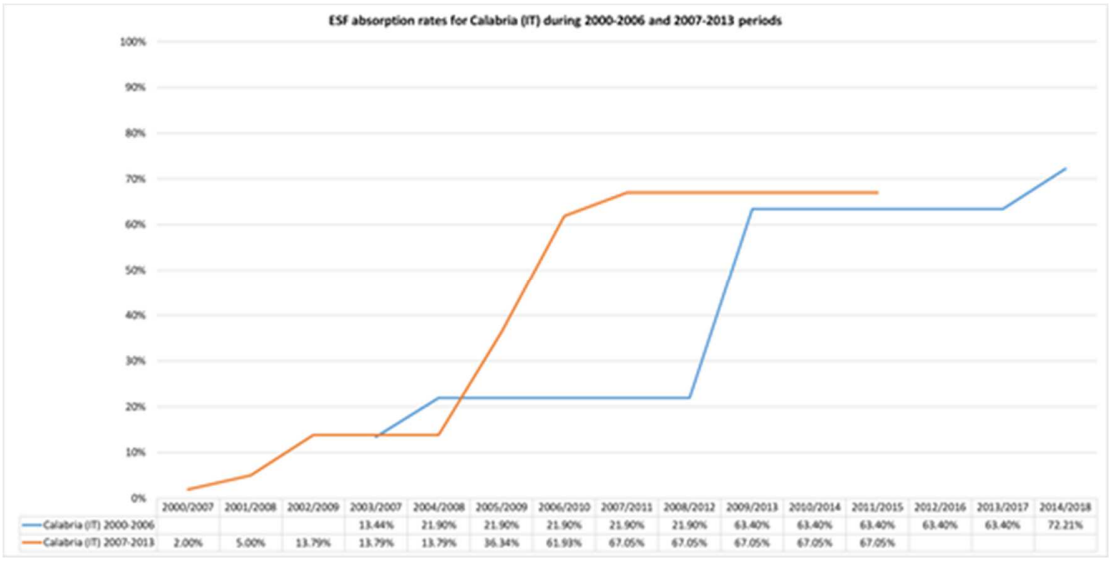


Figure 3.19. Comparison of absorption rates for ESF fund in Calabria, Italy, with programming period overlap (Own elaboration based on EU reports).

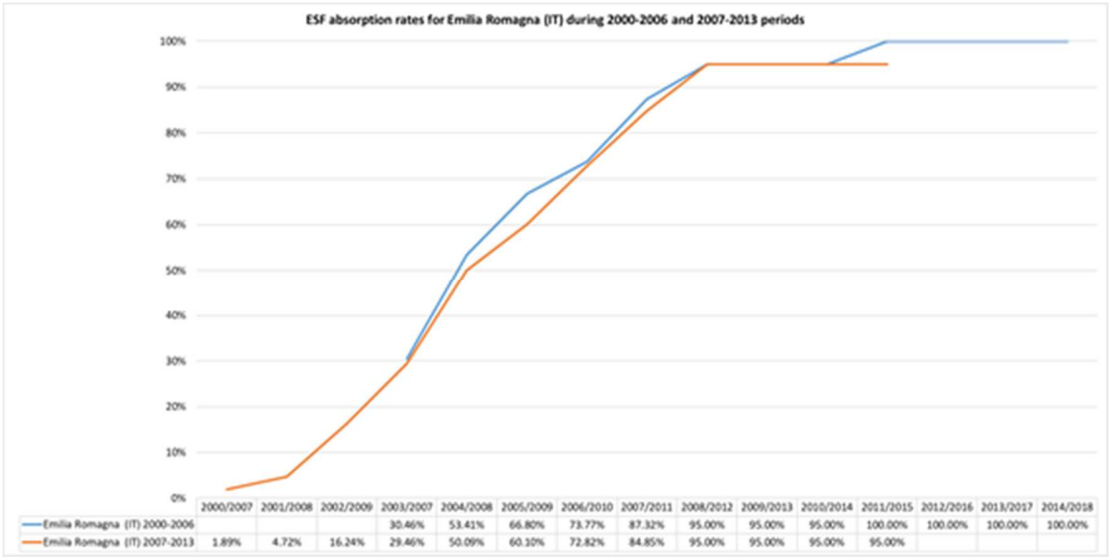


Figure 3.20. Comparison of absorption rates for ESF fund in Emilia Romagna, Italy, with programming period overlap (Own elaboration based on EU reports).

3.5. National awareness

Apart from the analysis of the absorption of the regional EU funds, the aim of the PERCEIVE project is to investigate the awareness of European citizens about the EU funded projects on their regions. To this end, data were retrieved from the available EU Eurobarometer reports (European Commission, 1995; 2008; 2010; 2013; 2015; 2017). The reports are not annual, thus the data collected are scattered along the time. The first report is identified in 1992 and the last one in 2017. It should be mentioned that some regions were not member of the EU since 1992, thus the relevant data are not available. Figure 3.21 illustrates the citizens' awareness (at a national level) about regional EU funded projects according to the Eurobarometers. The graph depicts the citizens' positive response to a general question, such as: *"Have you heard about any EU co-financed project that improves the region you live in?"*, for all nations with regions under study in the context of the PERCEIVE project. It should be mentioned that this question changes slightly during the years (Appendix A, Table A5). Each point in the graph constitutes the percentage of aware citizens as provided by the EU, while all values of the awareness between the documented ones are assumed to follow a linear trend.

Notably, the awareness data among the countries do not seem to follow the same unique pattern. More specifically, although in Austria, Italy, Spain, the awareness is increasing up to 2008, following the average EU trend, in the United Kingdom and Sweden, a decreasing or constant trend is identified. After 2008, only in Poland, citizens' awareness increases, reaching the highest percentage among all regions in 2017

(approximately 80%). Austria, Spain and the United Kingdom exhibit a considerably decreasing trend, while Romania and Sweden demonstrate a slightly increasing up to 2010 but then a decreasing one. In Italy, awareness seems to fluctuate after 2008, showing a decrease up to 2010, an abrupt increase up to 2013 and then a decrease again. All awareness data are presented analytically in tables in the Appendix A. Interestingly, although the funding absorption follows an increasing behaviour because projects completed and refunded are accumulating, the citizens' awareness does not seem to follow the same pattern. In other words, although more regional EU funded projects are performed through the years, it seems that there is a missing communication link that leads to the insufficient citizens' awareness about European Cohesion Policy.

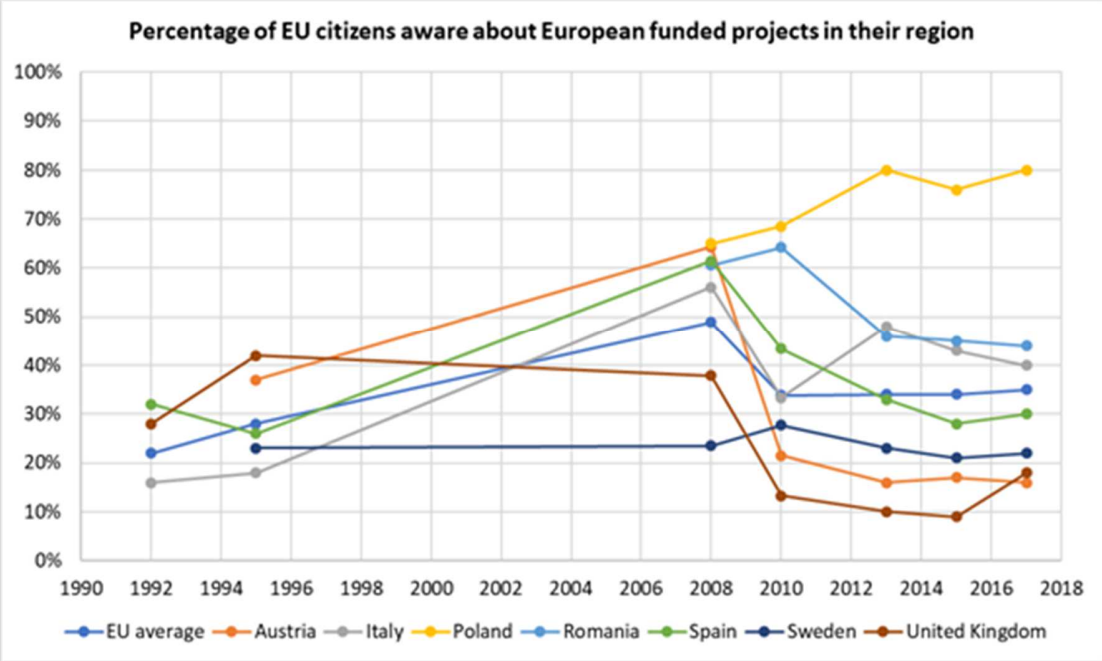


Figure 3.21. Citizens' awareness on regional EU funded projects (Own elaboration based on EU Eurobarometers).

Except for the Eurobarometers, an empirical research regarding the awareness of citizens about regional EU projects was carried out by the PERCEIVE researchers in 2017, as presented in the Deliverable 1.2 (Charron and Baur, 2017). People were asked to reply to the following question: *"Have you ever heard about any EU-funded project in your region-area?"*. The results of the study are presented in on Table 3.1. More specifically, the higher national awareness is documented in Poland (78%) and Spain (61%) and the lowest one in Austria (31%) and the United Kingdom (25%). As regards the regional awareness, the highest one is depicted in the Polish regions (more than 80%) and the lowest one in Norra Mellansverige (39%),

Sweden, and Essex (18%), United Kingdom. In addition, the major percentage differences between national and regional awareness, using the national awareness as a base, is highlighted in Austria (+65%), United Kingdom (-28%), Romania (-36%) and Spain (+20%).

Figure 3.22 provides a comparison of the citizens' awareness data between the Eurobarometer and the PERCEIVE deliverable in 2017. In fact, the graph maps significant differences between the two sources of data, highlighting even PERCEIVE values approximately twice the values of the Eurobarometer in Austria, Spain and Sweden. On the contrary, the lowest differences are documented in Poland and Romania. These considerable differences are detected probably due the different nature of the questions asked to the citizens. In fact, the EU question seems to be more specific asking about the awareness on EU ***co-financed*** projects that ***improve*** the regions in contrast to the more general PERCEIVE question. This fact may explain the lower percentages of the Eurobarometer study in most of the regions compared to PERCEIVE research, as people are sensitive to the way a question is asked and thus a more detailed question may lead to limitation in the responses.

Table 3.1. Citizens' awareness on regional EU funded projects in 2017 (Source: PERCEIVE Deliverable 1.2).

Country	National positive response	Region	Regional positive response	% Difference (National responses as a base)
Austria	31%	Burgenland	51%	64.52%
Italy	62%	Calabria	65%	4.84%
		Emilia Romagna	68%	9.68%
Poland	78%	Dolnośląskie	81%	3.85%
		Warmińsko-mazurskie	84%	7.69%
Romania	39%	Sud-Est	25%	-35.90%
Spain	61%	Extremadura	73%	19.67%
Sweden	42%	Norra Mellansverige	39%	-7.14%
United Kingdom	25%	Essex	18%	-28.00%

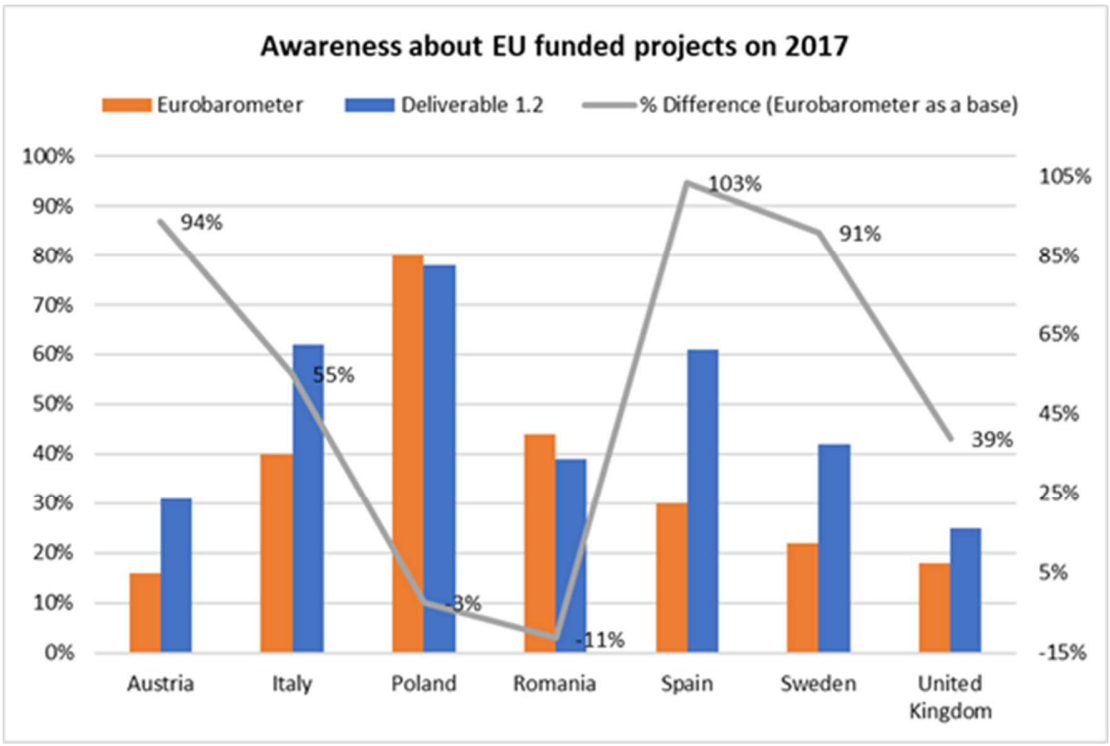


Figure 3.22. Comparison of citizens' awareness on regional EU funded projects on 2017 (Own elaboration based on EU reports and PERCEIVE Deliverable 1.2).

4. Qualitative analysis of the system: Causal loop diagrams

Due to the size and complexity of the system under study, we divided our analysis into two subsystems, namely: (*i*) the ***fund absorption system***, and (*ii*) the ***general public awareness system***. The fund absorption system focuses on the expenditure of EU structural funds in a LMA context, while the general public awareness system concentrates on the number of people aware of the EU role in the Cohesion policy still within the LMA region. Notably, the two systems are tightly interrelated given that the outputs of the one are inputs to the other and vice versa. As above mentioned, a LMA perspective is adopted as level of analysis. This choice has been taken in order to be in line with the PERCEIVE general approach. Therefore, only the aspects directly affecting (or affected) by the LMA performance, actions, scope and objectives are taken into consideration and described in detail. EU and nation-state actions are clearly important for LMA activities; however, they have been considered as external inputs to the system. Below, the qualitative representations of the two systems are going to be presented and explained.

4.1. Funds absorption system

In the following subsections, an elaborate analysis of the funds absorption system is provided. The system is divided into several smaller parts for facilitating the description.

4.1.1. Funds absorption overview

The system under study reflects the main flow of European Cohesion Policy funds from the EU to the regions, including all parameters and factors that affect this procedure. Notably, the analysis is ***multi-level***, including three key players: the EU, the regions and the final beneficiaries. In fact, the causal loop diagram illustrates how the initial EU funding is distributed ***dynamically***, beginning from the allocation of the funds to the regions up until the final refund of the beneficiaries for the projects accepted. Four major feedback loops exist in the system, namely: the "local managing authority learning" loop (in green), the "potential applications" loop (in purple), the "word of mouth" loop (in brown) and the "strategies to increase absorption rate" loop (in orange), all of which affecting (and get affected by) the main funding flow. Notably, some of the loops are intertwined, further highlighting the ***complexity*** of the system.

To develop the causal loop diagram, three types of sources were utilized: (*i*) EU literature, (*ii*) scientific literature and (*iii*) interviews with experts on the field. EU literature was used to build accurately the main flow of European Cohesion Policy funding. Given the rather qualitative nature of the rest variables within the system, scientific literature was utilised to the best possible extent to support the explanation of the connections among the variables. In case of an absence of related literature, empirical evidence was used to

validate the reliability of the relationships. In fact, PERCEIVE researchers performed interviews with experts in the area of EU funding to find any missing factors or links in the loops. Figure 4.1 illustrates the causal loop diagram of the system. The different parts of the diagram are explained in detail in the following subsections. In addition, all connections among the variables, together with the elaborate list of sources used, are presented in Appendix B.

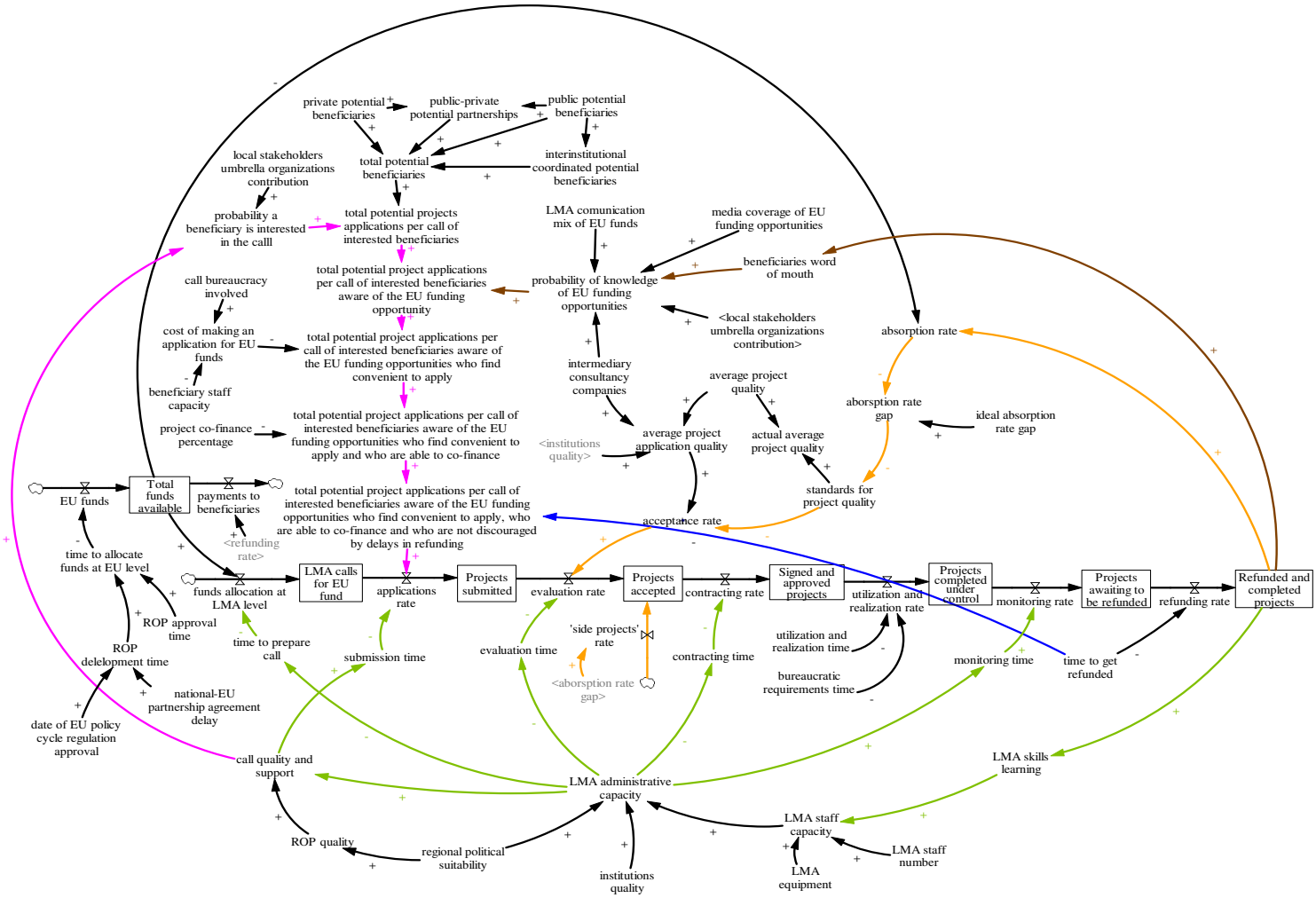


Figure 4.1. Funds absorption system: causal loop diagram.

4.1.2. Pipeline and resource stocks

The European Cohesion Policy funding scheme can be represented through a pipeline of stocks and rates, which is depicted in Figure 4.2. All resource stocks, reflecting the accumulation of funds, calls and projects in the system, are indicated, as already mentioned in section 2, with rectangles, while valves are

indicated with rates. At the start, after all necessary procedures to allocate funds are carried out (time to allocate funds at EU level), the *"EU funds"* flow in a stock of *"Total funds available"*, which in turn can be reduced when EU pays its commitments (*"payments to beneficiaries"* valve is opened). *"Total funds available"* stock directly affects LMA's *"EU funds allocation"* rate, which determines the amount of *"Region calls for EU funds",* after some time needed to prepare the call (*"time to prepare call"*). In fact, the more funds are allocated regionally, the more calls are prepared by the regions. Then, potential beneficiaries can apply to these calls. This happens in the system through the *"application rate"* mechanism: depending on the number of calls, potential beneficiaries make application, which accumulate into the stock of *"Projects submitted".* It is important to note that this process is not instantaneous, but it takes time to prepare and submit a project proposal (*"submission time"*). After that, these submitted applications are evaluated (*"evaluation rate")* based on an *"evaluation time"*, and all of those projects passing the evaluation accumulate into the stock of *"Projects accepted"*. Later, after a delay, these projects gets signed (*"contracting time"*) and therefore *"contracting rate"* moves *the projects approved to the state of "Signed and approved projects"*. Subsequently, after the bureaucratic requirements are performed (*"bureaucratic requirements time"*), the projects in this stock are put in place for a while (*"utilization and realization time"*). This is represented by the *"utilization and realization rate"* that brings completed projects in the stock of *"Projects completed under control".* Here, they are assessed for a period of time (*"monitoring time"*) and those that pass the monitoring phase move through the *"monitoring rate"* to the state of *"Projects awaiting to be refunded"*. After technicalities are solved and processed (*"time to get refunded"*), beneficiaries finally get refunded (*"refunding rate")* and all these projects accumulate in a stock named *"Refunded and completed projects"*. Two issues need to be mentioned: first, the *"refunding rate",* at the end of the pipeline, determines directly the initial *"payments to beneficiaries"*; second, along the whole pipeline, each rate is influenced by the related time for the process. It is important to remember that always the higher is the time, the lower the rate is.

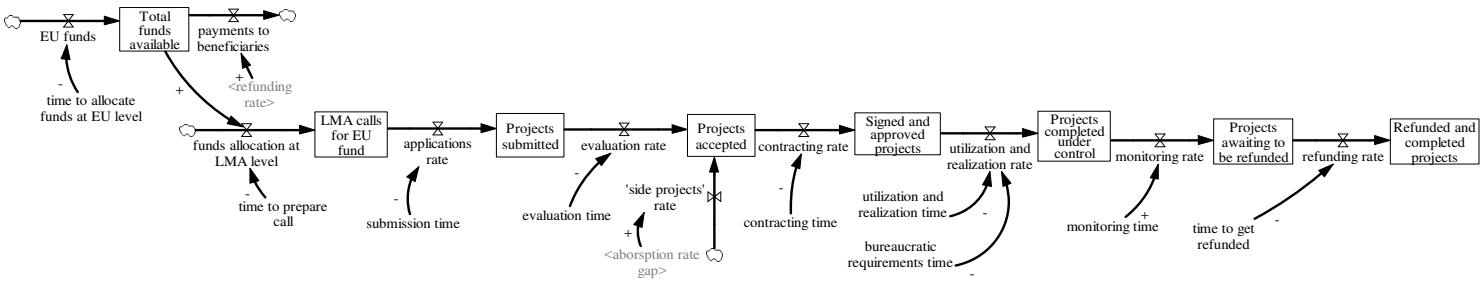


Figure 4.2. Funds absorption system: main pipeline.

4.1.3. Time to allocate funds at EU level

Figure 4.3 presents more in detail the factors affecting *"time to allocate funds at EU level"*. This time is comprised of two different components: *"ROP approval time"* and *"ROP development time"* (ROP stands for Regional Operational Programme). In fact, EU does not proceed to make the funding available to the LMA if the ROP hasn't been approved and, obviously, the ROP can't be approved if it hasn't been developed yet. The higher the two times are, the higher the *"time to allocate funds at EU level"* is (George, 2008; Milio, 2007) and this might result in delayed start of the LMA calls' writing phase. More specifically, the *"ROP development time"* is further influenced by the *"date of EU policy cycle regulation approval"* and the *"national-EU partnership agreement delay"* (George, 2008; Milio, 2007). In fact, when there is a delay in the date that the EU approves the related framework regulation or a delay between EU and the nation that receives the funding in signing the partnership agreement, the LMA can't proceed to develop its ROP.

