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Economic growth and innovation in EUSALP: Local specificities and growth assets for the competitiveness of the macro-region

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Abstract

In the last ten years the European Union has devoted specific attention and resources to the establishment of so-called *macro-regional strategies*, with the aim of joining together particular transnational areas according to a functional rather than administrative perspective. The present work is the first one that – focusing on the youngest EU macro-regional strategy (EUSALP) – highlights strengths and weaknesses of the macro-region in terms of both performance and territorial assets. The analysis is based on an original database gathered at NUTS3 level. Given the geo-morphological heterogeneity of the overall region, the identification of three distinct macro-territorial areas (Plain, Peri-alpine and Alpine) allows a more meaningful analysis, with the final objective of providing some policy suggestions to improve the competitiveness of the whole area through a s*mart specialization strategy.*

JEL Classification: *R10, P25*

Keywords: *macroregional strategies, EUSALP, macroregional comeptitiveness*

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1 Introduction

In the last ten years, the European Union has devoted specific attention and resources to the establishment of the so-called *macro-regional strategies*. Such strategies aim at joining together specific transnational areas according to a functional rather than administrative logic (Faludi, 2013), in order to favour the cooperative and organized solution of common challenges. In particular, the idea is to incentivize coordination and effective management of resources and political instruments according to the 3 *NOs* approach: no new institutions, no new laws, no new funds (European Commission, 2009, 2013). Both EU members and non-EU countries can be part of a macro-regional strategy, on a voluntary basis. Since 2009 the European Union has established four macro-regional strategies, in the Baltic Sea Region (EUSBSR – 2009), in the Danube Region (EUSDR – 2010), in the Adriatic and Ionian Region (EUSAIR – 2014); and in the Alpine Region (EUSALP – 2015).

While the first three have been already analysed in depth,[1] EUSALP is still a rather unknown reality. This is the first empirical work with the aim to highlight its economic structure and performance. In particular, the present paper aims at identifying the territorial specificities of the EUSALP macro-area, determining its local peculiarities with respect to Europe in terms of *competitiveness* and *territorial capital endowment* – the last one defined as the set of local, tangible and intangible, public and private, assets that constitutes the specific growth potentials of an area (OECD, 2001; European Commission, 2005; Camagni, 2009)[2]. The overall effort is to guide the implementation of the macro-regional strategy of EUSALP towards the exploitation of the strong assets present in the region and the overcoming of the weaknesses.

The macro-regional strategy of EUSALP is presented in an official document, called the Action Plan, published by the European Commission in July 2015 (European Commission, 2015). The Action Plan is organised around three thematic policy areas: economic growth and innovation; mobility and connectivity; environment and energy. Each thematic area comprises a set of actions that signal the areas in each policy interventions could be extremely useful for enhancing the competitiveness of the macro-region, stressing common issues and problems that the area should tackle.

In a diversified area like the one of EUSALP, that goes far beyond the Alpine area—peri-alpine and plain regions, on both the Liguria and Adriatic Sea coasts, have been included in EUSALP—a common strategy to increase the aggregate competitiveness calls for the identification of strengths and weaknesses of each area. Paradoxically, in order to identify a common strategy, there is a need to separate the macro-region into different homogenous geographical-morphological areas, that hide socio-economic peculiarities that have to be taken into consideration to avoid erroneous comparisons in terms of weaknesses and strengths. Once each peculiarity is highlighted, the macro-region can be re-aggregated on the basis of possible *complementarities* and *synergies* among different resources that stem from each peculiarity and specificity, launching in such a way common strategies based on a place-based approach (Foray *e altri*, 2009, 2011; Foray, 2015).

This paper presents the first step of the above mentioned reasoning, leaving the identification of complementarities and synergies to a subsequent study. The effort in this work is to highlight

[1] For EUSBSR see Metzger (2012), Kern e Ganzle (2013), EPSON (2014), Stead (2014), Tursie (2015), and Studzieniecki (2016); for EUSDR see Busek e Gjoreska (2010), Kern e Ganzle (2013), and Tursie (2015); for EUSAIR see Gadaleta *e altri* (2017).

