

ECONOMIC GROWTH AND INNOVATION IN EUSALP: LOCAL SPECIFICITIES AND GROWTH ASSETS FOR THE COMPETITIVENESS OF EUSALP

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1. Introduction

1.1 Aim and philosophy

This work aims at identifying the territorial specificities of the EUSALP macro-area, determining in particular its local peculiarities with respect to Europe in terms of *territorial capital endowment* – defined as the set of local, tangible and intangible, public and private, assets that constitutes the growth potentials of an area. This conceptual approach enables to highlight the relevance of specific growth assets for the building of a possible smart specialization strategy, where *smart* is intended in both an economic and territorial sense.

The concept of territorial capital was proposed for the first time by the OECD in its 2001 Territorial Outlook and was reiterated by DG Regio of the Commission of the European Union: “Each region has a specific ‘territorial capital’ that is distinct from that of other areas and generates a higher return for specific kinds of investments than for others, since these are better suited to the area and use its assets and potential more effectively. Territorial development policies (policies with a territorial approach to development) should first and foremost help areas to develop their territorial capital” (European Commission, 2005, p. 1). More recently the territorial capital concept was launched in a scientific context, with the aim to warrant closer inspection of the economic nature of all potential sources of development linked to territory and, consequently, of the laws of accumulation and depreciation of each component, on which to build sound development policies (Camagni, 2009).

EUSALP is a large and extremely differentiated region. Since the geographical specificities of an area forcedly turn into social and economic peculiarities in terms of development patterns, it is important to avoid the direct comparison between areas located in completely different geographic environments. Thus, the identification – based on morphological characteristics – of three macro-territorial areas, homogeneous for their internal geographical characteristics and different enough to be treated as separate entities, was considered appropriate.

As a consequence, the empirical analysis is carried out on the basis of a threefold, multi-scalar, spatial breakdown:

- a. **macro-regional (aggregated) scale**, comparing the EUSALP entire macro-region with Europe¹. This level of analysis has the aim to position EUSALP with respect to the rest of Europe, highlighting socio-economic strengths and weaknesses of the macro-region;
- b. **macro-territorial scale**, geographically distinguishing an **Alpine mountainous area**, hosting mainly small and medium-size cities; a **Peri-alpine foreland** hosting also medium-large and large cities; and a **Plain area, hosting mainly large cities** and their regional urban structure. These areas are identified through the appropriate aggregation of NUTS 3 regions (for further details on the methodology, see Section 2.2). The aim of this level of analysis is to define potential cooperation fields *across* macro territorial areas among differentiated

¹ The reference area along this report will be the European Union (28 countries) plus Switzerland and Liechtenstein, since these two countries are included in EUSALP.

socio-geographical environments: what we can call “*cross-areas complementarity networks*”;

- c. **micro-territorial scale**, considering directly single NUTS 3 areas with all their specificities. The aim of this level of analysis is to achieve a more precise appreciation of local, place specific assets, and to define commonalities of challenges, potential development assets and needs, and consequent cooperation potentials *within* macro territorial areas. This is what we can call “*wide-area synergy networks*”.

Overall, the ultimate aim of this study is to provide evidence to draw policy suggestions for the implementation of the Action Plan (European Commission, 2015), in particular referring to competitiveness and sustainable development.

1.2 Content and structure

This report is the result of a work organized according to three subsequent steps. The first step refers to the conceptual identification of socio-economic indicators of local specificities, *keeping clearly separated input indicators from performance indicators*. This allows to identify the peculiar territorial capital assets characterizing the EUSALP region, and in particular those input crucial for the competitiveness of its productive system. This first phase of the work was accompanied by a methodological definition of the three macro-territorial areas identified within EUSALP (for details, see Section 2.2).

The second step is a detailed collection of raw data, in particular at the 2013 NUTS3 level, which implies an effort in terms of data harmonization for existing data at 2010 NUTS3, an update of old information, and an estimation of some figures.

The third and final step included the construction of input (assets) and output (performance) indicators at different levels of geographical disaggregation (EUSALP, macro-territorial, micro-territorial).

Reflecting the Action Plan for EUSALP², this report is structured on the basis of different thematic **policy domains**: economic growth and innovation, spatial structure, environmental quality, and social inclusion³. Given the peculiar features of the EUSALP macro-region – an area characterized by the presence of several international borders, with the relating issues – cross-border integration was also considered as a policy domain to be analyzed. For each domain, input (assets) and output (performance) indicators are identified and discussed.

According to this logic, after presenting the main characteristics of EUSALP with respect to Europe and after explaining the logic and methodology leading to the identification of the three different macro-territorial areas, the report is organized on the basis of the five thematic policy domains, that are analyzed in depth and at different levels of geographical focus. The first thematic policy domain is *economic growth and innovation*; the related indicators take the reader through the analysis of the area in terms of GDP growth, employment rate, and productivity (performance),

² We refer here to the Communication from the Commission concerning a European Union Strategy for the Alpine Region and the relative Action Plan published on 28.7.2015.

³ This is not explicitly mentioned in the EC Action Plan, but the relevance of this domain emerges from the document.

which we try to explain through different types/patterns of innovation, human capital, saving propensity, demographic structure, sectoral and functional specialization, agglomeration economies (territorial assets). From here the focus moves to the second thematic policy domain under analysis: *cross-border integration*; this is analyzed taking economic losses (negative performance) into account and relating these to different types of barriers, i.e. linguistic socio-cultural and legal (negative assets). The third thematic policy domain to be explored is *spatial structure*: accessibility potential and tourism (performance) are investigated looking at settlement structure and land use (territorial assets). *Environmental quality* is also of great importance and is indeed the fourth thematic policy domain to be investigated: congestion and pollution are the main elements considered. Finally, the last thematic policy domain is *social inclusion*, in terms of social distress (negative performance), that is analyzed through cohesion, ecological consciousness, historical and cultural values (territorial assets). Table 1 summarizes the performance and territorial assets indicators analyzed by policy domains.

Table 1. Performance and territorial assets indicators by policy domains

Types of indicators	Performance indicators	Territorial assets
Policy domains		
Economic growth and innovation	GDP level and growth	Patterns of innovation
	Employment rate	Patenting activity
	Productivity	Market innovation
		Human capital
		Saving propensity
		Demographic structure
		Sectoral and functional specialization
		Agglomeration economies
Cross-border integration	GDP loss due to legal and administrative barriers	Legal and administrative barriers
		Linguistic barriers
		Social barriers
		Cultural barriers
Spatial structure	Tourism	Settlement structure
	Accessibility (rail, road, multimodal)	Land use
Environmental quality	Congestion	Settlement structure
	Pollution	Land use
Social inclusion	Unemployment rate	Cohesion
	Crime	Ecological consciousness
		Historical values
		Cultural values

2. EUSALP and its macro-territorial areas

2.1 EUSALP vs. Europe: structural characteristics



EUSALP is a rich and dynamic region, encompassing 77,211 million inhabitants: although it represents only 15% of the population of the reference area (EU28 plus Switzerland and Liechtenstein, now on generally called “Europe”), its share of GDP is around 23% (Figures 1a and 1b). Figure 2 shows the time trend of GDP with respect to Europe, presenting a peak in 2007 (24.4%).

Figure 1a. EUSALP – share of GDP in 2013



Data source: Eurostat

As will be shown in greater detail later on in this report, EUSALP is also particularly innovative, in all forms of innovation, from science-based innovation and new knowledge creation, to process and commercial innovation. It is also characterized by an especially well performing employment rate, even in the period of crisis.

Although relatively old in terms of median age of population, EUSALP remains an attractive region, this is witnessed by a constantly higher population growth rate with respect to Europe.



In addition, given its peculiar geographical position, and the related abundance of international borders within the area, EUSALP is more subject to cross-border integration problems with respect to the rest of Europe

Figure 2. Total European real GDP (mln 2010 euros) and EUSALP share



Data source: Eurostat

2.2 Macro-territorial areas

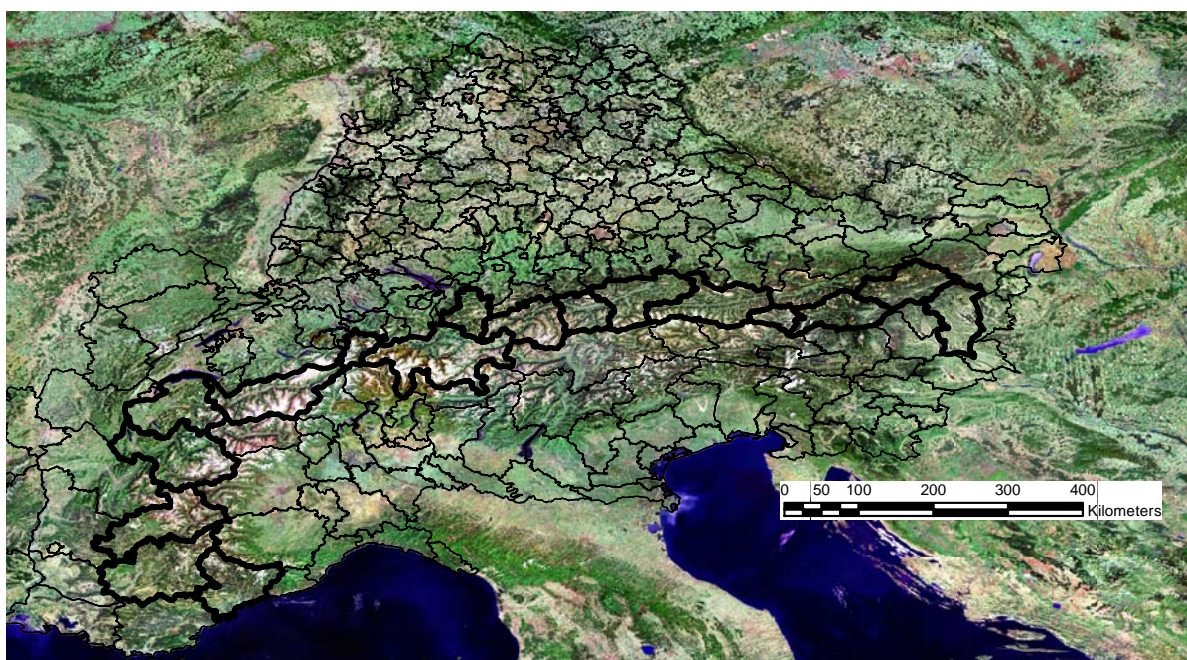


EUSALP is a very large and diversified region. Thus, in order to avoid the direct comparison between areas located in completely different socio-geographic environments, three macro-territorial areas were identified – relatively homogeneous in terms of their internal geographical characteristics and land use and different enough to be treated as separate entities. Two main criteria of a geomorphological nature were utilized: elevation and share of non-usable land.⁴ Working at the NUTS 3 level, the three macro-territorial areas were devised on the basis of their elevation weighted by the share of non-usable land: Plain, Peri-alpine, and Alpine areas. The identification of the Alpine area called for a third criterium, in order to guarantee mountain and green areas to be close to the Alpine chain: this criterium was identified in a maximum distance of 200 kilometers from NUTS3 regions with outermost highest peaks of the Alps, represented in Map 1.⁵ Map 2 provides the results of the three criteria. The thresholds chosen in each indicator to build the map are those providing the maximum possible geographical contiguity of NUTS3 regions in the macro-areas. The relative importance of the three macro areas in terms of GDP is respectively 45% for Plain, 34% for Peri-alpine and 21% for the Alpine area, and 50%, 32% and 18% respectively in terms of population.

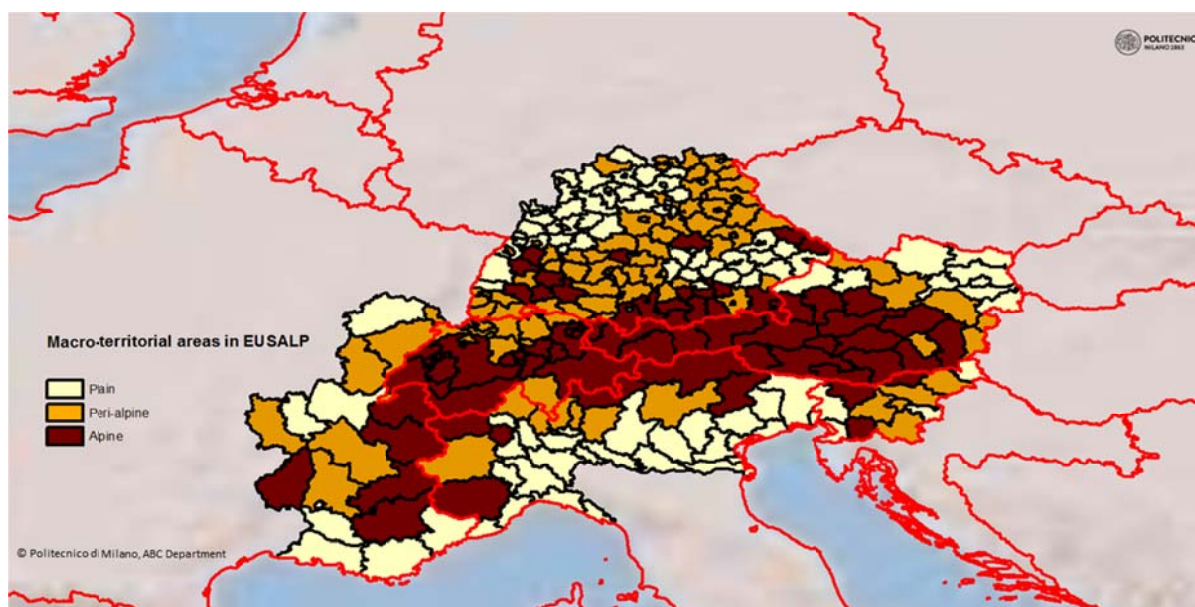
⁴ The share of non-usable land was computed considering the Swiss statistical office for Swiss cantons and ESPON re-elaboration of Corine Land Cover data for the rest of NUTS 3. Non-usable land was considered as the sum of the following categories: green areas, rocks, wetlands, and land covered in water. For further information on Corine Land Cover and its nomenclature, the reader can refer to: <https://www.eea.europa.eu/publications/COR0-landcover>, while for the Swiss data to: <http://www.landuse-stat.admin.ch>.

⁵ Three German NUTS3 regions at the Northern border with Czech Republic – located at the cross yard of two mountain chains, the Ore Mountains and the Thuringian Forest – are assigned to the Peri-Alpine macro-territorial area on the basis of this criterium.

Map 1. NUTS3 regions with the outermost highest peaks



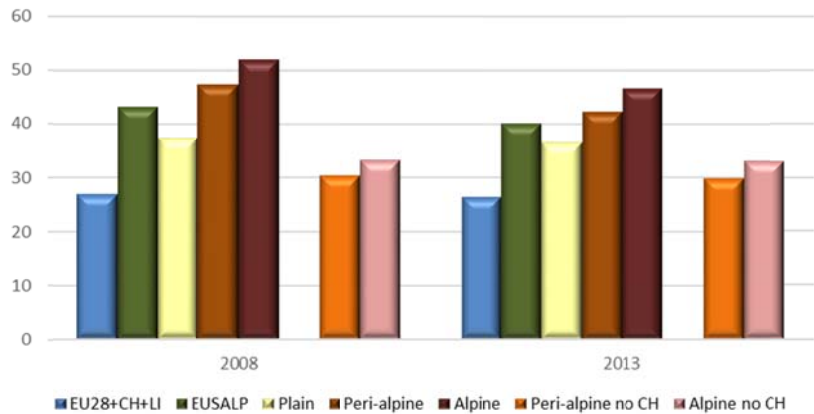
Map 2. The three macro-territorial areas of EUSALP





As already pointed out, EUSALP is a rich region. Figure 3 shows the level of **real per capita GDP** in 2008 and 2013.⁶ As can be clearly seen, EUSALP is richer than Europe in all its macro-territorial areas. The values of both the Peri-Alpine and the Alpine macro-areas, however, are severely biased by the presence of Swiss cantons⁷, as one can envisage by the two bars reporting their values excluding Swiss cantons. Such values are lower than the one of the Plain, showing a clearly identifiable “Switzerland effect”, but still higher than the European average. Within the three macro-areas, inequality in wealth is extremely reduced, confirming the appropriateness of the proposed spatial breakdown.

Figure 3. Real per capita GDP (thousand 2010 euros), 2008 and 2013



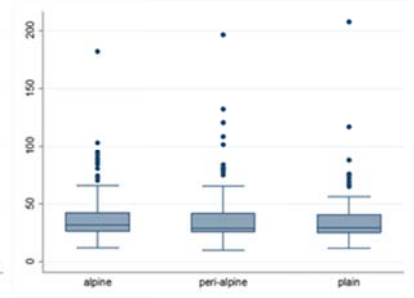
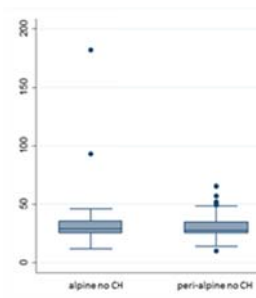
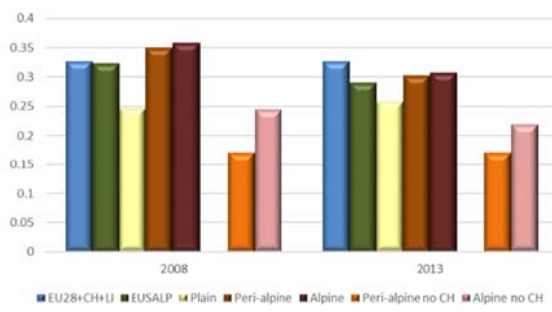
Data source: Eurostat and Swiss Statistical Office



The **spatial distribution of the EUSALP wealth is not even**. Figures 4a and 4b report the spatial inequalities (Gini coefficient) in GDP per capita for the different areas and the distribution of the observations in 2013, respectively. Overall, inequality was similar in EUSALP in 2008 with respect to Europe, but decreased during the period, although we can notice again the relevant (biasing) role played by Switzerland. In fact, the most unequal macro-areas are the Peri-alpine and the Alpine areas (Figure 4b); once the Swiss cantons are excluded, the Alpine area shows the same (low) inequality of the Plain, while in the Peri-alpine the inequality is even more contained. Some peculiar situations (outliers) of high inequality are present in all three areas.

⁶ Population and GDP data for Swiss cantons are retrieved from the Swiss Statistical Office, available only from 2008 onward.

⁷ Only one Swiss canton falls in the Plain macro-area, namely Basel.



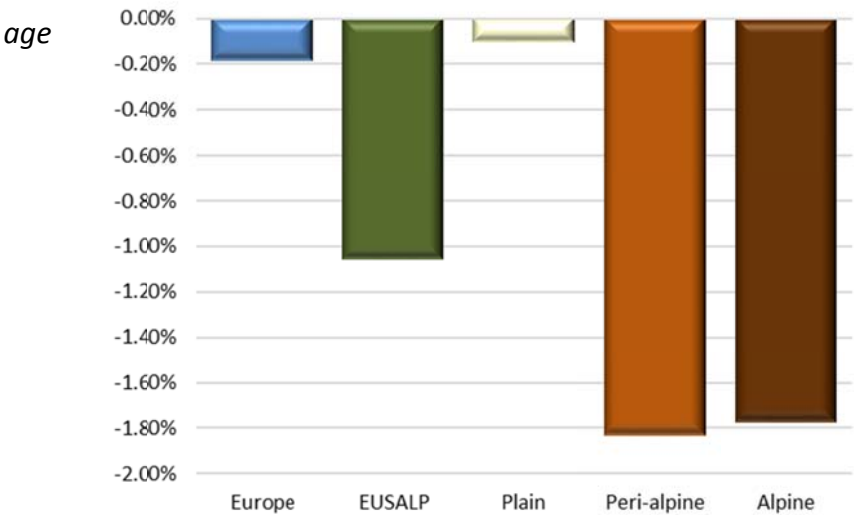
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3. Thematic policy domain 1: economic growth and innovation

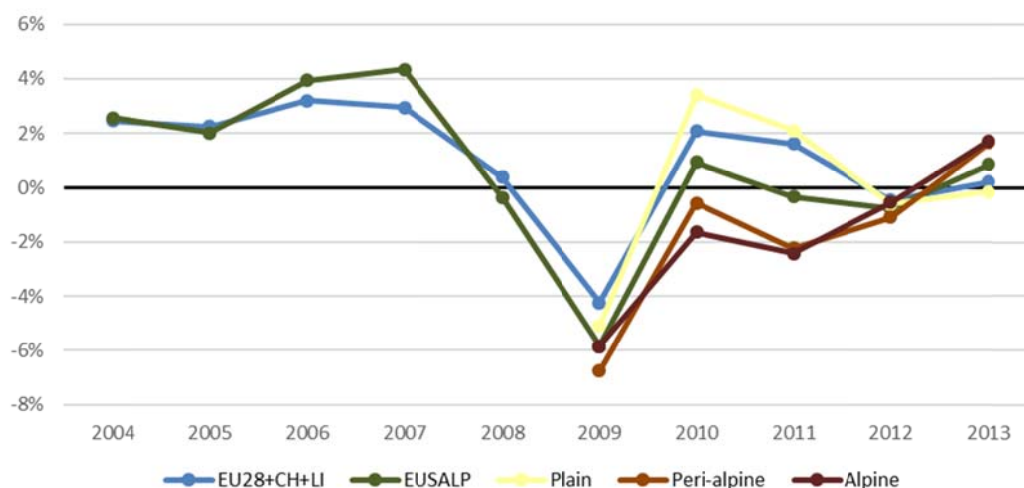
3.1 Performance indicators: GDP trend, employment dynamics, and productivity



Our analysis starts from this first policy domain by looking at performance indicators in terms of **GDP growth**, employment dynamics, and productivity. Although better performing than the reference area in terms of level of per capita GDP (Figure 3, Section 2.2), EUSALP growth experienced a more significant loss with respect to Europe during the crisis, especially in its Peri-alpine and Alpine macro-territorial areas (Figure 5a).



In addition, the analysis of the three macro-territorial areas allows to highlight a peculiar trend of the Alpine and Peri-alpine regions, suffering more during the crisis but recovering strongly in 2013 (Figure 5b). In order to interpret this result, the exchange rates of the Swiss franc with respect to the euro should be considered (Table 2). While between 2009 and 2012 the re-evaluation of the Swiss franc can partially explain the difficulty of the Alpine area in terms of exports and tourism trends (Figure 6), in 2013 the recovery in this area is a real one.

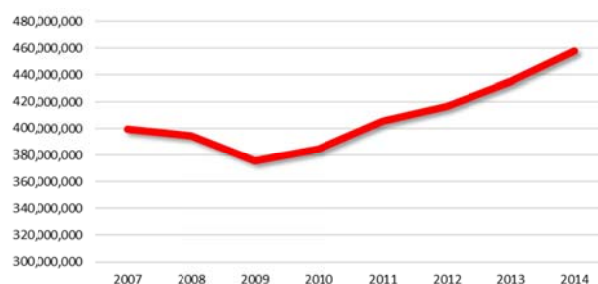


Data source: Eurostat

Table 2. Annual average exchange rate.