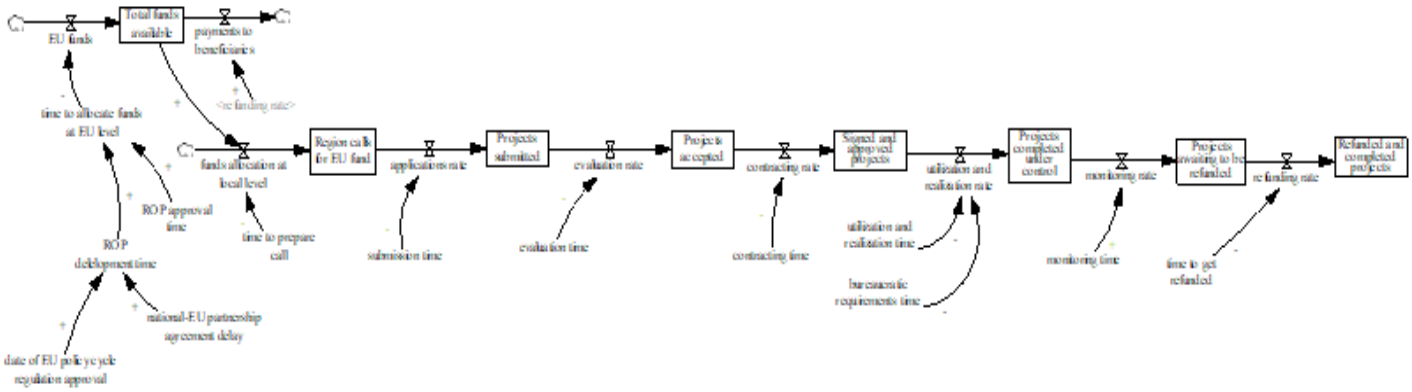


Figure 4.3. Funds absorption system: funds allocation at EU level.

4.1.4. Local managing authority learning loop

Figure 4.4 illustrates the local managing authority learning loop. Actually, this is not a sole loop but it is a structure of five different loops, given that local management authority's administrative capacity affects most of the delays involved in the EU funding process. More specifically, an accumulation of successful *"Refunded and completed projects"* generates an enhancement in experience and ability in the organization and managing of the funds (*"local managing authority skills learning"*). This leads to an increase in the *"staff capacity"* (Berică, 2010; Hapenciuc *et al*., 2013; Jaliu and Rădulescu, 2012; Lucian, 2014; Sumpíková *et al*., 2004; Tatar, 2010), which is further influenced by changes in *"staff number"* and *"equipment availability"*. A

raise in *"staff capacity"* fosters the *"local managing authority administrative capacity"* (Bericǎ, 2010; Hapenciuc *et al*., 2013; Jaliu and Rădulescu, 2012; Lucian, 2014; Sumpíková *et al*., 2004; Tatar, 2010), together with *"institution quality",* understood as quality of governance (Charron *et al*., 2015), and *"regional political suitability"*. This latter is a qualitative broad concept comprising many other concepts such as the regional organization, structure and size suitability to manage EU funds (Milio, 2007), the degree of regional autonomy in administering structural funds (George, 2008; Smętkowski *et al*., 2018; Tatar, 2010; Kyriacou and Roca-Sagalés, 2012), the number of departments involved in the process and the degree of cooperation among them (Milio, 2007; George, 2008; Lucian, 2014) and the overall political stability, continuity and correspondence with EU ideals. *"Regional political suitability"* also affects *"ROP quality",* that is, the adequacy of ROP to be easily implementable, to respond exactly to local beneficiaries needs and to be flexible enough to adapt to context variations. In turn, ROP directly influences *"call quality and support".* Getting back to the administrative capacity, an increase in its value reduces the time needed to process calls, applications and, in general, processes within the EU funding system (i.e. *"submission time"*, *"evaluation time"*, *"contracting time"* and *"monitoring time"*), given the increasing efficiency of the local managing authority. A decrease of each different time increases the related rates, making the flow through the pipeline quicker and therefore leading to more efficient processes. Similarly, in the broader loop, a reduction in the *"time to prepare call"* increases the *"EU funds allocation"* rate, which in turn increases the *"Region calls for EU funds"* stock. Then, an increase in this stock further increases the *"application rate"* (the more the calls are, the more project applications are submitted). The same positive effect is transmitted to the *"Refunded and completed projects"* stock. Finally, an increase in the aforementioned stock raises the knowledge of the local managing authorities and hence the *"local managing authority skills learning"* (Hapenciuc *et al*., 2013; Jaliu and Rădulescu, 2012; Lucian, 2014). Given that the loop has begun with an increase in the *"local managing authority skills learning"* and closed with an increase in the same variable, this loop can be considered as a reinforcing, or positive, loop. The other four loops follow exactly the same behavior.

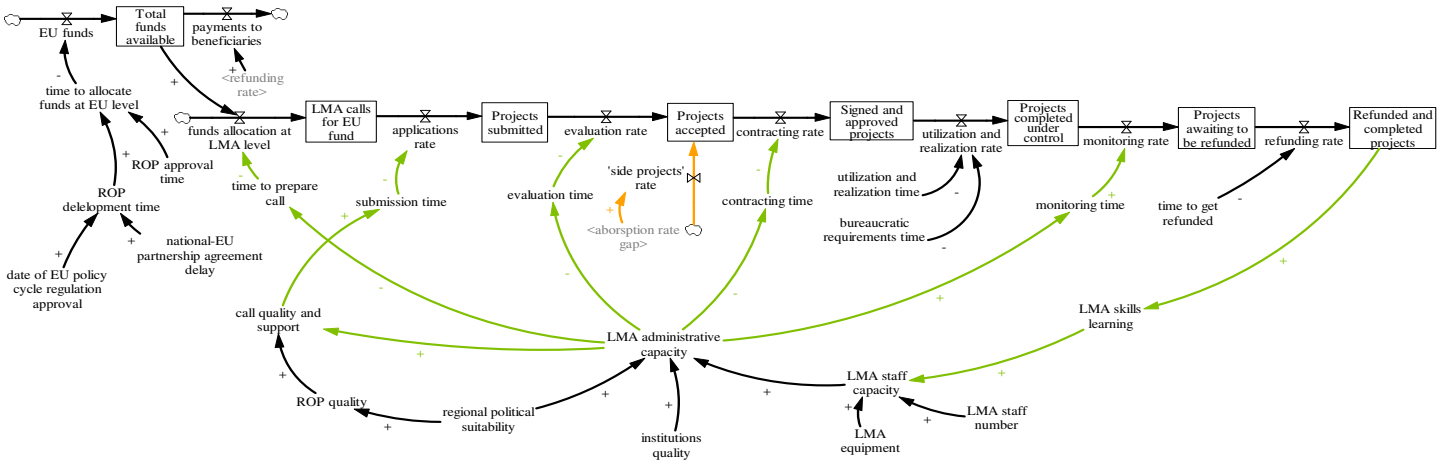


Figure 4.4. Funds absorption system: local managing authorities learning loop.

4.1.5. Project applications loop

Figure 4.5 presents the potential project applications loop. Before getting into the loop, it's important to note that the number of *"total potential beneficiaries"* consists of the sum of the *"public potential beneficiaries"*, *"interinstitutional coordinated potential beneficiaries"*, *"private potential beneficiaries"* and the *"public-private potential beneficiaries"*. In fact, these are the groups that, once added, make up the broader pool of beneficiaries who can apply for funds. Therefore, an increase of each component increases the total sum (George, 2008; Squinzi, 2013; Jaliu and Rădulescu, 2012). From this initial number representing the total potential in the region subjects who could make an application for a call, the system operates a series of 'cuts', which give a final number of potential beneficiaries that actually apply. We can imagine this as a sort of stream and every step we lose a portion of the total potential beneficiaries because they do not pass the cut. Getting back to the structure, a growth in the *"total potential beneficiaries"* causes an augmentation in the *"total potential projects applications per call of interested beneficiaries"* (T1) (Zaman and Cristea, 2011). This latter not only depends on the total number of potential beneficiaries but also on the *"probability a beneficiary is interested in the call",* which in turn depends on *"local stakeholders umbrella organizations contribution"* and on the *"call quality and support"*. As for *"local stakeholders umbrella organizations contribution"* , different stakeholders such as industrial, commercial, public organization can be involved in the call development to make the call more suitable for local needs and therefore more desirable in the eyes of potential beneficiaries. As for *"call quality and support"* , if a call is written in an easily accessible format and takes into account the possible necessities of potential beneficiaries and high quality support is offered during the application procedure, the probability a beneficiary is interested raises. If an increase in T1

occurs, the *"total potential project applications per call of interested beneficiaries aware of the EU funding opportunity"* (T2) grows too (Barbiero *et al*., 2017). As the name suggests, this variable takes into account not only the beneficiaries finding the call interesting but also the fact that they need to be informed about its existence in order to apply (T2 is regulated also by *"probability of knowledge of EU funding opportunities"*, this variable will be discussed in detail next paragraph). A change in T2, in turn, positively affects the *"total potential project applications per call of interested beneficiaries aware of the EU funding opportunities who find convenient to apply"* (T3) (Barbiero *et al*., 2017). This latter is also negatively influenced by any increase in the *"cost of making an application for EU funds"* that the beneficiaries should pay (Tatar, 2010), this latter being, obviously a discouraging factor. Then, an increase in T3 raises the *"total potential project applications per call of interested beneficiaries aware of the EU funding opportunities who find convenient to apply and who are able to co-finance"* (T4), which is reduced by an increase *"project co-finance percentage"* asked to the beneficiaries (Berică, 2010; George, 2008; Jurevičienė and Pileckaitė, 2013; Zaman and Cristea, 2011; Sumpíková *et al*., 2004; Tatar, 2010). Here, the skimming of the initial potential number continues: for applying for EU fund in the last instance, beneficiaries needs also 'to satisfy' the criteria of being able to co-finance the project. Finally, an increase in T4 further increases the *"total potential project applications per call of interested beneficiaries aware of the EU funding opportunities who find convenient to apply, who are able to co-finance and who are not discouraged by delays in refunding"* (T5) (Berică, 2010; George, 2008; Jurevičienė and Pileckaitė, 2013; Zaman and Cristea, 2011; Sumpíková *et al*., 2004; Tatar, 2010). This latter quantity is reduced by an increase in the *"time to be refunded"* regarding the beneficiaries' projects (Jaliu and Rădulescu, 2012). This mechanism acts as last funnel to the total potential beneficiaries' stream (the more beneficiaries have to wait after a project is completed to be refunded the more they perceive the investment as risky and therefore they are discouraged to apply), and the corresponding structure will be explained in detail in paragraph 4.1.7. After all the described cuts, and following the loop's logic, an increase in T5, which reflects the final amount of the total potential applications that are going to be submitted, fosters the *"applications rate"*. Hereafter, the positive relationships (i.e. increasing effects) continue, as indicated before in paragraph 4.1.4 for the local managing authority learning loop, up to the *"local managing authority administrative capacity"* that also has a positive effect on the *"call quality and support"* (Barbiero *et al*., 2017). An increase in the *"call quality and support"* towards the potential beneficiaries that aim to submit an application leads to an increase in the *"probability a beneficiary is interested in the call"* (Barbiero *et al*., 2017; Milio, 2007; Tatar, 2010), as previously explained. At the end of the loop, an increase in the aforementioned probability further raises T1, *"total potential projects applications per call of interested beneficiaries"*. Given that the loop has begun with an increase in the T1 and closed also with an increase in the same variable, this loop can be considered as a reinforcing, or else positive, loop.

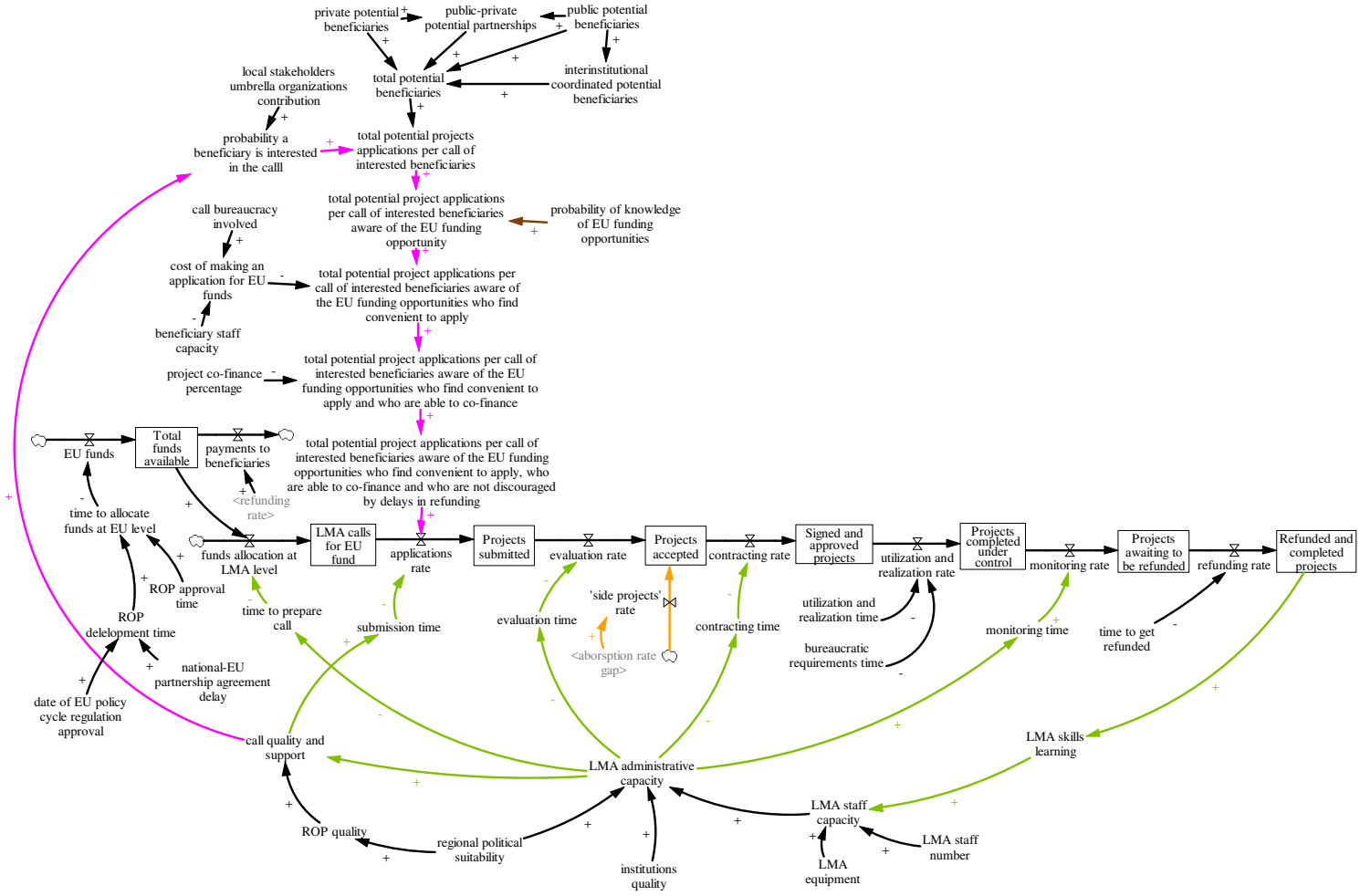


Figure 4.5. Funds absorption system: project applications loop.

4.1.6. Word of mouth loop

Figure 4.6 depicts the word of mouth loop. The logic underlying this structure is that the more EU funded projects are successfully completed the more beneficiaries will positively talk about EU funding and consequently inform other potential beneficiaries about this opportunity. Such mechanism translates in the structure in the following way: a raise in the *"Refunded and completed projects"* stock pushes the *"beneficiaries word of mouth"*, which in turn fosters the *"probability of knowledge of EU funding opportunities"*. This probability can be also increased by increments in the *"region communication mix of EU funds"*, *"media coverage of EU funding opportunities"*, *"local stakeholders umbrella organizations contribution"* and *"intermediary consultancy companies"* that can improve the communication of the funding

programmes to potential beneficiaries and inform them about both the existence of EU financing support calls and the feasibility of accessing to this funds (Barbiero *et al.*, 2017; Borz *et al.*, 2018; Capello and Perucca, 2017; Jurevičienė and Pileckaitė, 2013). Continuing within the loop, a change in the *"probability of knowledge of EU funding opportunities"* affects the number of *"total potential project applications per call of interested beneficiaries aware of the EU funding opportunity"* (Barbiero *et al.*, 2017) and, following the chain of variables, this translates in an increase of applications and such positive effect continues up until the *"Refunded and completed projects"* stock (as showed in paragraph 4.1.4). Given that the loop has begun with an increase in the aforementioned stock and closed with an increase in the same variable, this loop can be considered as a reinforcing, or positive, loop.

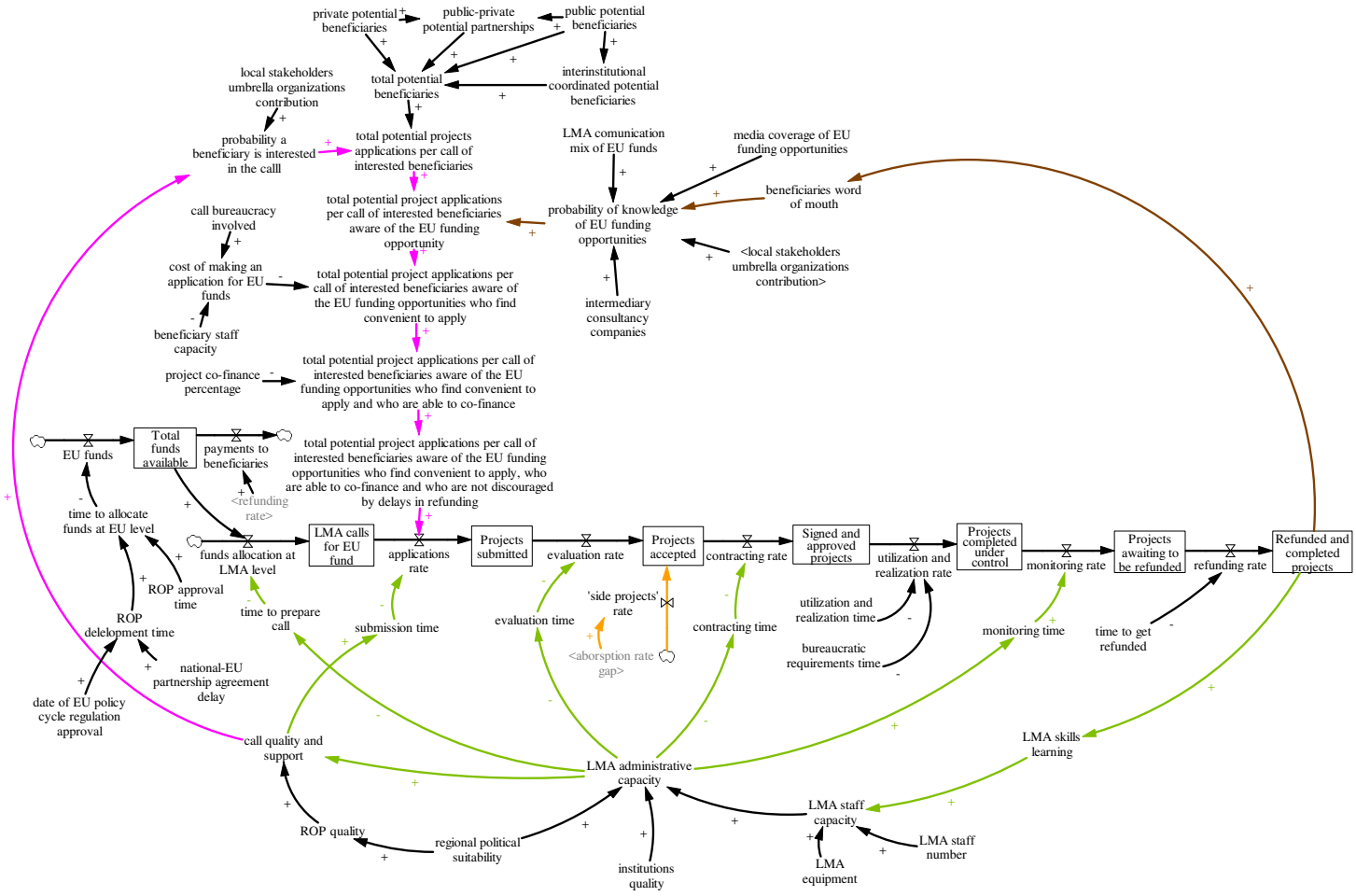


Figure 4.6. Funds absorption system: word of mouth loop.

4.1.7. Shortcut strategies to increase absorption loop

Figure 4.7 illustrates the shortcut strategies that a local managing authority can adopt with the purpose of increasing absorption rate if necessary. In fact, the absorption can be increased either by decreasing the standards of the projects' quality (the authority decreases its standards in order to accept more projects[2]) or by extending funding for existing projects ('side projects'). Thus, this is represented by not a sole loop but two different loops, as it is going to be described below. Beginning from the *"Refunded and completed projects"*, an increase in this stock increases the *"absorption rate"* of the EU funds (which clearly depends on the value of *"Total available funds"* stock) (Tatar, 2010; Zaman and Cristea, 2011). Consequently, an increasing *"absorption rate"* decreases the *"absorption rate gap"* (which is expressed as a comparison to an "ideal absorption rate"). Here, the two different loops separate. In the first loop, a reduction in the *"absorption rate gap" allows the local managing authority to* increase its *"standards for project quality"* to optimize the number of the projects that are going to be accepted. Thus, an increase in the *"standards for project quality"* reduces the *"acceptance rate"* which in turn decreases the *"evaluation rate"* (Burja and Jeler, 2018; Jurevičienė and Pileckaitė, 2013; Zaman and Cristea, 2011). As a result, as shown in paragraph 4.1.4, a reduction of the aforementioned rate will finally lead to a decrease of the *"Refunded and completed projects"* stock. At the same time, a reduction in the *"absorption rate gap"* decreases the *"'side projects' rate"*, which refers to the further financing of projects already implemented in order to boost the absorption of the EU funding (Corte dei Conti, 2017). Then, a reduction of the *"'side projects' rate"* reduces the "Projects accepted" stock value. Following again the same positive effect described in in paragraph 4.1.4, a reduction of the latter stock will decrease the *"Refunded and completed projects"* stock. In both cases, given that the loops have begun with an increase in the aforementioned stock and closed with a reduction in the same variable, these loops can be considered as balancing, or else negative, loops. In this case, it is important to note that this loop tends to work the other way around. If the *"absorption rate"* is not high enough, and inevitably the *"absorption gap"* is too large, as said, local authorities may tend to decreases their standards in order to augment the number of projects that get accepted and ultimately to increase the absorption. Similarly, for "side projects rate", when the absorption gap is large, the managing authority might decide to compensate with an increase in the side project flow, which quickly

[2] The idea that qualitative standards can be lowered to increase absorption rate the controversial. The workshops, focus groups and interviews that we conducted with stakeholders and policy-makers reached different conclusions in this issue. A different perspective to address the issue is one that points at the possibility to increase the potential number of beneficiaries by broadening the content of the calls. It is, however, argued that by facilitating the access of potential beneficiaries to the call, less motivated beneficiaries are reached thereby decreasing the average level of proposal. We reached the conclusion that this mechanism need to be further investigated.

increases the number of project funded and therefore the absorption. Obviously, the decreasing of projects accepted standards produces the effect of decreasing the quality of the average EU funded project under that policy scheme.

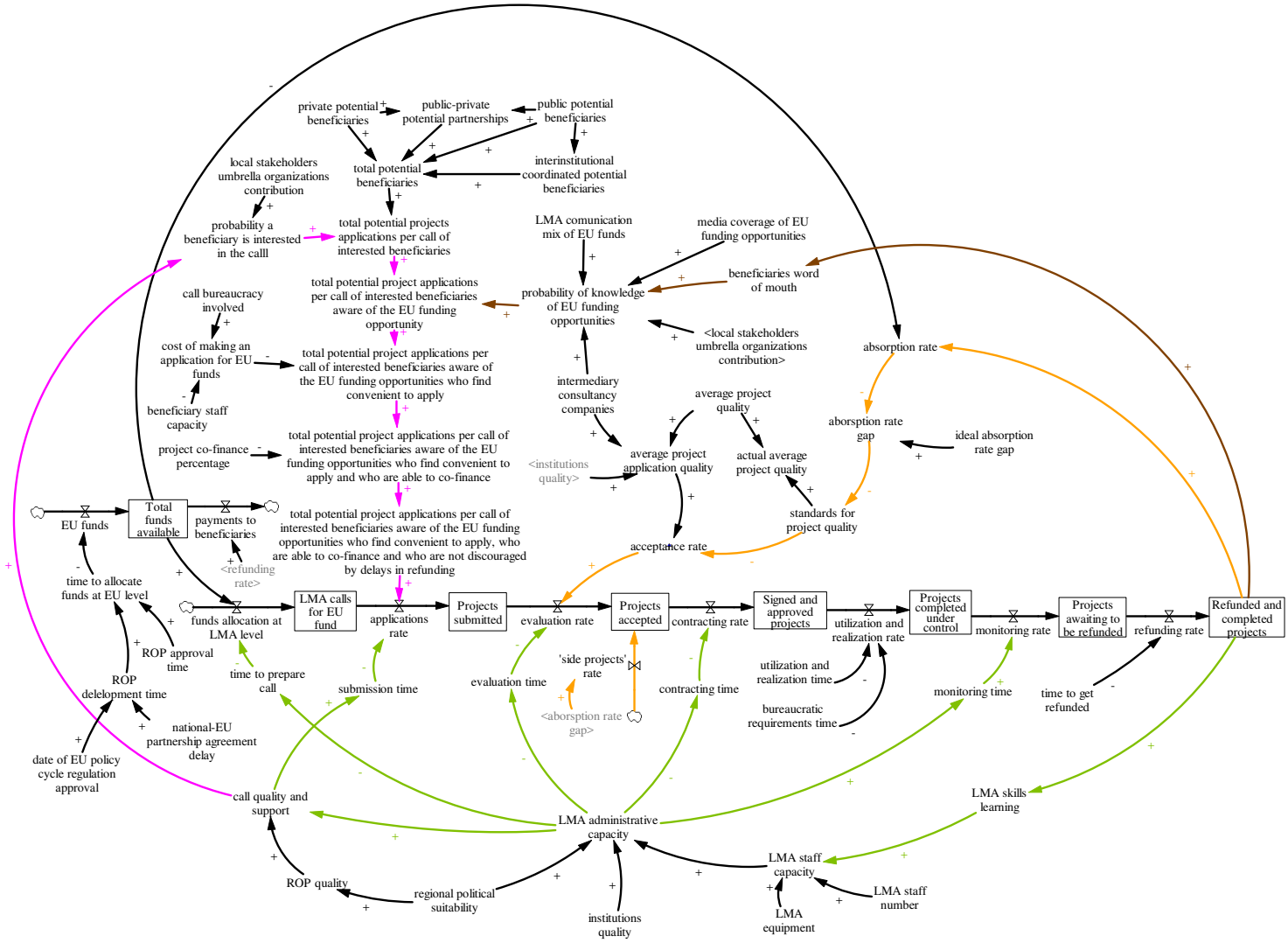


Figure 4.7. Funds absorption system: shortcut strategies to increase absorption loop.