[2] This goes in the direction of implementing the first *policy domain* (economic growth and innovation) highlighted within the Action Plan for the EUSALP macro-region (European Commission, 2015).

strengths and weaknesses of a large and extremely differentiated region, encompassing seven different countries (France, Italy, Switzerland, Liechtenstein, Austria, Germany and Slovenia), two of which are not members of the European Union. The area is also characterised by a diversified geo-morphological structure, that can hide social and economic peculiarities that require to avoid the direct comparison between areas located in completely different geographic environments.

As a consequence, the empirical analysis is carried out on the basis of a threefold, multi-scalar, spatial breakdown, chosen since it hides different social and economic specificities:

- *macro-regional* (aggregated) scale, comparing the EUSALP entire macro-region with Europe;[3]
- *macro-territorial* scale, which distinguishes three macro-territorial areas, homogeneous for their internal geographical characteristics and different enough to be treated as separate systems: Alpine mountainous area, a Peri-alpine foreland and a Plain area; and
- micro-territorial scale, considering directly single NUTS 3 areas with all their specificities.

The work is organized as follows: Section 2 describes EUSALP, explains the original geo-morphological identification of the three macro-territorial areas developed for this work, and sets the scene in terms of economic characteristics of the macro-region and its three macro-areas.

Section 3 addresses the *economic performance* of the macro-region. Section 4 presents instead territorial assets indicators, that have to be conceptually kept clearly separated from performance indicators. Finally, Section 5 concludes, providing suggestions for the competitiveness of the EUSALP according to a *smart specialization* perspective, articulated in a territorial sense.

2 EUSALP and its macro-territorial areas

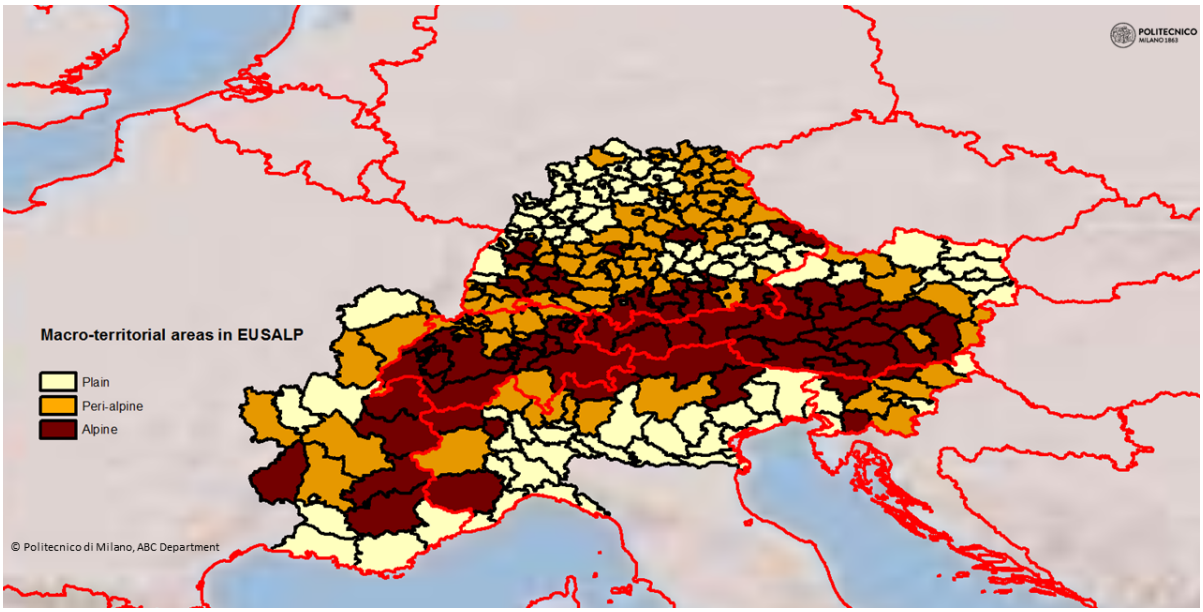
EUSALP is a very large and diversified region. Thus, in order to avoid the direct comparison between areas located in completely different socio-geographic environments, three macro-territorial areas were identified – relatively homogeneous in terms of their internal geographical characteristics and land use and different enough to be treated as separate entities. Two main criteria of a geo-morphological nature were used: elevation and share of non-usable land.[4] Working at the NUTS 3 level, 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 criterion, in order to guarantee mountain and green areas to be close to the Alpine chain: this criterion was identified in a maximum distance of 200 kilometres from NUTS3 regions with outermost highest peaks of the Alps.[5] Figure 1 provides the results of the three criteria. The thresholds chosen in each indicator to

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

[4] Non-usable land was considered as the sum of the following categories: green areas, rocks, wetlands, and land covered in water. The data were retrieved from the Swiss statistical office for Swiss cantons and from the ESPON re-elaboration of Corine Land Cover data for the rest of NUTS 3. For further information on Corine Land Cover and its nomenclature, the reader can refer to: , while for the Swiss data to: , both accessed 15 October 2018.