	2009	2010	2011	2012	2013
Euro	1	1	1	1	1
Swiss franc	1.51002	1.38034	1.23261	1.20528	1.23106

Source: Ufficio Italiano Cambi (UIC) Banca d'Italia



Data source: World Tourism Organization

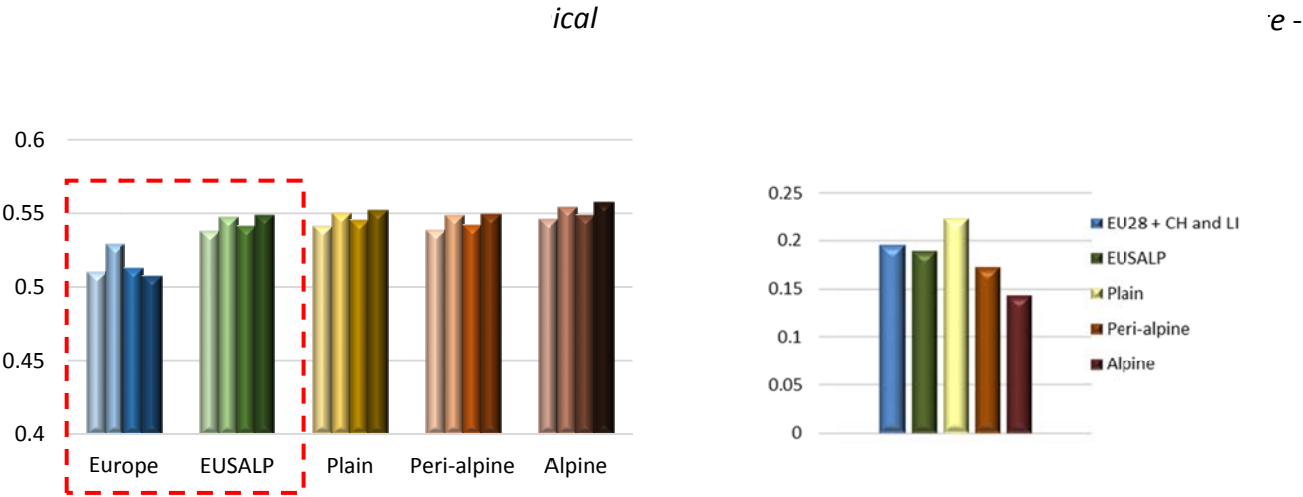


Employment rates (employment over population > 15 years) in EUSALP are always significantly higher than in the rest of Europe (Figure 7) mainly thanks to the high rates especially of Alpine area. While in Europe the employment distress during the economic crisis can be clearly highlighted, EUSALP suffers in the first period of the

crisis (2007-2010), but recovers effectively between 2010 and 2013, and all its three macro-territorial areas do (Figure 7).⁸



Within EUSALP there are different levels of spatial inequalities in employment rate, with a clear ranking, showing the highest inequality in the Plain, even higher than in Europe, followed by Peri-Alpine and Alpine (Figure 8).



Data source: Eurostat. Employment rate is computed as employed persons over population older than 15 years.

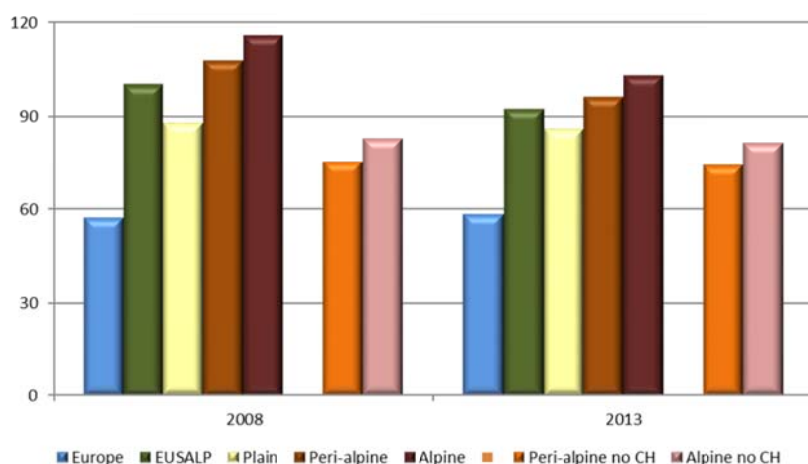


In terms of **productivity (measured as GDP per worker)**, EUSALP performs again much better than the reference area, being its level of productivity 70% higher in 2008 and almost 60% higher in 2013 (Figure 9). This is the case for all the macro-territorial areas, particularly for the Alpine, followed by the Peri-Alpine. However, this result is again driven by Switzerland but, if this effect is taken away, both EUSALP and the single macro-territorial areas show higher productivities to respect to Europe. Between 2008 and 2013 productivity decreases in EUSALP while it remains stable in Europe (Figure 9). This result is due to a double effect: a decrease in GDP and an increase in employment, the last one being the outcome of a policy of employment protection during the crisis (a model especially developed in Germany).⁹



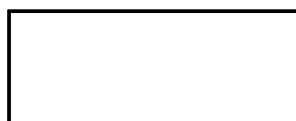
⁸ Results on employment data are consistent with the COWI results on the composite employment indicator. Also in our case, the nine COWI regions with a lower than average employment indicator, namely France-Comté, Province-Alpes-Cote d’Azur, Piemonte, Valle d’Aosta, Liguria, Veneto and Lombardia, register a lower than EU average employment rate. The same holds for unemployment rate, which results in these regions as being higher than EU average.

⁹ Growth rates of employment during the crisis 2008-2013 are in the following numbers: Europe – 0.55%; EUSALP +0.4%; Plain +0.32%; Peri-Alpine +0.41%; Alpine +0.58%.



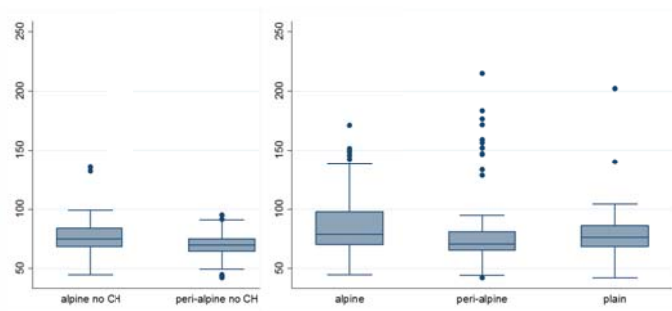
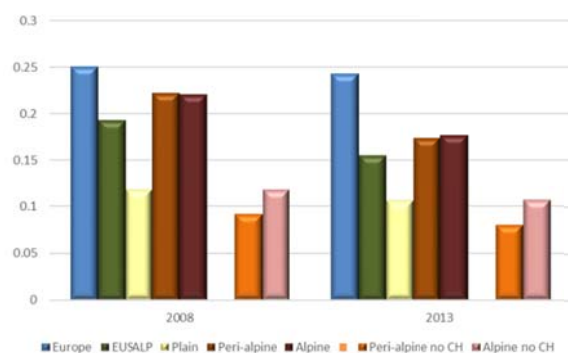
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Data source: Eurostat



In terms of **disparities in productivity levels**, EUSALP is significantly more homogeneous than the reference area, but it is extremely diversified if the three macro-territorial areas are considered. In particular, the Alpine and the Peri-Alpine areas come out to be much more heterogeneous than the Plain as for the distribution of GDP per worker unless Swiss cantons are not considered. Figures 10a and 10b also show the spatial inequality in productivity levels over time in all three macro-territorial areas. Although inequality decreases within EUSALP, once more, if the Swiss cantons are excluded, the Alpine area shows the same inequality than the Plain, while in the Peri-alpine the inequality is even more limited.

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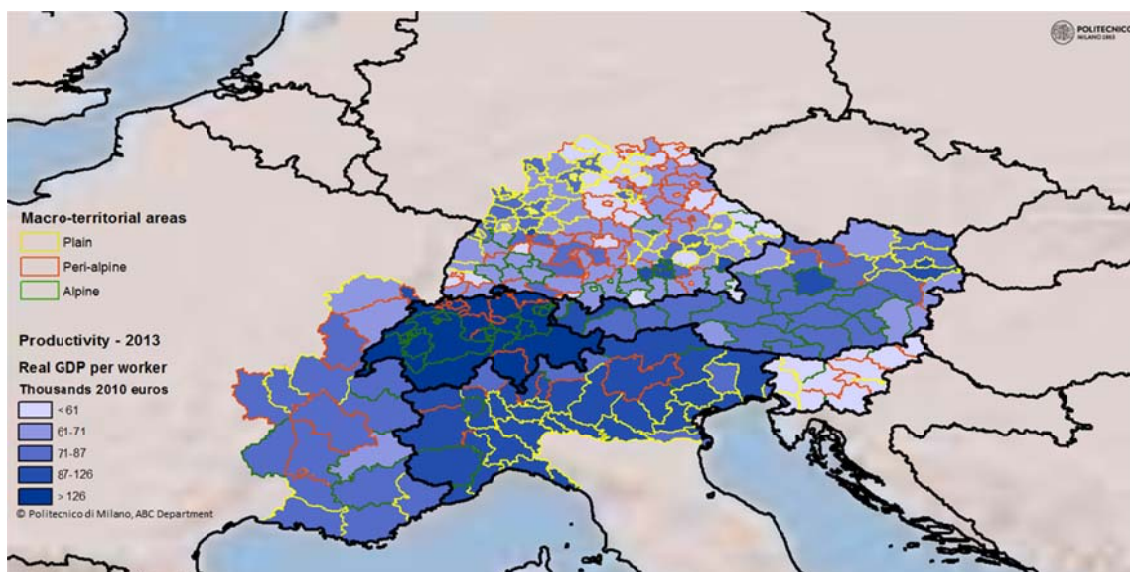
Data source: Eurostat



In order to have a clearer picture of the situation, it is particularly important to take the micro-territorial level into account; therefore, the analysis is further focused at the NUTS 3 level (Map 3). It immediately comes out how Switzerland is absolutely the best performer in terms of GDP per worker. Northern Italian areas also perform relatively well, followed by French areas, while Slovenian areas show a lower productivity level. German areas look very differentiated in this respect, and in general with lower performance due to the general philosophy of prioritizing employment levels with respect to productivity during the crisis.

Starting from this overall picture, a question arises, namely what are the possible sources of the (different) levels of productivity observed? In order to try to answer this question, the next sections investigate territorial capital endowment: innovation, human capital, saving propensity, demographic structure, sectoral and functional specialization and agglomeration economies.

Map 3. Productivity (GDP per worker) in 2013



3.2 Innovation activity

EUSALP shows very relevant differences with respect to the rest of Europe in terms of innovation modes. This can be identified by applying the innovation pattern typology built by this research group within an ESPON project.¹⁰ **Innovation patterns** were defined considering the structural and territorial characteristics associated

¹⁰ Capello and Lenzi, 2013; ESPON KIT (Knowledge, Innovation, Territory), 2012-2013

http://www.espon.eu/main/Menu_Projects/Menu_ESPON2013Projects/Menu_AppliedResearch/kit.html.

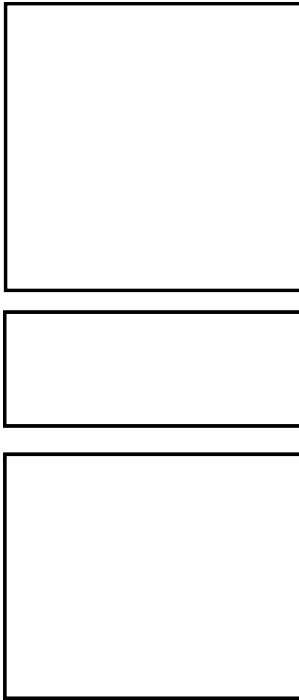
with the knowledge creation and product and process innovation activities of European regions. Innovation patterns represent alternative ways of generating innovation (from science-based to imitative innovation) developed in different areas thanks to specific context conditions. In particular, five innovation patterns have been highlighted: 1) an imitative innovation pattern, where innovation is primarily based on imitation processes; 2) a smart creative diversification one, where knowledge is primarily sourced outside the area but applied to local innovation needs through informal knowledge transmission channels; 3) a smart technological application one, where knowledge is primarily sourced outside the area but applied to local innovation needs through formal knowledge transmission channels; 4) an applied science pattern, where knowledge is primarily created by local firms, universities and research centers in applied scientific fields; and 5) a science-based pattern, where knowledge is primarily created by local firms, universities and research centers in science-based fields and general purpose technologies.



Figure 11 shows that EUSALP presents an innovation model mostly based on science, both general purpose and applied; and on smart technological application (the last three patterns, the most desirable and appropriate for an advanced area representing 85% of its territories). The rest of Europe shows a high share of regions in the smart creative diversification pattern, followed by the smart technological application one, where creativity in adopting product and process innovation merges with external knowledge. The strong innovative capacity of EUSALP is also witnessed by the lack of regions belonging to the imitative innovation pattern.



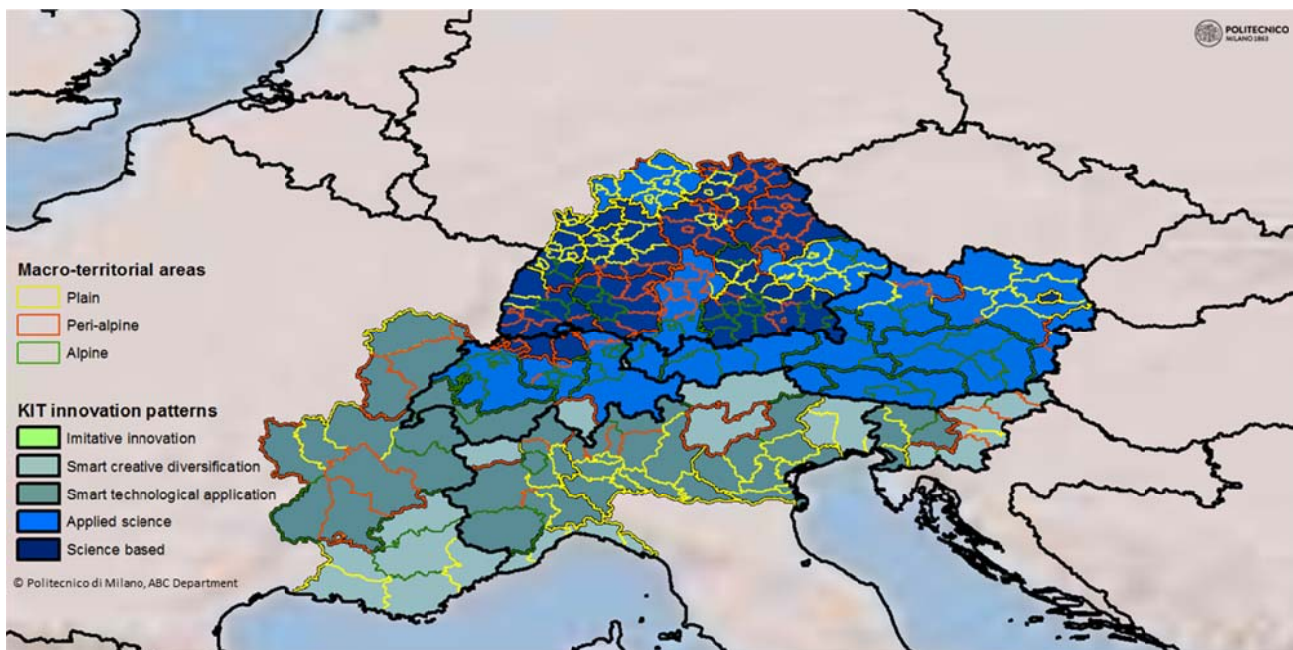
Data source: ESPON KIT (Knowledge, Innovation, Territory); Capello and Lenzi, 2013.



The distribution of the different innovation patterns within EUSALP is shown in Map 4.¹¹ Patterns seem to be highly dependent on countries, with German areas being mainly characterized by a science-based type of innovative behavior (5); Austrian and Swiss areas mainly by an applied science one (4) and French, Italian, and Slovenian areas mainly by smart technological application (3) and also creative diversification (2). At the macro-territorial level, some major trends emerge, namely: Plain shows a clear North-South divide, with the Southern part more characterized by a smart

technological application pattern (3) and the Northern part by a science-based and applied innovation pattern (4 and 5). The Alpine area seems to be an applied knowledge creative area; in the Peri-Alpine the two patterns based on knowledge created outside the area prevail in the South (2 and 3), while the North looks rather as a knowledge creation area (4 and 5).

Map 4. Innovation patterns (ESPON KIT categories)

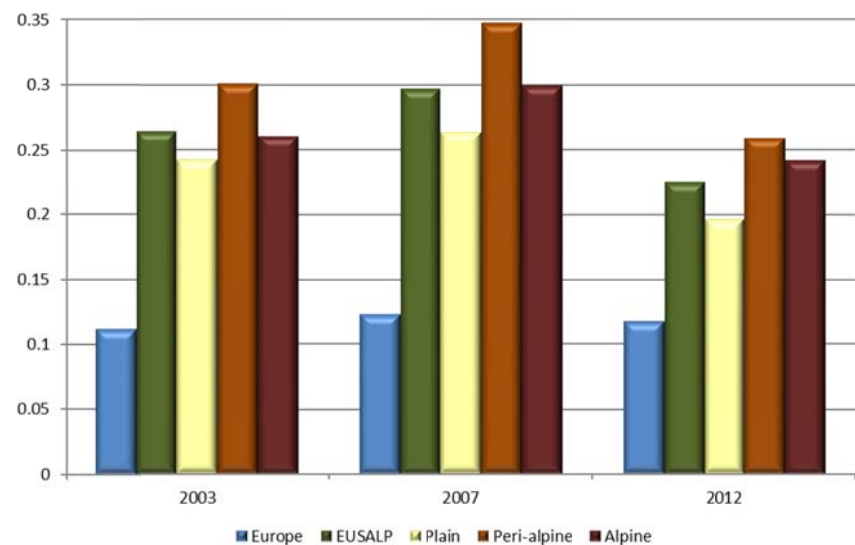


¹¹ Original data on patterns were produced at NUTS2 level, therefore some NUTS3 belonging to different macro-areas share the same overall pattern.

In addition, two indicators have been built, which in principle capture the different phases of the innovation process: knowledge creation through patenting, strictly related to R&D activities, and an indicator linked to market innovation, namely trademarks registration.

Concerning **patenting activity**, EUSALP is extremely advanced compared to the rest of Europe (Figure 12), patenting 2.36 times more in 2003, 2.44 times more in 2007, and almost 2 times more in 2012 in per capita terms. This last figure shows that EUSALP maintains the leadership in patenting also during the crisis, in spite of a generalized decrease of patenting activity. The striking fact concerns the strengths and resilience of all macro-areas, and particularly of the Peri-alpine one. The Alpine area shows a relatively good performance in knowledge creation, while Plain is the weakest within EUSALP in terms of patents per thousand residents, still doubling the average European index. Moreover, the disparity in patenting activity within the single macro-territorial areas is limited, showing very homogeneous internal behavior (Figures 13a and 13b).

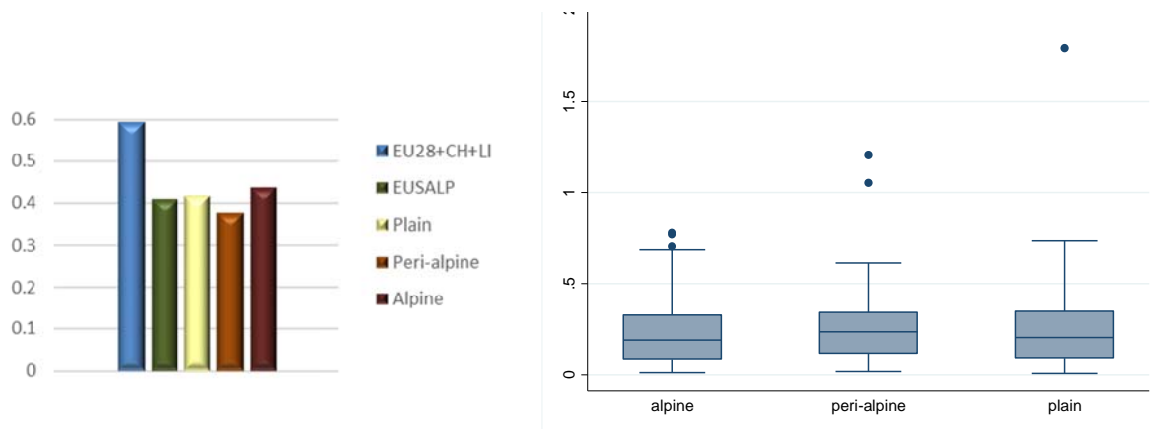
Overall, the good patenting activity could be one of the sources of greater EUSALP productivity with respect to the rest of Europe. Analyzing the situation in detail, however, we can see that this could be the case for the **level** of productivity, higher than the European one, but not for the **growth** of productivity, which was decreasing in EUSALP between 2008 and 2013 (Figure 9 above).



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Data source: Eurostat

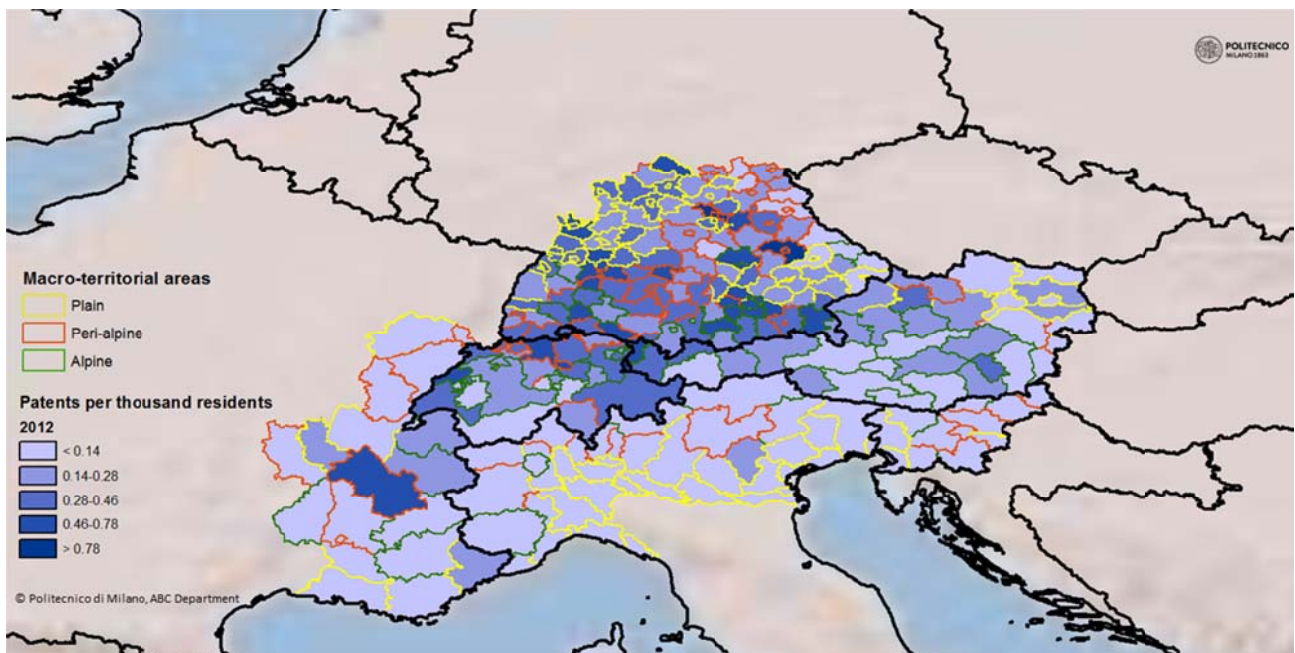
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Data source: Eurostat

The situation can be analyzed in greater territorial depth. This is done through looking at the NUTS3 level and the result is shown in Map 5. In terms of patenting activity, Germany performs overall particularly well, especially the Erlangen area in Bavaria, followed by Munich, Nuremberg and Stuttgart. Other “champions” are Neuchâtel and Basel in Switzerland, Liechtenstein, and Isère, with Grenoble, in France. Austrian and especially Italian and Slovenian areas, instead, perform relatively poorly as far as this indicator is concerned.