4.1.8. Time to get refunded as a possible discouraging factor

The last mechanism represented in the funds absorption causal loop diagram is portrayed with a blue line and it is visible in Figure 4.8 below. Once the monitoring authority has checked a project, it has to wait a certain amount of time to be refunded (*"time to get refunded"*). That amount of time seems to be a relevant

factor in the potential beneficiaries' considerations: if this time increase too much (or appear to be unreliable) it can discourage potential beneficiaries from applying because they do not feel they can rely on the regularity of payments.

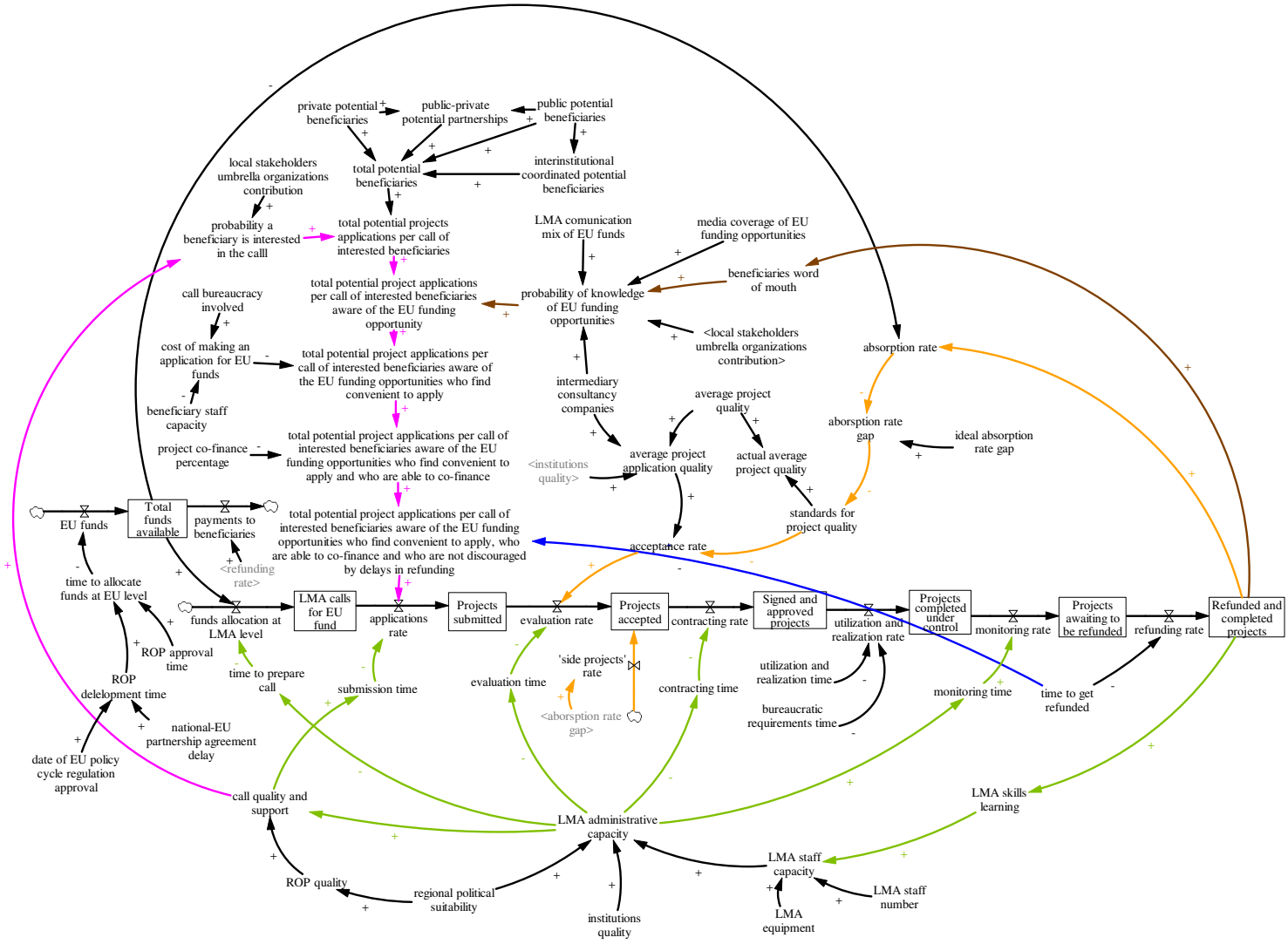


Figure 4.8. Funds absorption system: time to be refunded as a possible discouraging factor.

4.2. General public awareness system

In the following subsections, an elaborate analysis of the general public awareness system is provided. The system is divided into several smaller parts for providing a more efficient description.

4.2.1. General public awareness overview

The system under study reflects the main streams of information that affect the European citizens' awareness about EU Structural Funds, namely the ERDF and ESF schemes. In the context of the PERCEIVE project, *a person is considered as aware if they have heard about any EU co-financed project that improves the area where they live*. To the best of our knowledge, this is a first research effort for mapping all major factors that potentially influence these streams of information. In fact, there are four main streams as presented in Figure 1, namely: (*i*) the "EU direct" stream (highlighted in blue), (*ii*) the "local managing authority" stream (highlighted in orange), (*iii*) the "media" stream (highlighted in red), and (*iv*) the "funded projects implemented stream" (highlighted in green). The system further includes a "closed pipeline" mechanism that balances the trade-off between citizens' awareness and forgetfulness about EU funded projects on their region. In contrast to the funds absorption part, which was based on both EU/scientific literature and interviews with experts, the development of the general public absorption part is mainly based on empirical research, including observation of the real world, communication with general public and of course interviews with experts on the field, all performed by PERCEIVE researchers. Figure 4.9 illustrates the causal loop diagram of the system. The different parts of the diagram are explained in detail in the following subsections.

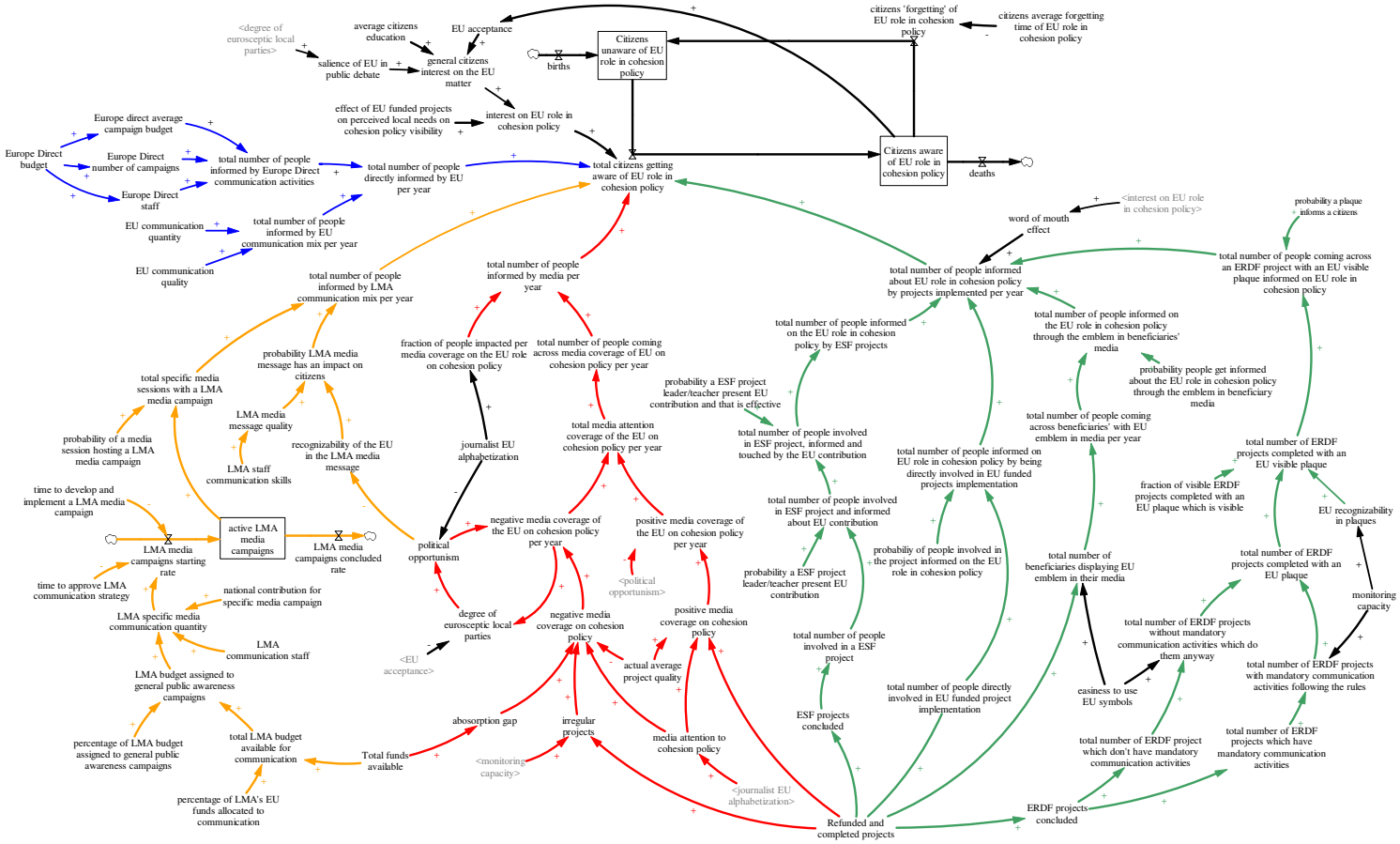


Figure 4.9. General public awareness system: causal loop diagram.

4.2.2. System main "closed pipeline"

Figure 4.10 depicts the main flow of citizens that get either aware or forgetful about the European Cohesion Policy. More specifically, a growth in the rate of actual "births" in a region increases the total number of *"citizens unaware of EU role in cohesion policy"* (system state), as new-borns are obviously not aware of the existence of cohesion policy. Through the years, citizens might get aware and they move through the *"total citizens getting aware of EU role in cohesion policy"* rate from being aware to the stock of citizens aware (*"citizens aware of EU role in cohesion policy"*). The total number of aware citizens can be decreased due a rise of two different rates: either (*i*) the rate of actual *"deaths"* in the regions or (*ii*) the *"citizens 'forgetting' of EU role in cohesion policy"* rate. In fact, the rate of forgetfulness can be augmented when the *"citizens average forgetting time of EU role in cohesion policy"* is reduced, as the lower this time is the quicker the citizens forget about European Cohesion Policy. The aforementioned rate further fosters the

total number of unaware citizens, closing the circular flow that represents the trade-off between citizens' awareness and forgetfulness.

In addition, an increase in the *"citizens aware of EU role in cohesion policy"* state causes the growth of the *"EU acceptance"*, which in turn raises the *"general citizens interest on the EU matter"*. In fact, as the awareness grows, citizens seem to accept more the concept of EU, thus, they get more concerned about EU issues. The citizens' interest can be further boosted when *"average citizens' education"* or *"salience of EU in public debate"* is augmented. In general, as resulting from our PERCEIVE survey, people that are more educated are potentially keener on political issues, including EU topic, while the prominence of EU publicly can further foster citizens' interest. Notably, the *"salience of EU in public debate"* might increase when the *"degree of Eurosceptic parties"* is increased, as Euroscepticism usually constitutes a focal topic on public political discussion. Furthermore, a growth in the *"general citizens interest on the EU matter"* can consequently lead to a rise of the *"interest on EU role in cohesion policy"*. At the same time, an interest on European Cohesion Policy can be further increased when the *"effect of EU funded projects on perceived local needs on cohesion policy visibility"* grows, as obviously the visibility of the EU projects' results and effects can enhance citizens' interest.

Finally, an increase in the interest on European Cohesion Policy can further boost the rise of the *"total citizens getting aware of EU role in cohesion policy"* rate. This rate, which constitutes one of the key variables of the system under study, can be positively affected by the variables that express each one of the information streams. Namely: (*i*) "total number of people directly informed by EU per year" (EU direct stream), (*ii*) *"total number of people informed by LMA communication mix per year"* (local managing authority stream), (*iii*) *"total number of people informed by media per year"* (media stream), and (*iv*) *"total number of people informed about EU role in cohesion policy by projects implemented per year"* (funded projects implemented stream).

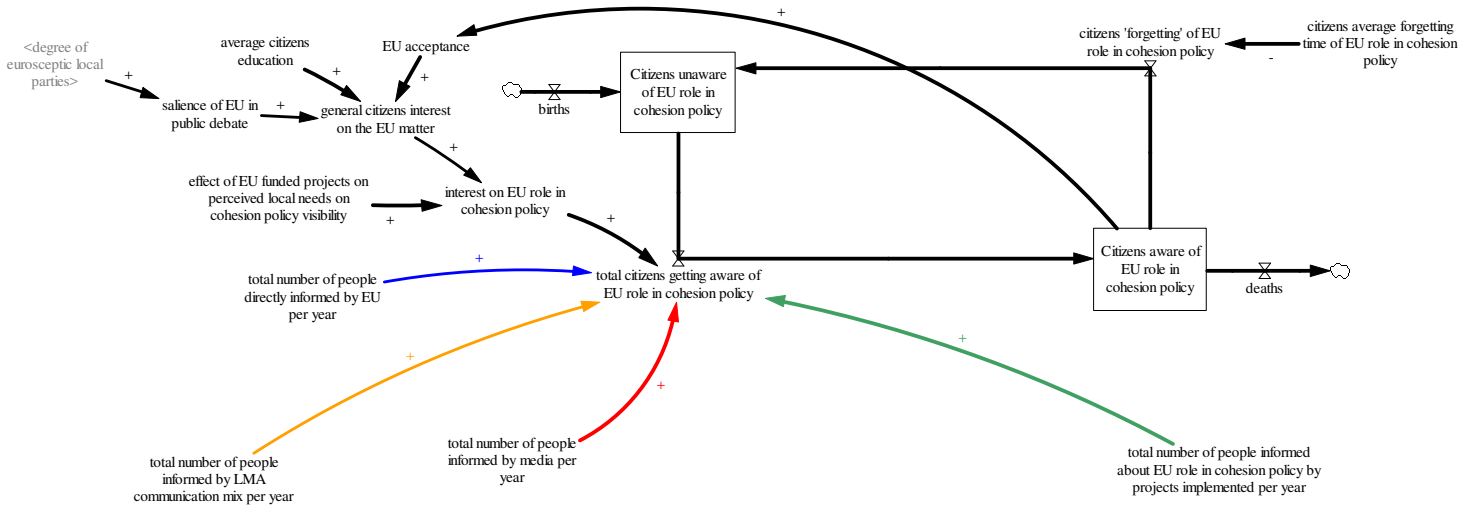


Figure 4.10. General public awareness system: main "closed pipeline".

4.2.3. EU direct stream of information

Figure 4.11 illustrates the EU direct stream of information that supports citizens' awareness about European Cohesion Policy. This stream is composed of two sources: one is the Europe Direct agencies work with locals (a network of information centres, documentation centres and speakers in every EU region) and the other is the communication directly put in place by European institutions through media campaigns.

With respect to the first sub stream, the total budget that EU provides for informing people about its goals and actions through the Europe Direct agency (*"Europe Direct budget"*) can have a positive influence on: (*i*) the budget of the information campaigns (*"Europe Direct average campaign budget"*), (*ii*) the number of the related campaigns (*"Europe Direct number of campaigns"*), as well as (*iii*) the number of personnel that is engaged with such campaigns (*"Europe Direct staff"*). An increase of the quantity of all three factors can lead to a rise of the *"total number of people informed by Europe Direct communication activities"*, as obviously the more and the better the campaigns are the more citizens will get aware about the cohesion policy.

At the same time, both the "EU communication quantity" and the "EU communication quality" in general may positively influence the "total number of people informed by EU communication mix per year", excluding the specific campaigns organised. The total number of citizens informed by both the Europe Direct agency and the EU in general equals to the "total number of people directly informed by EU per year" that in turn may also impact positively the *"total citizens getting aware of EU role in cohesion policy"* rate.

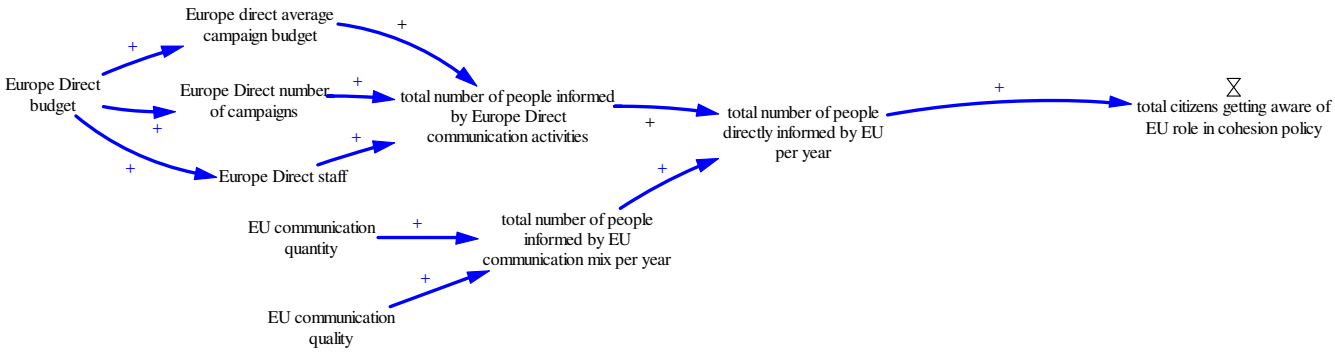


Figure 4.11. General public awareness system: EU direct stream of information.

4.2.4. Local managing authority stream of information

Figure 4.12 presents the local managing authority stream of information that enhances citizens' awareness about European Cohesion Policy. More specifically, a part of the EU's *"Total funds available"*, which is expressed through the *"percentage of LMA's EU funds allocated to communication"*, covers the *"total LMA budget available for communication"* about the European Cohesion Policy. Then, part of the communication budget (expressed through the "percentage of LMA budget assigned to general public awareness campaigns") is especially allocated to the local managing authorities for launching campaigns to raise the general public's awareness (*"LMA budget assigned to general public awareness campaigns"*). An increased budget for campaigns and a high number of local managing authorities' personnel engaged in communication activities (*"LMA communication staff"*), as well as a potentially high *"national contribution for specific media campaign"*, could foster the number of campaigns the LMA does (*"LMA specific media communication quantity")*. In fact, the more the communication budget is, the more media sessions for raising awareness the local managing authorities could cover. Then, increased quantity of media communication increases the related rate *("LMA media campaigns starting rate"*). However, this rate obviously decreases if the *"time to approve LMA communication strategy"* or the *"time to develop and implement a LMA media campaign"* are high. The media campaigns rate accumulates into a stock of *"Active LMA media campaigns"* that is depleted by the relevant *"LMA media campaigns concluded rate"*. Finally, an

increased total number of *"Active LMA media campaigns"* can potentially raise the *"total specific media session with a LMA media campaign"*, taking into consideration the *"probability of a media session hosting a LMA media campaign"*.

In addition, growing citizens' *"EU acceptance"* can obviously decrease the *"degree of Eurosceptic local parties"*, which in turn lessens the phenomenon of the so-called *"political opportunism"* that is the focal goal of the Eurosceptic parties. A low *"political opportunism"* can hopefully lead to an increased *"recognizability of the EU in the LMA media message"* by the citizens, which in turn boosts the likelihood of a positive effect of the local managing authorities' media campaigns on the citizens (*"probability LMA media message has an impact on citizens"*). Such an increased probability, along with a large number of *"total specific media session with a LMA media campaign"*, can raise the *"total number of people informed by LMA communication mix per year"*, as the more the effective local managing authorities' campaigns exist the more people get informed. Finally, the total number of people informed by the local managing authorities further sums to the *"total citizens getting aware of EU role in cohesion policy"* rate.

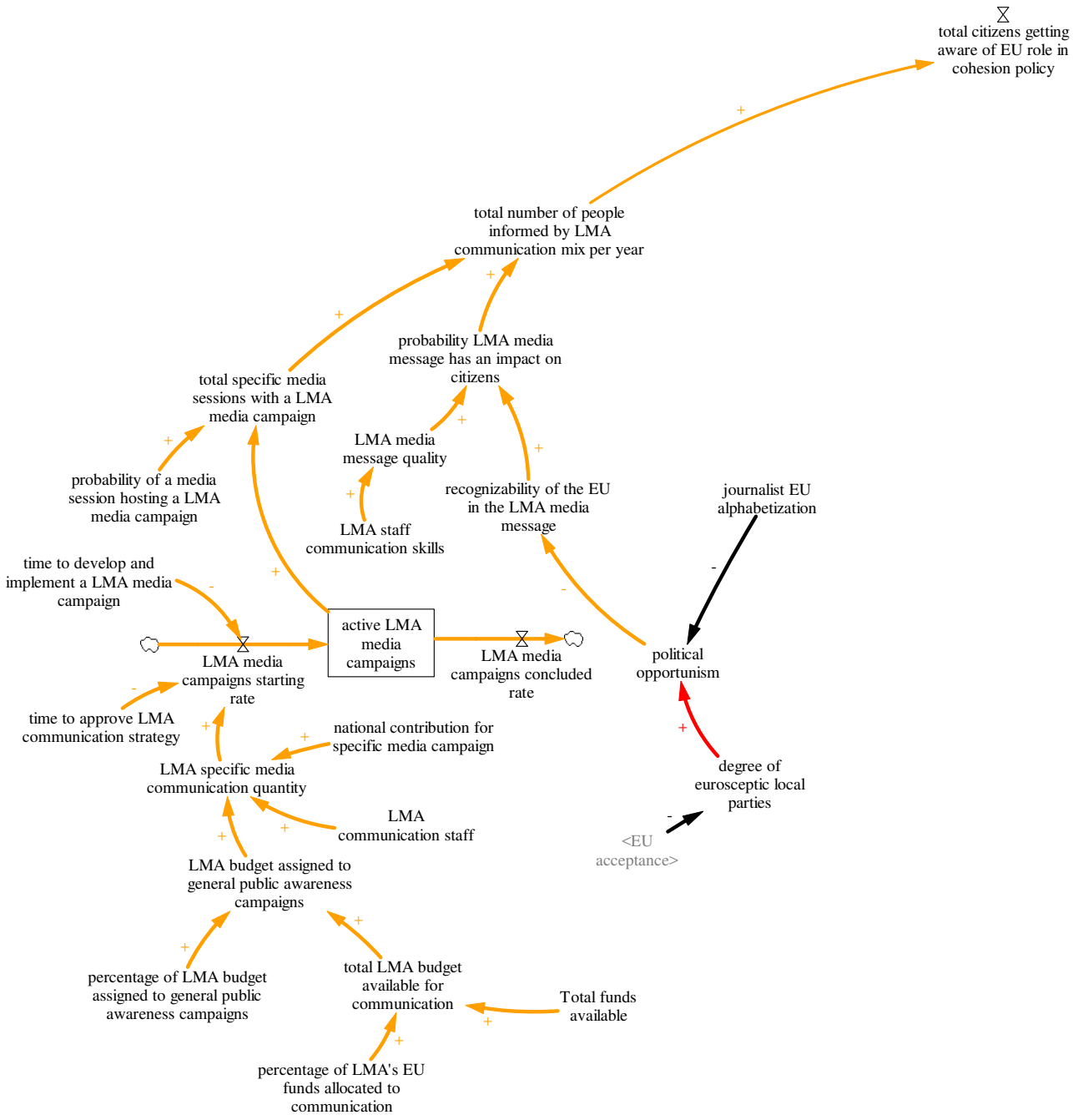


Figure 4.12. General public awareness system: local managing authority stream of information.

4.2.5. Media stream of information

Figure 4.13 depicts the media stream of information that boosts citizens' awareness about European Cohesion Policy. The media affect the awareness through two different streams, namely: (*i*) the positive news stream, and (*ii*) the negative news stream. Although the two streams cause contradictory types of awareness, this part of the model focuses only on the fact that citizens get informed about cohesion policy and structural funds, no matter the nature of the news.