[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 criterion.

Figura 1: *The three macro-territorial areas of EUSALP*



Fonte: ???

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, in 2013.

EUSALP is a rich region. Figure 2 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 biased by the presence of Swiss cantons,[7] as one can appreciate 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.

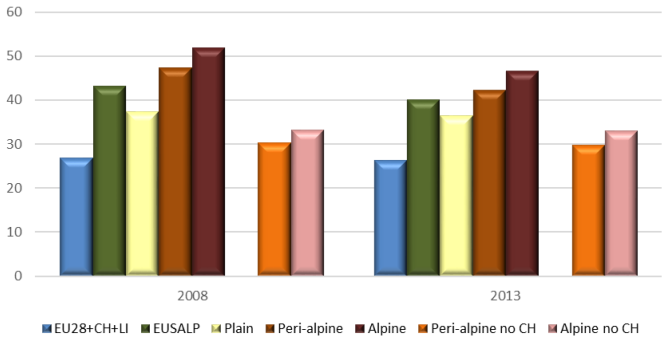
When one analyses the spatial distribution of wealth, one finds out that this is not even, even if it decreases over time (Figure 3). Overall, the inequality was similar in EUSALP in 2008 with respect to Europe, but decreased during the period, although we can notice again the relevant (biasing) role played by Switzerland. In fact, the most unequal macro-areas are the Peri-alpine and the Alpine areas; 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. Figure 3 shows the Gini coefficient measuring the inequalities in per capita GDP among NUTS3.

Starting from this overall picture, the next sections analyse the economic growth and innovation of the macro-region, taking into account its main characteristics according to a conceptual approach that firstly looks at some performance indicators (Section 3) and then relates EUSALP competitiveness with its possible sources (Section 4).

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

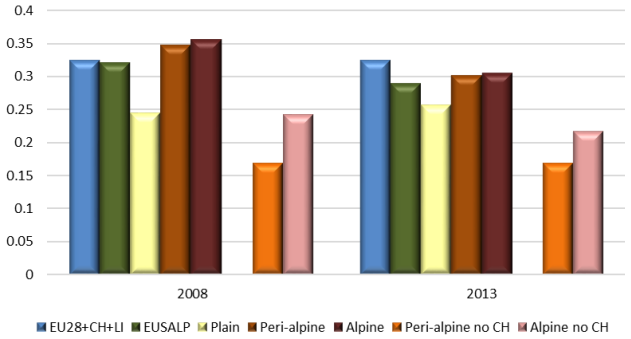
[7] Only one Swiss canton falls in the Plain macro-area, namely Basel.

Figura 2: *Real per capita GDP (thousand 2010 euros), 2008 and 2013*



Fonte: Eurostat and Swiss Statistical Office

Figura 3: *Spatial inequalities in per capita GDP - 2008 and 2013 (Gini coefficient)*