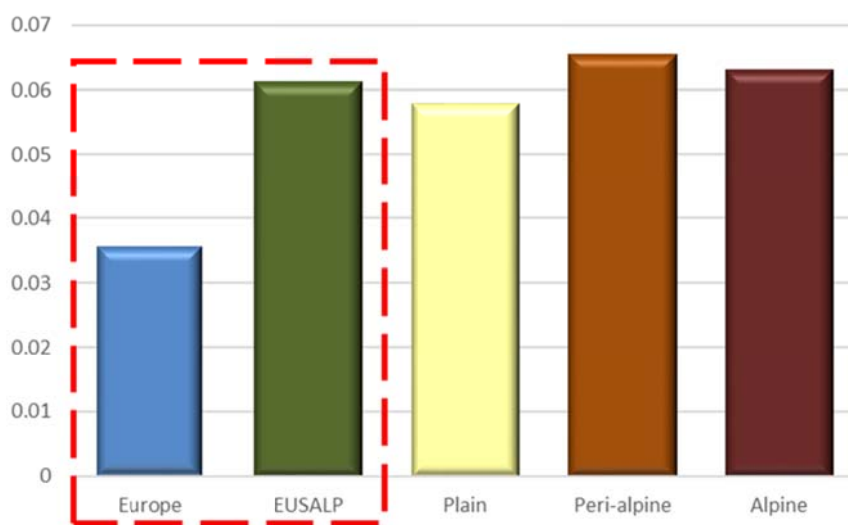
Map 5. Patents per thousand residents in 2012



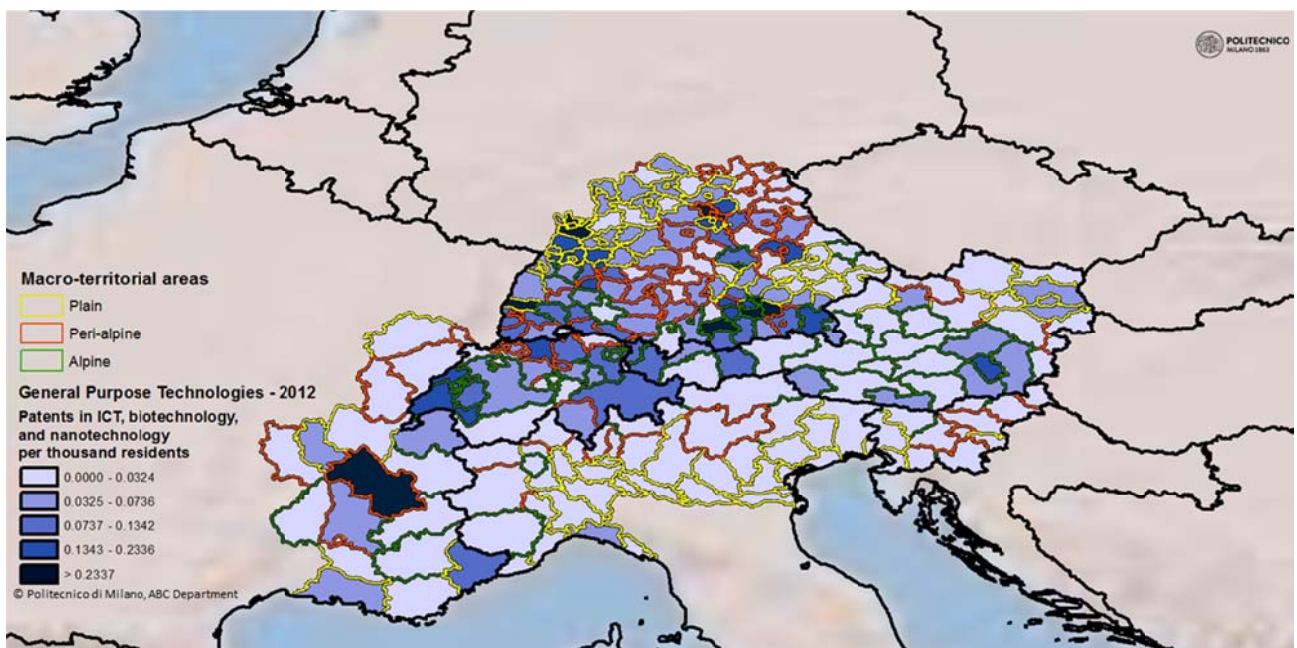


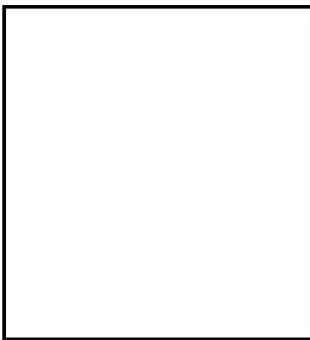
The outstanding performance in patenting activity in EUSALP is confirmed also when a focus on **General Purpose Technologies (GPT)**, namely biotechnology, nanotechnology and ICTs, is analyzed (Figure 14), where the prominence of the Peri-Alpine area emerges with respect to the other two areas.

The spatial concentration of GPT research centers is shown in Map 6, where Grenoble in France; Heidelberg, Freiburg, Nuremberg, and Munich in Germany; Geneva and Lausanne in Switzerland; and Graz in Austria show a strong specialization in GPT patenting activity.



Map 6. General Purpose Technologies (GPT) – 2012

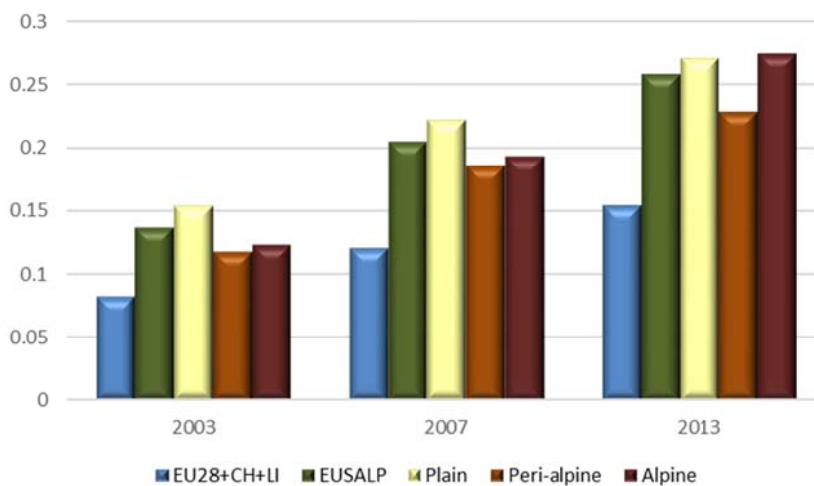




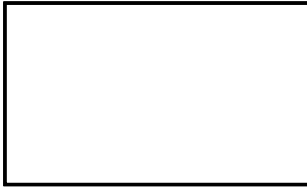
The second indicator, of market innovation, is represented by **trademarks**. Also in this form of innovation, EUSALP outperforms the rest of Europe. EUSALP innovates through trademarks almost 70% more than Europe in 2003, 2007 and 2013 (Figure 15). This particular kind of innovative capacity increases also during the economic crisis, as is also pointed out in scientific studies (Stoneman 2016)¹². Trademarks look, indeed, as counter-cyclical and can be exploited as a strategy to cope with the crisis since they do not usually involve significant investments, and give a quick return in terms of visibility on the market.

Plain registers a relatively better trademarking performance with respect to the Peri-alpine and Alpine areas in 2003 and 2007 while, interestingly enough, the Alpine region outperforms the other two areas in the most recent year (2013) (Figure 15).

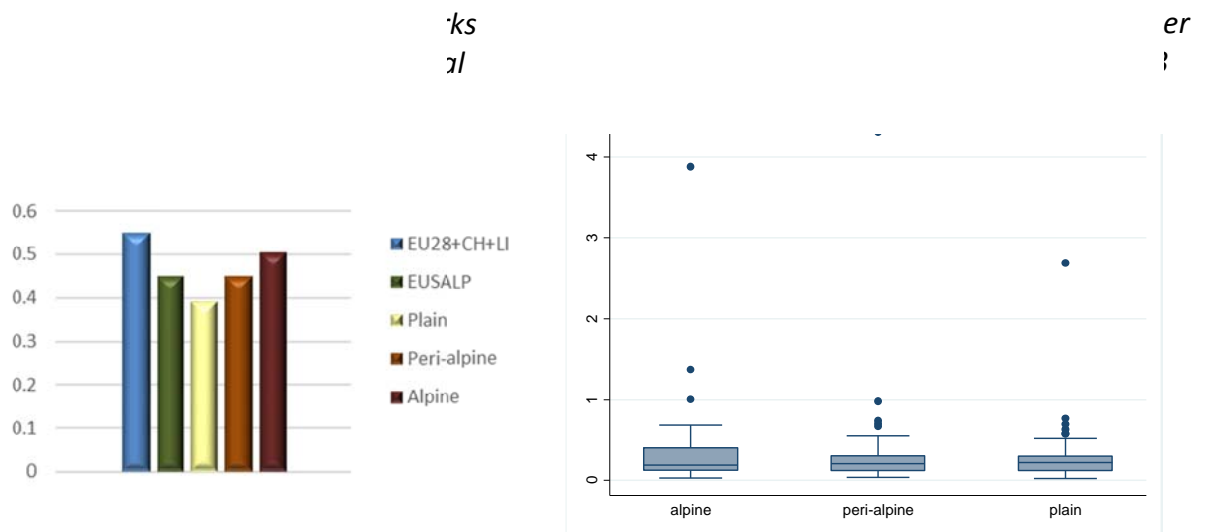
If one compares productivity levels (Figure 9) with the patenting and trademarking activities performance (Figures 14 and 15) overall one finds a good explanation of the links between competitiveness and innovation, and the striking similar performance of the three macro-territorial areas. On the other hand, a huge differentiation exists among the single NUTS3 regions inside each macro-area, and the relative weakness of most Italian regions in R&D.



¹² According to the author, one might argue that “soft innovation” has been growing faster than functional innovation.



The spatial distribution of trademarking activity is more homogeneous within EUSALP than in the rest of Europe (Figures 16a and 16b). Among the three macro-territorial areas the greater disparity is in the Alpine region: this means that market innovation is more spatially concentrated within the Alpine area, while it is much more spatially diffused in the Plain.

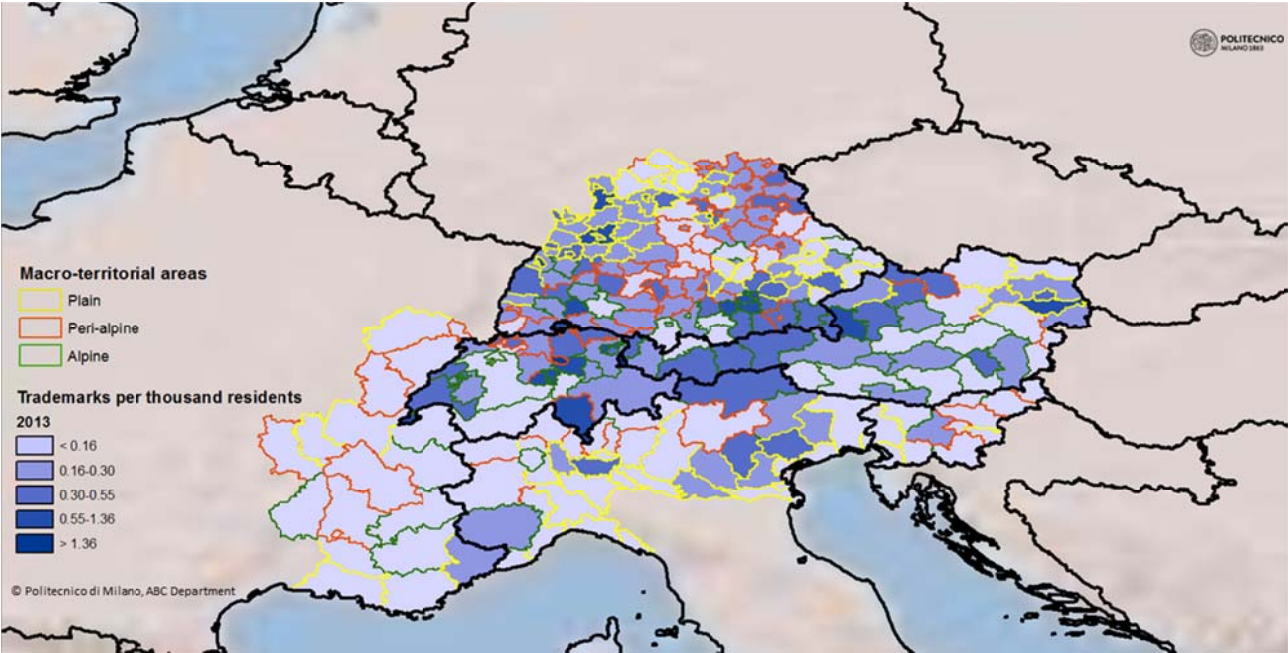


Data source: Eurostat

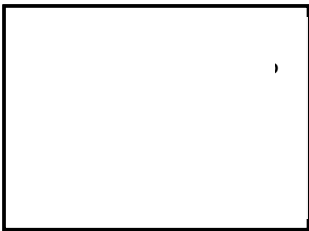


Also for market innovation a micro-territorial focus looks appropriate (Map 7). The situation looks much more scattered with respect to patenting activity, the only exception being some peculiar “champions” (Zug and Basel in Switzerland and Liechtenstein). As for this particular innovation mode, overall French areas seem to perform relatively poorly.

Map 7. Trademarks per thousand residents in 2013

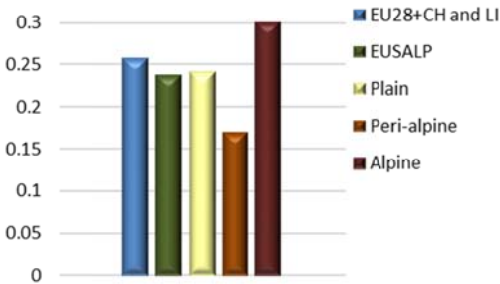
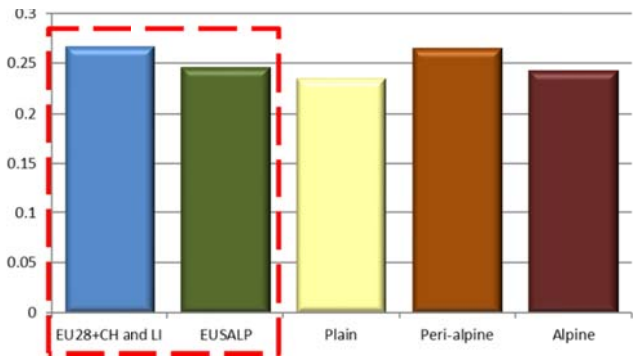


3.3 Human capital



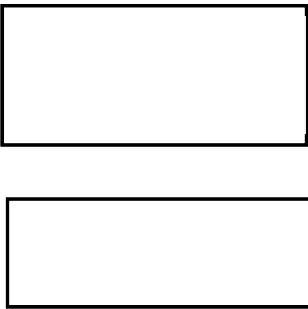
As for the level of education, the **share of tertiary graduated people** in EUSALP is slightly lower with respect to the rest of Europe (Figure 17). Although for this indicator the internal disparity within EUSALP is limited compared to the reference area, the Alpine macro-territorial area shows a highly spatially unequal distribution (Figure 18). Thus, the outstanding productivity and innovative capacity noted above are not reflected in a particularly high rate of educated human capital.

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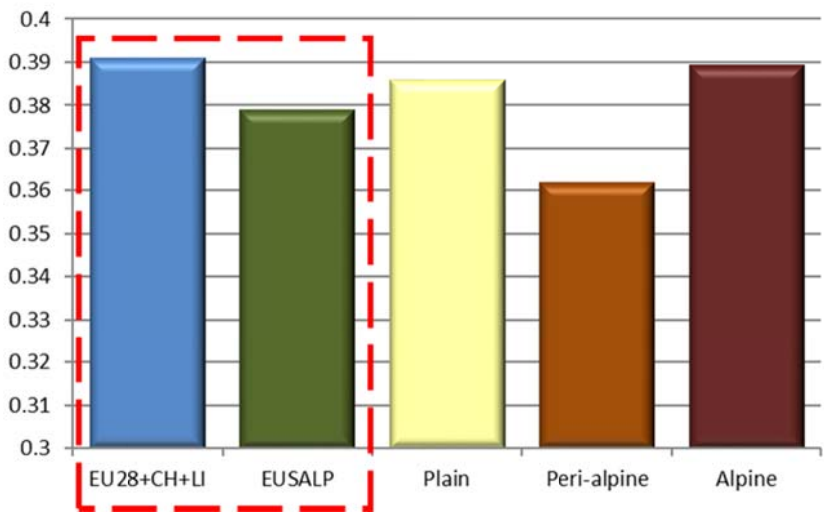


Data source: Eurostat

3.4 Saving propensity

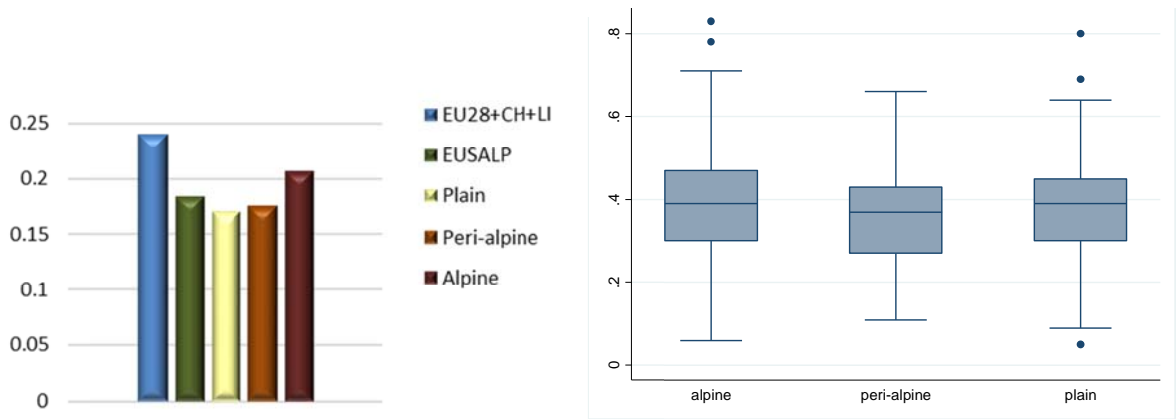


The propensity to save money is relatively less pronounced in EUSALP with respect to the rest of Europe, even if the difference is limited. In the reference area, indeed, 39% of respondents think that teaching thrift to children is important, while slightly less than 38% answer in the same way in EUSALP (Figure 19). Within the macro-territorial areas, saving propensity is lower in the Peri-alpine (36%), while it is similar in the other two sub-regions. Figures 20a and 20b show a lower spatial inequality in EUSALP with respect to Europe.



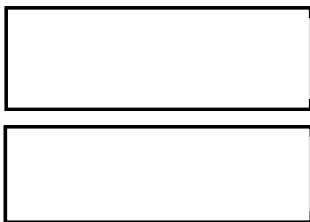
Data source: European Value Survey, 2009. % of respondents stating thrift is important to be taught

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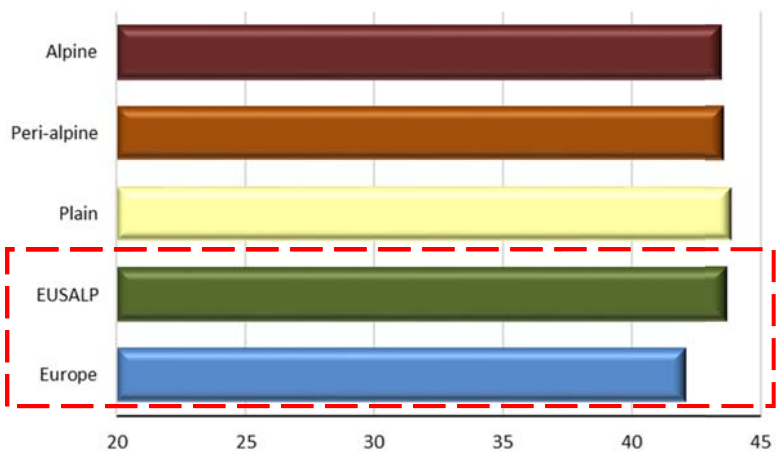


Data source: European Value Survey, 2009. Share of respondents stating thrift is important to be taught.

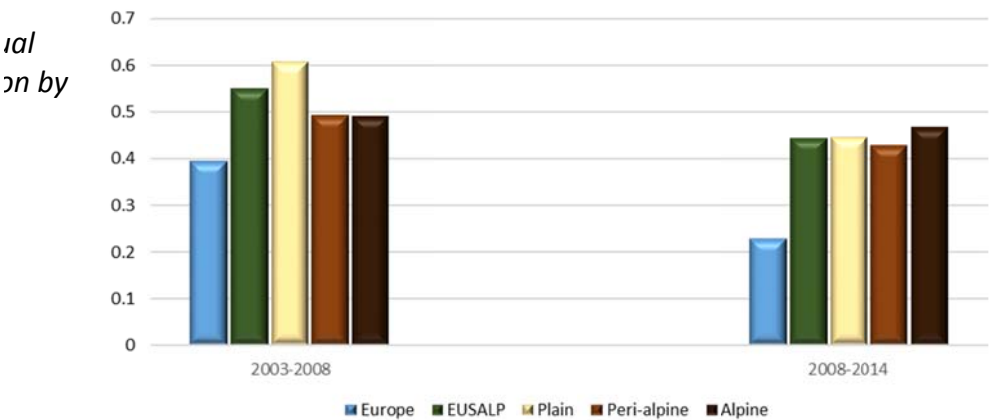
3.5 Demographic structure



EUSALP has a relatively old population with respect to Europe, being the median age 43.7 years and 42.1 in the reference area (Figure 21). In particular, the Plain macro-territorial area is the oldest, with a median age equal to 43.9 years. Nevertheless, the EUSALP area is relatively attractive, and this holds for all three macro-areas, with a remarkable relative performance before and after the crisis (Figure 22). The difference between the two periods refers to a reduction of growth rates in all macro-territorial areas, particularly in the Plain that was leading in the first period.



Data source: Eurostat.

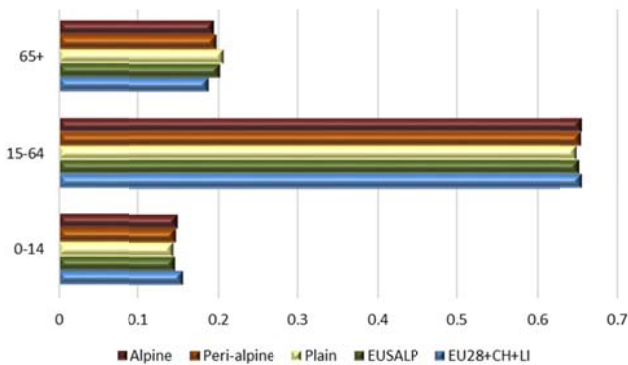


Data source: Eurostat.