More specifically, the *"positive media coverage on cohesion policy"* is influenced by the number of *"Refunded and completed projects"*, the *"actual average project quality"* and the *"media attention to cohesion policy"*. In fact, the more the projects completed are and the better quality they have, the more positive the media coverage is. At the same time, when there is a high media attention to related issues (which gets fostered by the increased *"journalist EU alphabetization"*), the positive coverage is further increased. Obviously, the *"positive media coverage on cohesion policy"* has a positive effect on the *"positive media coverage of the EU on cohesion policy per year"*, which is, however, negatively affected by the *"political opportunism"*. In fact, the existence of increased *"political opportunism"*, which constitutes the consequence of low journalists' political education (*"journalist EU alphabetization"*) and aims at raising political influence by disregarding ethical principles, could decrease the level of positive news on cohesion policy.

In contrast, the *"negative media coverage on cohesion policy"* is affected by the EU funds' *"absorption gap"*, the number of *"irregular projects"* and the *"actual average project quality"*. Regarding the projects' quality, when it is low, the negative news on European Cohesion Policy is increased. In addition, any irregularities on the projects completed (a high number of *"Refunded and completed projects"* raises the possibility of the existence of *"irregular projects"*) augments the negative media coverage. Finally, an increased absorption gap, which gets higher when the volume of *"Total funds available"* is high, can further have a negative effect on cohesion policy's media coverage. Obviously, the *"negative media coverage on cohesion policy"* has a positive impact on the *"negative media coverage of the EU on cohesion policy per year"*. At his point, the **vicious cycle** of negative political news should be mentioned. Specifically, a high *"negative media coverage of the EU on cohesion policy per year"* increases the *"degree of Eurosceptic local parties"* in Europe, which in turn raises the journalists' *"political opportunism"*. Finally, an increased opportunism further causes the growth of negative news on cohesion policy and thus the same cyclical effect begins repeatedly, always increasing the participating factors.

The quantities of the negative and the positive media coverage per year sum to the *"total media attention coverage of the EU on cohesion policy per year"*, which in turn has a positive effect on the *"total*

number of people coming across media coverage of EU on cohesion policy per year". However, when the citizens come across a media coverage on cohesion policy, this fact does not always imply that they actually get informed. In fact, the *"total number of people informed by media per year"* is augmented when there is a growth on the *"fraction of people impacted per media coverage on the EU role on cohesion policy"*. This means that only if there is significant impact of the news on the citizens (which is high when the *"journalist EU alphabetization"* is high too), they actually get aware of the media message. Finally, the total number of citizens that get informed on cohesion policy by the media further add to the final *"total citizens getting aware of EU role in cohesion policy"* rate.

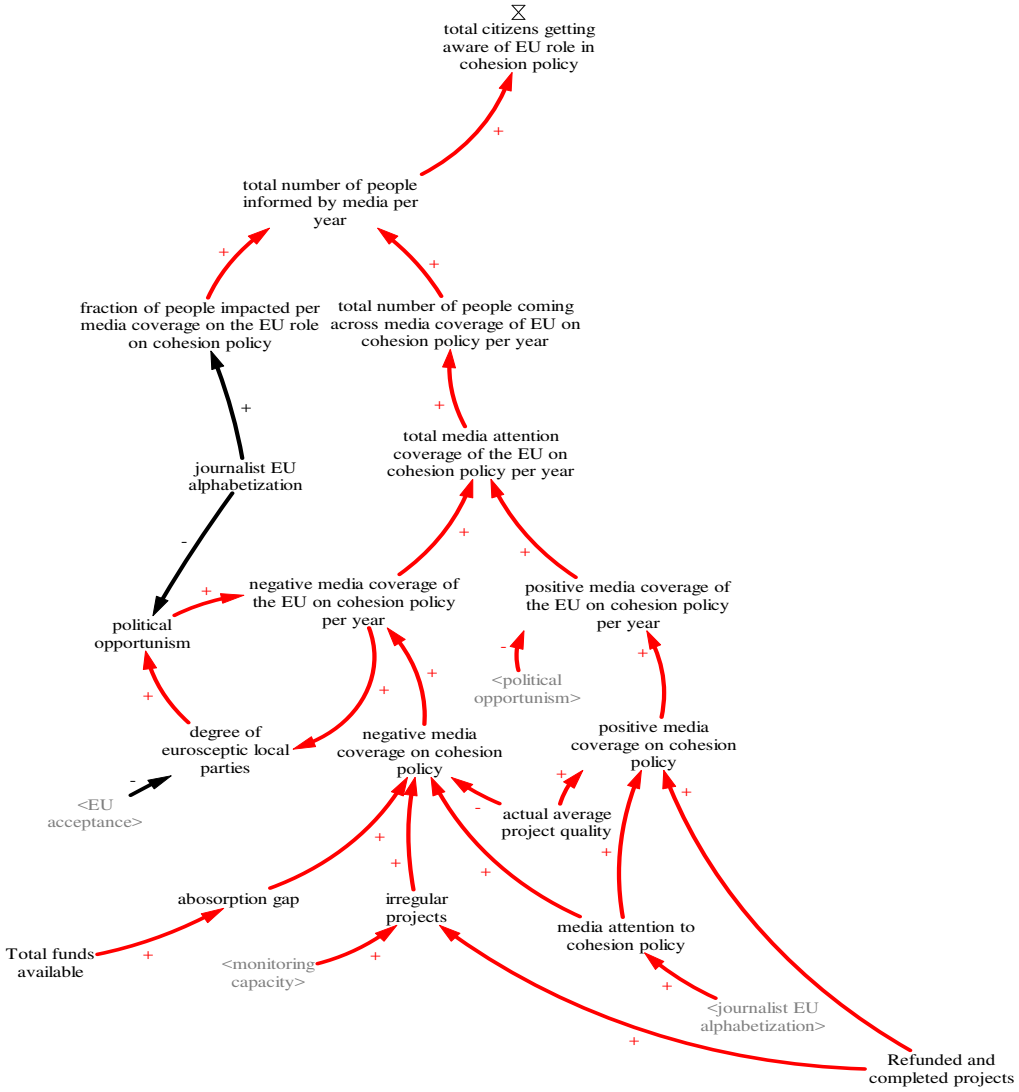


Figure 4.13. General public awareness system: media stream of information.

4.2.6. Funded projects implemented stream of information

Figure 4.14 illustrates the funded projects implemented stream of information that enhances citizens' awareness about European Cohesion Policy. This stream is divided into four sub-streams concerning the citizens' awareness: (*i*) after the participation at an ESF program, (*ii*) after the direct involvement in a European Cohesion Policy project, (*iii*) after informing from the project beneficiaries' media networks, and (*iv*) after recognising the related label of the ERDF programme on a project sign. In addition, the *"word of mouth"* effect, which is increased when the *"interest on EU role in cohesion policy"* is high, has an additional positive impact on the funded projects implemented stream.

Beginning from the first sub-stream, an increased number of *"Refunded and completed projects"* (that may also imply a high number of *"ESF projects concluded"*) raises the *"total number of people involved in a ESF project"*. A high number of people participating at an ESF project, along with a considerable *"probability a ESF project leader/teacher present EU contribution"*, can lead to an increased *"total number of people involved in ESF project and informed about EU contribution"*. However, apart from conveying the EU contribution message to the participants, project leaders/teachers should further make it in an effective way. Such a high probability *("probability a ESF project leader/teacher present EU contribution and that is effective"*), along with a great number of participants getting informed about ESF programme, can lead to a growth in the *"total number of people informed on the EU role in cohesion policy by ESF projects"*.

With respect to the people that have a direct involvement in a regional EU funded programme, a high number of *"Refunded and completed projects"* could increase the *"total number of people directly involved in EU funded project implementation"*. However, not all people involved in the projects are really informed about the role and the goals of the EU in the cohesion policy. Therefore, except for a high number of people involved in the projects, a high *"probability of people involved in the project informed on the EU role in cohesion policy"* is further required for obtaining a growth of the *"total number of people informed on EU role in cohesion policy by being directly involved in EU funded projects implementation"*.

Concerning the citizens that get informed through the beneficiaries' media networks, a high number of *"Refunded and completed projects"* may increase the *"total number of beneficiaries displaying EU emblem in their media"* (that is further augmented by a high *"easiness to use EU symbols"*). A significant number of beneficiaries displaying EU emblem further raises the *"total number of people coming across beneficiaries' with EU emblem in media per year"*. However, not necessarily all the people that have seen the emblem translate the contact with the symbol in awareness concerning the role the EU in the cohesion policy. Thus, apart from an increased number of people that have observed the EU emblem, an increased *"probability*

people get informed about the EU role in cohesion policy through the emblem in beneficiary media" is further required to augment *"total number of people informed on the EU role in cohesion policy through the emblem in beneficiaries' media"*.

Finally, going through the sub-stream of people that recognise the label of EU funding on an ERDF project's sign, an increased number of *"Refunded and completed projects"* may imply an increased number of *"ERDF projects concluded"*. ERDF projects are divided into: (*i*) the projects that have optional communication activities *("total number of ERDF project which don't have mandatory communication activities"*), and (*ii*) the ones that have mandatory (*"total number of ERDF projects which have mandatory communication activities"*). Therefore, an increase of the total ERDF projects could lead to a growth of both categories. Then, an increase of the first category projects may increase the existence of optional communication activities (*"total number of ERDF projects without mandatory communication activities which do them anyway"*), while those of the second category obviously raise the existence of mandatory communication activities (*"total number of ERDF projects with mandatory communication activities following the rules"*). It should be also mentioned that the optional activities may be enhanced by a higher *"easiness to use EU symbols"*, while the mandatory ones could be fostered by a higher level *"monitoring capacity"*. The number of projects that perform optional and mandatory communication activities sum to the *"total number of ERDF projects completed with an EU plaque"* in order to communicate the EU funding contribution. However, only if there is an increased visibility of the plaque the *"total number of ERDF projects completed with an EU visible plaque"* gets augmented (further increased by a high *"EU recognizability in plaques"* which in turn is affected positively by the *"monitoring capacity"*). Thereafter, if many projects have a visible EU plaque, the *"total number of people coming across an ERDF project with an EU visible plaque informed on EU role in cohesion policy"* can be raised, always given an increased probability that the plaque provides a meaningful information about EU funding (*"probability a plaque informs citizens"*). Finally, all citizens of the four different sub-streams add to the *"total number of people informed about EU role in cohesion policy by projects implemented per year"*.

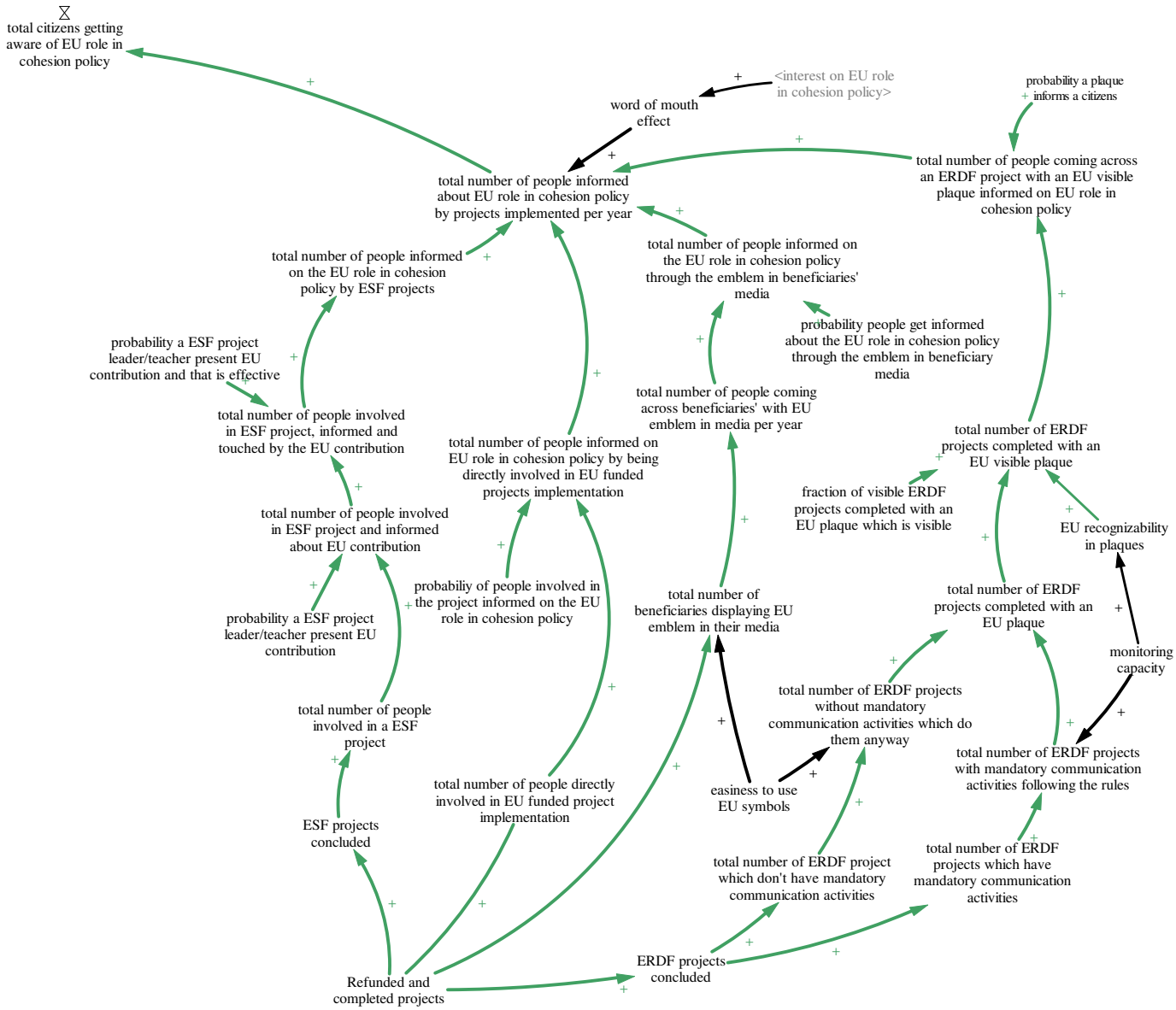


Figure 4.14. General public awareness system: funded projects implemented stream of information.

5. Conclusions

The presented conceptual map crystallizes the expertise of stakeholders and policy-makers as collected through our interviews, focus groups and workshops. In addition, the map capitalizes on the empirical studies conducted by the members of the PERCEIVE team.

While scattered literature is available from the organization perspective of EU management fund, our modelling exercise is an attempt at developing an organic view on the system (putting together many factors). Obviously, this is just a qualitative model: quantification is necessary to assess how variables of interest are affected by several factors all having different weight. The formalization and calibration, which is the next step work, will translate the qualitative map into a model to be simulated with a computer in order to support policy-making with sensitivity and scenario analysis.

However, the qualitative model bring about a number of contributions.

First, it provides a framework to be used for an in-depth analysis of relevant actors and variables and for the rigorous analysis of cause-effect relationships affecting behaviour of interests (absorption of funds, quality of investments and awareness of the role of European Union and of cohesion policies in local socioeconomic development).

Second, the qualitative map elicits a number of challenges worth exploring further.

Absorption rate and analysis of resilience

Despite emphasis is moving away from the analysis of absorption rates, the analysis of this figure may be useful for a number of reasons. Specifically, we suggest, the analysis of the "absorption curve", that is, the time-dependent pattern of yearly absorption along a programming period, may convey a number of insights. First, the dynamic pattern of absorption rates may unveil sources of organizational pressures in specific points in time when LMAs need to increase the audience of possible beneficiaries. This may generate oscillation in the quality of administration and governance. Second, the features of the longitudinal pattern of the absorption rates provides information on the ability of LMAs in distributing their effort along the programming period. Third, the change in the features of the pattern across different programming periods provide information on how LMAs learn, from one period to the following, to administrate fund allocation. This issue is as well connected to the trade-off between learning and flexibility. The higher is the difference between competence and skills required from one programming period to the following, the lower will be the chance to learn and to shape resilient routines. On the other hand, the flexibility of programmes and calls to adapt to emergent needs may require changes in the way calls are administered.

This issue speaks to the concept of ambidexterity, which, in organization theory, refers to the ability of organizations to both learn from the past and maintain their adaption skills. In addition, this inter-period analysis of the curves of absorption highlights the effects on the exogenous factors on the patterns of absorption.

In general, the analysis of the absorption curve reveals how sensitive the management of funds may be to exogenous disturbances. This speaks to the relevance of the analysis of the resilience of cohesion policy implementation in respect to influences such as:

1. National or EU policy intervention that accelerate/slow down the formal requisites required.
2. Support from political administration in term of resource allocation.
3. Stability of political administration.

Communication

One area of intervention that the model highlights concerns the focus and the direction of communication policies. Besides traditional, top-down, communication policies, another approach to communication would concentrate on building "communities" of stakeholders that, bottom-up, spread information and activate word of mouth.

The beneficiary as well may be a political entity that, for political interest, resists the implementation of communication policies. Political interest or negligence may have similar effect. In this context, the analysis of the process of monitoring is probably strategic and can be a key part of the model.

Finally, under an organizational point of view, the model highlights the competition between resource allocated to administration and communication. In a further version, it is important to emphasise this trade-off by modelling the resource stock of personnel, possibly divided into communication and administration personnel, and the stock of budget allocated. Here, again, we underline the crucial role of policy-making in terms of resource allocation to LMAs. Precisely, the scarcity of resource allocation makes it more difficult to manage the communication-administration trade-off thereby hindering the delicate, as well as necessary, process of development of communication skills and capacity.

5.1. Future directions

The next step of our research will be the formalization and calibration of our qualitative map. The two sub models will pass, first, through a process of refinement through the use of literature and interviews with experts[3], quantification and validation of the quality of the output.

With respect to the funds absorption model, the research team will continue deepening the existent literature and interviewing field experts. The refinements are expected to consist in minor tuning of the underlying structure here presented. Regarding the quantification process, it is going to gather most of our attention. First, the structure here discussed is going to be translated in a quantified stock and flow diagram and then 'calibrated' with real world data. Data on this system are considered as available to some extent, although they appear hard to access and collect at a first look. Much effort will be put in this phase in order to contact local managing authorities and other key subjects that might provide useful information.

After calibrating the model with real world data, the research team is going to compare the resulting absorption rate behaviour over time with the real one (reported here in section 3). Being able to replicate reality represent an important target, since achieving this goal may provide a first formal validation of the quality of the model (Barlas, 1996; Sterman 2000). The aim is to test the model against as many real absorption cases as possible give that the more absorption rates it replicates the higher can be the confidence in it. It has been planned to extend the range of cases along two different dimensions: space (different of regions) and time (different policy cycles). Figure 6.1 below depicts graphically how this phase of the work will be structured.

[3] This process has started already as we presented the qualitative map to an audience of academicians, policy-makers and stakeholders at the PERCEIVE Bucharest conference held on the 25-26 of October 2018.

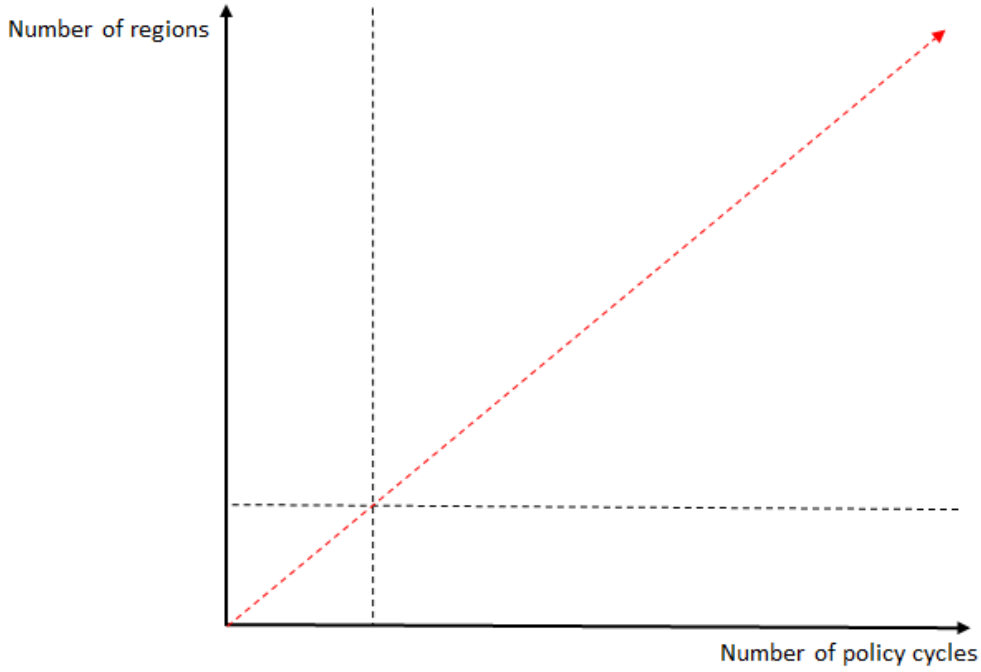


Figure 6.1. Funds absorption system: quantification direction.

The red dotted line shows how ideally this replication phase will unfold, namely being able to replicate several policy cycles for many EU regions. However, this is a rather ambitious goal. The minimum objective that the PERCEIVE team wants to achieve is to be able to gather data and replicate the absorption rate of a policy cycle of one PERCEIVE partners' region. From then, the team will try to reproduce the behaviour over time of the same sample region for another policy cycle, and then move to another region going through the same process till time allows (hopefully for all PERCEIVE partner regions).

In addition to this, many other rigorous validation tests will be undertaken in parallel in order to increase the confidence in the model and its outputs, namely: structure and parameter confirmation test, dimensional consistency, formal inspections, walkthroughs, extreme conditions tests, behaviour sensitivity tests, modified-behaviour predictions (Barlas, 1996; Sterman 2000).

Regarding the general communication model, the work will slightly differ from the previous one. As mentioned, also this structure will be firstly refined. Yet, the system that the model is trying to represent is more difficult to formalize than the previous one; beside the presence of many 'soft variables' hardly amenable to a quantification, there is a general lack of literature (except for the PERCEIVE and COHESIFY projects). While for the 'absorption model' several 'hard' and quantified evidences are available, here these latter are lacking because communication related phenomena are generally 'soft' and qualitative. These

elements make it difficult to root the structure in previous scientific work and makes it necessary to check, assess and validate the structure here presented with interviews with experts (and again with previous PERCEIVE Working Packages). Once enough confidence on the capability of the model to represent the phenomenon under study will be considered satisfactory, a proper quantification will be developed, namely a stock and flow diagram built. As said, quantification in this case appears to be much more challenging than for the previous system, due to the generic lack of data. However, all the useful information produced in previous PERCEIVE Working Packages will be used to feed the stock and flow model. This information will constitute the 'hard nodes' around which simulation tests will be performed in order to test different dynamic hypothesis. Finally, validation test will be performed through the whole quantification process, similarly to what has been described for the funds absorption model (Barlas, 1996; Sterman 2000).

Appendices

A. Reference mode data and additional graphs

Table A1. ERDF data during the 2000-2006 period for the regions under study (Source: EU reports).

Year	Data type	Burgenland (AT)	Calabria (IT)	Emilia Romagna (IT)	Dolnośląskie (PL)	Warmińsko-mazurskie (PL)	Sud-Est (RO)	Extremadura (ES)	Norra Mellansverige (SE)	Essex (UK)
2003	Accumulated commitments	100,697,617 €	671,112,000 €	62,135,730 €				866,490,000 €	93,749,166 €	87,896,000 €
2004		126,996,721 €	859,722,000 €	84,220,990 €				1,099,299,253 €	116,953,176 €	109,236,240 €
2005		153,937,211 €	1,057,166,000 €	106,319,770 €				1,336,733,905 €	140,565,511 €	130,088,570 €
2006		181,519,085 €	1,258,742,000 €	128,033,372 €				1,579,118,955 €	164,621,351 €	150,155,340 €
2007		181,519,085 €	1,258,742,000 €	128,033,372 €				1,579,118,955 €	164,621,351 €	150,155,340 €
2008		181,519,085 €	1,258,742,000 €	128,033,372 €				1,579,118,955 €	164,621,351 €	150,155,340 €
2009		181,519,085 €	1,258,742,000 €	128,033,372 €				1,579,118,955 €	164,621,351 €	150,155,340 €
2010		181,519,085 €	1,258,742,000 €	128,033,372 €				1,579,118,955 €	164,621,351 €	150,155,340 €
2011		181,519,085 €	1,258,742,000 €	128,033,372 €				1,579,118,955 €	156,390,283 €	143,343,843 €
2012		181,519,085 €	1,258,742,000 €	128,033,372 €				1,579,118,955 €	156,390,283 €	143,343,843 €
2013		181,519,085 €	1,258,742,000 €	128,033,372 €				1,579,118,955 €	156,390,283 €	143,343,843 €
2014		181,519,085 €	1,258,742,000 €	128,033,372 €	322,970,519 €	214,160,713 €		1,579,118,955 €	156,390,283 €	143,343,843 €
2003	Accumulated payments	72,139,365 €	287,185,276 €	22,705,902 €				458,433,366 €	55,286,428 €	28,649,965 €
2004		98,027,152 €	415,372,472 €	34,065,461 €	32,380,230 €	21,471,226 €		748,359,183 €	77,622,952 €	53,621,721 €
2005		115,263,712 €	512,237,517 €	51,410,837 €	59,867,982 €	39,698,266 €		955,236,184 €	110,139,732 €	82,380,268 €
2006		129,753,030 €	769,575,027 €	86,229,720 €	123,289,970 €	81,753,182 €		1,267,137,371 €	133,701,432 €	104,104,192 €
2007		150,582,676 €	903,163,836 €	99,981,594 €	219,424,026 €	145,499,366 €		1,267,137,371 €	153,403,263 €	122,460,063 €
2008		172,443,131 €	1,176,147,168 €	121,631,703 €	304,259,882 €	201,753,750 €		1,402,533,177 €	156,390,283 €	135,270,949 €

Year	Data type	Burgenland (AT)	Calabria (IT)	Emilia Romagna (IT)	Dolnośląskie (PL)	Warmińsko-mazurskie (PL)	Sud-Est (RO)	Extremadura (ES)	Norra Mellansverige (SE)	Essex (UK)
2009		172,443,131 €	1,195,804,900 €	121,631,703 €	307,612,185 €	203,976,651 €		1,443,048,286 €	156,390,283 €	142,647,573 €
2010		172,443,131 €	1,195,804,900 €	121,631,703 €	307,612,185 €	203,976,651 €		1,500,163,007 €	156,390,283 €	142,647,573 €
2011		181,519,085 €	1,195,804,900 €	128,033,372 €	307,654,066 €	204,004,422 €		1,500,163,007 €	156,390,283 €	142,647,573 €
2012		181,519,085 €	1,195,804,900 €	128,033,372 €	322,265,411 €	213,693,158 €		1,513,657,680 €	156,390,283 €	142,647,573 €
2013		181,519,085 €	1,195,804,900 €	128,033,372 €	322,970,519 €	214,160,713 €		1,579,118,955 €	156,390,283 €	142,647,573 €
2014		181,519,085 €	1,195,804,900 €	128,033,372 €	322,970,519 €	214,160,713 €		1,579,118,955 €	156,390,283 €	142,647,573 €
2003	Pay rate	71.64%	42.79%	36.54%				52.91%	58.97%	32.60%
2004		77.19%	48.31%	40.45%				68.08%	66.37%	49.09%
2005		74.88%	48.45%	48.35%				71.46%	78.35%	63.33%
2006		71.48%	61.14%	67.35%				80.24%	81.22%	69.33%
2007		82.96%	71.75%	78.09%				80.24%	93.19%	81.56%
2008		95.00%	93.44%	95.00%				88.82%	95.00%	90.09%
2009		95.00%	95.00%	95.00%				91.38%	95.00%	95.00%
2010		95.00%	95.00%	95.00%				95.00%	95.00%	95.00%
2011		100.00%	95.00%	100.00%				95.00%	100.00%	99.51%
2012		100.00%	95.00%	100.00%				95.85%	100.00%	99.51%
2013		100.00%	95.00%	100.00%				100.00%	100.00%	99.51%
2014		100.00%	95.00%	100.00%				100.00%	100.00%	99.51%
2003	Absorption rate	39.74%	22.82%	17.73%				29.03%	35.35%	19.99%
2004		54.00%	33.00%	26.61%	10.03%	10.03%		47.39%	49.63%	37.41%
2005		63.50%	40.69%	40.15%	18.54%	18.54%		60.49%	70.43%	57.47%
2006		71.48%	61.14%	67.35%	38.17%	38.17%		80.24%	85.49%	72.63%
2007		82.96%	71.75%	78.09%	67.94%	67.94%		80.24%	98.09%	85.43%

Year	Data type	Burgenland (AT)	Calabria (IT)	Emilia Romagna (IT)	Dolnośląskie (PL)	Warmińsko-mazurskie (PL)	Sud-Est (RO)	Extremadura (ES)	Norra Mellansverige (SE)	Essex (UK)
2008		95.00%	93.44%	95.00%	94.21%	94.21%		88.82%	100.00%	94.37%
2009		95.00%	95.00%	95.00%	95.24%	95.24%		91.38%	100.00%	99.51%
2010		95.00%	95.00%	95.00%	95.24%	95.24%		95.00%	100.00%	99.51%
2011		100.00%	95.00%	100.00%	95.26%	95.26%		95.00%	100.00%	99.51%
2012		100.00%	95.00%	100.00%	99.78%	99.78%		95.85%	100.00%	99.51%
2013		100.00%	95.00%	100.00%	100.00%	100.00%		100.00%	100.00%	99.51%
2014		100.00%	95.00%	100.00%	100.00%	100.00%		100.00%	100.00%	99.51%

Table A2. ERDF data during the 2007-2013 period for the regions under study (Source: EU reports).

Year	Data type	Burgenland (AT)	Calabria (IT)	Emilia Romagna (IT)	Dolnośląskie (PL)	Warmińsko-mazurskie (PL)	Sud-Est (RO)	Extremadura (ES)	Norra Mellansverige (SE)	Essex (UK)
2007	Accumulated commitments	20,825,461 €	201,649,567 €	17,232,042 €	170,066,906 €	145,309,518 €		212,554,167 €	26,228,196 €	
2008		40,739,808 €	407,332,124 €	34,808,725 €	344,116,251 €	294,021,734 €		429,359,417 €	52,980,955 €	
2009		59,698,267 €	617,128,334 €	52,736,941 €	522,121,812 €	446,114,242 €		650,500,772 €	80,268,769 €	
2010		77,654,636 €	831,120,467 €	71,023,722 €	697,805,240 €	596,222,660 €		876,064,954 €	108,102,340 €	
2011		94,561,249 €	1,049,392,444 €	89,676,238 €	877,120,552 €	751,581,932 €		1,106,140,420 €	136,492,582 €	
2012		110,368,931 €	1,272,029,861 €	108,701,805 €	1,056,410,894 €	909,150,978 €		1,340,817,395 €	165,450,629 €	
2013		125,026,964 €	1,499,120,026 €	142,733,377 €	1,240,184,092 €	1,070,550,290 €		1,580,187,909 €	194,987,837 €	
2014		125,026,964 €	1,499,120,026 €	142,733,765 €	1,240,184,092 €	1,070,550,290 €		1,580,187,909 €	194,987,837 €	
2015		125,026,964 €	1,499,120,026 €	142,733,765 €	1,240,184,092 €	1,070,550,290 €		1,580,187,909 €	194,987,837 €	
2016		125,026,964 €	1,499,120,026 €	142,733,765 €	1,240,184,092 €	1,070,550,290 €		1,580,187,909 €	194,987,837 €	
2017		125,026,964 €	1,499,120,026 €	142,733,765 €	1,240,184,092 €	1,070,550,290 €		1,580,187,909 €	192,841,556 €	
2018		125,026,964 €	1,499,120,026 €	142,733,765 €	1,240,184,092 €	1,070,550,290 €		1,580,187,909 €	192,841,556 €	

Year	Data type	Burgenland (AT)	Calabria (IT)	Emilia Romagna (IT)	Dolnośląskie (PL)	Warmińsko-mazurskie (PL)	Sud-Est (RO)	Extremadura (ES)	Norra Mellansverige (SE)	Essex (UK)
2007	Accumulated payments	2,500,539 €	29,982,401 €	2,562,158 €	24,262,898 €	20,730,841 €	25,086,210 €	31,603,758 €	3,899,757 €	739,965 €
2008		6,251,348 €	74,956,001 €	6,405,394 €	60,657,244 €	51,827,102 €	62,715,526 €	79,009,395 €	9,749,392 €	1,849,912 €
2009		16,698,684 €	112,434,002 €	17,740,454 €	198,574,737 €	123,597,450 €	122,827,862 €	223,962,723 €	36,911,731 €	3,118,776 €
2010		28,691,520 €	210,039,914 €	25,507,847 €	399,971,567 €	310,692,780 €	142,438,930 €	321,448,180 €	62,238,873 €	5,368,497 €
2011		46,540,014 €	210,039,914 €	43,573,130 €	655,914,838 €	470,402,304 €	198,830,162 €	653,977,093 €	108,817,254 €	7,058,721 €
2012		53,954,584 €	210,039,914 €	54,410,476 €	849,566,637 €	627,035,930 €	281,325,938 €	966,826,084 €	134,083,994 €	12,665,228 €
2013		72,985,021 €	210,039,914 €	93,854,812 €	1,013,303,655 €	756,715,920 €	445,128,882 €	1,115,888,170 €	163,207,782 €	12,665,228 €
2014		107,219,889 €	210,039,914 €	113,555,516 €	1,178,174,887 €	970,696,457 €	691,720,386 €	1,319,691,789 €	183,244,873 €	25,146,996 €
2015		118,775,616 €	1,049,533,783 €	134,759,130 €	1,178,174,887 €	1,017,022,776 €	825,276,146 €	1,395,015,405 €	185,238,445 €	32,398,553 €
2016		118,775,616 €	1,351,965,570 €	135,597,077 €	1,178,174,887 €	1,017,022,776 €	1,101,390,802 €	1,460,035,349 €	185,238,445 €	35,148,330 €
2017		118,775,616 €	1,410,714,105 €	142,733,765 €	1,178,174,887 €	1,017,022,776 €	1,101,390,802 €	1,460,035,349 €	192,841,556 €	35,148,330 €
2018		120,895,685 €	1,410,714,105 €	142,733,765 €	1,178,174,887 €	1,070,550,290 €	1,101,390,802 €	1,460,035,349 €	192,841,556 €	35,148,330 €
2007	Pay rate	12.01%	14.87%	14.87%	14.27%	14.27%		14.87%	14.87%	
2008		15.34%	18.40%	18.40%	17.63%	17.63%		18.40%	18.40%	
2009		27.97%	18.22%	33.64%	38.03%	27.71%		34.43%	45.99%	
2010		36.95%	25.27%	35.91%	57.32%	52.11%		36.69%	57.57%	
2011		49.22%	20.02%	48.59%	74.78%	62.59%		59.12%	79.72%	
2012		48.89%	16.51%	50.05%	80.42%	68.97%		72.11%	81.04%	
2013		58.38%	14.01%	65.76%	81.71%	70.68%		70.62%	83.70%	
2014		85.76%	14.01%	79.56%	95.00%	90.67%		83.51%	93.98%	
2015		95.00%	70.01%	94.41%	95.00%	95.00%		88.28%	95.00%	
2016		95.00%	90.18%	95.00%	95.00%	95.00%		92.40%	95.00%	
2017		95.00%	94.10%	100.00%	95.00%	95.00%		92.40%	100.00%	
2018		96.70%	94.10%	100.00%	95.00%	100.00%		92.40%	100.00%	

Year	Data type	Burgenland (AT)	Calabria (IT)	Emilia Romagna (IT)	Dolnośląskie (PL)	Warmińsko-mazurskie (PL)	Sud-Est (RO)	Extremadura (ES)	Norra Mellansverige (SE)	Essex (UK)
2007	Absorption rate	2.00%	2.00%	1.80%	1.96%	1.94%		2.00%	2.02%	
2008		5.00%	5.00%	4.49%	4.89%	4.84%		5.00%	5.06%	
2009		13.36%	7.50%	12.43%	16.01%	11.55%		14.17%	19.14%	
2010		22.95%	14.01%	17.87%	32.25%	29.02%		20.34%	32.27%	
2011		37.22%	14.01%	30.53%	52.89%	43.94%		41.39%	56.43%	
2012		43.15%	14.01%	38.12%	68.50%	58.57%		61.18%	69.53%	
2013		58.38%	14.01%	65.76%	81.71%	70.68%		70.62%	84.63%	
2014		85.76%	14.01%	79.56%	95.00%	90.67%		83.51%	95.02%	
2015		95.00%	70.01%	94.41%	95.00%	95.00%		88.28%	96.06%	
2016		95.00%	90.18%	95.00%	95.00%	95.00%		92.40%	96.06%	
2017		95.00%	94.10%	100.00%	95.00%	95.00%		92.40%	100.00%	
2018		96.70%	94.10%	100.00%	95.00%	100.00%		92.40%	100.00%	

Table A3. ESF data during the 2000-2006 period for the regions under study (Source: EU reports).

Year	Data type	Burgenland (AT)	Calabria (IT)	Emilia Romagna (IT)	Dolnośląskie (PL)	Warmińsko-mazurskie (PL)	Sud-Est (RO)	Extremadura (ES)	Norra Mellansverige (SE)	Essex (UK)
2003	Accumulated commitments	31,871,192 €	233,362,000 €	321,993,921 €				210,427,981 €	13,232,866 €	8,016,000 €
2004		40,191,171 €	294,805,000 €	410,005,106 €				260,455,725 €	18,054,547 €	10,157,510 €
2005		48,714,151 €	359,197,000 €	499,776,469 €				311,476,231 €	22,935,712 €	12,346,030 €
2006		57,440,139 €	424,883,000 €	591,343,315 €				363,573,000 €	27,878,649 €	14,575,560 €
2007		57,440,139 €	424,883,000 €	591,343,315 €				363,573,000 €	27,878,649 €	14,575,560 €
2008		57,440,139 €	424,883,000 €	591,343,315 €				363,573,000 €	27,878,649 €	14,575,560 €
2009		57,440,139 €	424,883,000 €	591,343,315 €				363,573,000 €	27,878,649 €	14,575,560 €

Year	Data type	Burgenland (AT)	Calabria (IT)	Emilia Romagna (IT)	Dolnośląskie (PL)	Warmińsko-mazurskie (PL)	Sud-Est (RO)	Extremadura (ES)	Norra Mellansverige (SE)	Essex (UK)
2010		57,440,139 €	424,883,000 €	591,343,315 €				363,573,000 €	26,496,592 €	13,544,840 €
2011		57,440,139 €	424,883,000 €	591,343,315 €				363,573,000 €	26,484,717 €	13,544,840 €
2012		57,440,139 €	424,883,000 €	591,343,315 €				363,573,000 €	26,484,717 €	13,544,840 €
2013		57,440,139 €	424,883,000 €	591,343,315 €				363,573,000 €	26,484,717 €	13,544,840 €
2014		57,440,139 €	424,883,000 €	591,343,315 €	166,872,324 €	151,105,915 €		363,573,000 €	26,484,717 €	13,544,840 €
2003	Accumulated payments	22,233,948 €	57,107,253 €	180,108,366 €				158,044,810 €	10,471,970 €	1,601,463 €
2004		31,195,004 €	93,064,242 €	315,842,831 €	16,722,105 €	15,142,170 €		195,646,425 €	13,165,933 €	4,150,387 €
2005		38,690,910 €	93,064,242 €	395,044,512 €	31,019,766 €	28,088,961 €		245,664,810 €	19,028,450 €	5,788,871 €
2006		44,815,300 €	93,064,242 €	436,214,038 €	55,664,848 €	50,405,530 €		268,799,473 €	22,721,750 €	10,046,516 €
2007		48,489,455 €	93,064,242 €	516,356,363 €	121,692,583 €	110,194,841 €		345,394,350 €	25,475,190 €	11,159,482 €
2008		54,568,132 €	93,064,242 €	561,776,149 €	153,146,553 €	138,676,981 €		345,394,350 €	26,484,717 €	12,844,126 €
2009		54,568,132 €	269,392,986 €	561,776,149 €	158,859,999 €	143,850,610 €		345,394,350 €	26,484,717 €	13,544,840 €
2010		57,219,393 €	269,392,986 €	561,776,149 €	158,859,999 €	143,850,610 €		345,394,350 €	26,484,717 €	13,544,840 €
2011		57,219,393 €	269,392,986 €	591,343,315 €	161,203,240 €	145,972,457 €		363,573,000 €	26,484,717 €	13,544,840 €
2012		57,219,393 €	269,392,986 €	591,343,315 €	166,844,137 €	151,080,392 €		363,573,000 €	26,484,717 €	13,544,840 €
2013		57,219,393 €	269,392,986 €	591,343,315 €	166,872,324 €	151,105,915 €		363,573,000 €	26,484,717 €	13,544,840 €
2014		57,219,393 €	306,827,119 €	591,343,315 €	166,872,324 €	151,105,915 €		363,573,000 €	26,484,717 €	13,544,840 €
2003	Pay rate	69.76%	24.47%	55.94%				75.11%	79.14%	19.98%
2004		77.62%	31.57%	77.03%				75.12%	72.92%	40.86%
2005		79.42%	25.91%	79.04%				78.87%	82.96%	46.89%
2006		78.02%	21.90%	73.77%				73.93%	81.50%	68.93%
2007		84.42%	21.90%	87.32%				95.00%	91.38%	76.56%
2008		95.00%	21.90%	95.00%				95.00%	95.00%	88.12%

Year	Data type	Burgenland (AT)	Calabria (IT)	Emilia Romagna (IT)	Dolnośląskie (PL)	Warmińsko-mazurskie (PL)	Sud-Est (RO)	Extremadura (ES)	Norra Mellansverige (SE)	Essex (UK)
2009		95.00%	63.40%	95.00%				95.00%	95.00%	92.93%
2010		99.62%	63.40%	95.00%				95.00%	99.96%	100.00%
2011		99.62%	63.40%	100.00%				100.00%	100.00%	100.00%
2012		99.62%	63.40%	100.00%				100.00%	100.00%	100.00%
2013		99.62%	63.40%	100.00%				100.00%	100.00%	100.00%
2014		99.62%	72.21%	100.00%				100.00%	100.00%	100.00%
2003	Absorption rate	38.71%	13.44%	30.46%				43.47%	39.54%	11.82%
2004		54.31%	21.90%	53.41%	10.02%	10.02%		53.81%	49.71%	30.64%
2005		67.36%	21.90%	66.80%	18.59%	18.59%		67.57%	71.85%	42.74%
2006		78.02%	21.90%	73.77%	33.36%	33.36%		73.93%	85.79%	74.17%
2007		84.42%	21.90%	87.32%	72.93%	72.93%		95.00%	96.19%	82.39%
2008		95.00%	21.90%	95.00%	91.77%	91.77%		95.00%	100.00%	94.83%
2009		95.00%	63.40%	95.00%	95.20%	95.20%		95.00%	100.00%	100.00%
2010		99.62%	63.40%	95.00%	95.20%	95.20%		95.00%	100.00%	100.00%
2011		99.62%	63.40%	100.00%	96.60%	96.60%		100.00%	100.00%	100.00%
2012		99.62%	63.40%	100.00%	99.98%	99.98%		100.00%	100.00%	100.00%
2013		99.62%	63.40%	100.00%	100.00%	100.00%		100.00%	100.00%	100.00%
2014		99.62%	72.21%	100.00%	100.00%	100.00%		100.00%	100.00%	100.00%

Table A4. ESF data during the 2007-2013 period for the regions under study (Source: EU reports).

Year	Data type	Burgenland (AT)	Calabria (IT)	Emilia Romagna (IT)	Dolnośląskie (PL)	Warmińsko-mazurskie (PL)	Sud-Est (RO)	Extremadura (ES)	Norra Mellansverige (SE)	Essex (UK)
2007		8,684,843 €	57,873,685 €	39,806,017 €				33,639,530 €		

Year	Data type	Burgenland (AT)	Calabria (IT)	Emilia Romagna (IT)	Dolnośląskie (PL)	Warmińsko-mazurskie (PL)	Sud-Est (RO)	Extremadura (ES)	Norra Mellansverige (SE)	Essex (UK)
2008	Accumulated commitments	16,989,724 €	116,904,845 €	80,408,154 €				67,951,850 €		
2009		24,895,971 €	177,116,627 €	121,822,334 €				102,950,417 €		
2010		32,384,316 €	238,532,645 €	164,064,798 €				138,648,955 €		
2011		39,434,881 €	301,176,983 €	207,152,112 €				175,061,464 €		
2012		46,027,160 €	365,074,208 €	251,101,171 €				212,202,223 €		
2013		52,140,000 €	430,249,377 €	313,496,873 €				283,515,056 €		
2014		52,140,000 €	430,249,377 €	313,496,873 €				283,515,056 €		
2015		52,140,000 €	430,249,377 €	313,496,873 €				283,515,056 €		
2016		52,140,000 €	430,249,377 €	313,496,873 €				283,515,056 €		
2017		52,140,000 €	430,249,377 €	313,496,873 €				283,515,056 €		
2018		52,140,000 €	430,249,377 €	313,496,873 €	826,482,944 €	1,766,718,347 €	467,485,074 €	283,515,056 €	79,518,747 €	
2007	Accumulated payments	1,042,800 €	8,604,988 €	5,918,584 €	16,877,652 €	35,840,916 €	10,917,500 €	5,001,716 €	1,657,338 €	1,249,582 €
2008		2,607,000 €	21,512,469 €	14,796,461 €	42,194,130 €	89,602,292 €	27,293,750 €	12,504,290 €	4,143,345 €	3,123,954 €
2009		13,513,935 €	59,329,905 €	50,909,929 €	124,042,722 €	213,370,252 €	49,353,456 €	54,773,687 €	11,752,546 €	12,196,997 €
2010		20,921,635 €	59,329,905 €	92,348,537 €	208,083,070 €	462,417,308 €	74,732,133 €	73,772,968 €	21,640,949 €	23,083,787 €
2011		28,132,518 €	59,329,905 €	157,039,820 €	349,949,697 €	727,656,044 €	101,963,156 €	135,571,282 €	37,086,259 €	27,576,475 €
2012		36,007,702 €	156,368,480 €	188,407,237 €	494,032,337 €	997,982,252 €	118,389,210 €	182,136,053 €	37,086,259 €	38,421,691 €
2013		44,442,726 €	266,472,454 €	228,289,970 €	625,570,403 €	1,276,943,052 €	223,789,724 €	216,978,384 €	49,200,390 €	38,421,691 €
2014		49,533,000 €	288,502,959 €	266,000,409 €	758,766,675 €	1,639,384,140 €	241,246,270 €	242,961,402 €	74,514,118 €	44,327,017 €
2015		49,533,000 €	288,502,959 €	297,822,029 €	826,482,944 €	1,759,838,092 €	349,952,405 €	269,339,303 €	78,723,560 €	55,048,316 €
2016		49,533,000 €	288,502,959 €	297,822,029 €	826,482,944 €	1,766,718,347 €	444,110,820 €	269,339,303 €	78,723,560 €	59,285,828 €
2017		49,533,000 €	288,502,959 €	297,822,029 €	826,482,944 €	1,766,718,347 €	444,110,820 €	283,515,056 €	78,723,560 €	59,285,828 €
2018		52,140,000 €	288,502,959 €	297,822,029 €	826,482,944 €	1,766,718,347 €	444,110,820 €	283,515,056 €	78,723,560 €	59,285,828 €
2007	Pay rate	12.01%	14.87%	14.87%				14.87%		

Year	Data type	Burgenland (AT)	Calabria (IT)	Emilia Romagna (IT)	Dolnośląskie (PL)	Warmińsko-mazurskie (PL)	Sud-Est (RO)	Extremadura (ES)	Norra Mellansverige (SE)	Essex (UK)
2008		15.34%	18.40%	18.40%				18.40%		
2009		54.28%	33.50%	41.79%				53.20%		
2010		64.60%	24.87%	56.29%				53.21%		
2011		71.34%	19.70%	75.81%				77.44%		
2012		78.23%	42.83%	75.03%				85.83%		
2013		85.24%	61.93%	72.82%				76.53%		
2014		95.00%	67.05%	84.85%				85.70%		
2015		95.00%	67.05%	95.00%				95.00%		
2016		95.00%	67.05%	95.00%				95.00%		
2017		95.00%	67.05%	95.00%				100.00%		
2018		100.00%	67.05%	95.00%				100.00%		
2007	Absorption rate	2.00%	2.00%	1.89%	2.04%	2.03%	2.34%	1.76%	2.08%	
2008		5.00%	5.00%	4.72%	5.11%	5.07%	5.84%	4.41%	5.21%	
2009		25.92%	13.79%	16.24%	15.01%	12.08%	10.56%	19.32%	14.78%	
2010		40.13%	13.79%	29.46%	25.82%	26.17%	15.99%	26.02%	27.21%	
2011		53.96%	13.79%	50.09%	42.34%	41.19%	21.81%	47.82%	46.64%	
2012		69.06%	36.34%	60.10%	59.78%	56.49%	25.32%	64.24%	46.64%	
2013		85.24%	61.93%	72.82%	75.69%	72.28%	47.87%	76.53%	61.87%	
2014		95.00%	67.05%	84.85%	91.81%	92.79%	51.61%	85.70%	93.71%	
2015		95.00%	67.05%	95.00%	100.00%	99.61%	74.86%	95.00%	99.00%	
2016		95.00%	67.05%	95.00%	100.00%	100.00%	95.00%	95.00%	99.00%	
2017		95.00%	67.05%	95.00%	100.00%	100.00%	95.00%	100.00%	99.00%	
2018		100.00%	67.05%	95.00%	100.00%	100.00%	95.00%	100.00%	99.00%	

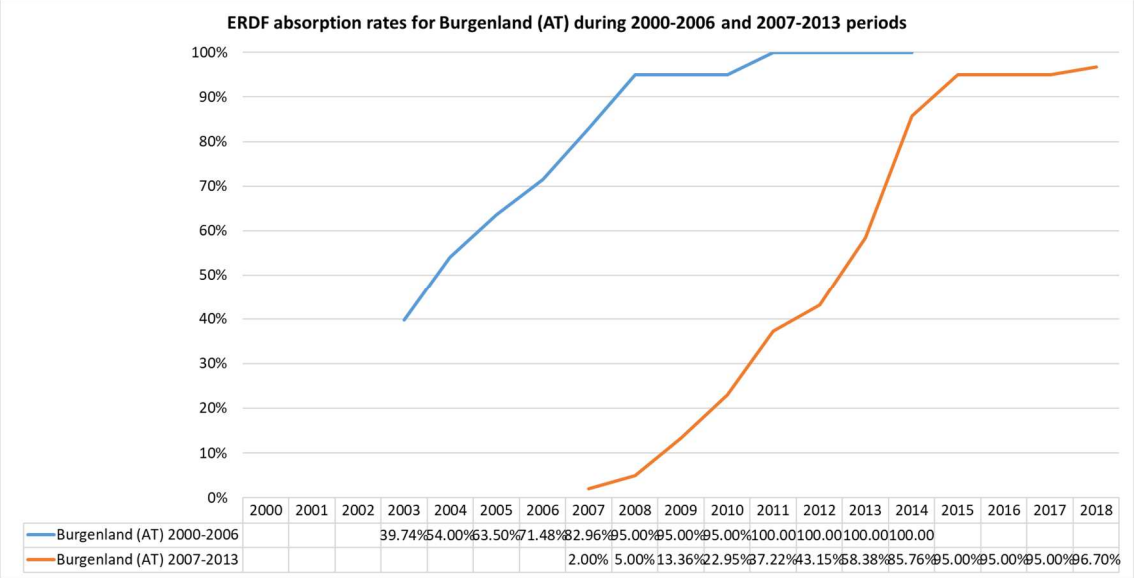


Figure A1. Comparison of absorption rates for ERDF fund in Burgenland, Austria (Own elaboration based on EU reports).