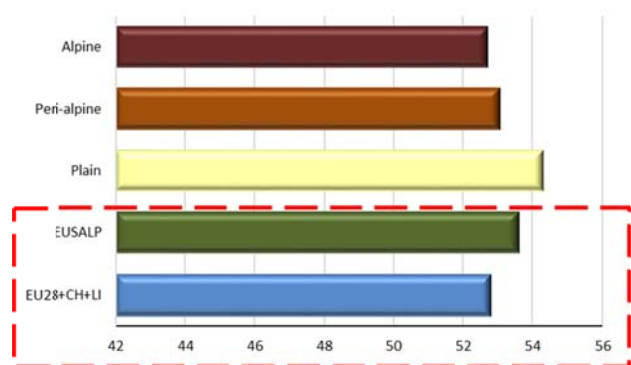
Figures 23 and 24 show the age structure and the consequent age dependency ratio (population aged 0-14 and more than 65 over population aged 15-64), used to measure the pressure on productive population. They confirm the point, given by the lower presence of young and the higher presence of old people in EUSALP. Within the macro-region, the pressure on productive population is similar in the Alpine and in the Peri-alpine, while the Plain, encompassing large cities, registers a higher dependency ratio (Figure 24). The Alpine macro-territorial area is, indeed, characterized by a higher share of active population aged 15-64 years.

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Data source: Eurostat.

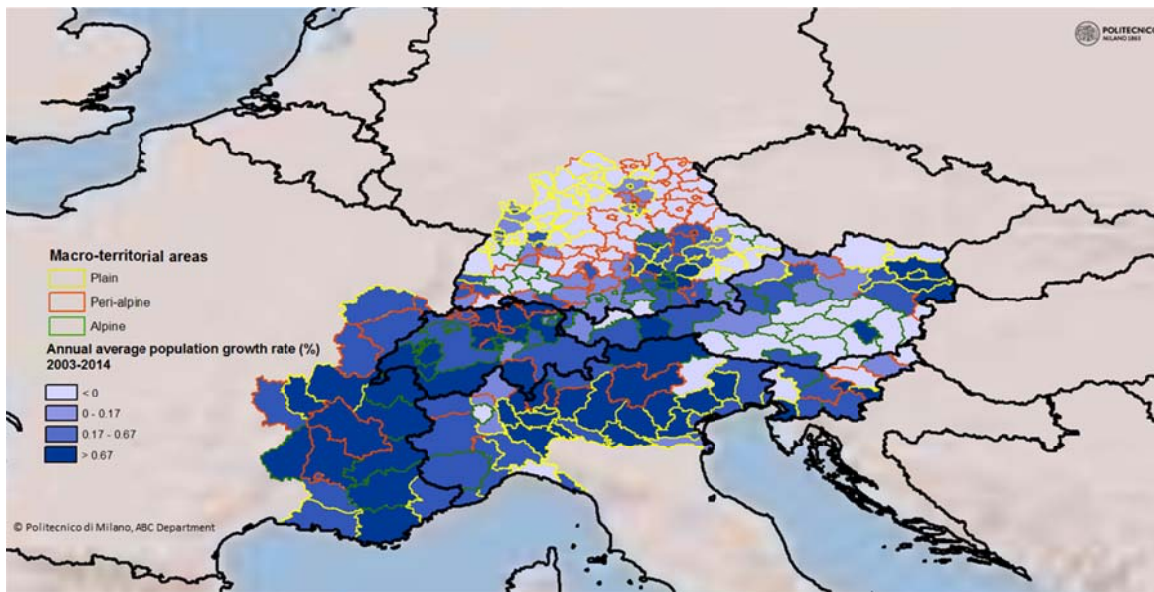
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Data source: Eurostat.

Despite the overall attractiveness of the region, some areas suffer from negative population growth. In the period 2003-2014, some depopulation is registered in many small German areas in the Peri-alpine and in the Plain, as well as in many Austrian Alpine NUTS3 (Map 8).

Map 8. Population average annual growth rate 2003-2011



3.6 Sectoral and functional specialization



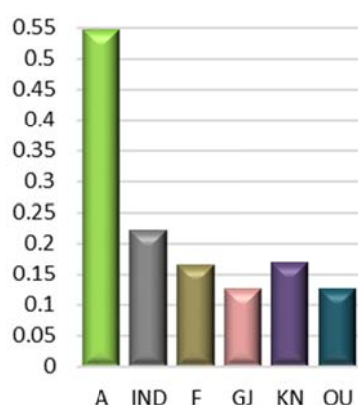
Overall, EUSALP is not specialized in agriculture (Figure 25), having a share of employment in agriculture that is just slightly more than half with respect to Europe. On the other hand, EUSALP shows a clear specialization in industry with respect to Europe, and this specialization is almost homogeneously present in the three macro areas (Figure 26).

Within EUSALP the picture of sectoral specialization is only slightly differentiated with respect to the average (Figure 26). The Alpine area is highly specialised in agriculture, but also in tourism (construction and retail, transport, accommodation) and slightly less specialized in industry and finance. Moreover, the agricultural specialization in the Alpine macro-area is clearly spatially concentrated, while touristic activities are homogeneously distributed (Figure 27).



Data source: Eurostat and Swiss Federal Statistical Office.

Figure 27. Spatial inequality of sectoral employment shares in the Alpine area



A: Agriculture, fishing, and hunting
 IND: Industry (except construction)
 F: Construction
 G-J: Wholesale and retail trade, transport, accommodation and food service
 K-N: Financial & insurance; real estate; professional, scientific and technical activities; administrative and support service
 O-U: PA, defence, education, human health and social work; arts, entertainment and recreation; other service; activities of households; extra-territorial organizations

Data source: Eurostat and Swiss Federal Statistical Office.

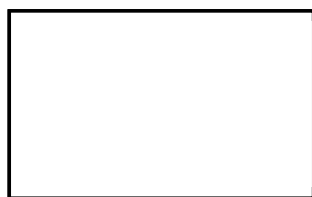
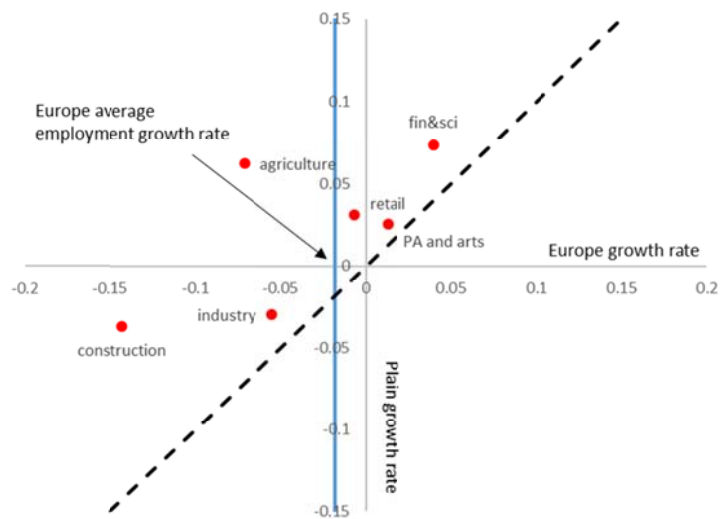


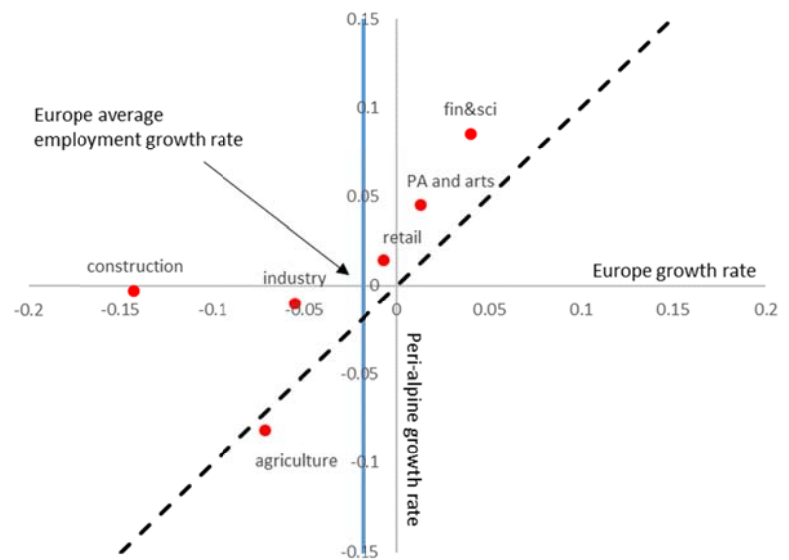
Figure 26 shows instead that the Peri-alpine area registers a slight specialization in industry, finance and science, while the Plain in finance and science.

Figures 28a, 28b, and 28c report an analysis of the dynamics of single sectors in the three macro-territorial areas with respect to Europe, based on employment indicators. For the way they are constructed, the charts allow to separate out two distinct reasons for growth in a sub-area: i) a growth due to the competitiveness of its sectors (*a supply, competitive effect*), and ii) a growth due to a specialization in those sectors that register a higher demand at the world level (*a demand, mix, or composition effect*).

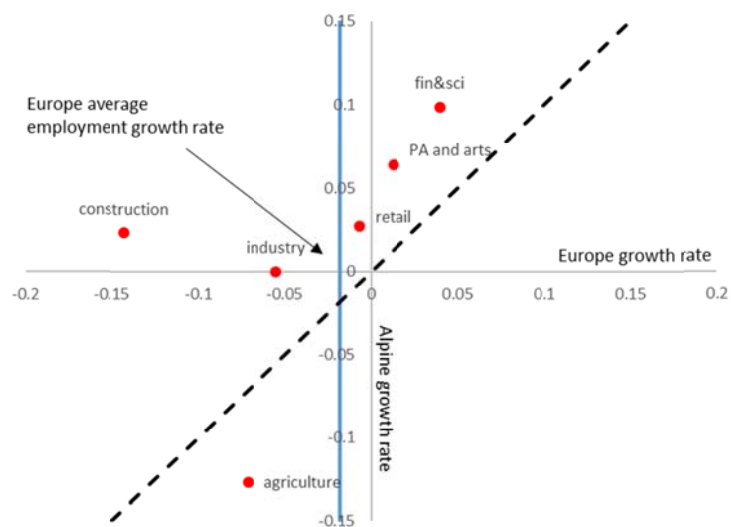


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Data source: Eurostat.



Data source: Eurostat and Swiss Federal Statistical Office.



Data source: Eurostat and Swiss Federal Statistical Office.

Sectoral competitiveness in all three macro-territorial areas...

... especially in the respective industries of specialization.

Clear identification of Science and Finance centers in Peri-alpine and Plain.

In particular, when industries lay above the 45 degrees' line in Figure 28 we fall under case i, since these industries register a higher employment growth with respect to Europe. "Dynamic" sectors at the European level (with a higher employment growth rate than the average), locate on the right of the vertical line in Figure 28. When they have a large share of employment in the region, they generate a positive mix effect (case ii).

Figures 28a, 28b and 28c report the **sectoral employment growth** of the three macro-territorial areas with respect to Europe. In all three cases, the number of sectors registering a higher employment growth with respect to their European average (i.e. located above the 45 degrees' line) is quite remarkable. A high competitiveness is everywhere present in the *filière* of tourism (construction and retail, transport, accommodation), and financial, insurance, technical and scientific activities. This last category generates also a positive mix effect, being a sector that at the European level grows more than the average. The three areas register a competitive growth rate in their respective sectors of specialization: the tourism *filière* in the Alpine; science and finance in Plain and in Peri-alpine areas.

The dynamics of the industry sector – which is a sector of specialization for the entire EUSALP and a large one (22.2% of EUSALP employment) – is remarkable. Despite the general negative employment trend of this sector in Europe, all three macro-territorial areas register a lower reduction of employment, demonstrating a relative competitiveness, a positive attitude towards such activities which are strictly tied to the relevant science and technology sector.

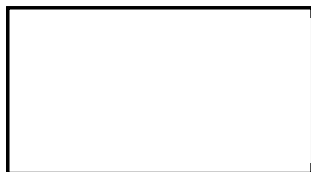
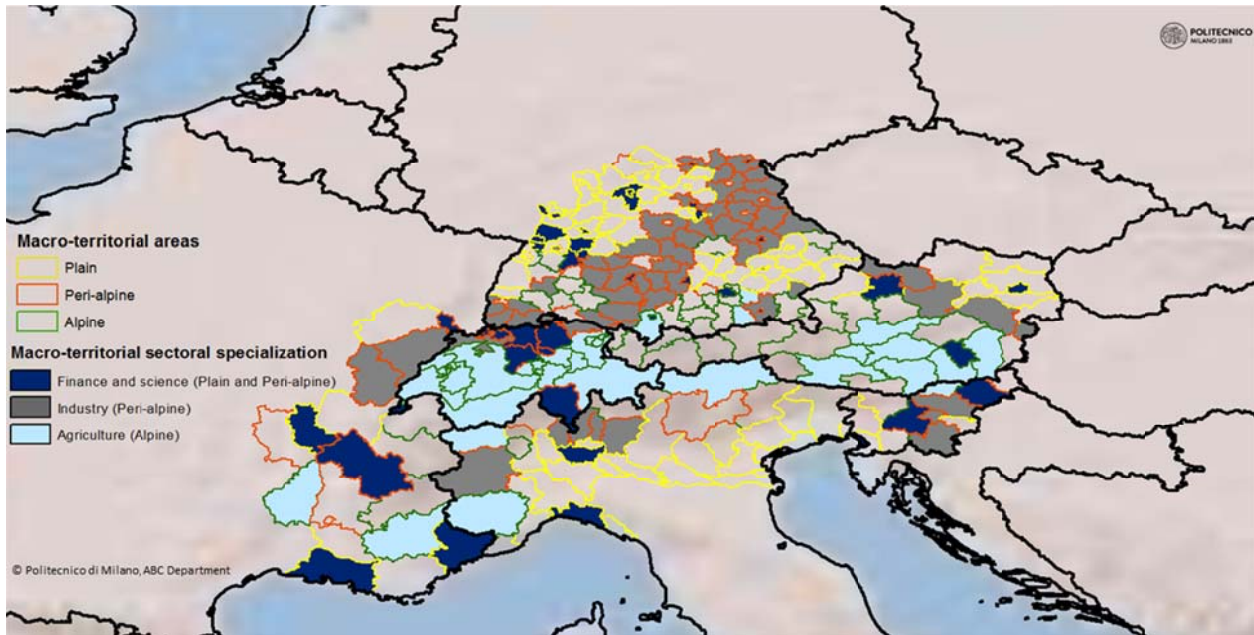
The main exception to this overall picture is agriculture in both the Alpine and the Peri-alpine macro-territorial areas, which lack competitiveness and generate a negative mix effect.

The spatial distribution of each sector of specialization within each macro-areas shows, as could be expected, that finance and science is concentrated around some main urban areas (Map 9).¹³ In the Plain they are mainly: Lyon, Marseille, and Nice in France; Genoa, Milan, and Trieste in Italy; Basel municipality in Switzerland; Linz and Vienna in Austria; Karlsruhe, Heidelberg, Stuttgart, Munich municipality and Nuremberg in Germany. In the Peri-alpine macro-territorial area

¹³ Map 9 has to be read with caution. It shows the relative NUTS3 sectoral specialization within each macro-area, and not the relative NUTS3 sectoral specialization with respect to the average of EUSALP. The last one would give a different information, since it would also highlight, for example, NUTS3 areas specialised in agriculture outside the Alpine, or NUTS3 regions that are specialised in industry outside the Peri-alpine. Maps of the relative sectoral specialization with respect to EUSALP are presented in Annex 1.

finance and science is concentrated around: Geneva, Zurich, Lucerne, and Lugano in Switzerland; Graz in Austria; and Grenoble in France. The industrial specialization is very widely diffused in the Peri-alpine area, as well as the agricultural specialization in the Alpine area.

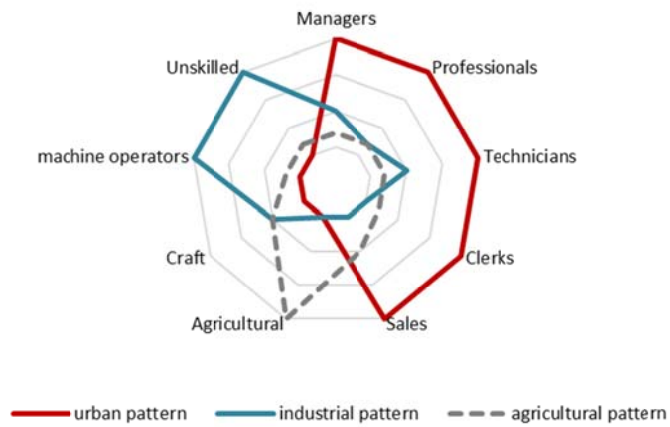
Map 9. Location of sectors of specialization of the three macro-territorial areas



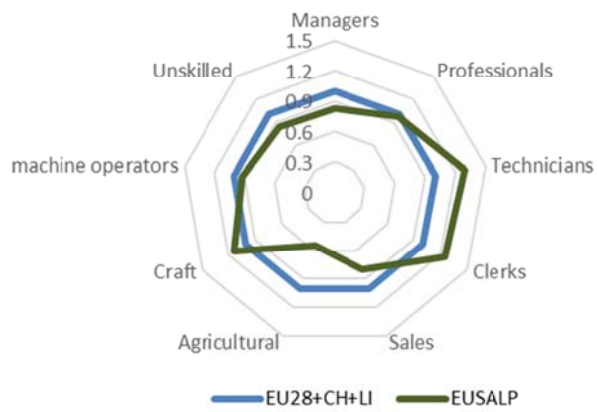
Analyzing now the **functional specialization** (measured through occupations), a theoretical framework can be useful to interpret the emerging picture. We can, indeed, identify three theoretical specialization patterns: an urban pattern (mainly characterized by high-skilled functions), an industrial pattern (mainly characterized by industrial functions), and a pure agricultural pattern. These theoretical categories are graphically represented in Figure 29.

Having this abstract framework in mind, and comparing this theoretical chart to the one with real data for EUSALP (Figure 30), we can see how EUSALP mainly shows industrial characteristics with respect Europe.

The Alpine macro-territorial area reflects its main agricultural specificity, while the other two macro-territorial areas share the main industrial profile of EUSALP, adding some urban features in the case of the Plain (Figure 31).

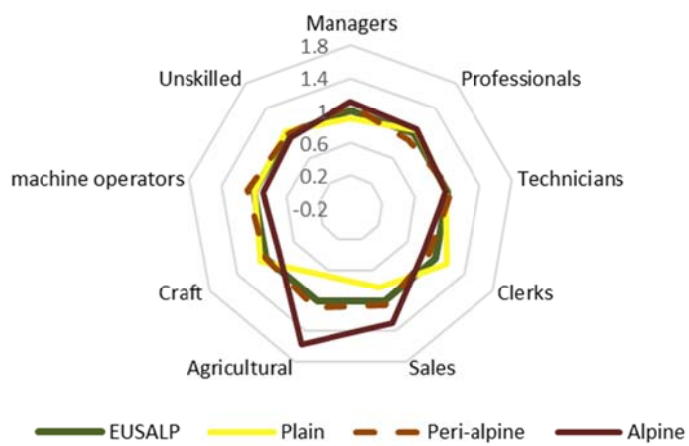


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Data source: Eurostat, Swiss Federal Statistical Office, German Federal Statistical Office

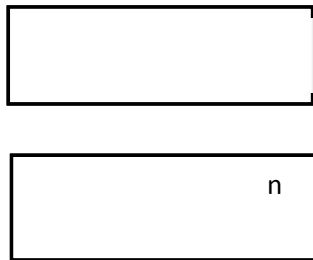


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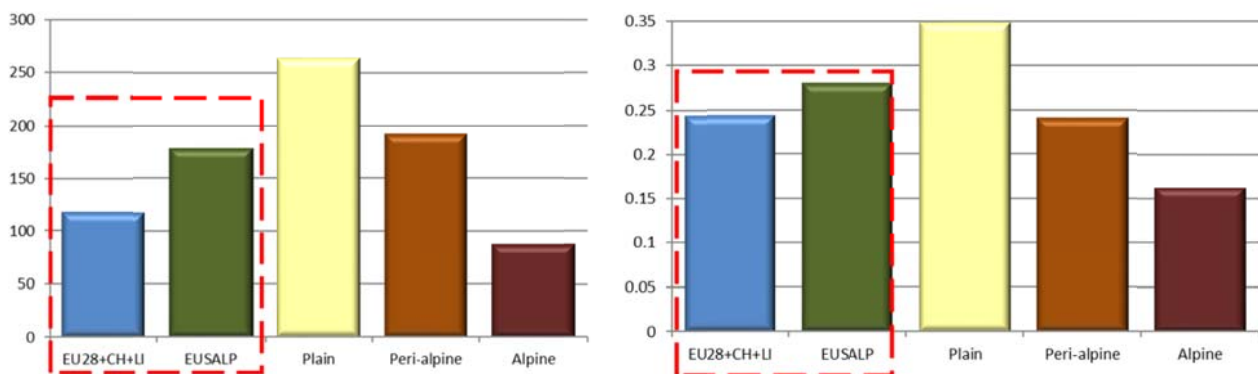
Data source: Eurostat, Swiss Federal Statistical Office, German Federal Statistical Office

3.7 Agglomeration economies

Agglomeration economies are the benefits (advantages) stemming from co-location of many different activities in proximity to each other. Mentioned in the literature as important sources of local competitiveness, we want here to explore the hypothesis that these economies could be one of the sources of productivity in EUSALP. In order to investigate this idea, two indicators – population density and share of population in largest municipality – are analyzed. As expected, they convey a similar and consistent message and can be read together.



EUSALP is a relatively densely populated region, with a large share of population living in largest municipalities compared to the rest of Europe (Figures 32a and 32b). As expected, this result is largely driven by the Plain area, while the Alpine area shows values that are nearly half of those associated to EUSALP for both indicators. The Alpine area is indeed an interesting case, having a homogeneously low population density and a much lower share of population in largest municipality with respect to both Europe and EUSALP. This shows a highly dispersed population on the territory and implies that “big cities” within this sub-region are in fact smaller than in the reference area.



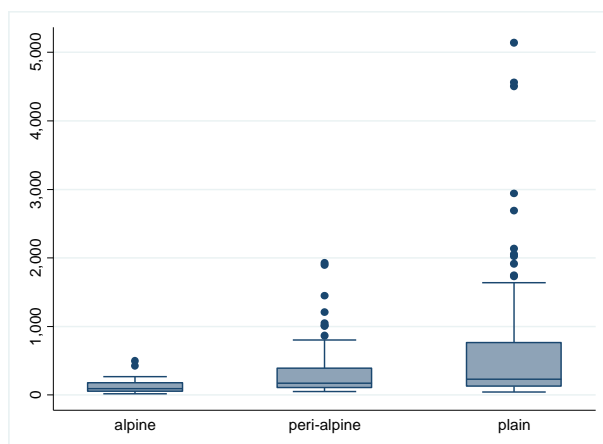
Data source: Eurostat.

An extremely densely populated Plain...