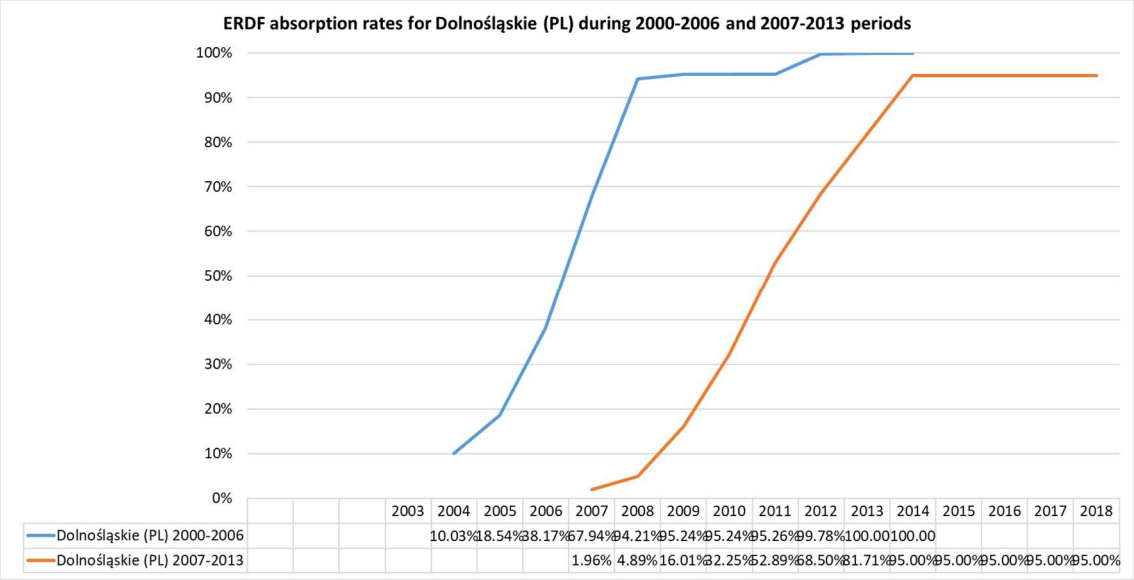


Figure A2. Comparison of absorption rates for ERDF fund in Dolnośląskie, Poland (Own elaboration based on EU reports).

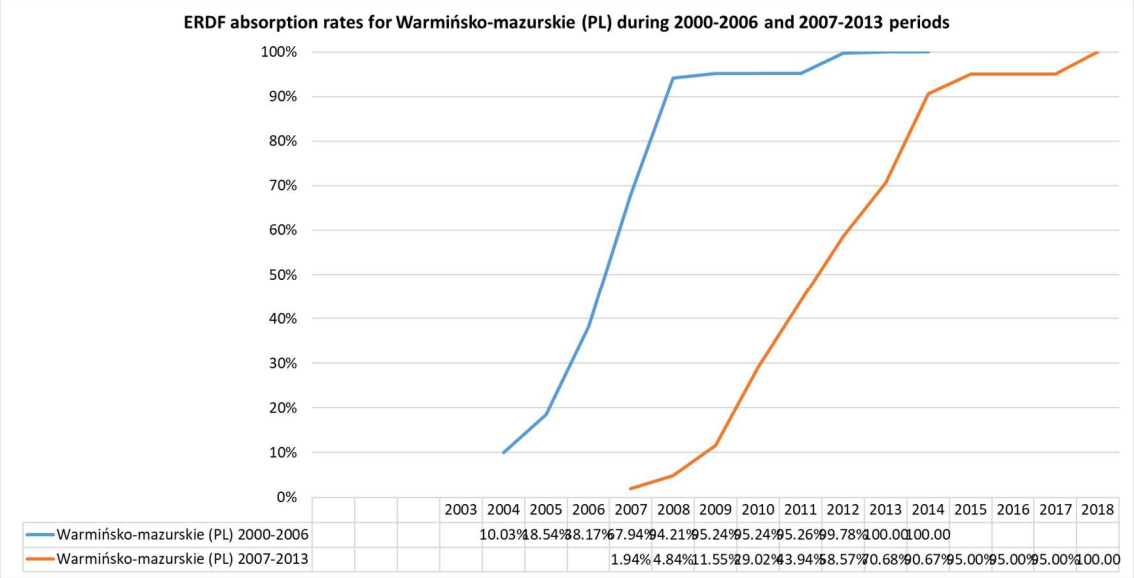


Figure A3. Comparison of absorption rates for ERDF fund in Warmińsko-mazurskie, Poland (Own elaboration based on EU reports).

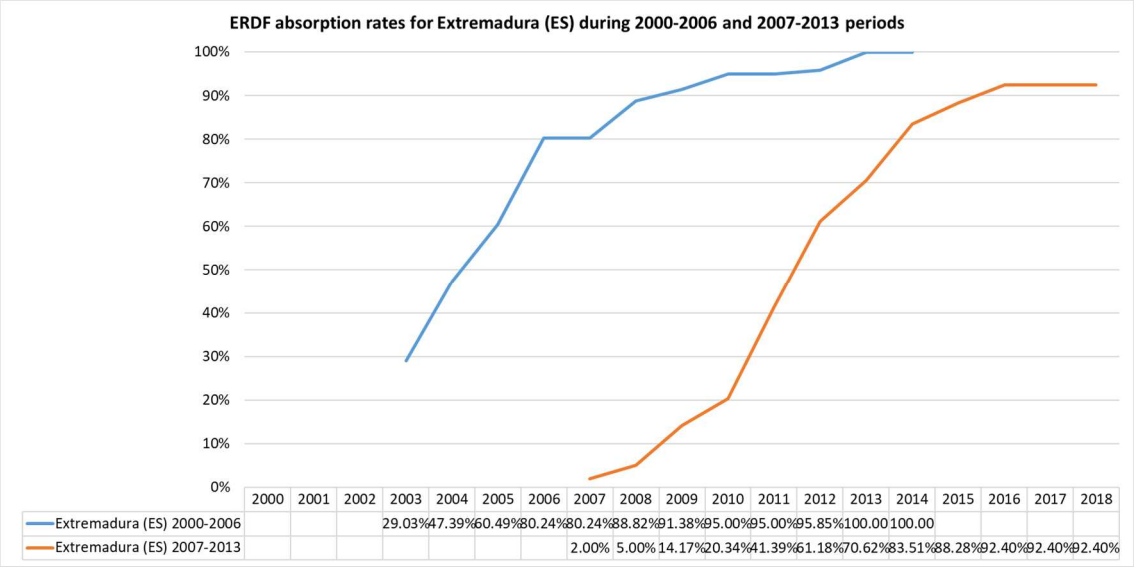


Figure A4. Comparison of absorption rates for ERDF fund in Extremadura, Spain (Own elaboration based on EU reports).

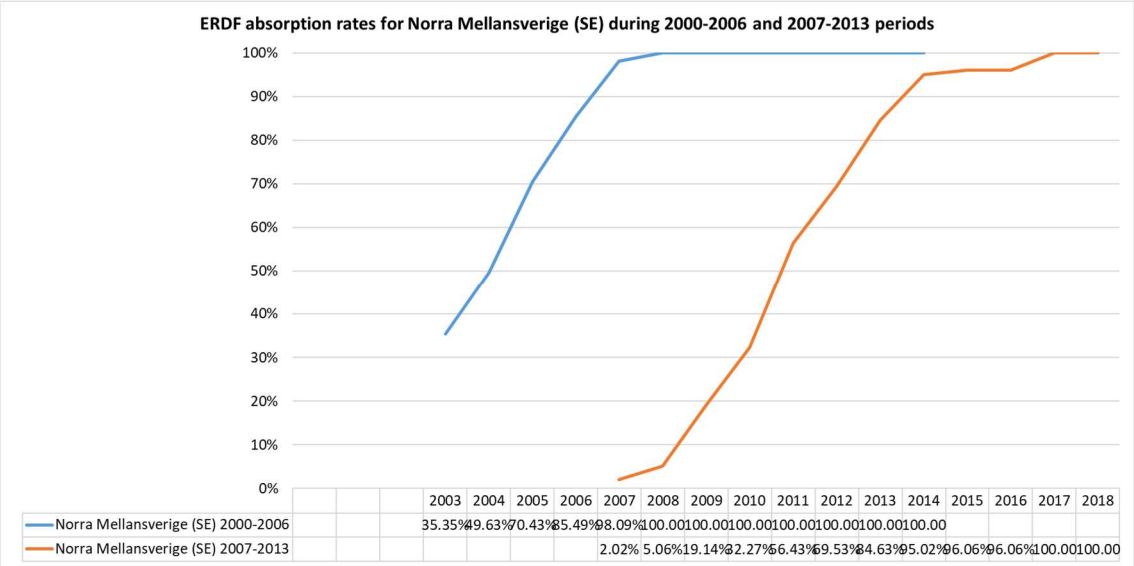


Figure A5. Comparison of absorption rates for ERDF fund in Norra Mellansverige, Sweden (Own elaboration based on EU reports).

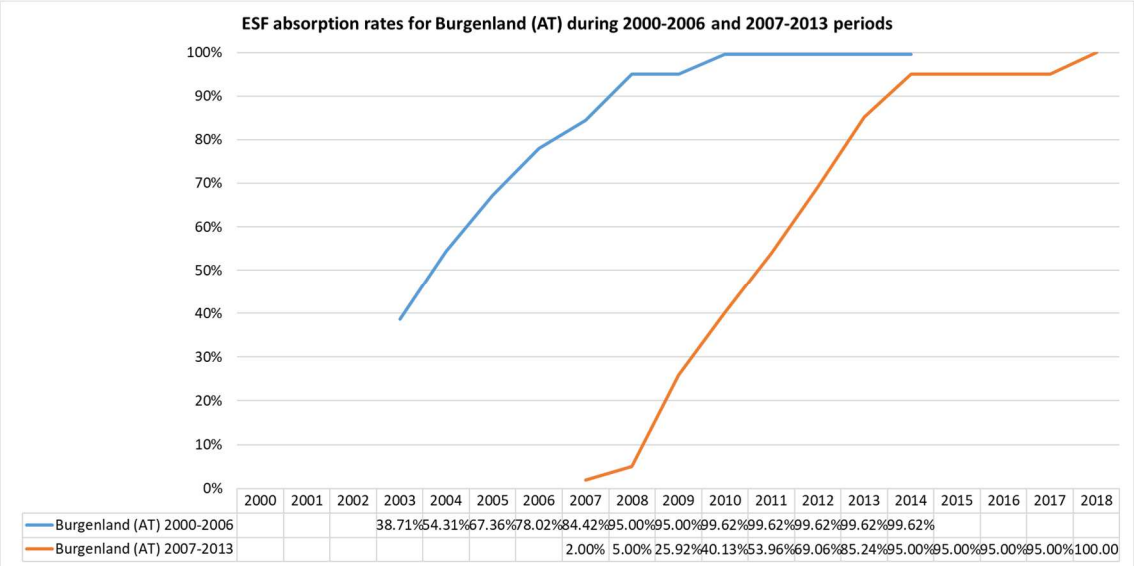


Figure A6. Comparison of absorption rates for ESF fund in Burgenland, Austria (Own elaboration based on EU reports).

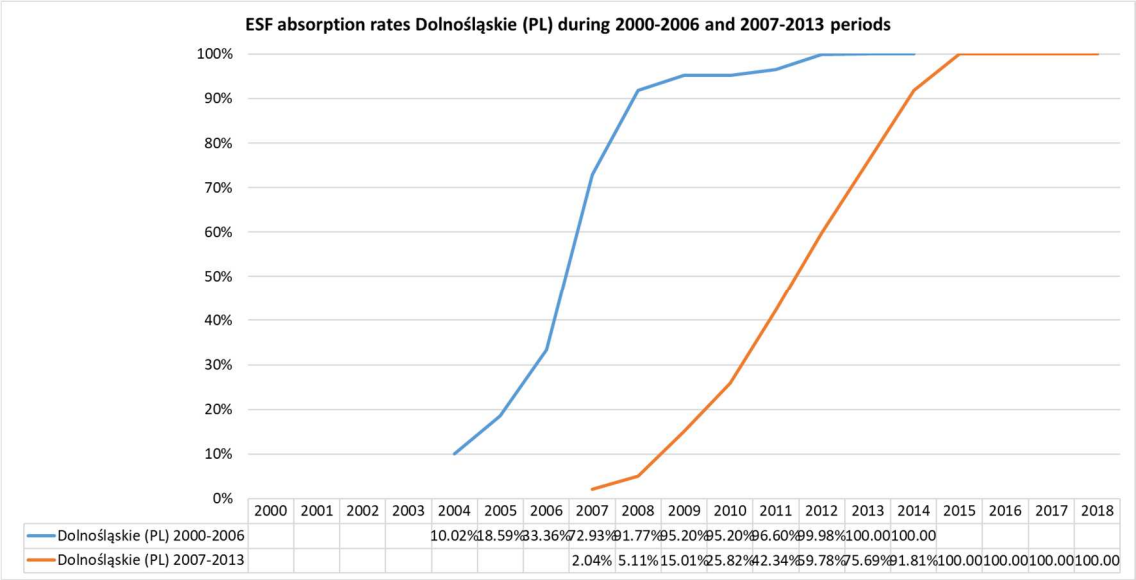


Figure A7. Comparison of absorption rates for ESF fund in Dolnośląskie, Poland (Own elaboration based on EU reports).

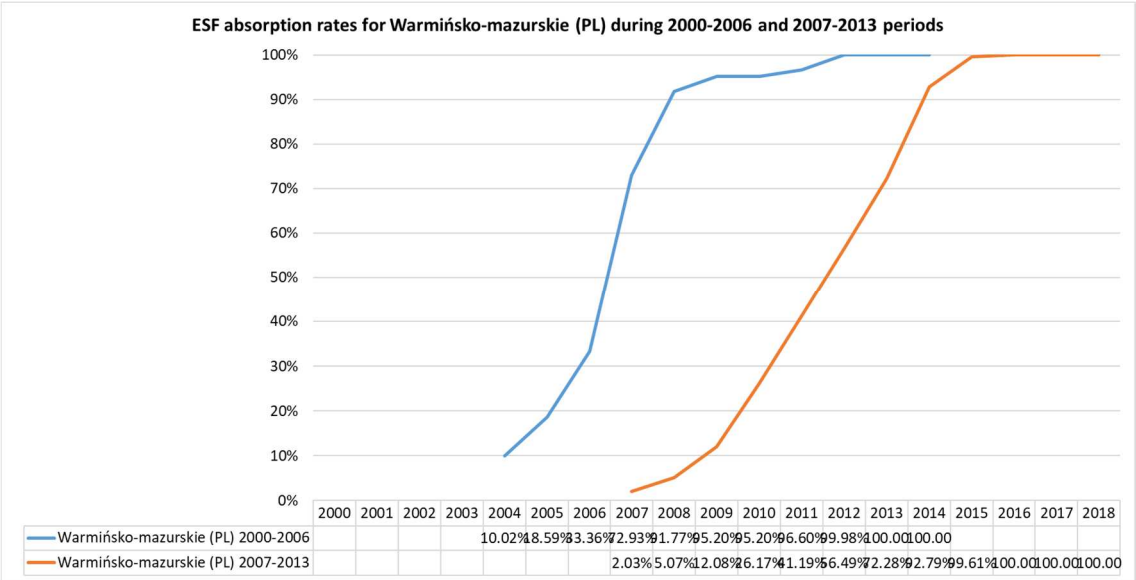


Figure A8. Comparison of absorption rates for ESF fund in Warmińsko-mazurskie, Poland (Own elaboration based on EU reports).

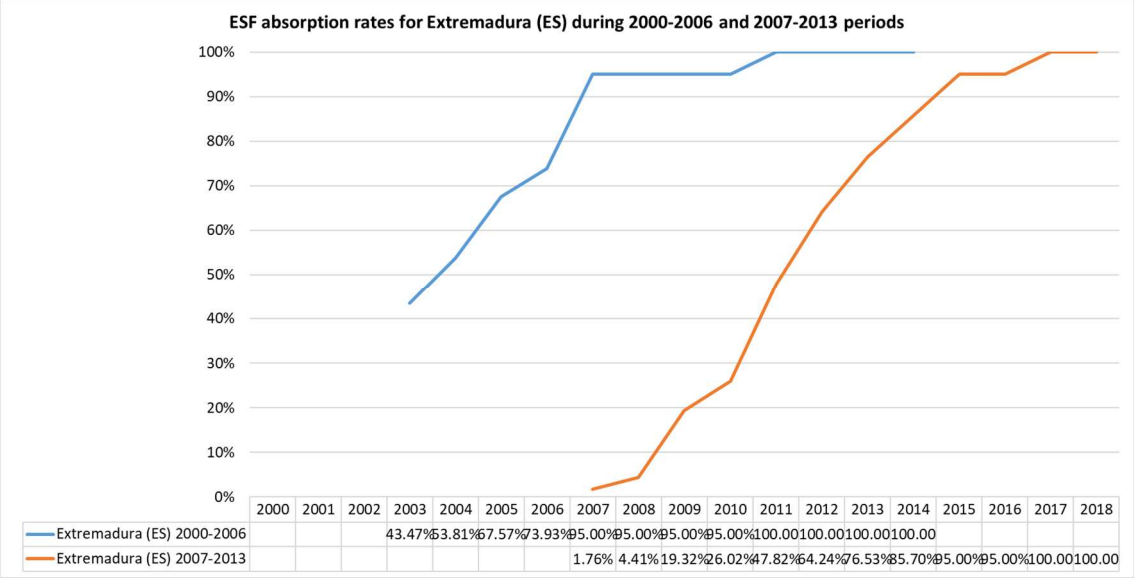


Figure A9. Comparison of absorption rates for ESF fund in Extremadura, Spain (Own elaboration based on EU reports).

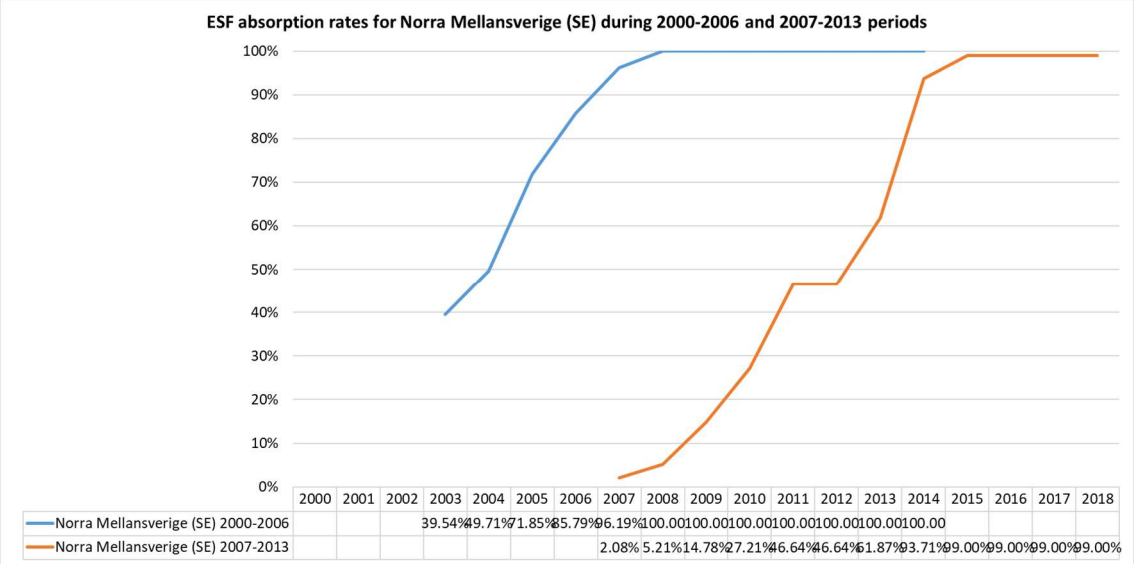
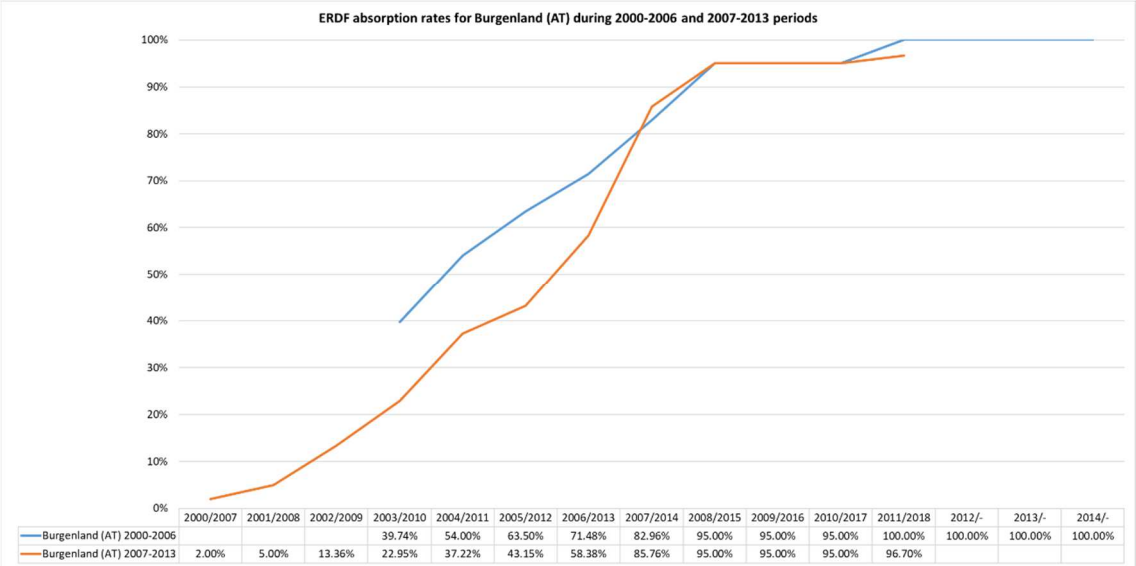
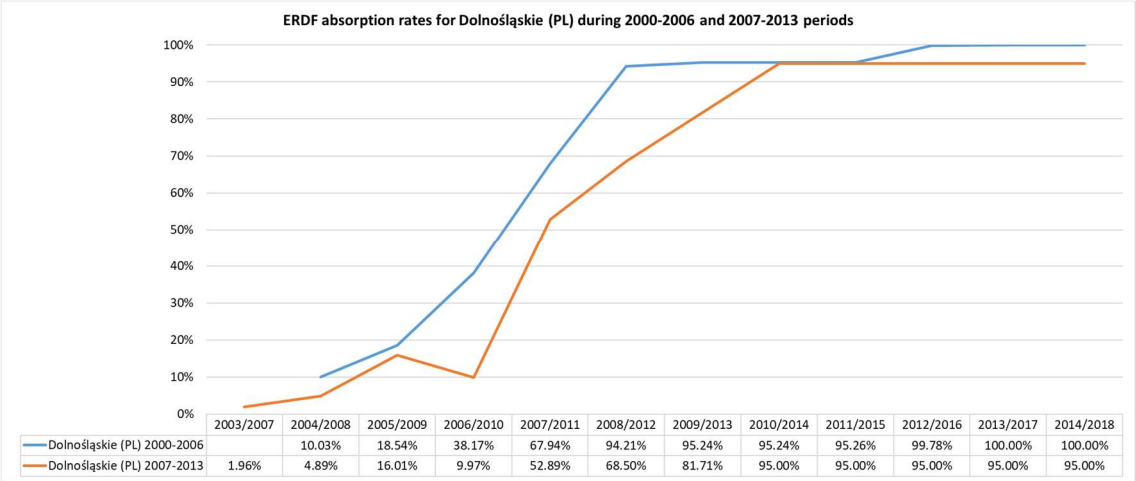


Figure A10. Comparison of absorption rates for ESF fund in Norra Mellansverige, Sweden (Own elaboration based on EU reports).



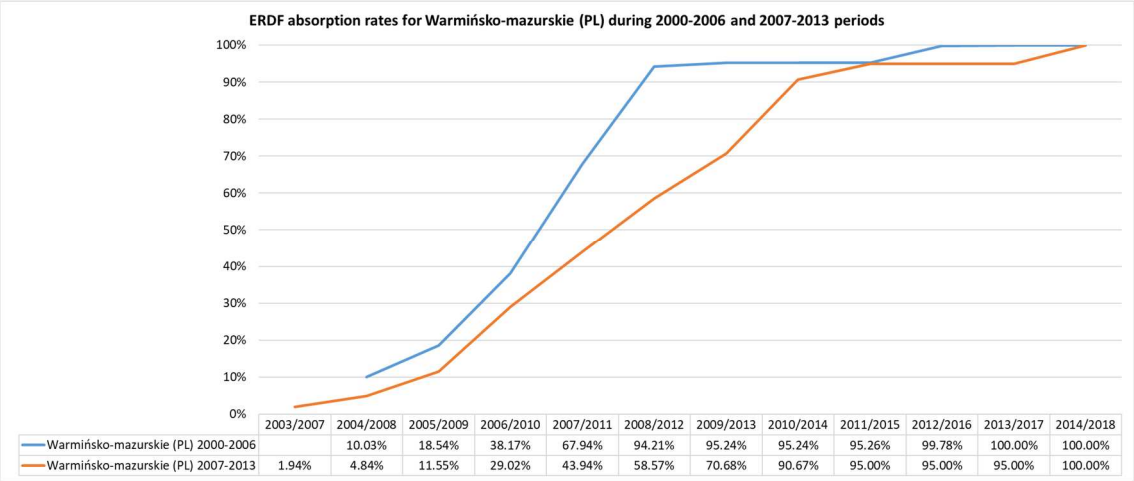
	2000/2007	2001/2008	2002/2009	2003/2010	2004/2011	2005/2012	2006/2013	2007/2014	2008/2015	2009/2016	2010/2017	2011/2018	2012/-	2013/-	2014/-
Burgenland (AT) 2000-2006				39.74%	54.00%	63.50%	71.48%	82.96%	95.00%	95.00%	95.00%	100.00%	100.00%	100.00%	100.00%
Burgenland (AT) 2007-2013	2.00%	5.00%	13.36%	22.95%	37.22%	43.15%	58.38%	85.76%	95.00%	95.00%	95.00%	96.70%			

Figure A11. Comparison of absorption rates for ERDF fund in Burgenland, Austria, with programming period overlap (Own elaboration based on EU reports).



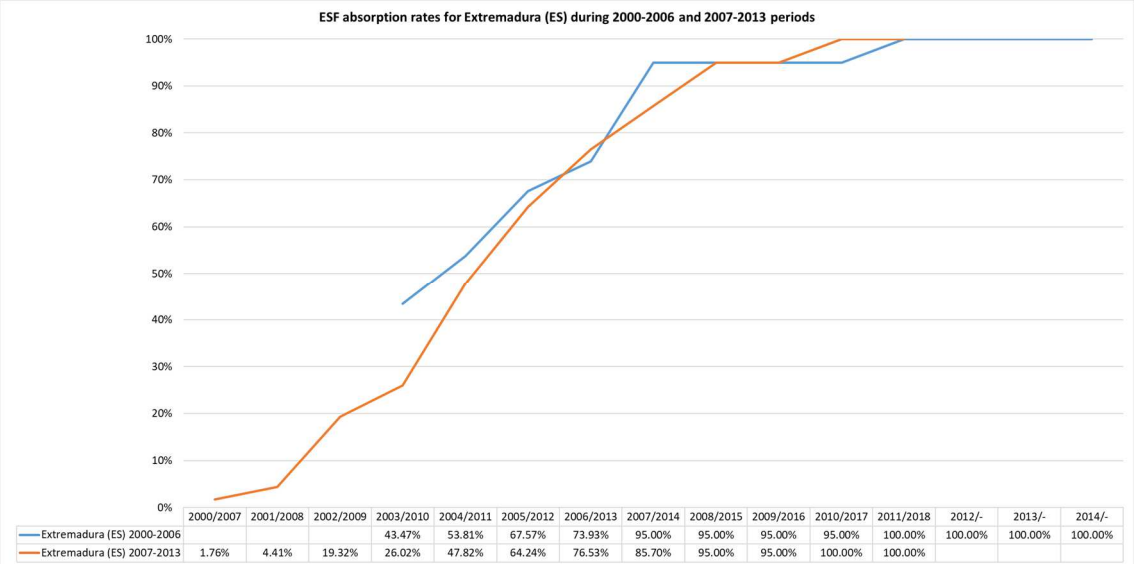
	2003/2007	2004/2008	2005/2009	2006/2010	2007/2011	2008/2012	2009/2013	2010/2014	2011/2015	2012/2016	2013/2017	2014/2018
Dolnośląskie (PL) 2000-2006		10.03%	18.54%	38.17%	67.94%	94.21%	95.24%	95.24%	95.26%	99.78%	100.00%	100.00%
Dolnośląskie (PL) 2007-2013	1.96%	4.89%	16.01%	9.97%	52.89%	68.50%	81.71%	95.00%	95.00%	95.00%	95.00%	95.00%

Figure A12. Comparison of absorption rates for ERDF fund in Dolnośląskie, Poland, with programming period overlap (Own elaboration based on EU reports).



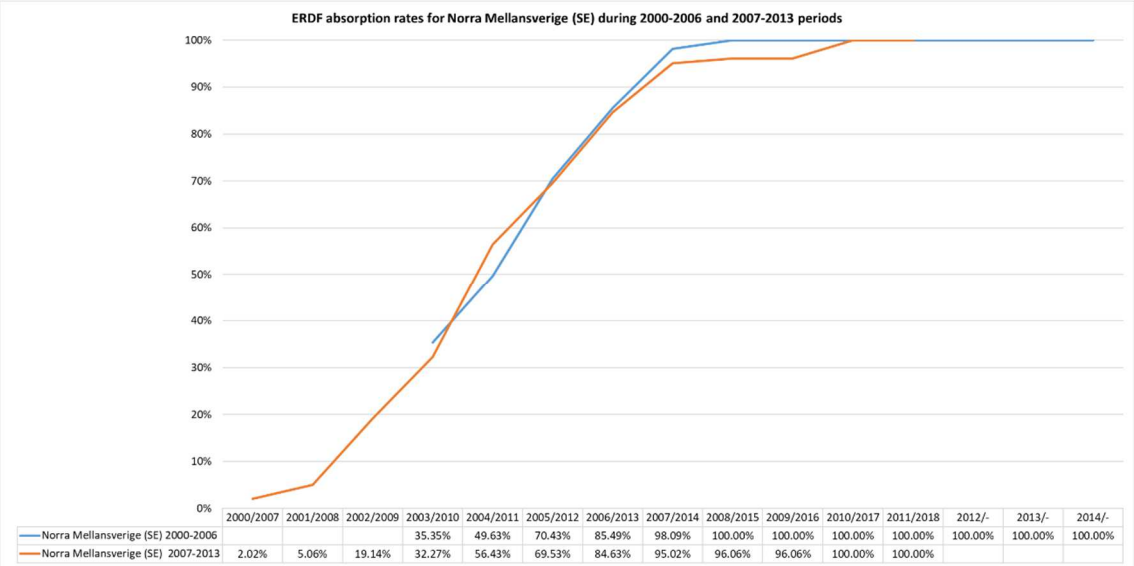
	2003/2007	2004/2008	2005/2009	2006/2010	2007/2011	2008/2012	2009/2013	2010/2014	2011/2015	2012/2016	2013/2017	2014/2018
Warmińsko-mazurskie (PL) 2000-2006		10.03%	18.54%	38.17%	67.94%	94.21%	95.24%	95.24%	95.26%	99.78%	100.00%	100.00%
Warmińsko-mazurskie (PL) 2007-2013	1.94%	4.84%	11.55%	29.02%	43.94%	58.57%	70.68%	90.67%	95.00%	95.00%	95.00%	100.00%

Figure A13. Comparison of absorption rates for ERDF fund in Warmińsko-mazurskie, Poland, with programming period overlap (Own elaboration based on EU reports).



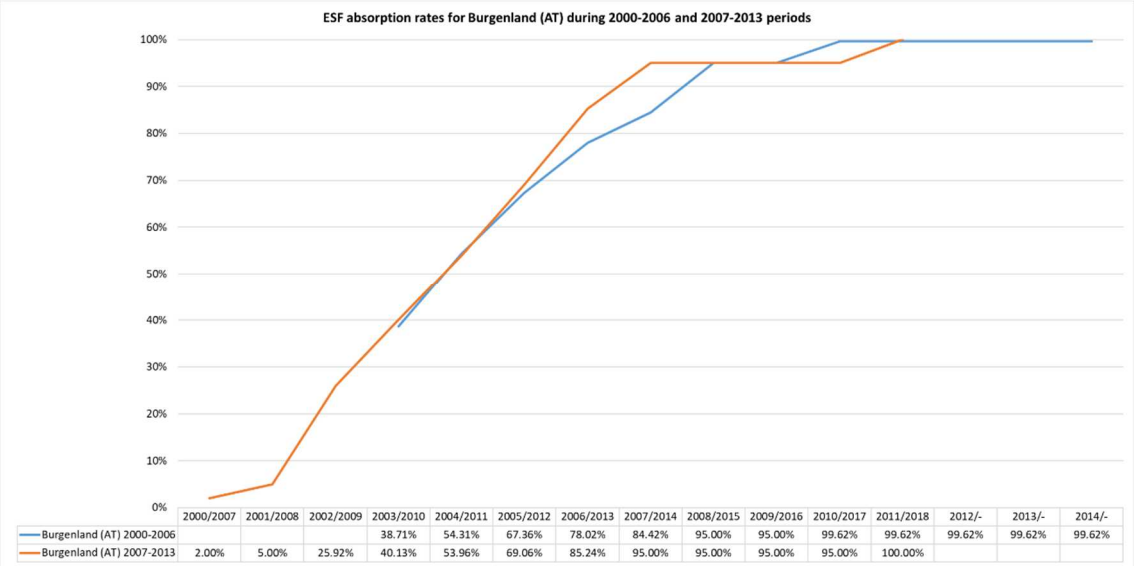
	2000/2007	2001/2008	2002/2009	2003/2010	2004/2011	2005/2012	2006/2013	2007/2014	2008/2015	2009/2016	2010/2017	2011/2018	2012/-	2013/-	2014/-
Extremadura (ES) 2000-2006				43.47%	53.81%	67.57%	73.93%	95.00%	95.00%	95.00%	95.00%	100.00%	100.00%	100.00%	100.00%
Extremadura (ES) 2007-2013	1.76%	4.41%	19.32%	26.02%	47.82%	64.24%	76.53%	85.70%	95.00%	95.00%	100.00%	100.00%			

Figure A14. Comparison of absorption rates for ERDF fund in Extremadura, Spain, with programming period overlap (Own elaboration based on EU reports).



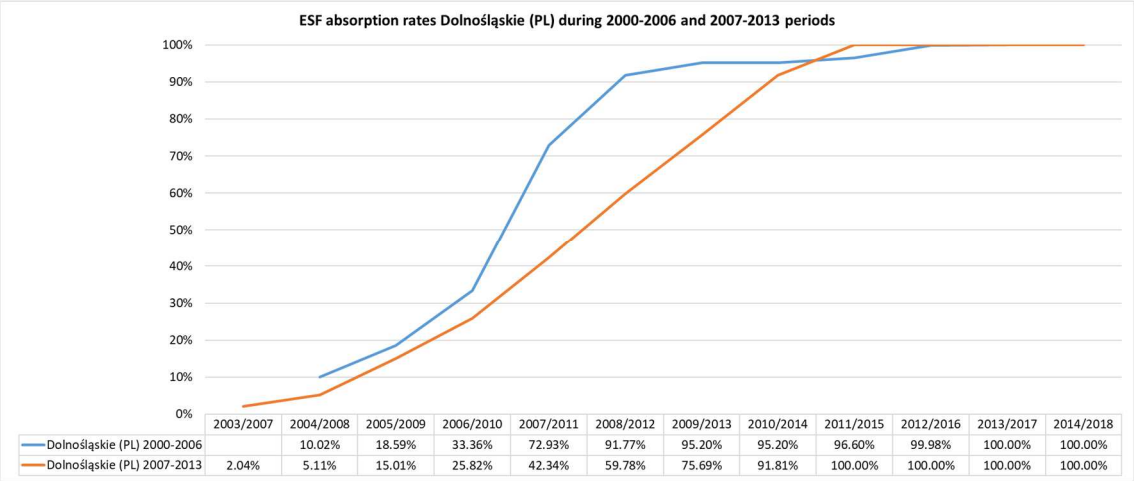
	2000/2007	2001/2008	2002/2009	2003/2010	2004/2011	2005/2012	2006/2013	2007/2014	2008/2015	2009/2016	2010/2017	2011/2018	2012/-	2013/-	2014/-
Norra Mellansverige (SE) 2000-2006				35.35%	49.63%	70.43%	85.49%	98.09%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Norra Mellansverige (SE) 2007-2013	2.02%	5.06%	19.14%	32.27%	56.43%	69.53%	84.63%	95.02%	96.06%	96.06%	100.00%	100.00%			

Figure A15. Comparison of absorption rates for ERDF fund in Norra Mellasverige, with programming period overlap (Own elaboration based on EU reports).



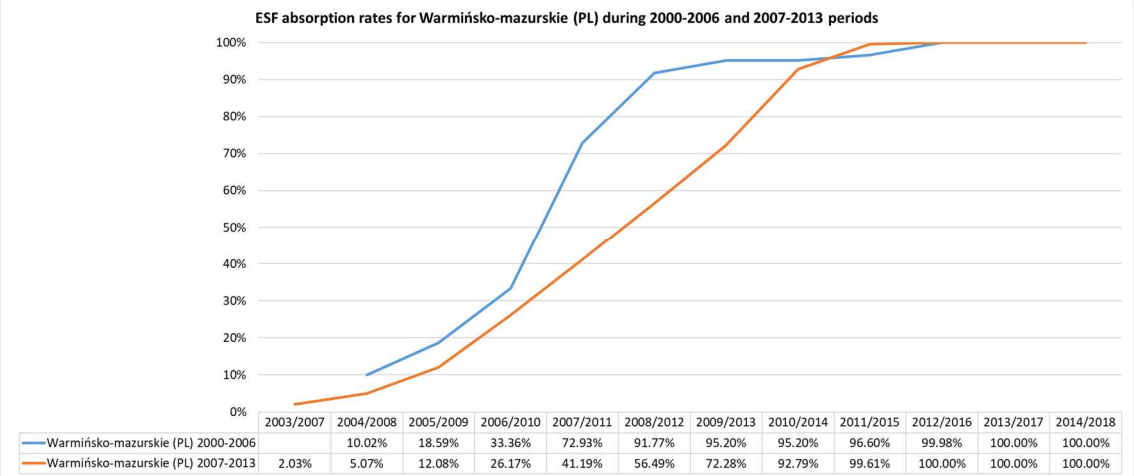
	2000/2007	2001/2008	2002/2009	2003/2010	2004/2011	2005/2012	2006/2013	2007/2014	2008/2015	2009/2016	2010/2017	2011/2018	2012/-	2013/-	2014/-
Burgenland (AT) 2000-2006				38.71%	54.31%	67.36%	78.02%	84.42%	95.00%	95.00%	99.62%	99.62%	99.62%	99.62%	99.62%
Burgenland (AT) 2007-2013	2.00%	5.00%	25.92%	40.13%	53.96%	69.06%	85.24%	95.00%	95.00%	95.00%	95.00%	100.00%			

Figure A16. Comparison of absorption rates for ESF fund in Burgenland, Austria, with programming period overlap (Own elaboration based on EU reports).



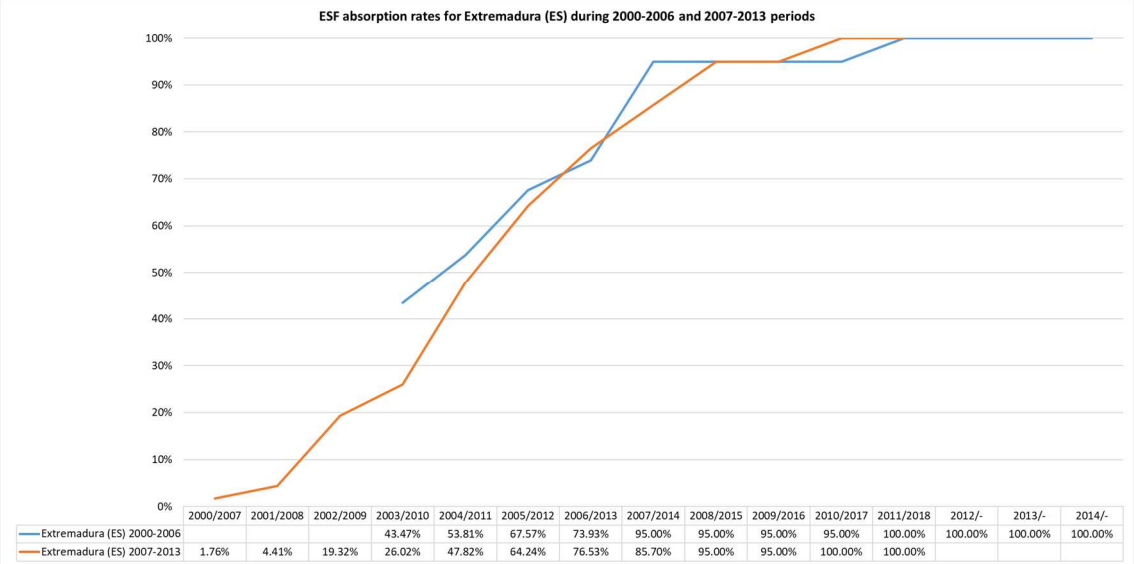
	2003/2007	2004/2008	2005/2009	2006/2010	2007/2011	2008/2012	2009/2013	2010/2014	2011/2015	2012/2016	2013/2017	2014/2018
Dolnośląskie (PL) 2000-2006		10.02%	18.59%	33.36%	72.93%	91.77%	95.20%	95.20%	96.60%	99.98%	100.00%	100.00%
Dolnośląskie (PL) 2007-2013	2.04%	5.11%	15.01%	25.82%	42.34%	59.78%	75.69%	91.81%	100.00%	100.00%	100.00%	100.00%

Figure A17. Comparison of absorption rates for ESF fund in Dolnośląskie, Poland, with programming period overlap (Own elaboration based on EU reports).



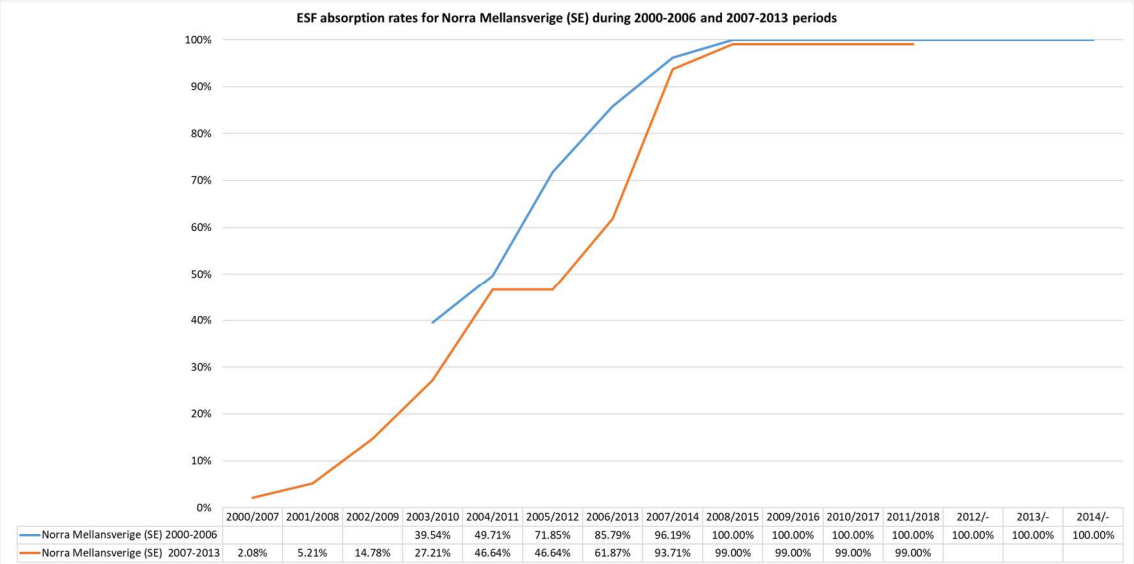
	2003/2007	2004/2008	2005/2009	2006/2010	2007/2011	2008/2012	2009/2013	2010/2014	2011/2015	2012/2016	2013/2017	2014/2018
Warmińsko-mazurskie (PL) 2000-2006		10.02%	18.59%	33.36%	72.93%	91.77%	95.20%	95.20%	96.60%	99.98%	100.00%	100.00%
Warmińsko-mazurskie (PL) 2007-2013	2.03%	5.07%	12.08%	26.17%	41.19%	56.49%	72.28%	92.79%	99.61%	100.00%	100.00%	100.00%

Figure A18. Comparison of absorption rates for ESF fund in Warmińsko-mazurskie, Poland, with programming period overlap (Own elaboration based on EU reports).



	2000/2007	2001/2008	2002/2009	2003/2010	2004/2011	2005/2012	2006/2013	2007/2014	2008/2015	2009/2016	2010/2017	2011/2018	2012/-	2013/-	2014/-
Extremadura (ES) 2000-2006				43.47%	53.81%	67.57%	73.93%	95.00%	95.00%	95.00%	95.00%	100.00%	100.00%	100.00%	100.00%
Extremadura (ES) 2007-2013	1.76%	4.41%	19.32%	26.02%	47.82%	64.24%	76.53%	85.70%	95.00%	95.00%	100.00%	100.00%			

Figure A19. Comparison of absorption rates for ERDF fund in Extremadura, Spain, with programming period overlap (Own elaboration based on EU reports).



	2000/2007	2001/2008	2002/2009	2003/2010	2004/2011	2005/2012	2006/2013	2007/2014	2008/2015	2009/2016	2010/2017	2011/2018	2012/-	2013/-	2014/-
Norra Mellansverige (SE) 2000-2006				39.54%	49.71%	71.85%	85.79%	96.19%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Norra Mellansverige (SE) 2007-2013	2.08%	5.21%	14.78%	27.21%	46.64%	46.64%	61.87%	93.71%	99.00%	99.00%	99.00%	99.00%			

Figure A20. Comparison of absorption rates for ERDF fund in Norra Mellasverige, Sweden, with programming period overlap (Own elaboration based on EU reports).

Table A5. European citizens awareness on regional EU funded projects (Source: Eurobarometers).

Year	Country	Positive response	Question
1992	EU12	22.0%	EU provides a regional development fund (ERDF) to help less developed UE regions. Do you know any activity of this EU regional development fund (ERDF) in your country?
	Austria	Not member	
	Italy	16.0%	
	Poland	Not member	
	Romania	Not member	
	Spain	32.0%	
	Sweden	Not member	
	United Kingdom	28.0%	
1995	EU15	28.0%	
	Austria	37.0%	
	Italy	18.0%	
	Poland	Not member	
	Romania	Not member	
	Spain	26.0%	
	Sweden	23.0%	
	United Kingdom	42.0%	
2008	EU27	48.9%	Europe supports its regions and cities through EU Regional Policy. Are you aware that your city or region receives support from the EU Regional Policy?
	Austria	64.3%	
	Italy	56.1%	
	Poland	65.0%	
	Romania	60.6%	
	Spain	61.5%	
	Sweden	23.5%	
	United Kingdom	37.9%	

Year	Country	Positive response	Question
2010	EU27	33.8%	Europe provides financial support in regions and cities. Have you heard about EU co-financed projects to improve the area you live in?
	Austria	21.5%	
	Italy	33.4%	
	Poland	68.5%	
	Romania	64.2%	
	Spain	43.4%	
	Sweden	27.7%	
	United Kingdom	13.3%	
2013	EU28	34.0%	
	Austria	16.0%	
	Italy	48.0%	
	Poland	80.0%	
	Romania	46.0%	
	Spain	33.0%	
	Sweden	23.0%	
	United Kingdom	10.0%	
2015	EU28	34.0%	
	Austria	17.0%	
	Italy	43.0%	
	Poland	76.0%	
	Romania	45.0%	
	Spain	28.0%	
	Sweden	21.0%	
	United Kingdom	9.0%	
2017	EU28	35.0%	

Year	Country	Positive response	Question
	Austria	16.0%	
	Italy	40.0%	
	Poland	80.0%	
	Romania	44.0%	
	Spain	30.0%	
	Sweden	22.0%	
	United Kingdom	18.0%	

B. Causal relationships

Table B1. Causal relationships: funds absorption system.