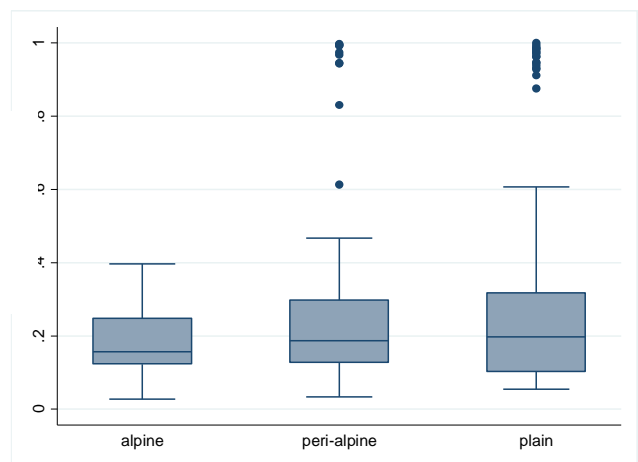
... and a sparser Alpine.

The opposite situation characterizes the Plain area, which shows a high concentration of population: on average 34% of the population lives in the largest municipality (24% in the rest of Europe and 28% in EUSALP). This suggests that part of the success in productivity in the Plain area can be due to agglomeration economies (Figures 33a and 33b).

*Figure 33a. Spatial inequality of population density (inhabitants per km²) – 2014
(distribution of the observations)*



*Figure 33b. Spatial inequality of population in largest municipality – 2011
(distribution of the observations)*



Data source: Eurostat. For the share of population in largest municipality, given the way in which the indicator is computed, it produces outliers when a NUTS3 region is defined as a city itself (this is sometimes the case, especially in Germany).

3.8 Conclusions on economic growth and innovation: a sketch of the results

EUSALP is a prosperous and competitive region of 77 million inhabitants, representing 15% of population of EU+EFTA countries (“Europe”) and 23% of GDP.

Given the high internal differentiation of the region, three macro-areas were devised on the basis of three geo-morphological indicators, namely elevation, share of unusable land and distance from the external alpine peaks. The three macro-areas called Alpine, Peri-alpine and Plain, represent respectively 18%, 32% and 50% of EUSALP population and 21%, 34% and 45% of its GDP.

Per capita GDP in EUSALP is much higher than in Europe, where the Alpine area is leading, followed by the Peri-alpine and the Plain. If Swiss regions (the richest) are not considered, the internal ranking changes, with the Plain leading, followed by the Alpine. Disparities in income (as well in many other indicators) inside each macro-area are lower than the EUSALP average, and this confirms the logical consistency of the proposed breakdown.

Competitiveness (GDP per worker) is also much higher than in “Europe”, even if the distance is decreasing in time. In general, EUSALP grew at a slightly higher rate than Europe, with the

exception of the first period of crisis, 2008-12, in which it suffered more, due to its openness to foreign trade and to international tourism; only the Plain showed a minor decrease with respect to the other macro-areas.

Employment rates in EUSALP are higher than in Europe, and they show a better resilience to the crisis and a faster rebound in 2013. Reading the three economic indicators together – namely GDP growth, productivity per workers and employment – a strong feeling emerges concerning the policy and political reaction to the crisis that the entire EUSALP area apparently assumed, prioritizing employment levels to productivity levels (an attitude that generally in Europe is attributed to Germany).

As a consequence of all what precedes, EUSALP can be conceived as a highly attractive area. In fact, its growth rate of population is constantly much higher than the European one, and this is true for all internal macro-areas (particularly for the Plain in the growth period 2003-08 and, less significantly, for the Alpine area in the crisis period 2008-14). In spite of this general trend, some small areas in the German Peri-alpine and some others in the Austrian Alpine areas suffered from some population decline.

Concerning structural and territorial capital elements, and referring to innovation processes, 85% of EUSALP territory falls inside the 3 most desirable patterns of innovation (out of 5) - the most appropriate for an advanced macro-region, linked to basic and applied science. An “applied science” pattern prevails in Austrian and Swiss regions, a “applied” and a “basic science” in German regions and a “smart technological application” in Italian and French regions. General patenting activity levels and patenting in general purpose technologies – doubling the European average – confirm the strength of EUSALP and, strikingly, the relative homogeneity of the performance of the three macro-areas (with a slight leadership of the Peri-alpine). A similar picture emerges from trademarking activities, where, inside EUSALP, the Plain is leading. As expected, patenting activities are highly concentrated at NUTS3 level, with low general intensity in Italian regions.

The strong link R&D-innovation-competitiveness is reinforced by an evident profile – of EUSALP and of all its macro-territorial areas – in industry, the main recipient and actor in the Industry 4.0. This profile emerges both in terms of sectoral employment and of occupations.

As far as territorial capital assets are concerned, EUSALP shows, on the negative side, a lower saving propensity, a lower level of human capital, and a higher age dependency ratio with respect to Europe.

EUSALP is, however, somehow diversified. The **Plain**, beyond a better endowment of market innovation with respect to EUSALP, shows a higher level of agglomeration economies and a good competitive performance in all sectors, especially in finance and science (its specialization sectors). All this allowed it to show a better GDP growth rate inside EUSALP (excluding Swiss cantons) and a better resilience to the crisis.

On its turn, the **Peri-alpine** macro-territorial area is characterized still with reference to the EUSALP average by a good patenting performance, even in general purpose technologies, a good human capital endowment with a limited spatial heterogeneity, and consequently by a good competitive performance in the sectors of specialization, namely industry and science and finance.

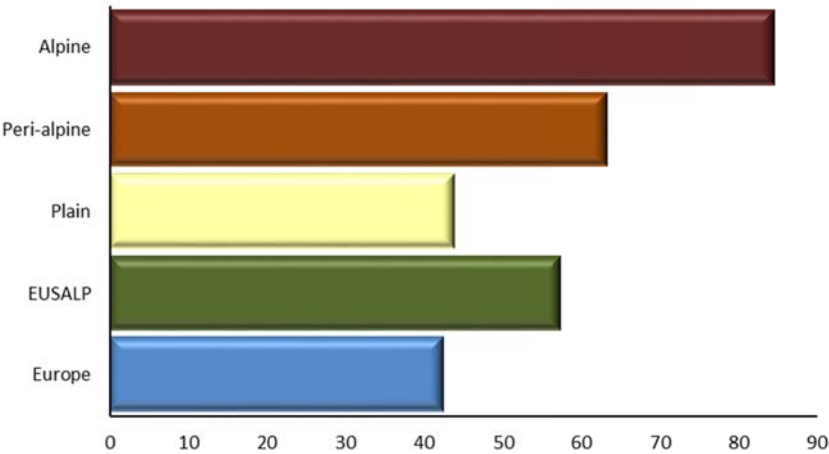
The performance of the **Alpine** macro-territorial area is outstanding, tied to a good employment growth rate, increasing in the period of crisis, and a high productivity level, even if decreasing in time. This good performance is associated with a good patenting activity, a good market innovation, the highest in EUSALP. It is the only macro-territorial area with an agricultural and touristic profile, but it shares also a modern industrial vocation as the entire EUSALP.

4. Thematic policy domain 2: cross-border integration

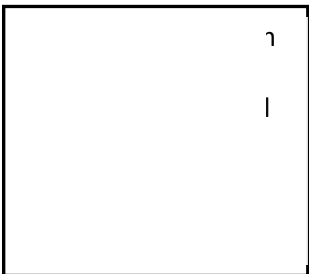
4.1 Performance indicator: GDP loss due to the presence of the border



EUSALP is an area with many international border regions¹⁴, significantly more frequent than in the rest of Europe. In fact, more than 57% of the resident population in EUSALP live in “border regions”, with respect to the 42% of Europe (Figure 34). Especially the Alpine area registers a large share of population living in border areas, the largest among the three sub-territorial areas and more than the double with respect to the European one; this is the result of the presence of all countries that are part of the EUSALP macro-region (France, Italy, Switzerland, Liechtenstein, Germany, Austria and Slovenia).



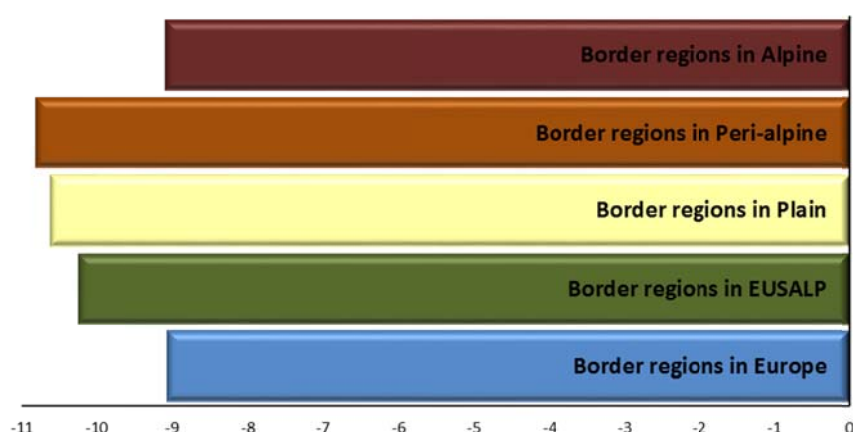
Source: EU project n. 2014CE16BAT010 / 2014CE16BAT011 / 2014CE16BAT012



Thus, EUSALP is subject to all the possible barriers emerging in border areas, such as legal, linguistic and sociocultural ones (see also next Section). The impact of these barriers on a macro-region depends on two effects: a) the sensitivity of the single border regions to the barrier effect, depending on the specificity of their territorial assets, and b) the share of population living in border regions within the macro-area, as seen before (Figure 34). The loss of GDP for all European cross-

¹⁴ Border regions have been identified as in the study entitled “Collecting solid evidence to assess the needs to be addressed by Interreg cross-border cooperation programmes”, Framework Contracts 2014CE16BAT010 / 2014CE16BAT011 / 2014CE16BAT012 (Service Request 2015CE160AT044)”.

border regions determined by legal and administrative barriers alone was estimated for 2013 in 9% of their GDP (Figure 35)¹⁵ (effect a). The same loss calculated for EUSALP border regions would be higher than the European average, being more than 10%. The loss on the Peri-alpine border regions would be the most relevant while the one on Alpine border regions would be lower, due to a limited endowment, in the latter case, of those assets which are more sensitive to legal border barriers (accessibility, trust, agglomeration economies).

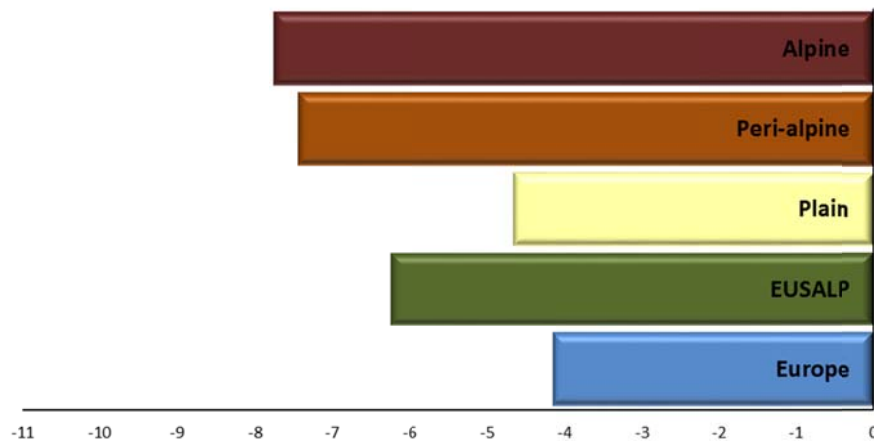


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Source: EU project “Quantification of the effects of legal and administrative border obstacles in border regions” (Expert contract number — 2016CE160AT091)

However, total impact of barriers can be calculated on macro-territorial areas (and not just on their border regions), and it would depend also on the higher or lower presence of border regions inside each of them (effects a + b). Taking both elements into account, the picture changes (Figure 35b): losses on total EUSALP GDP would account to 6%; losses on the Alpine GDP would be the highest (due to the high presence of border regions) while losses on the Plain GDP would be the lowest (for the opposite reason).

¹⁵ The costs of legal and administrative border barriers in terms of GDP loss has been measured in the expert contract number 2016CE160AT091, by Politecnico di Milano for DGRegio.

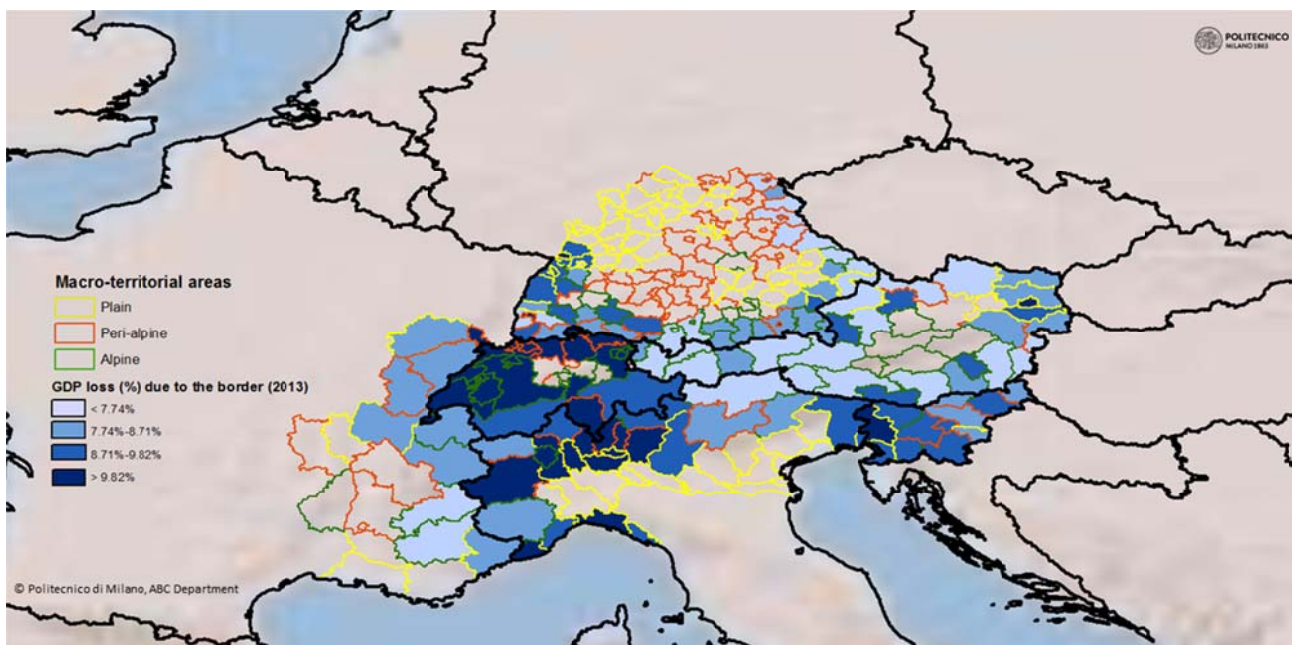


GDP

To get a more precise picture of the situation, the micro-territorial level is investigated (impact of borders on the single NUTs3 regions). The result is shown in Map 10. As can be seen, the highest loss is concentrated in a few areas, especially in Switzerland. North-western Italy is the mostly affected in the Peri-alpine and Plain macro-territorial areas, as well as Gorizia and Vienna areas.

In order to interpret the sources of integration problems, the next Section investigates administrative, legal, linguistic and socio-cultural barriers.

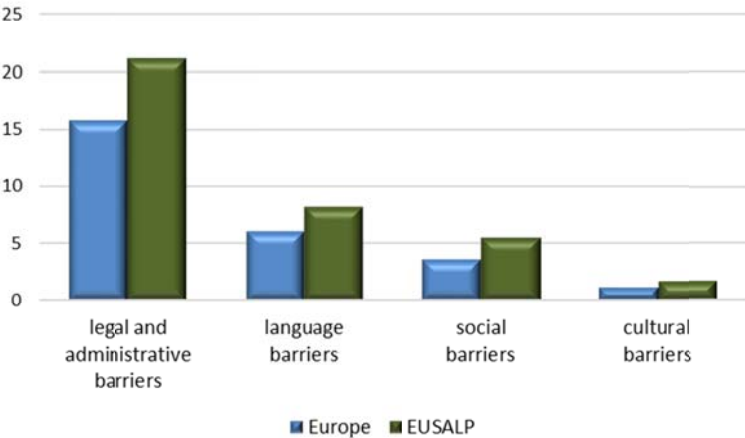
Map 10. GDP loss (% share on GDP) in border regions due to legal and borders – 2013



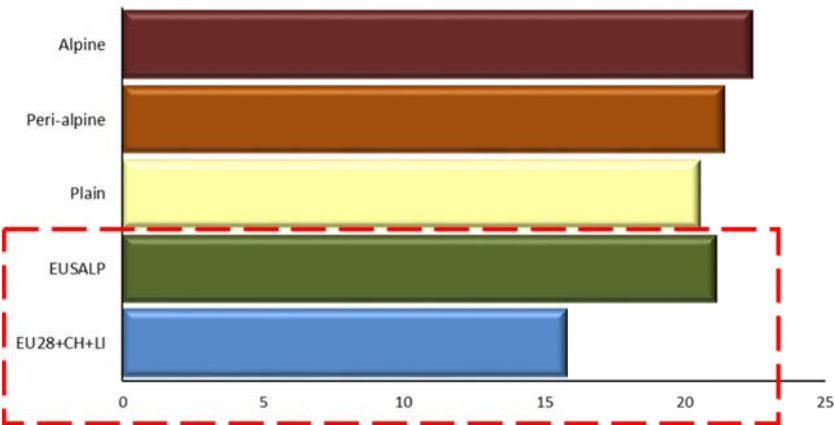
4.2. Perceived cross-border integration problems: legal, administrative and socio-cultural barriers



At the basis of the GDP loss in cross-border areas there is the presence of different types of **legal and administrative**, as well as **sociocultural, barriers**. As for the first category, people in EUSALP do indeed perceive legal differences as a barrier much more than in the rest of Europe. In particular, more than 21% of the residents in EUSALP perceive legal and administrative issues as a barrier, while less than 16% in Europe. Language barriers are the second source of obstacle in both Europe and EUSALP, while socio-cultural differences are attributed a relatively limited role (Figure 36).



The legal and administrative border barriers are perceived as an obstacle especially in the Alpine area, where more than 22% of respondents stress the problem (Figure 37). The difference with the other two macro-areas is in fact not so significant, suggesting that these kinds of barriers are perceived as obstacles in all areas.



Data source: Eurobarometer 422 (2015).

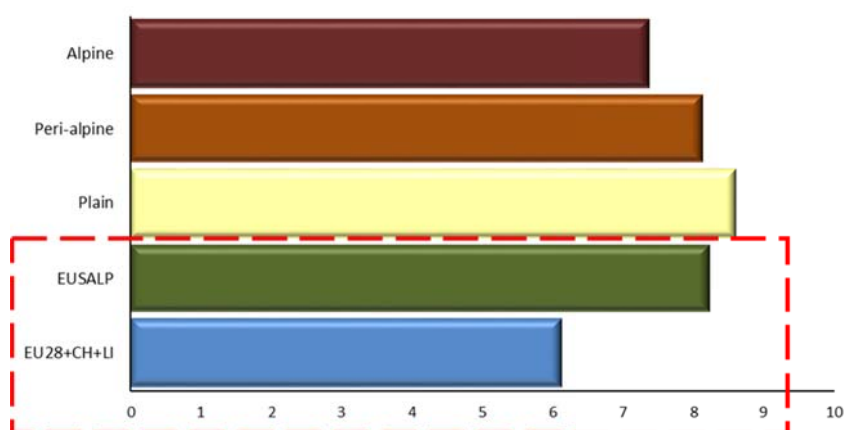
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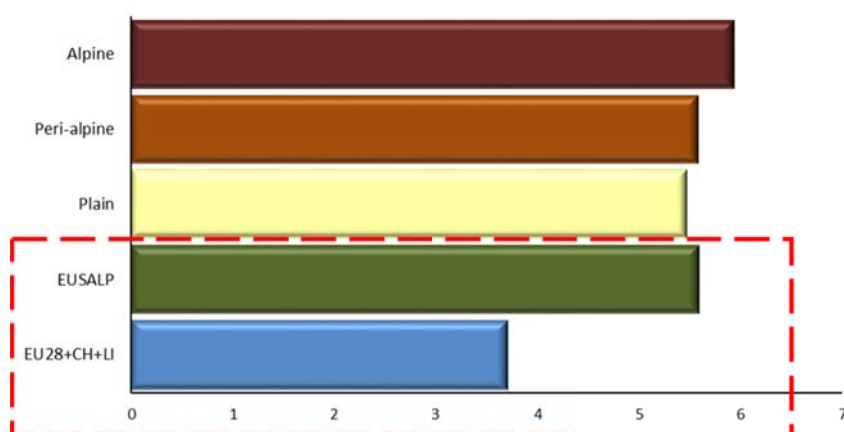
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A similar situation can be highlighted about linguistic and socio-cultural barriers. Although these barriers seem to be less relevant than the legal and administrative ones, as said before, they still play a role (Figure 36). As shown in Figure 38, **the presence of different languages is perceived as a barrier** by more than 8% of respondents in EUSALP, while it is only 6% in Europe. In this case the problem is particularly significant in the Plain macro-territorial area (8.6%), while it is relatively less perceived in the Alpine sub-region (7.4%), possibly due to the multilingual nature of a large part of this area (e.g. Swiss cantons).

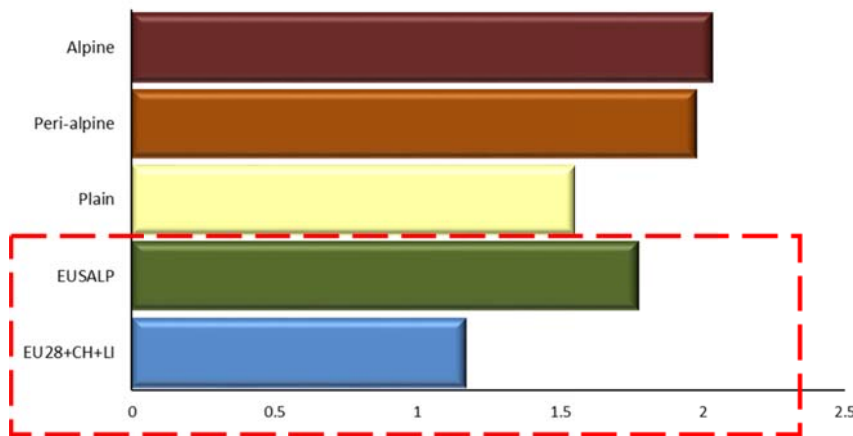


Data source: Eurobarometer 422 (2015).

As for **socio-cultural barriers** (Figures 39 and 40, respectively), again, the Alpine macro-territorial area turns out to be the most affected. In absolute terms, however, both social and cultural barriers are perceived as the least relevant (Figures 39 and 40).