Concept 1 (C1)	Concept 2 (C2)	Notes	Type of connection	Source
date of EU policy cycle regulation approval	ROP development time	An increase in C1 date increases C2 time	Main flow	Interview with D. Ferrara (Regione Emilia-Romagna) 10-7-2018; George (2008); Milio (2007)
national-EU partnership agreement delay	ROP development time	An increase in C1 delay increases C2 time	Main flow	Interview with D. Ferrara (Regione Emilia-Romagna) 10-7-2018; George (2008); Milio (2007)
ROP development time	time to allocate funds at EU level	An increase in C1 time increases C2 time	Main flow	Interview with D. Ferrara (Regione Emilia-Romagna) 10-7-2018; George (2008); Milio (2007)
ROP approval time	time to allocate funds at EU level	An increase in C1 time increases C2 time	Main flow	Interview with D. Ferrara (Regione Emilia-Romagna) 10-7-2018; George (2008); Milio (2007)
time to allocate funds at EU level	EU funds	An increase of C1 time decreases the C2 rate	Main flow	Interview with D. Ferrara (Regione Emilia-Romagna) 10-7-2018; George (2008); Milio (2007)
EU funds	Total funds available	An increase in C1 rate increases C2 state	Main flow	Interview with D. Ferrara (Regione Emilia-Romagna) 10-7-2018; Interview with G. Chiellino (Sole24Ore journalist and Perceive Advisory Board) 25-06-2018; Interview with P.M. Reverberi and V. Aiello (Perceive Experts at Università di Bologna) 11-06-2018; European Commission (2018c); Department for Communities and Local Government (2015)
payments to beneficiaries	Total funds available	An increase in C1 rate decreases C2 state	Main flow	Interview with D. Ferrara (Regione Emilia-Romagna) 10-7-2018; Interview with G. Chiellino (Sole24Ore journalist and Perceive Advisory Board) 25-06-2018; Interview with P.M. Reverberi and V. Aiello (Perceive Experts at Università di Bologna) 11-06-2018; European Commission (2018c); Department for Communities and Local Government (2015)
refunding rate	payments to beneficiaries	An increase in C1 rate increases C2 rate	Main flow	Interview with D. Ferrara (Regione Emilia-Romagna) 10-7-2018; Interview with

Concept 1 (C1)	Concept 2 (C2)	Notes	Type of connection	Source
				G. Chiellino (Sole24Ore journalist and Perceive Advisory Board) 25-06-2018; Interview with P.M. Reverberi and V. Aiello (Perceive Experts at Università di Bologna) 11-06-2018; European Commission (2018c); Department for Communities and Local Government (2015)
Total funds available	EU funds allocation at local level	An increase of C1 state increases C2 rate	Main flow	Interview with D. Ferrara (Regione Emilia-Romagna) 10-7-2018; Interview with G. Chiellino (Sole24Ore journalist and Perceive Advisory Board) 25-06-2018; Interview with P.M. Reverberi and V. Aiello (Perceive Experts at Università di Bologna) 11-06-2018; European Commission (2018c); Department for Communities and Local Government (2015)
EU funds allocation at local level	Region calls for EU fund	An increase in C1 rate increases C2 state	Main flow	Interview with D. Ferrara (Regione Emilia-Romagna) 10-7-2018; Interview with G. Chiellino (Sole24Ore journalist and Perceive Advisory Board) 25-06-2018; Interview with P.M. Reverberi and V. Aiello (Perceive Experts at Università di Bologna) 11-06-2018; European Commission (2018c); Department for Communities and Local Government (2015)
applications rate	Region calls for EU fund	An increase in C1 rate decreases C2 state	Main flow	Interview with D. Ferrara (Regione Emilia-Romagna) 10-7-2018; Interview with G. Chiellino (Sole24Ore journalist and Perceive Advisory Board) 25-06-2018; Interview with P.M. Reverberi and V. Aiello (Perceive Experts at Università di Bologna) 11-06-2018; European Commission (2018c); Department for Communities and Local Government (2015)
applications rate	Projects submitted	An increase in C1 rate increases C2 state	Main flow	Interview with D. Ferrara (Regione Emilia-Romagna) 10-7-2018; Interview with G. Chiellino (Sole24Ore journalist and Perceive

Concept 1 (C1)	Concept 2 (C2)	Notes	Type of connection	Source
				Advisory Board) 25-06-2018; Interview with P.M. Reverberi and V. Aiello (Perceive Experts at Università di Bologna) 11-06-2018; European Commission (2018c); Department for Communities and Local Government (2015)
evaluation rate	Projects submitted	An increase in C1 rate decreases C2 state	Main flow	Interview with D. Ferrara (Regione Emilia-Romagna) 10-7-2018; Interview with G. Chiellino (Sole24Ore journalist and Perceive Advisory Board) 25-06-2018; Interview with P.M. Reverberi and V. Aiello (Perceive Experts at Università di Bologna) 11-06-2018; European Commission (2018c); Department for Communities and Local Government (2015)
evaluation rate	Projects accepted	An increase in C1 rate increases C2 state	Main flow	Interview with D. Ferrara (Regione Emilia-Romagna) 10-7-2018; Interview with G. Chiellino (Sole24Ore journalist and Perceive Advisory Board) 25-06-2018; Interview with P.M. Reverberi and V. Aiello (Perceive Experts at Università di Bologna) 11-06-2018; European Commission (2018c); Department for Communities and Local Government (2015)
side projects' rate	Projects accepted	An increase in C1 rate increases C2 state	Main flow	Interview with D. Ferrara (Regione Emilia-Romagna) 10-7-2018; Interview with G. Chiellino (Sole24Ore journalist and Perceive Advisory Board) 25-06-2018; Interview with Pierre Reverberi and Valentina Aiello (Perceive Experts at Università di Bologna) 11-06-2018; Corte dei Conti, (2017)
contracting rate	Projects accepted	An increase in C1 rate decreases C2 state	Main flow	Interview with D. Ferrara (Regione Emilia-Romagna) 10-7-2018; Interview with G. Chiellino (Sole24Ore journalist and Perceive Advisory Board) 25-06-2018; Interview with P.M. Reverberi and V. Aiello (Perceive Experts at Università di Bologna) 11-

Concept 1 (C1)	Concept 2 (C2)	Notes	Type of connection	Source
				06-2018; European Commission (2018c); Department for Communities and Local Government (2015)
contracting rate	Signed and approved projects	An increase in C1 rate increases C2 state	Main flow	Interview with D. Ferrara (Regione Emilia-Romagna) 10-7-2018; Interview with G. Chiellino (Sole24Ore journalist and Perceive Advisory Board) 25-06-2018; Interview with P.M. Reverberi and V. Aiello (Perceive Experts at Università di Bologna) 11-06-2018; European Commission (2018c); Department for Communities and Local Government (2015)
utilization and realization rate	Signed and approved projects	An increase in C1 rate decreases C2 state	Main flow	Interview with D. Ferrara (Regione Emilia-Romagna) 10-7-2018; Interview with G. Chiellino (Sole24Ore journalist and Perceive Advisory Board) 25-06-2018; Interview with P.M. Reverberi and V. Aiello (Perceive Experts at Università di Bologna) 11-06-2018; European Commission (2018c); Department for Communities and Local Government (2015)
utilization and realization rate	Projects completed under control	An increase in C1 rate increases C2 state	Main flow	Interview with D. Ferrara (Regione Emilia-Romagna) 10-7-2018
monitoring rate	Projects completed under control	An increase in C1 rate decreases C2 state	Main flow	Interview with D. Ferrara (Regione Emilia-Romagna) 10-7-2018
monitoring rate	Projects awaiting to be refunded	An increase in C1 rate increases C2 state	Main flow	Interview with D. Ferrara (Regione Emilia-Romagna) 10-7-2018
refunding rate	Projects awaiting to be refunded	An increase in C1 rate decreases C2 state	Main flow	Interview with D. Ferrara (Regione Emilia-Romagna) 10-7-2018; Interview with G. Chiellino (Sole24Ore journalist and Perceive Advisory Board) 25-06-2018; Interview with P.M. Reverberi and V. Aiello (Perceive Experts at Università di Bologna) 11-06-2018; European Commission (2018c); Department for Communities and Local Government (2015)

Concept 1 (C1)	Concept 2 (C2)	Notes	Type of connection	Source
refunding rate	Refunded and completed projects	An increase in C1 rate increases C2 state	Main flow	Interview with D. Ferrara (Regione Emilia-Romagna) 10-7-2018; Interview with G. Chiellino (Sole24Ore journalist and Perceive Advisory Board) 25-06-2018; Interview with P.M. Reverberi and V. Aiello (Perceive Experts at Università di Bologna) 11-06-2018; European Commission (2018c); Department for Communities and Local Government (2015)
time to prepare call	EU funds allocation at local level	An increase in C1 time decreases C2 rate	Main flow	Interview with D. Ferrara (Regione Emilia-Romagna) 10-7-2018
submission time	applications rate	An increase in C1 time decreases C2 rate	Main flow	Jurevičienė and Pileckaitė (2013)
evaluation time	evaluation rate	An increase in C1 time decreases C2 rate	Main flow	Berică (2010)
contracting time	contracting rate	An increase in C1 time decreases C2 rate	Main flow	Interview with D. Ferrara (Regione Emilia-Romagna) 10-7-2018; Interview with G. Chiellino (Sole24Ore journalist and Perceive Advisory Board) 25-06-2018; Interview with P.M. Reverberi and V. Aiello (Perceive Experts at Università di Bologna) 11-06-2018; European Commission (2018c); Department for Communities and Local Government (2015)
utilization and realization time	utilization and realization rate	An increase in C1 time decreases C2 rate	Main flow	George (2008); Squinzi (2013)
bureaucratic requirements time	utilization and realization rate	An increase in C1 time decreases C2 rate	Main flow	Interview with G. Chiellino (Sole24Ore journalist and Perceive Advisory Board) 25-06-2018; Smętkowski *et al*. (2018)
monitoring time	monitoring rate	An increase in C1 time decreases C2 rate	Main flow	Interview with D. Ferrara (Regione Emilia-Romagna) 10-7-2018; Burja and Jeler (2018)
time to get refunded	refunding rate	An increase in C1 time decreases C2 rate	Main flow	Interview with B. Sartore (Private consultant) 17-04-2018; Berică (2010); George (2008); Jaliu and Rădulescu (2012)
call quality and support	submission time	An increase in C1 quality decreases C2 time	Administrative capacity flow	Interview with B. Sartore (Private consultant) 17-04-2018; Barbiero *et al*. (2017)

Concept 1 (C1)	Concept 2 (C2)	Notes	Type of connection	Source
ROP quality	call quality and support	An increase in C1 quality increases C2 quality	Administrative capacity flow	Milio (2007); Squinzi (2013)
regional political suitability	ROP quality	An increase in C1 suitability increases C2 quality	Administrative capacity flow	Interview with P.M. Reverberi and V. Aiello (Perceive Experts at Università di Bologna) 11-06-2018; Milio (2007); Squinzi (2013)
regional political suitability	local managing authority administrative capacity	An increase in C1 suitability increases C2 capacity	Administrative capacity flow	Interview with G. Chiellino (Sole24Ore journalist and Perceive Advisory Board) 25-06-2018; Interview with P.M. Reverberi and V. Aiello (Perceive Experts at Università di Bologna) 11-06-2018; George (2008); Milio (2007); Smętkowski *et al*. (2018); Tatar (2010); Kyriacou and Roca-Sagalés (2012); Lucian (2014); RAI RADIO RAI 1 "Radio anch'io" 27-06-2018 "Decreto dignità, lavoro, fondi europei"
institutions quality	local managing authority administrative capacity	An increase in C1 quality increases C2 capacity	Administrative capacity flow	Smętkowski *et al*. (2018); Charron and Lapuente (2013); Capello and Perucca, G. (2017)
staff capacity	local managing authority administrative capacity	An increase in C1 capacity increases C2 capacity	Administrative capacity flow	Interview with D. Ferrara (Regione Emilia-Romagna) 10-7-2018; Interview with G. Chiellino (Sole24Ore journalist and Perceive Advisory Board) 25-06-2018; Interview with P.M. Reverberi and V. Aiello (Perceive Experts at Università di Bologna) 11-06-2018; Berică (2010); Hapenciuc *et al*. (2013); Jaliu and Rădulescu (2012); Lucian (2014); Milio (2007); Sumpíková *et al*. (2004); Tatar (2010)
staff number	staff capacity	An increase in C1 number increases C2 capacity	Administrative capacity flow	Interview with D. Ferrara (Regione Emilia-Romagna) 10-7-2018; Interview with G. Chiellino (Sole24Ore journalist and Perceive Advisory Board) 25-06-2018
equipment availability	staff capacity	An increase in C1 availability increases C2 capacity	Administrative capacity flow	Interview with D. Ferrara (Regione Emilia-Romagna) 10-7-2018; Interview with G. Chiellino (Sole24Ore journalist and Perceive Advisory Board) 25-06-2018; Interview with P.M. Reverberi and V. Aiello (Perceive Experts at

Concept 1 (C1)	Concept 2 (C2)	Notes	Type of connection	Source
				Università di Bologna) 11-06-2018
local managing authority skills learning	staff capacity	An increase in C1 learning increases C2 capacity	Administrative capacity flow	Berică (2010); Hapenciuc *et al*. (2013); Jaliu and Rădulescu (2012); Lucian (2014); Sumpíková *et al*. (2004); Tatar (2010)
Refunded and completed projects	local managing authority skills learning	An increase in C1 capacity increases C2 time	Administrative capacity flow	Interview with D. Ferrara (Regione Emilia-Romagna) 10-7-2018; Interview with G. Chiellino (Sole24Ore journalist and Perceive Advisory Board) 25-06-2018; Hapenciuc *et al*. (2013); Jaliu and Rădulescu (2012); Lucian (2014)
local managing authority administrative capacity	call quality and support	An increase in C1 capacity increases C2 quality	Administrative capacity flow	Interview with B. Sartore (private consultant) 17-04-2018); Barbiero *et al*. (2017)
local managing authority administrative capacity	time to prepare call	An increase in C1 capacity decreases C2 time	Administrative capacity flow	Interview with D. Ferrara (Regione Emilia-Romagna) 10-7-2018; Interview with G. Chiellino (Sole24Ore journalist and Perceive Advisory Board) 25-06-2018
local managing authority administrative capacity	evaluation time	An increase in C1 capacity decreases C2 time	Administrative capacity flow	Interview with D. Ferrara (Regione Emilia-Romagna) 10-7-2018; Interview with G. Chiellino (Sole24Ore journalist and Perceive Advisory Board) 25-06-2018; Berică (2010)
local managing authority administrative capacity	contracting time	An increase in C1 capacity decreases C2 time	Administrative capacity flow	Interview with D. Ferrara (Regione Emilia-Romagna) 10-7-2018; Interview with G. Chiellino (Sole24Ore journalist and Perceive Advisory Board) 25-06-2018;
local managing authority administrative capacity	monitoring time	An increase in C1 capacity decreases C2 time	Administrative capacity flow	Interview with D. Ferrara (Regione Emilia-Romagna) 10-7-2018; Interview with G. Chiellino (Sole24Ore journalist and Perceive Advisory Board) 25-06-2018; Burja and Jeler (2018)
Total funds available	absorption rate	An increase in C1 funds decreases C2 rate	Absorption rate flow	Tatar (2010); Zaman and Cristea (2011)
Refunded and completed projects	absorption rate	An increase in C1 projects increases C2 rate	Absorption rate flow	Tatar (2010); Zaman and Cristea (2011)
absorption rate	absorption rate gap	An increase in C1 rate decreases C2 gap	Absorption rate flow	Mathematical logical function
ideal absorption rate gap	absorption rate gap	An increase in C1 gap decreases C2 gap	Absorption rate flow	Katsarova, 2013

Concept 1 (C1)	Concept 2 (C2)	Notes	Type of connection	Source
absorption rate gap	standards for project quality	An increase in C1 gap decreases C2 standards	Absorption rate flow	Interview with P.M. Reverberi and V. Aiello (Perceive Experts at Università di Bologna) 11-06-2018; Burja and Jeler (2018); Jurevičienė and Pileckaitė (2013)
standards for project quality	acceptance rate	An increase in C1 standards decreases C2 rate	Absorption rate flow	Interview with P.M. Reverberi and V. Aiello (Perceive Experts at Università di Bologna) 11-06-2018; Burja and Jeler (2018); Jurevičienė and Pileckaitė (2013); Zaman and Cristea (2011)
average project application quality	acceptance rate	An increase in C1 quality increases C2 rate	Absorption rate flow	Interview with B. Sartore (Private consultant) 17-04-2018); George (2008)
acceptance rate	evaluation rate	An increase in C1 rate increases C2 rate	Absorption rate flow	Zaman and Cristea (2011)
absorption rate gap	'side projects' rate	An increase in C1 gap increases C2 rate	Absorption rate flow	Interview with D. Ferrara (Regione Emilia-Romagna) 10-7-2018; Interview with G. Chiellino (Sole24Ore journalist and Perceive Advisory Board) 25-06-2018; Interview with P.M. Reverberi and V. Aiello (Perceive Experts at Università di Bologna) 11-06-2018; Corte dei Conti (2017)
standards for project quality	actual average project quality	An increase in C1 quality increases C2 quality	Project quality flow	Interview with P.M. Reverberi and V. Aiello (Perceive Experts at Università di Bologna) 11-06-2018; Corte dei Conti (2017)
average project quality	actual average project quality	An increase in C1 quality increases C2 quality	Project quality flow	Interview with P.M. Reverberi and V. Aiello (Perceive Experts at Università di Bologna) 11-06-2018; Cottone (2018, Video in "Il Sole 24 Ore" Journal)
average project quality	average project application quality	An increase in C1 quality increases C2 quality	Project quality flow	Interview with B. Sartore (Private consultant) 17-04-2018; George (2008)
institutions quality	average project application quality	An increase in C1 quality increases C2 quality	Project quality flow	George (2008); Jaliu and Rădulescu (2012); RAI RADIO RAI 1 "Radio anch'io" 27-06-2018 "Decreto dignità, lavoro, fondi europei"
intermediary consultancy companies	average project application quality	An increase in C1 companies increases C2 quality	Project quality flow	Jurevičienė and Pileckaitė (2013)

Concept 1 (C1)	Concept 2 (C2)	Notes	Type of connection	Source
Refunded and completed projects	beneficiaries word of mouth	An increase in C1 state increases C2 quantity	Knowledge probability flow	Interview with B. Sartore (private consultant) 17-04-2018
beneficiaries word of mouth	probability of knowledge of EU funding opportunities	An increase in C1 quantity increases C2 probability	Knowledge probability flow	Interview with B. Sartore (private consultant) 17-04-2018
media coverage of EU funding opportunities	probability of knowledge of EU funding opportunities	An increase in C1 quantity increases C2 probability	Knowledge probability flow	Barbiero *et al*. (2017); Region of Emilia-Romagna (2012); Region of Emilia-Romagna (2014)
region communication mix of EU funds	probability of knowledge of EU funding opportunities	An increase in C1 quantity increases C2 probability	Knowledge probability flow	Region of Emilia-Romagna (2012); Barbiero *et al*. (2017); Borz *et al*. (2018); Capello and Perucca (2017); University of Bologna (PERCEIVE). (2017); European Commission (2014)
intermediary consultancy companies	probability of knowledge of EU funding opportunities	An increase in C1 quantity increases C2 probability	Knowledge probability flow	Jurevičienė and Pileckaitė (2013)
local stakeholders umbrella organizations contribution	probability of knowledge of EU funding opportunities	An increase in C1 quantity increases C2 probability	Knowledge probability flow	Interview with D. Ferrara (Regione Emilia-Romagna) 10-7-2018; Region of Emilia-Romagna (2012); RAI RADIO RAI 1 "Radio anch'io" 27-06-2018 "Decreto dignità, lavoro, fondi europei"
public potential beneficiaries	interinstitutional coordinated potential beneficiaries	An increase in C1 beneficiaries increases C2 beneficiaries	Potential beneficiaries flow	George (2008)
public potential beneficiaries	public-private potential partnerships	An increase in C1 beneficiaries increases C2 partnerships	Potential beneficiaries flow	George (2008); Squinzi (2013)
private potential beneficiaries	public-private potential partnerships	An increase in C1 beneficiaries increases C2 partnerships	Potential beneficiaries flow	George (2008); Squinzi (2013)
public potential beneficiaries	total potential beneficiaries	An increase in C1 beneficiaries increases C2 beneficiaries	Potential beneficiaries flow	Jaliu and Rădulescu (2012)
Interinstitutional coordinated potential beneficiaries	total potential beneficiaries	An increase in C1 beneficiaries increases C2 beneficiaries	Potential beneficiaries flow	Jaliu and Rădulescu (2012)
private potential beneficiaries	total potential beneficiaries	An increase in C1 beneficiaries increases C2 beneficiaries	Potential beneficiaries flow	Interview with B. Sartore (private consultant) 17-04-2018; Squinzi (2013)
public-private potential partnerships	total potential beneficiaries	An increase in C1 partnerships increases C2 beneficiaries	Potential beneficiaries flow	George (2008); Squinzi (2013)
call quality and support	probability a beneficiary is interested in the call	An increase in C1 quality increases C2 probability	Potential applications flow	Barbiero *et al*. (2017); Milio (2007); Tatar (2010)

Concept 1 (C1)	Concept 2 (C2)	Notes	Type of connection	Source
local stakeholders umbrella organizations contribution	probability a beneficiary is interested in the call	An increase in C1 contribution increases C2 probability	Potential applications flow	Interview with D. Ferrara (Regione Emilia-Romagna) 10-7-2018; RAI RADIO RAI 1 "Radio anch'io" 27-06-2018 "Decreto dignità, lavoro, fondi europei"
total potential beneficiaries	total potential projects applications per call of interested beneficiaries	An increase in C1 beneficiaries increases C2 applications	Potential applications flow	Region of Emilia-Romagna (2012); Zaman and Cristea (2011)
probability a beneficiary is interested in the call	total potential projects applications per call of interested beneficiaries	An increase in C1 probability increases C2 applications	Potential applications flow	Barbiero *et al.* (2017); Milio (2007); Tatar (2010)
total potential projects applications per call of interested beneficiaries	total potential project applications per call of interested beneficiaries aware of the EU funding opportunity	An increase in C1 applications increases C2 applications	Potential applications flow	Barbiero *et al.* (2017)
probability of knowledge of EU funding opportunities	total potential project applications per call of interested beneficiaries aware of the EU funding opportunity	An increase in C1 probability increases C2 applications	Potential applications flow	Interview with G. Chiellino (Sole24Ore journalist and Perceive Advisory Board) 25-06-2018; Interview with B. Sartore (private consultant) 17-04-2018; Barbiero *et al.* (2017)
call bureaucracy involved	cost of making an application for EU funds	An increase in C1 quantity increases C2 costs	Potential applications flow	Interview with G. Chiellino (Sole24Ore journalist and Perceive Advisory Board) 25-06-2018; Interview with B. Sartore (private consultant) 17-04-2018); Smętkowski *et al.* (2018)
beneficiary staff capacity	cost of making an application for EU funds	An increase in C1 capacity decreases C2 costs	Potential applications flow	Interview with G. Chiellino (Sole24Ore journalist and Perceive Advisory Board) 25-06-2018; Tatar (2010)
total potential project applications per call of interested beneficiaries aware of the EU funding opportunity	total potential project applications per call of interested beneficiaries aware of the EU funding opportunities who find convenient to apply	An increase in C1 applications increases C2 applications	Potential applications flow	Interview with G. Chiellino (Sole24Ore journalist and Perceive Advisory Board) 25-06-2018; Interview with B. Sartore (private consultant) 17-04-2018; Barbiero *et al.* (2017)
cost of making an application for EU funds	total potential project applications per call of interested beneficiaries aware of the EU funding opportunities who find convenient to apply	An increase in C1 costs decreases C2 applications	Potential applications flow	Interview with G. Chiellino (Sole24Ore journalist and Perceive Advisory Board) 25-06-2018; Interview with B. Sartore (private consultant) 17-04-2018; Tatar (2010)
total potential project applications per call of interested beneficiaries aware of the EU funding opportunities who find convenient to apply	total potential project applications per call of interested beneficiaries aware of the EU funding opportunities who find convenient to apply and who are able to co-finance	An increase in C1 applications increases C2 applications	Potential applications flow	Berică (2010); George (2008); Jurevičienė and Pileckaitė (2013); Zaman and Cristea (2011); Sumpíková *et al.* (2004); Tatar (2010); University of Bologna (2017); RAI RADIO RAI 1 "Radio anch'io" 27-06-2018 "Decreto dignità, lavoro, fondi europei"

Concept 1 (C1)	Concept 2 (C2)	Notes	Type of connection	Source
project co-finance percentage	total potential project applications per call of interested beneficiaries aware of the EU funding opportunities who find convenient to apply and who are able to co-finance	An increase in C1 percentage decreases C2 applications	Potential applications flow	Berică (2010); George (2008); Jurevičienė and Pileckaitė (2013); Zaman and Cristea (2011); Sumpíková *et al.* (2004); Tatar (2010); University of Bologna (2017); RAI RADIO RAI 1 "Radio anch'io" 27-06-2018 "Decreto dignità, lavoro, fondi europei"
total potential project applications per call of interested beneficiaries aware of the EU funding opportunities who find convenient to apply and who are able to co-finance	total potential project applications per call of interested beneficiaries aware of the EU funding opportunities who find convenient to apply, who are able to co-finance and who are not discouraged by delays in refunding	An increase in C1 applications increases C2 applications	Potential applications flow	Berică (2010); George (2008); Jurevičienė and Pileckaitė (2013); Zaman and Cristea (2011); Sumpíková *et al.* (2004); Tatar (2010); University of Bologna (2017); RAI RADIO RAI 1 "Radio anch'io" 27-06-2018 "Decreto dignità, lavoro, fondi europei"
time to get refunded	total potential project applications per call of interested beneficiaries aware of the EU funding opportunities who find convenient to apply, who are able to co-finance and who are not discouraged by delays in refunding	An increase in C1 time decreases C2 applications	Potential applications flow	Interview with B. Sartore (private consultant) 17-04-2018; Jaliu and Rădulescu (2012)

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