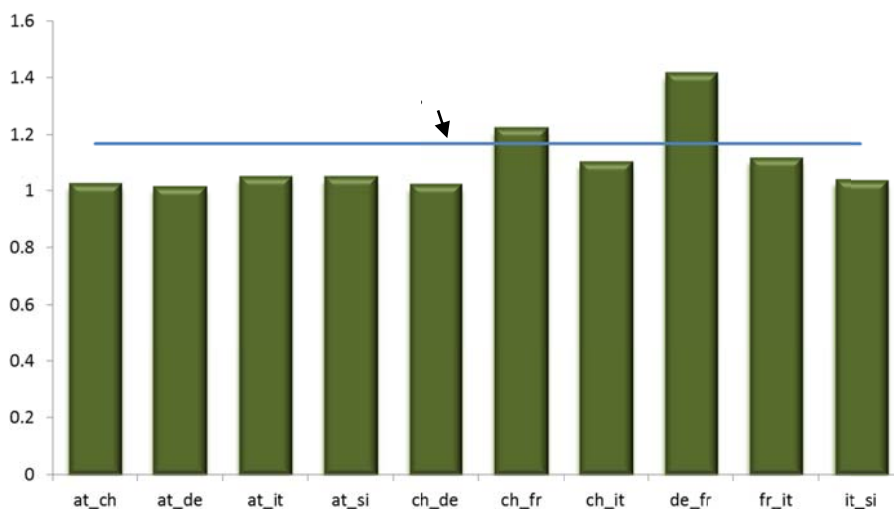


Data source: Eurobarometer 422 (2015).



Data source: Eurobarometer 422 (2015).

Figure 41 shows the (likely) lack of labour market integration within cross-border regions, measured as the ratio between the average employment rate of NUTS3 belonging to a country of a border region and the average employment rate of NUTS3 belonging to the other country of the same border region: the higher the indicator, the higher the lack of labour market integration.¹⁶ The Figure shows a rather likely high long term integration of the labour market in all border regions of EUSALP, higher than the average of European border regions, with two exceptions, namely Germany-France, and Switzerland-France border regions.



Data source: own calculations on Eurostat data

¹⁶ The index of the share in employment rates is calculated as employment rate of the border region's NUTS3 in country A over employment rate of the border region's NUTS3 in country B, where the country with the highest employment rate is always at the numerator. The closer the index to 1, the higher the long term integration of the two labour markets, as differences in labour market conditions are compensated through migration. In the short term, compensation could be through transborder-commuting and in this case the differences persist and the index may even worsen.

4.3 Conclusion on cross border integration: a sketch of the results

With respect to the rest of Europe, EUSALP registers a higher share of population living in border regions and is much more affected by border-related issues.

Barriers that are created by an international border are of different types: legal and administrative, linguistic and sociocultural. The first type is perceived as the most problematic in Europe as a whole, and in EUSALP in particular. The loss of GDP generated by the existence of legal and administrative border barriers is estimated to be higher than 4% on Europe's GDP and higher than 6% on EUSALP GDP. In terms of loss for the border regions alone, these figures are 9% and 10.2% respectively.

Linguistic differences are the second perceived border-related problems while a relatively limited weight is attributed to social and cultural differences.

The situation within EUSALP is differentiated. The **Plain** is, indeed, characterized by:

- the lowest share of population living in border regions and consequently the lowest quantitative impact on GDP;
- a lower perception of legal and socio-cultural barriers;
- a relatively higher perception of linguistic barriers.

The **Peri-alpine** macro-territorial area is characterized by:

- a high perception of linguistic barriers;
- a relatively high perception of legal and administrative barriers;
- the most relevant loss of GDP due to legal and administrative barriers.

Finally, the **Alpine** macro-territorial area registers:

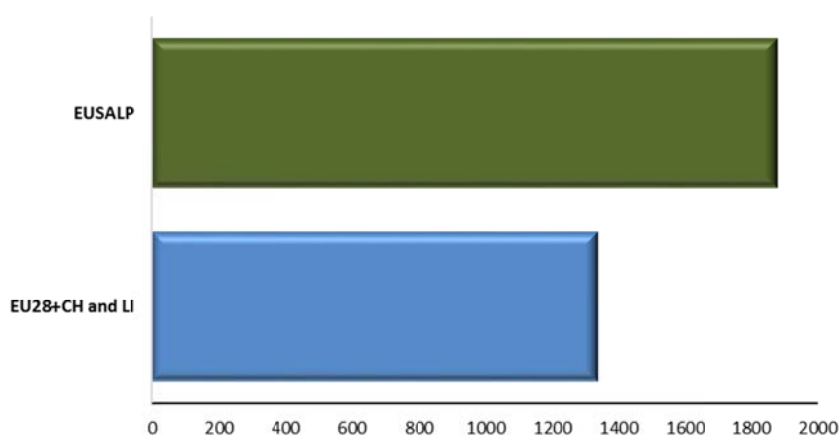
- the highest share of population living in border regions;
- therefore the highest loss of GDP on the entire macro-area due to legal and administrative barriers;
- the lowest loss in GDP on its single border regions due to a lower endowment of assets sensitive to the presence of legal borders;
- the highest perception of legal and administrative barriers and the lowest perception of linguistic barriers. This can be due to the multilingual nature of the area.

5. Thematic policy domain 3: spatial structure

5.1 Performance indicators: accessibility potential and tourism



Tourism can be considered as an indicator of attractiveness and therefore it can be interpreted as a performance indicator of the geographical/spatial structure of an area. Visitor attraction in EUSALP is much higher than the average European one (Figure 42). This is likely to be due to the touristic vocation of the Alpine macro area and to the presence of big cities in the Plain.



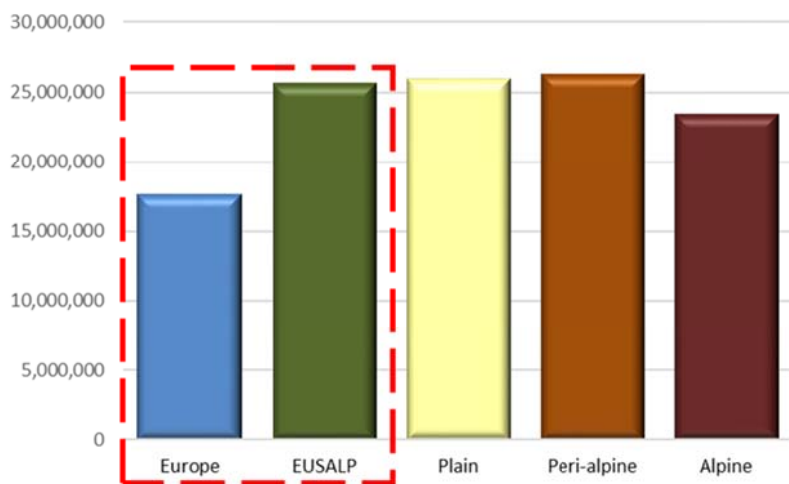
Data source: ESPON, ATTREG (Attractiveness of European Regions and Cities for Residents and Visitors)



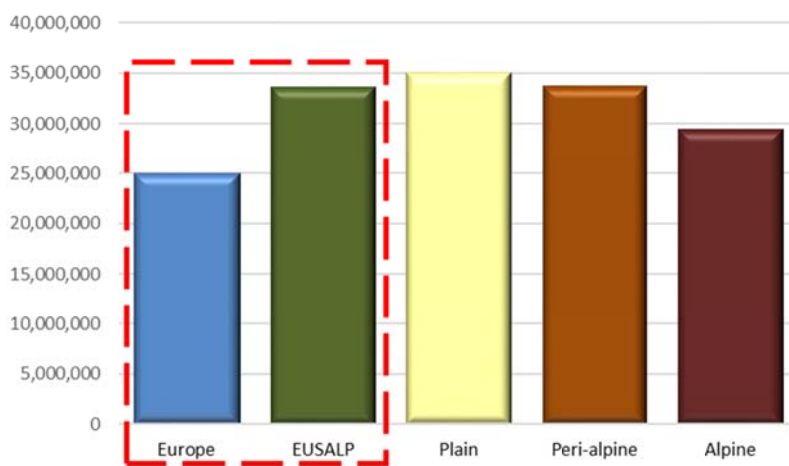
Also by looking at another type of indicator capturing the attractiveness of an area, namely physical accessibility, EUSALP shows a good performance in relative terms. In fact, according to three different indicators – road, rail, air and multimodal accessibility – EUSALP turns out to be more accessible than the rest of Europe (Figures 43, 44, 45 and 46).¹⁷

As far as accessibility is concerned, a breakdown of information at the macro-territorial level is available, and provides a picture of the Alpine region as an area with relatively lower accessibility than the other two macro-territorial areas.

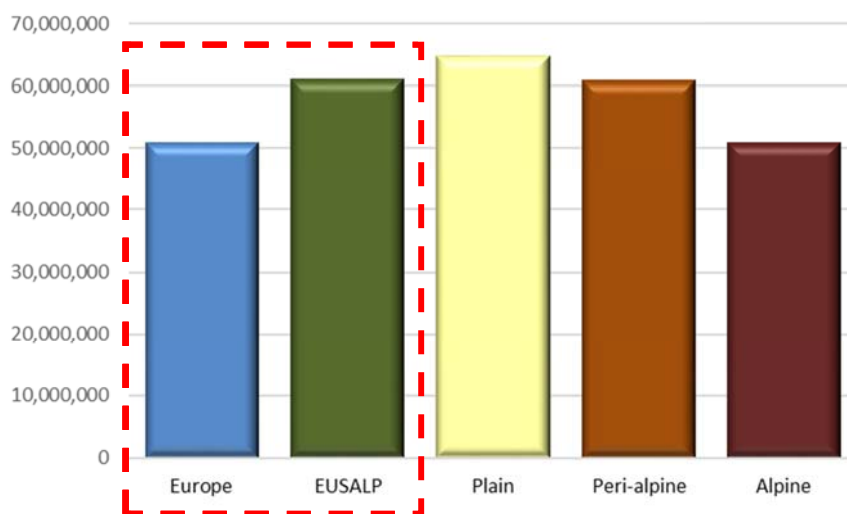
¹⁷ Multimodal accessibility combines three indicators of accessibility: road, rail, and air (source: ESPON TRACC - Transport ACCessibility at regional/local scale and patterns in Europe).



Data source: ESPON, TRACC (TRansport ACCessibility at regional/local scale and patterns in Europe)

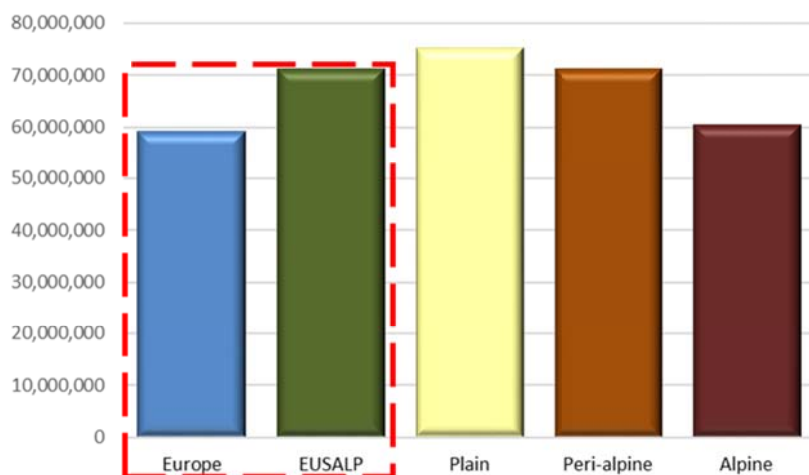


Data source: ESPON, TRACC (TRansport ACCessibility at regional/local scale and patterns in Europe)



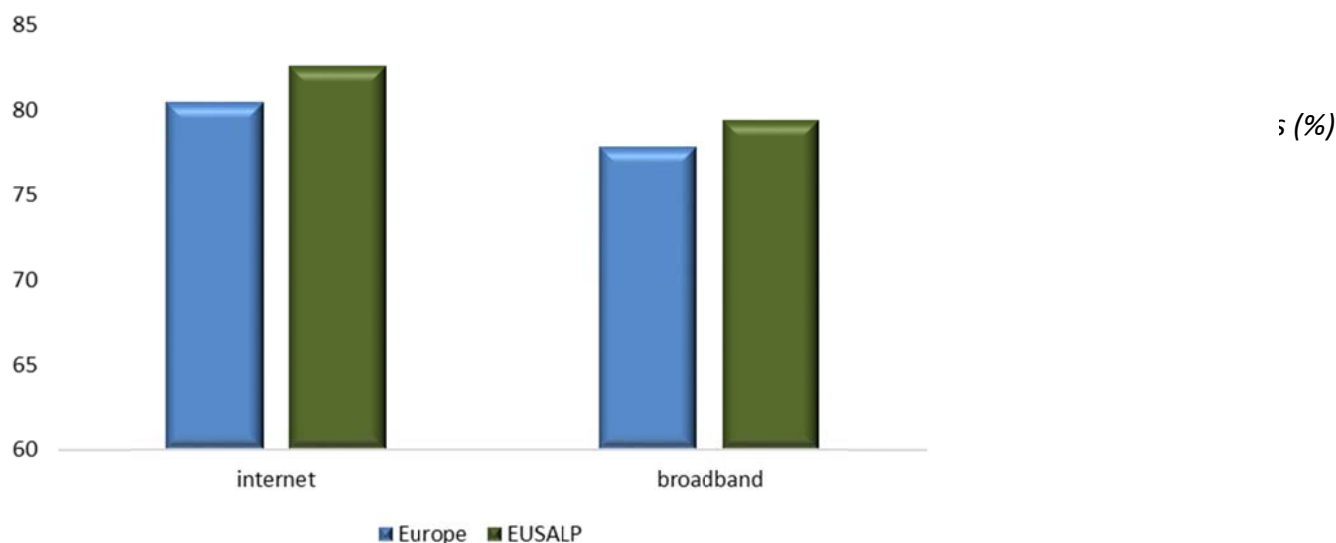
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Data source: ESPON, TRACC (TRansport ACCessibility at regional/local scale and patterns in Europe)

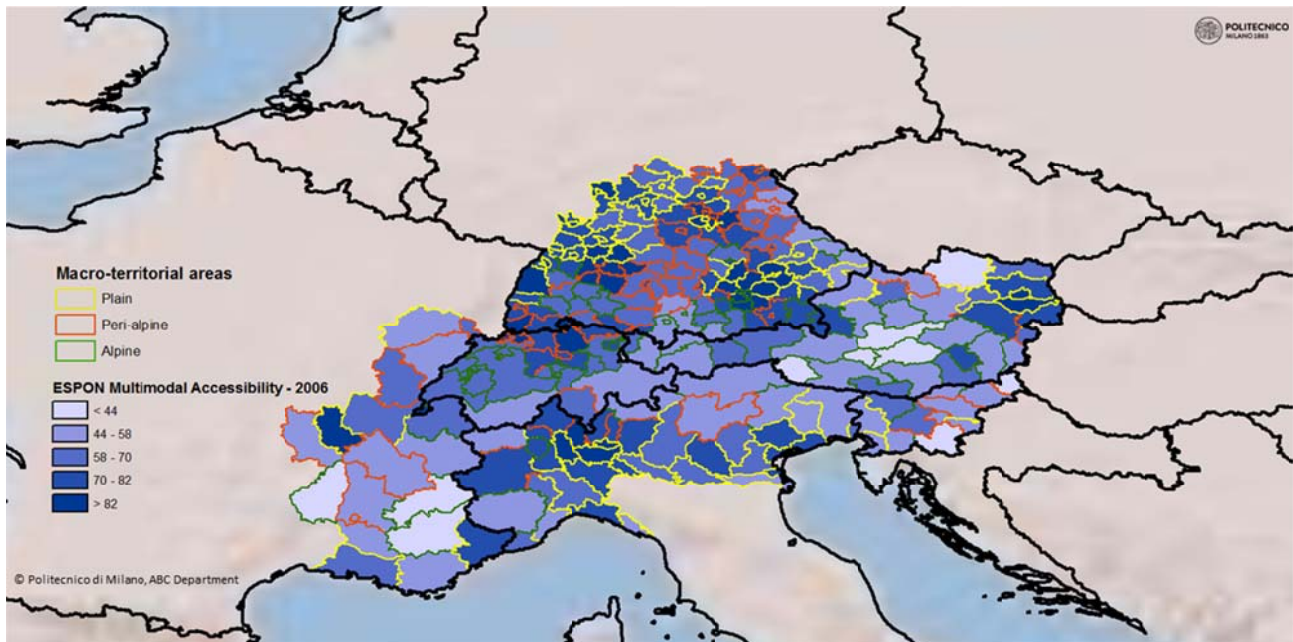
EUSALP is rather accessible. The same applies for digital connectivity, which shows a higher than European average level, both for what concerns internet, and for the most advanced broadband access (Figure 47).



Data source: Eurostat

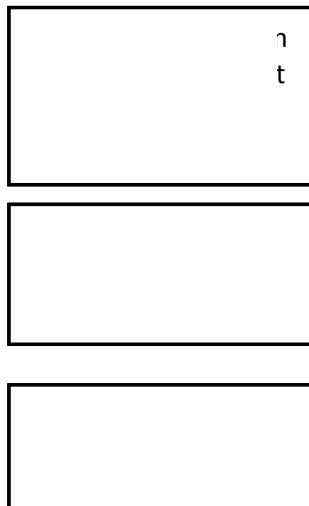
In order to go in greater depth in the observation of this performance indicator, a focus at the micro-territorial level seems appropriate. This is reported in Map 11. As expected, metropolitan areas emerge as the more accessible. In particular Lyon, Milan, Stuttgart, Heidelberg, Vienna and Basel in the Plain macro-territorial area; Nuremberg, Geneva, and Zurich in the Peri-alpine; the Alpine ring of Munich, Salzburg and Innsbruck in the Alpine macro-territorial area.

Map 11. Multimodal accessibility – 2006



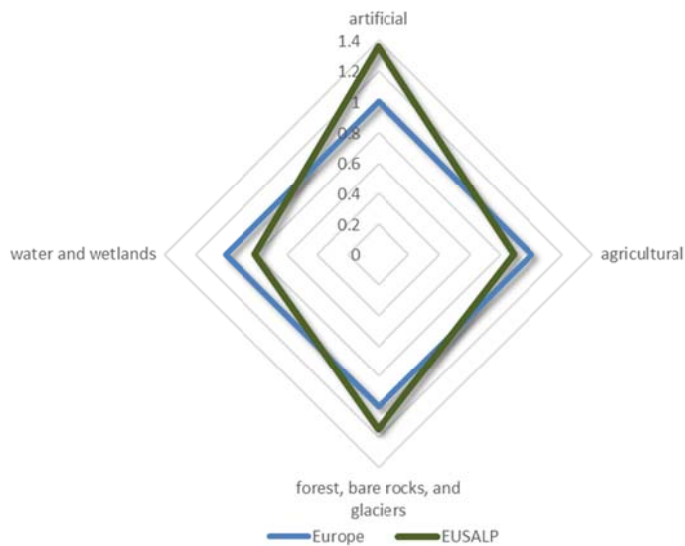
The next section investigates the territorial assets that are associated to the performance indicators of the geographical structure. In particular, settlement structure and land use will be analyzed.

5.2 Geographical assets: land use and settlement structure

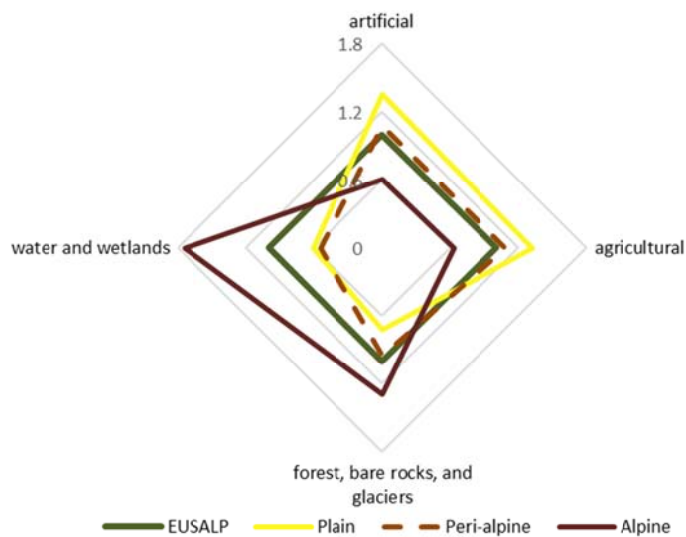


Looking at the indicator of land uses, the specificity of the EUSALP area taken as a whole emerges quite clearly. As expected, with respect to Europe, it is more green, having a high share of forest, bare rocks and glaciers, but also, strikingly, richer in artificial land – which includes urban fabric (industrial, commercial and transport units; mines, dumps, and construction sites; artificial, non-agricultural vegetated areas), on the other hand, it is less endowed with water, wetlands and agricultural land (Figure 48).

Huge internal differences emerge if we move the focus to the three macro-territorial areas (Figure 49). The Plain area, and to a lesser extent, the Peri-Alpine area show a relatively large extension of artificial and agricultural land, although the share of NUTS 3 regions defined as rural is very limited (Figure 49). On the other hand, the Alpine area shows a predominance of unusable land – green, rocks, glaciers and water – and a relatively small share of agricultural and artificial land.



Data source: ESPON from Corine Land Cover



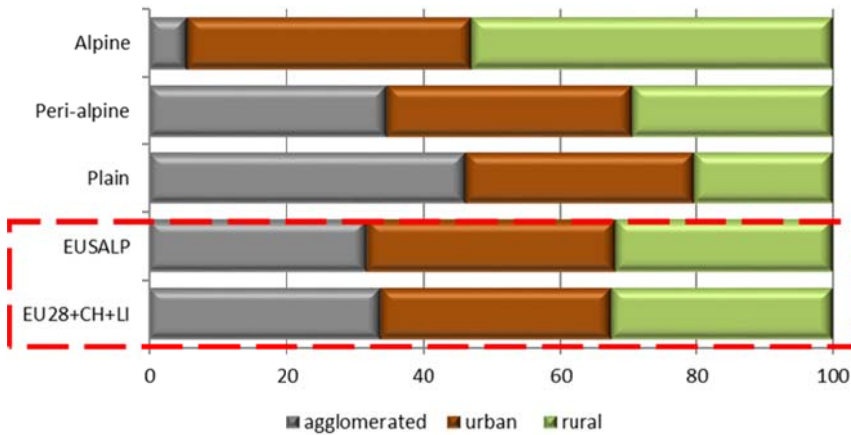
Data source: ESPON from Corine Land Cover.

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Looking at the settlement structure and keeping in mind that this breakdown refers only to “usable land”, EUSALP shows a similar pattern to the European one: about 36% of NUTS3 belonging to EUSALP fall in the category of urban, 32% rural and 32% agglomerated (Figure 50)¹⁸. However, when EUSALP is analyzed in its three macro-territorial areas, clear differences emerge: Alpine is both

are defined (ESPON Database) as those regions hosting a city of more than 300,000 inhabitants and a population density higher than 300 inhabitants/km sq. or with a population density between 150– and 300 inhabitants/km sq. Urban regions are defined as hosting a city between 150,000 and 300,000 inhabitants and a population density between 150 and 300 inhabitants/km sq. (or a smaller population density – between 100 and 150 inh./km but with a bigger centre, with more than 300,000 inh.) or a population density between 100 and 150 inh./kms

urban and rural, missing agglomerated areas. The nature of an agglomerated Plain emerges, and of a more diversified Peri-alpine area, hosting all the three features, equally represented.



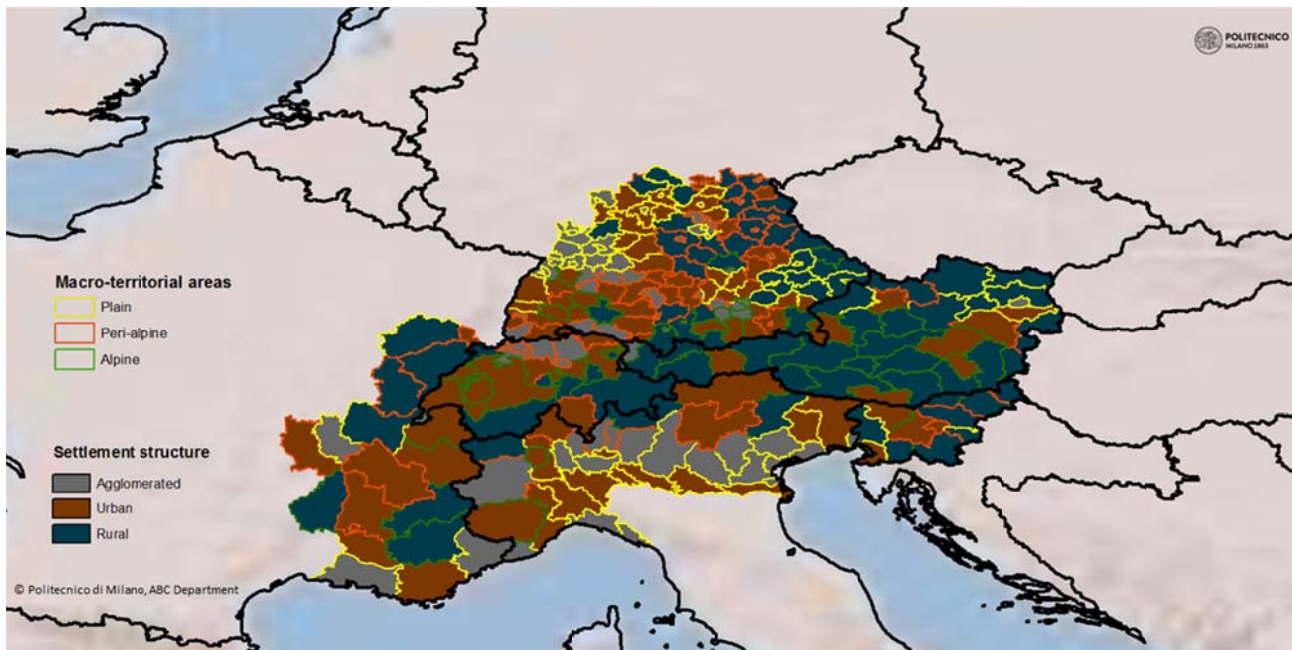
Data source: ESPON

Comparing Figures 49 and 50, and referring to the contradictory message that emerges for the Alpine and the Plain areas – the former showing large rural settlements and a low relative share of agricultural land, the latter presenting the opposite condition – we may argue that the agricultural sector in the Alpine region is relatively labour intensive with respect to the Plain. This impression is confirmed by the higher intensity of agricultural employment per km² of agricultural land, achieving 0.85 in the Alpine area and 0.79 in the Plain.

Focusing once again on the micro-territorial level, we can get further – more disaggregated – information on the settlement structure. As can be seen in Map 12, agglomeration occurs – as expected – around the main metropolitan areas, namely: Lyon, Marseille, Nice, Milan, Genoa, Stuttgart, Heidelberg, Karlsruhe, Munich, Nuremberg, Vienna and Basel in the Plain macro-territorial area; Turin, Geneva and Zurich in the Peri-alpine; Liechtenstein in the Alpine. As is clearly shown, in particular, the Alpine sub-region is significantly characterized by a rural settlement structure.

Map 12. Settlement structure – 1999

sq. Finally, rural regions are those areas with a population density lower than 100 inh./sq. km. and a centre with more than 125,000 inh., or a population density lower than 100 inh./sq. kms. with a centre smaller than 125,000 inhabitants.



5.3. Conclusions on spatial structure: a sketch of the results

In terms of physical, spatial structure – land uses and settlement structure – **EUSALP** presents a clear specificity with respect to Europe in the wider presence of green and natural spaces (particularly in the Alpine macro-area) on the one side, and of artificial, urbanized lands (particularly in the Plain area). Furthermore, other specificities concern the high presence of water-covered lands in the Alpine area and of agricultural areas in the Plain (with extensive, labour-intensive production methods).

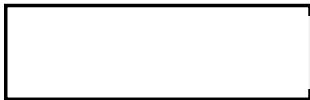
On the other hand, considering the settlement structure inside “usable” land, EUSALP as a whole presents a similar pattern with respect to Europe, with similar shares of agglomerated, urban and rural regions. This fact hides profound differences among the internal macro-areas, witnessed by the prevalence of agglomerated settlements in the Plain, a prevalence of rural settlements in the Alpine area and a more equilibrated structure in the Peri-alpine area.

6. Thematic policy domain 4: environmental quality

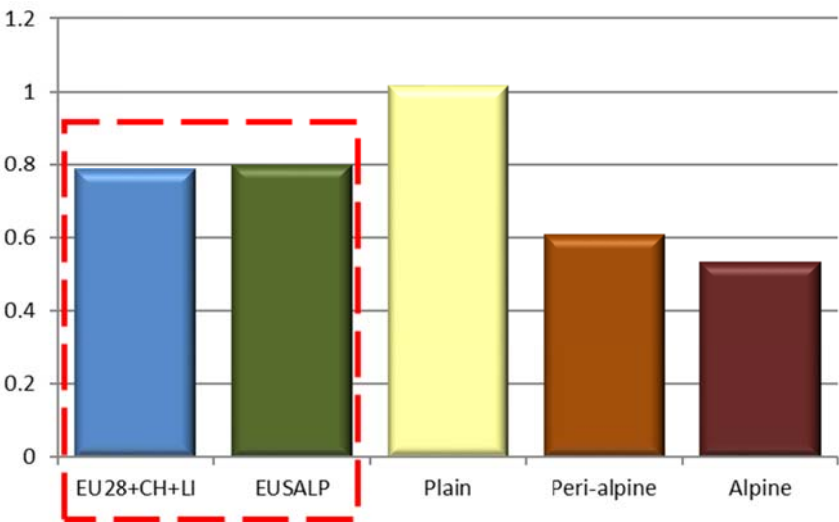
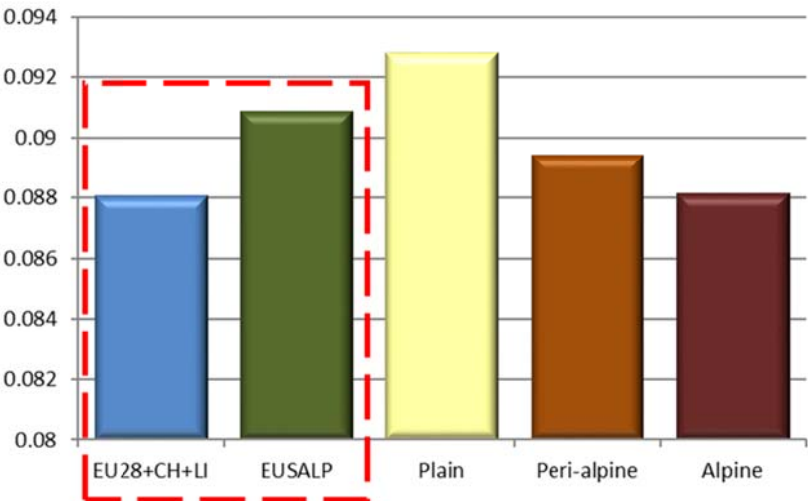
6.1 Performance indicators: congestion and pollution



Given its highly urbanized nature, EUSALP is a relatively congested area with respect to the rest of Europe (Figure 51), although the difference is not particularly remarkable (9.1% of driving time spent on congestion conditions in EUSALP vs. 8.8% in the reference area). As could be expected, the situation is more serious in the Plain macro-territorial area (9.3%), while it is better in the Alpine (8.8%).



The picture is similar for pollution. As for this indicator, EUSALP performs in a similar way with respect to Europe, again with the worst performance in the Plain macro-territorial area and the best in the Alpine (see Figure 52).

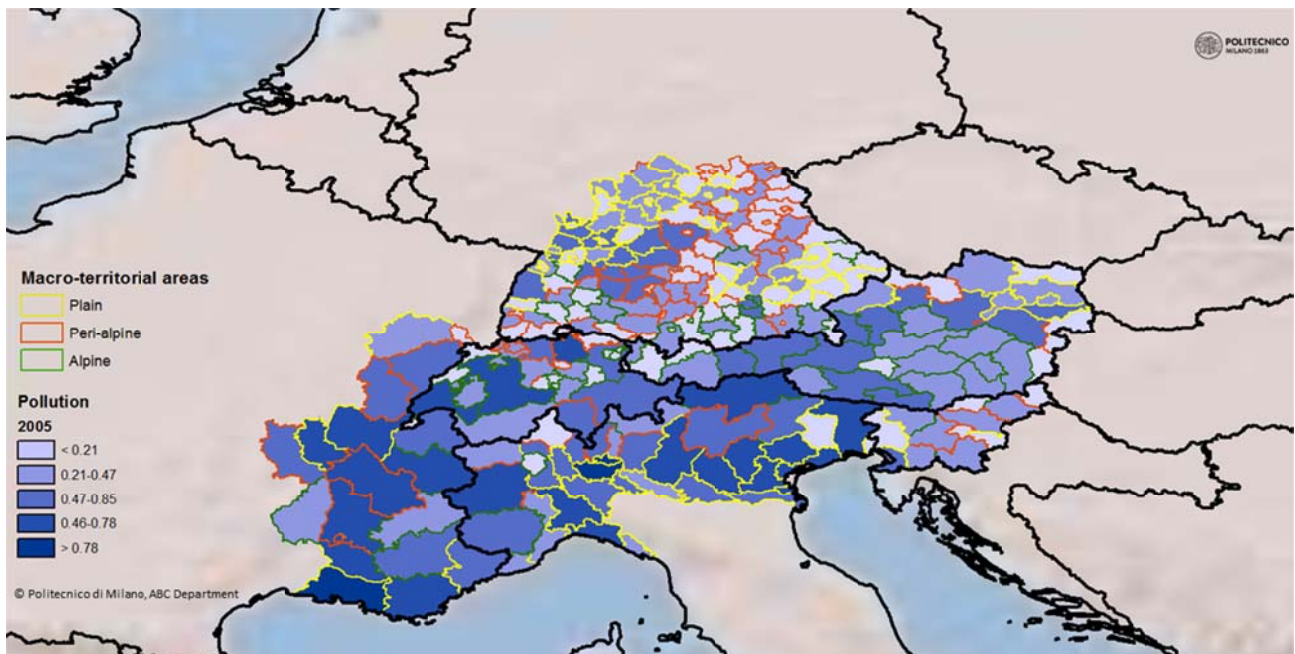


Data source: ESPON, TIPTAP (Territorial Impact Package for Transport and Agricultural Policies)

This picture is consistent with the data on settlement structure and land use, since it can be expected that more “artificial” areas are also particularly subject to traffic, congestion and pollution. Touristic traffic should also be taken into consideration in the Alpine area. Given the size of touristic presence with respect to inhabitants in winter and summer seasons.

To get a clearer idea on the micro-territorial distribution of pollution, the indicator is represented in Map 13. The situation looks particularly serious in French and Italian Plain regions (Marseille and Milan areas in particular), while it looks better in the Alpine macro-territorial area.

Map 13. Pollution – 2006



6.2 Conclusions on environmental quality: a sketch of the results

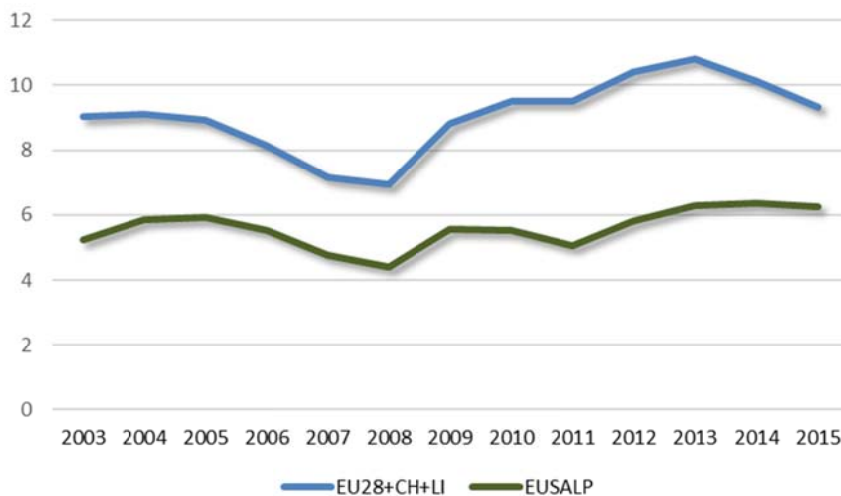
EUSALP is a relatively congested and (up to a certain extent) polluted area with respect to Europe. As could be expected, this result is mainly due to the more urbanised **Plain** area, while the greener **Alpine** region registers the best performance in terms of congestion and especially pollution levels. The **Peri-alpine** sub-region places itself in an intermediate position for both performance indicators analyzed.

7. Thematic policy domain 5: social inclusion

7.1 Performance indicators: unemployment rate and crime

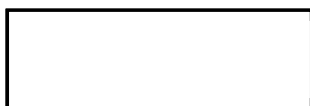


In EUSALP, social distress – measured through unemployment rate – is lower with respect to the rest of Europe (Figure 53). In particular, the two unemployment rates lines presented in Figure 53 show a similar trend in time, but the distance between the two was slightly striking up to 2008 but was enlarging again thereafter.

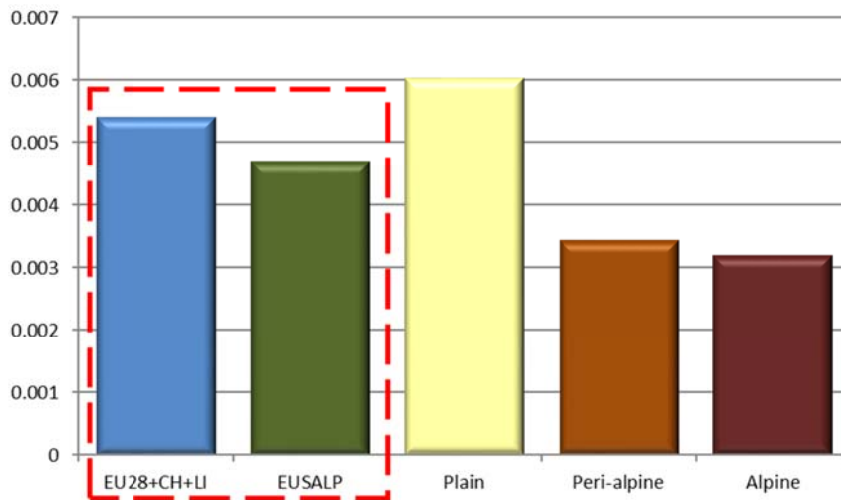


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Data source: Eurostat



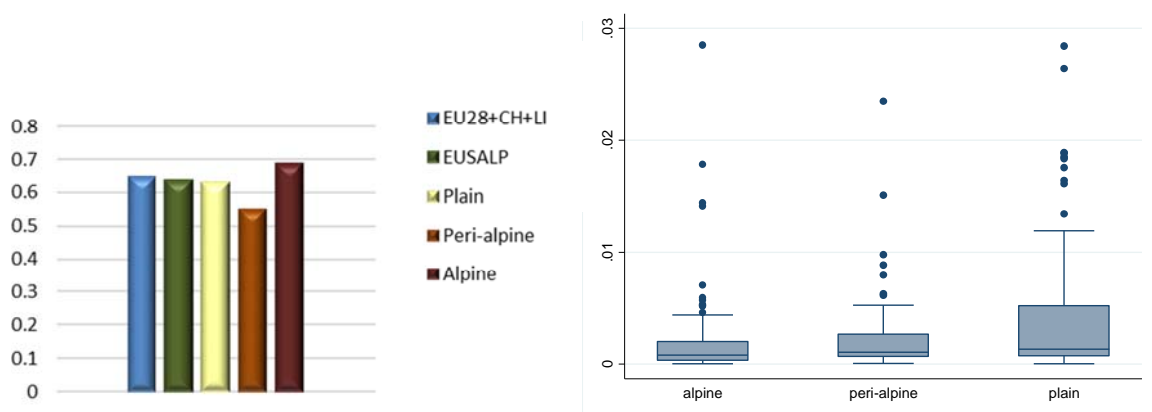
As for another indicator of social performance (once again to be interpreted as a negative performance) – crime – Figure 54 reports the number of crimes (intentional homicide, robbery, burglary, theft of vehicle) per 100,000 residents in the 2008-2010 period. As can be easily seen, EUSALP is relatively more secure with respect to the rest of Europe, with rather different situations in the three macro-territorial areas. The Plain is, indeed, less secure, due to the presence of large urban agglomerations. Figures 55a and 55b show that the spatial inequality within the single macro-territorial areas is very similar among them.



Data source: Eurostat

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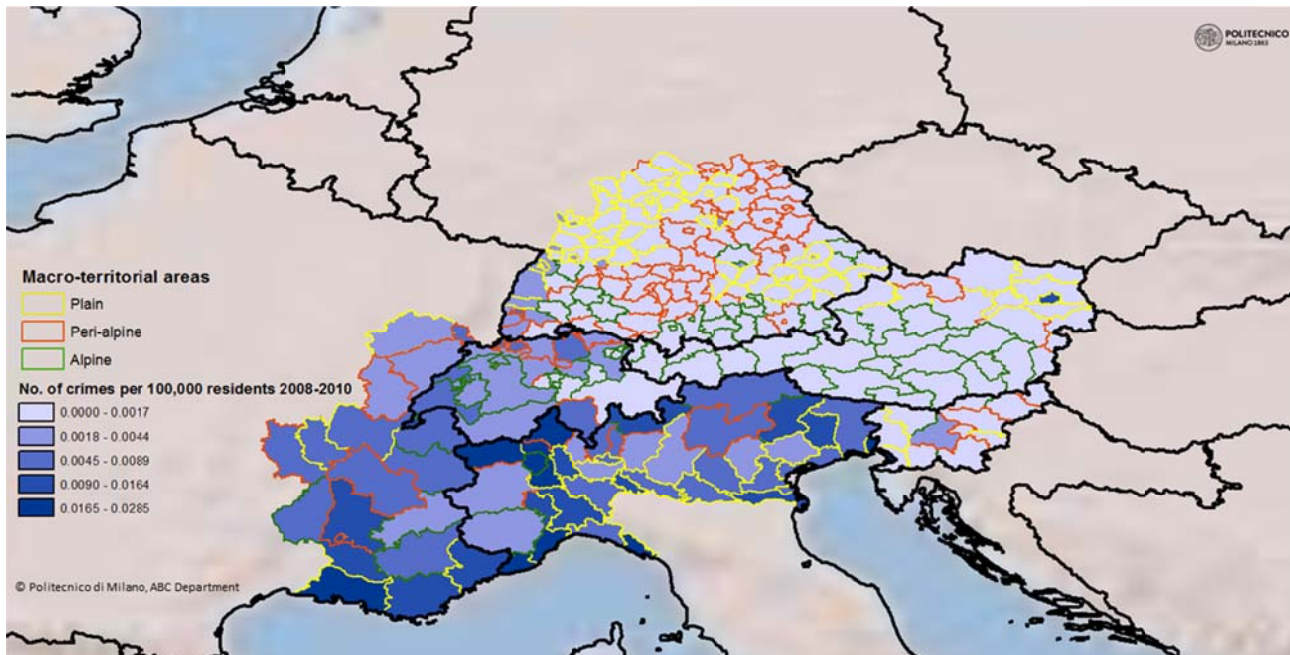


Data source: Eurostat

A more precise representation is provided at the micro-territorial level in Map 14. Here there seems to be a sort of south-west – north-east divide, with the first region being more seriously affected by crime and the second being more secure. Remarkably, most of the Alpine macro-territorial area falls in the second category.

The overall situation in terms of social distress (unemployment rate and crime) can be the result of different conditions (e.g. cohesion, altruism, historical and cultural values), that are analyzed in the following section.

Map 14. Number of crimes per 100,000 residents, 2008-2010



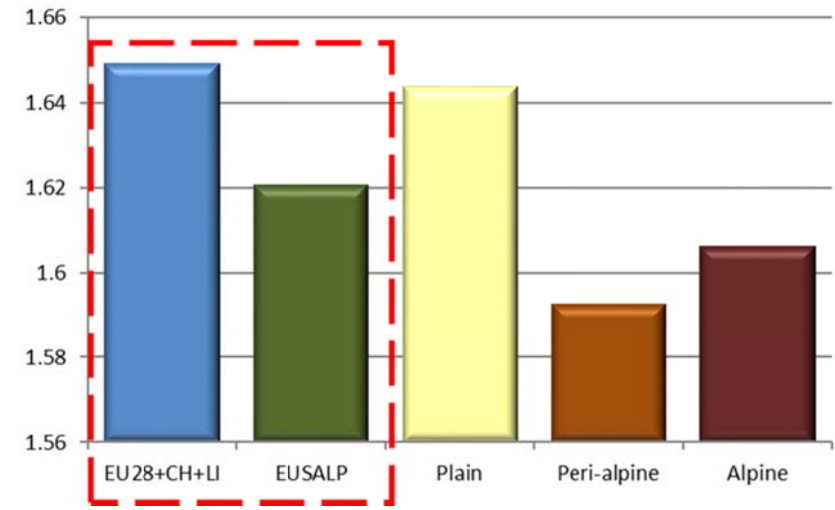
7.2 Social assets: cohesion, ecological consciousness, historical and cultural values

Social inclusion is meant in this study as a condition of social cohesion (measured through trust), ecological consciousness (measured through volunteering for the environment), richness in historical and cultural values (measured as existing cultural heritage and cultural events), openness to sociocultural diversities.



The first asset analyzed here is social cohesion, represented through “trust”. The share of respondents in the European Value Survey (EVS) 2009 claimed that “people can be trusted” are those saying that “you cannot be too careful”. As shown in Figure 56, EUSALP is less cohesive than the rest of Europe, with a rather different situation in the three macro-territorial areas. Trust is higher in the Plain macro-territorial area (as high as in the reference area), while the Peri-alpine and the Alpine sub-regions show a significantly lower level (Figure 56). The Alpine registers also very diversified internal situation (Figures 57a and 57b).

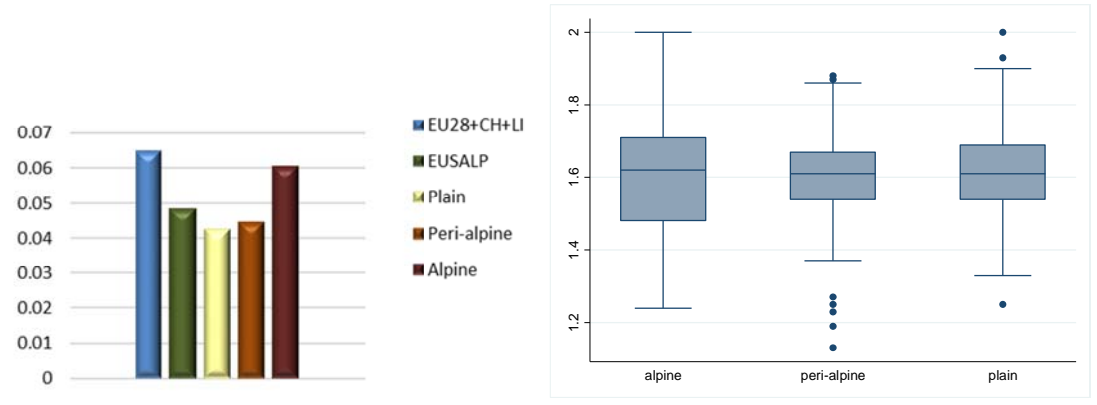
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Data source: European Value Survey, 2009.

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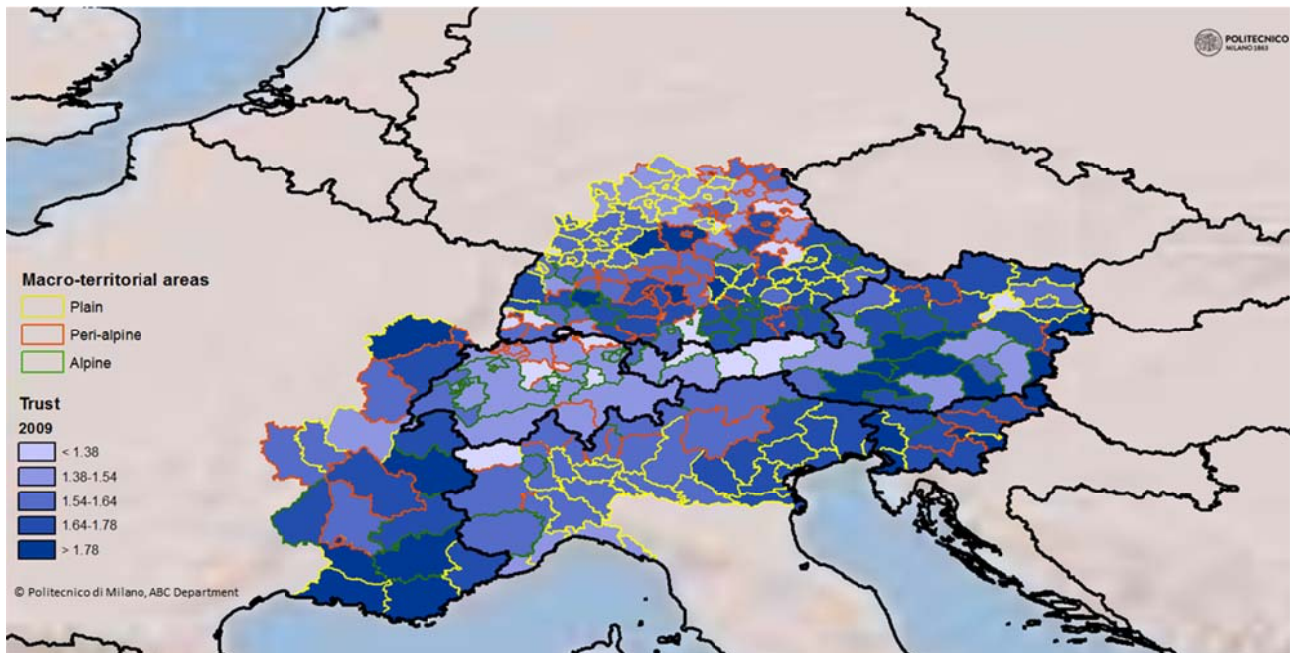
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Data source: European Value Survey, 2009.

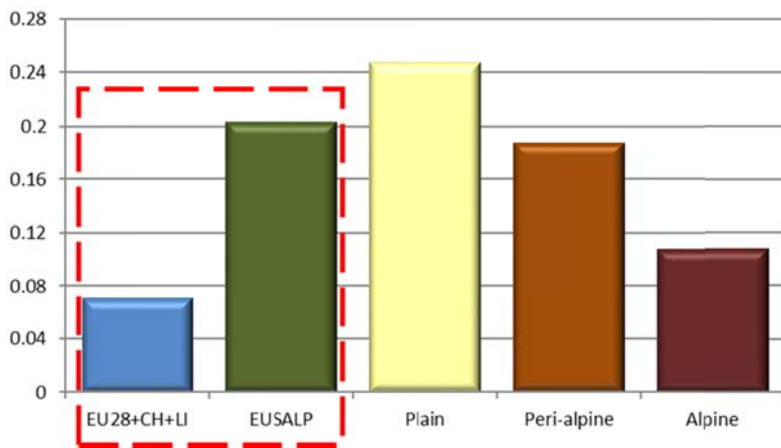
To investigate the picture in greater depth, the micro-territorial situation is represented in Map 15. The Plain macro-territorial area looks in fact characterized by higher trust, especially in French and north-eastern Italian regions. Much lower levels of trust are registered in the Alpine area, especially in Switzerland and western Austria, but also in the Northern German regions inside the Plain area.

Map 15. Trust – 2009



As for ecological consciousness, it was measured as the share of people volunteering for environment, ecology, or animal rights (EVS 2009). This kind of ecological attitude can be in a sense considered as a luxury good (you can “afford” to take care of these issues only if you do not have other kinds of more material problems). Consistently, these virtues are much more present in a rich area such as EUSALP, that presents a value of 20% with respect to a mere 7% in Europe (Figure 58).

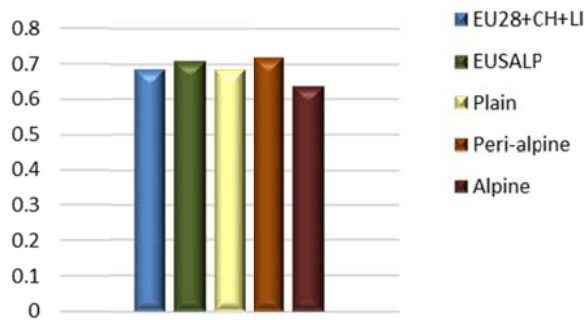
Within EUSALP, the Alpine area – despite its wealth – shows a lower environmentally consciousness propensity with respect to the other areas (about 10%), while the Plain registers a definitely greater volunteering attitude (more than 24%). Beyond wealth, another relevant factor determining this attitude is likely to be an urban condition and culture. Figures 59a and 59b display respectively the spatial diversification and the distribution of the observations for this indicator. The spatial distribution comes out to be very homogeneous inside and among the macro-territorial areas.



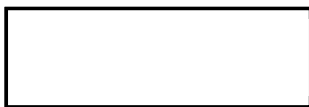
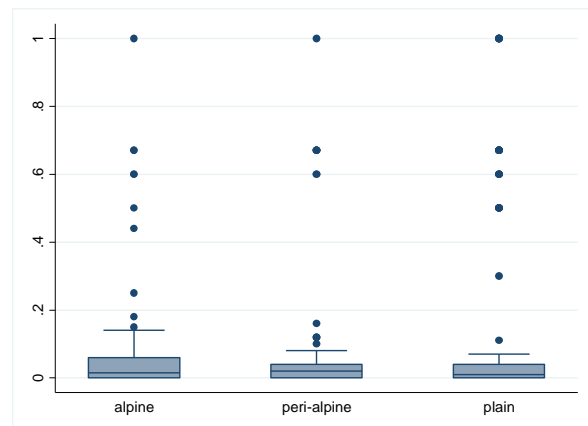
Data source: European Value Survey, 2009.

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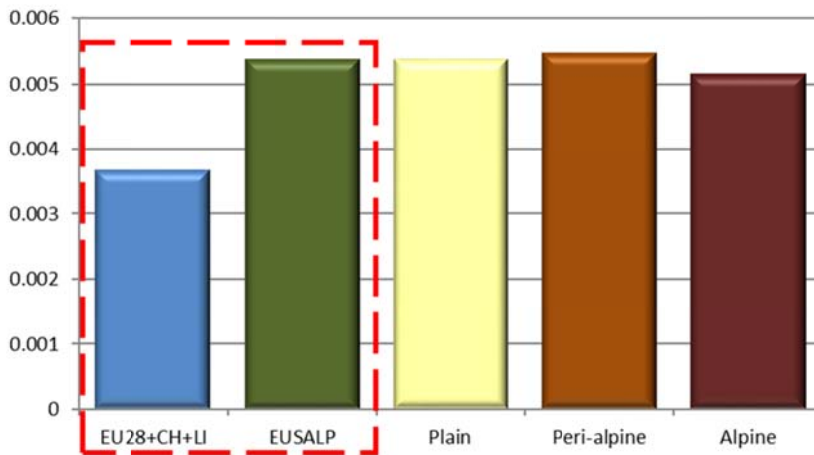
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Data source: European Value Survey, 2009.



The relevance of historical values was measured as cultural heritage, in terms of number of monuments per capita. EUSALP shows a value which is 45% higher with respect to the rest of Europe (Figure 60).

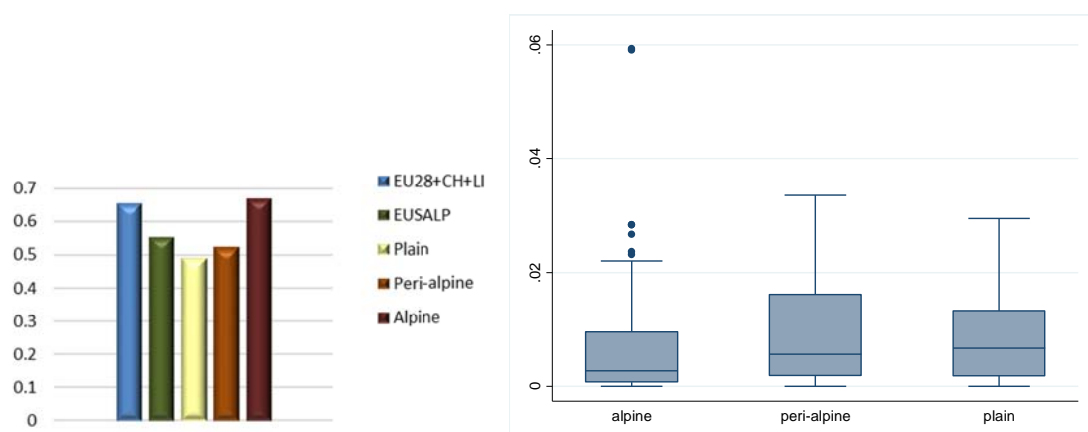


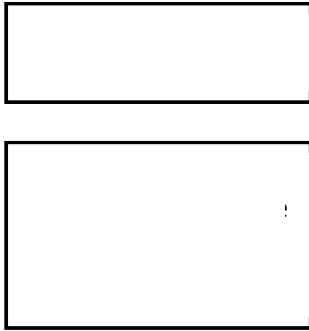
Data source: ESPON project 1.3.3, Impacts of cultural heritage and identity

The three macro-territorial areas do not show relevant differences: cultural heritage is present in Plain, Peri-alpine and Alpine macro-territorial areas more than in the rest of Europe. Figures 61a and 61b show the spatial diversification and the distribution of the observations for the different areas, respectively. While the Plain and Peri-alpine macro-territorial areas look quite homogeneous, cultural heritage in the Alpine sub-region turns out to be more concentrated.

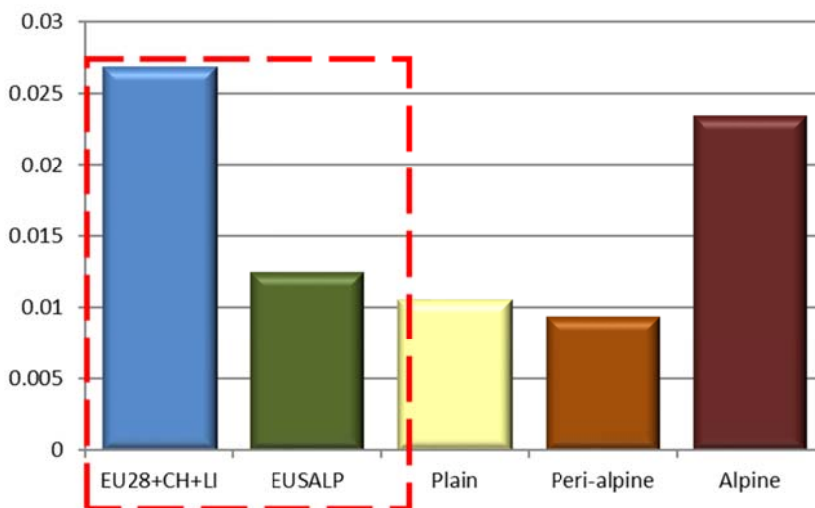
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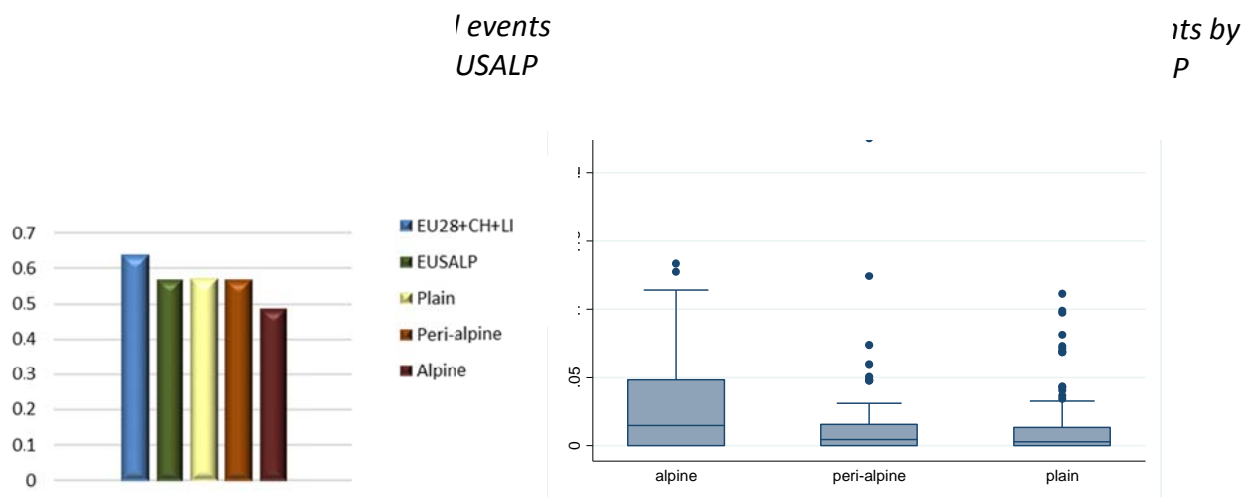


A different picture emerges for what concerns the **cultural values**, measured as the number of cultural events per thousand residents. EUSALP on average shows a much lower value of cultural values. In fact, it accounts for less than half of the cultural events with respect to Europe (Figure 62). The cultural events, however, are spatially concentrated in the Alpine region. Traditional festivals in mountain villages, musical and theatrical events in cities, indeed, take place within this macro-territorial area. These aspects can be both exploited for and explained by its touristic nature (specialization). Figures 63a and 63b show the spatial inequality of cultural values within each macro-territorial areas: there do not seem to be particularly relevant differences in terms of distribution, although the Alpine macro-territorial area is slightly more homogeneous as far as this specific indicator is concerned.



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Data source: ESPON project 1.3.3, *Impacts of cultural heritage and identity*



Data source: ESPON project 1.3.3, Impacts of cultural heritage and identity

7.3 Conclusions on social inclusion: a sketch of the results

EUSALP shows a much lower social distress (unemployment and crime) with respect to the rest of Europe. Overall, the region is less open and cohesive (lower trust), but more environmentally involved (higher ecological consciousness). It also shows higher historical traditions, but a lower attention to cultural events.

The area registers different situations in the different in the macro-territorial areas. The **Plain** area is a relatively cohesive and open (trust) area. It shows high historical values, but it is also subject to a greater social distress in terms of crime, due to its urban-agglomerated nature. A different picture is obtained in the **Alpine** macro-territorial area. This mountain area is instead scarcely open and cohesive (trust), but shows the lowest level of social distress (crime and high density of cultural events), that are exploited for tourism. Finally, the **Peri-alpine** area registers a relatively low level of crime, associated to the lowest level of trust, and the lowest organisation of cultural events.

8. Conclusions and seeds for a policy strategy

In this study the richness of economic potential of EUSALP clearly emerged. **EUSALP** is a wealthy and dynamic area, which managed to go through the crisis without too hard sacrifice and was able to recover in 2013, reaching the GDP levels and overcoming the employment levels of 2008.

The area as a whole presents a wide array of potentialities. It registers an incredible productivity level, even if decreasing during the crisis; it is an impressively innovative area, both in terms of new knowledge produced as well as of market innovation, with a clear technological vocation with respect to Europe as a whole.

EUSALP is also characterised by a relevant presence of industrial activities, the main recipients of its research potential, evenly distributed throughout the three macro-areas. Its industrial specialization and the relatively large size of the sector, weighting nearly one fourth of overall GDP, can explain the decrease in productivity during the crisis period, when the industrial sector was hit by the strong contraction of international trade. At the same time, even in presence of the crisis, the competitive advantage of the sector allowed a better performance with respect to the European industry. This economic profile generated a clear attractiveness of the area in terms of population in the whole macro-region.

The strength of EUSALP economy also lies on the wide complementarities that exist both among sectors - presenting an astonishing variety of activities – and among the three macro-territorial areas that were devised on the basis of geo-morphological indicators (elevation, share of unusable land and distance from Alpine peaks. In fact, EUSALP encompasses a rich, dynamic and advanced **Alpine area**, with clear vocations in touristic and agricultural activities, which do not prevent a relevant presence of industrial, financial and advanced service activities, including applied research and market innovation processes. Around the Alpine core area lies a **Peri-Alpine area**, with a leadership in basic science, patenting and general purpose technologies, backed by a performing industrial sector and efficient financial activities. Finally, EUSALP also lies on a rich **Plain area**, presenting large and medium-large urban settlements generating agglomeration economies on which the competitiveness of the economic fabric relies. This macro-area is characterized by a North-South divide in terms of innovation processes: a Northern part, mainly generating new knowledge according to a science-based pattern, and a Southern one, smartly applying to local industries knowledge sourced outside, favouring strong internal innovation.

The three macro-areas are widely homogeneous internally, even if, in some specific cases like R&D facilities and financial centres, location of the related activities are spatially concentrated in a network of urban poles. In spite of the existing complementarities among economic activities inside the single macro-territorial areas, particularly in the industrial innovation and touristic filières, further integration potentials could be achieved through “cross-areas complementarity networks” – intended as cooperation agreements between complementary activities emphasizing specialization and division of labour - and through “wide area synergy networks” – namely cooperation among similar activities inside each single macro-territorial area, allowing the reach of a superior critical mass.

For what concerns, “**cross-areas complementarity networks**”, we envisage the following opportunities:

- **complementarity between knowledge creation and application processes**, based on a network link between advanced research centres (particularly in the Peri-alpine area), universities, mainly present in large urban areas (Plain) and dispersed industry, taking advantage of existing excellences, agglomeration economies and major accessibility nodes;
- **linkage between industrial/touristic specialization and accessibility**. The Plain, with its harbours and airports can reinforce its role of gatekeeper for the industrial activity of the whole EUSALP area, and for the worldwide touristic activity of the Alpine area;
- **cooperation between science based activities and touristic services**. Large opportunities exist to modernise the touristic activities of the Alpine area with the science-oriented nature of the entire macro-region, by guiding innovation activities to upgrade ski-infrastructure and to provide new touristic smart services;
- **linkage between the communication-commercialisation filière and small and medium enterprises in agriculture and tourism services**, the former mainly located in large urban areas and the latter mainly in the Alpine and Plain areas, in order to strengthen market innovation;
- **complementarity between research in bio-technologies and agricultural activities**, to the advantage of the Alpine and the Plain areas;
- **complementarity between energy, construction and forest industries**, allowing developments in sustainable and green construction.

The study shows also possibilities in terms of “**wide area synergy networks**”, linking firms acting in similar sectors achieving economies of scale and scope. The sectors in which these synergies are likely to be more easily achieved are:

- **scientific research and high education**, enlarging the flow and sharing of students and researchers, integrating basic scientists and applied scientists, and merging competences in related and complementary fields;
- **touristic services**, integrating through new organizational and logistic innovations spatially proximate areas, and/or complementary in the typology of services provided (lake / sea / mountain / cultural tourism);
- **exchange of good organizational and technical practices in services of general interest**, like health, urban and spatial planning, environmental planning, transport infrastructure and management of cultural heritage;
- **cooperation among public administrations in the coordination and integration of legal and administrative systems across borders**, a cooperation that the study proved to be crucial: in fact, huge losses in GDP could be avoided through limited investments of a mainly organizational character.

Of course, single regions inside EUSALP and the single macro-areas present specificities and particular needs which require a place-based approach. This is why the entire EUSALP community should embrace the place-based strategy in a convinced way, merging the knowledge and capabilities of local intermediate institutions and actors with on the one side common methodology and guidelines in order to more easily devise the better strategies for each place, and on the other side with a general vision for the specific macro-areas and regions of the EUSALP space.

As was underlined in the study, EUSALP presents an actual economic strength and a potential for future growth and modernization comparable with the Northern area of the large capitals of Europe (London, Paris, Brussels, Berlin). This potential, if supported by a strong political will, could allow the macro-region to upgrade its decision-making power inside the Union, counterbalancing the power of the Northern area.

Beyond political will, which is in the hands of policy-makers, a crucial precondition for achieving this result lies in the psychological attitudes of people and collectivities of the macro-region. Enhancing trust with neighbouring regions and countries and reinforcing an Alpine identity building process should become a priority in the political agenda in the near future.

The study has provided an interesting picture of the macro-region, with its potentialities, both in terms of socio-economic, natural and cultural resource endowment and socio-economic performance. The results open to **possible future research questions**, that could encompass:

- the identification of **the most important and strategic resources that explain the relatively good socio-economic performance of the macro-region**. By taking into consideration the different types of development models that have emerged by the present analysis (e.g. knowledge driven development model; touristic/natural development model; industry-driven model), it would be interesting to highlight: i) which areas belonging to specific development models are able to use in the most optimal way the strategic resource typical for that development model; ii) which areas, instead, use the strategic resources in a suboptimal way; iii) which complementary resources are strategic for that type of development model, and whether areas based on this development model are sufficiently endowed of these complementary resources; iv) whether areas are able to use their complementary resources in an efficient way. An analysis like this allows a **more in-depth understanding of specialisation of the macro-region and of its macro-territorial areas, and of the success of the area**;
- the measurement of **the strategic resource integration level** of the EUSALP area. By this an analysis is intended of the degree to which the areas belonging to the macroregion are integrated in terms of resource exploitation. In other words, it would be interesting to understand if NUTS3 regions within the macroregion are able to use resources of other NUTS3, and if this happens among similar or complementary regions. The integration

- concerns both inter and intra-macro territorial level (**more in-depth understanding of integration/cooperation of the macro-region and of its macro-territorial areas**);
- a last interesting analysis could be the measurement of **trade integration**, of the degree of openness of EUSALP and of its single areas.

The three above mentioned research lines would allow to develop important normative suggestions. The identification of the degree of efficient exploitation of strategic resources and of the presence of complementary resources for each type of development model could be extremely useful to reinterpret the smart specialization strategy towards a resource-based strategy rather than an industry-based strategy, as it is mostly the case in the way it is now conceived.

The second and third research lines, instead, would help an in-depth analysis and understanding of the integration / cooperation level, which would certainly lead to an identification of the right cooperation strategies both among and within macro-territorial areas based on already existing integration capacities and cooperation willingness.

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