Fonte: Eurostat

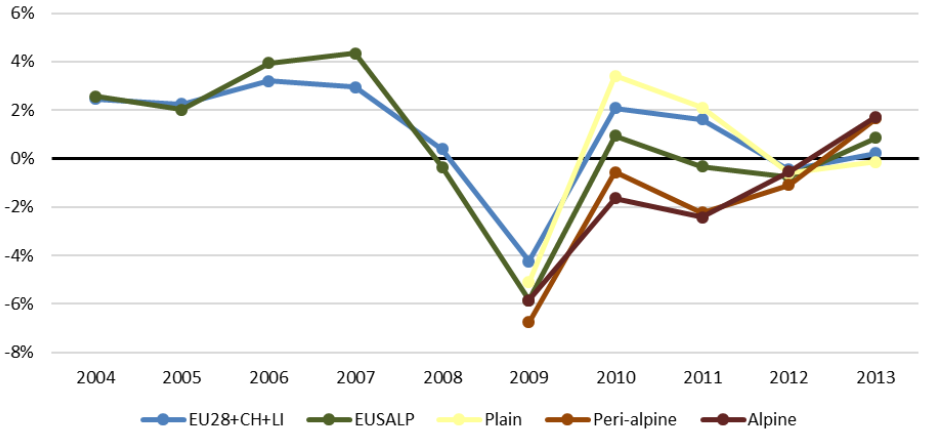
3 Performance indicators

Our characterization of EUSALP starts by analysing three classical performance indicators: *GDP growth, employment dynamics,* and *productivity.* As for GDP growth, EUSALP experienced a more significant loss with respect to Europe during the crisis, especially in its Peri-alpine and Alpine macro-territorial areas (Figure 4). 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 4). In order to interpret this result, the exchange rates of the Swiss franc with respect to the euro should be considered (Table 1). 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, in 2013 the recovery in this area is a real one.

Moving to the employment dynamics, the employment rates (computed as employment over population older than 15 years) in EUSALP are always significantly higher than in the rest of Europe (Figure 5), mainly thanks to the high rates especially of the Peri-alpine and Alpine areas. 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 5).

Within EUSALP there are different levels of spatial inequalities in employment rate, with a

Figura 4: *Annual real GDP growth rates (2004-2013*



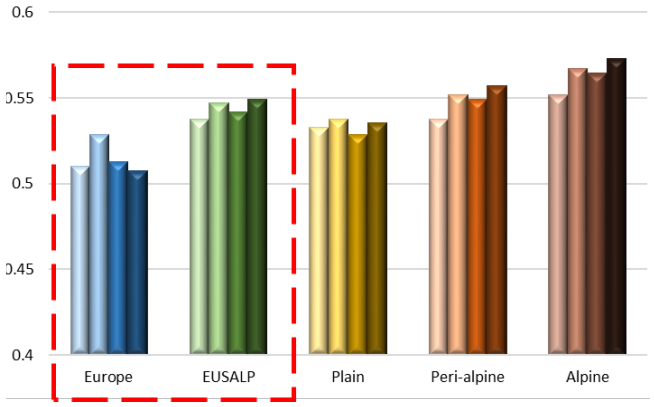
Fonte: Eurostat

Tabella 1: *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

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

Figura 5: *Employment rates by geographical areas (2003-2007-2010-2013)*

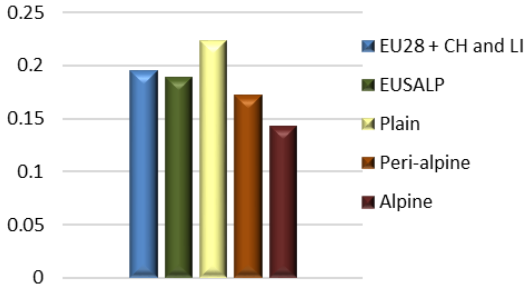


Fonte: Eurostat. Employment rate is computed as employed persons over population older than 15 years.

clear ranking, showing the highest inequality in the Plain, even higher than in Europe, followed by Peri-Alpine and Alpine (Figure 6).

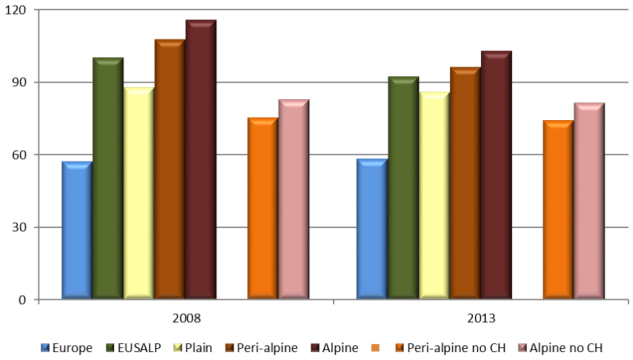
In terms of *productivity* (measured as GDP per worker), EUSALP performs again much better than the reference area, being its level of productivity 70% higher in 2008 and almost 60% higher in 2013 (Figure 7). This is the case for all the macro-territorial areas, particularly for the Alpine, followed by the Peri-Alpine. However, this result is again driven by Switzerland. In

Figura 6: *Spatial inequalities in employment rate - 2013 (Gini coefficient)*



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

Figura 7: *Real GDP per worker (thousand 2010 euros)*



Fonte: Eurostat.

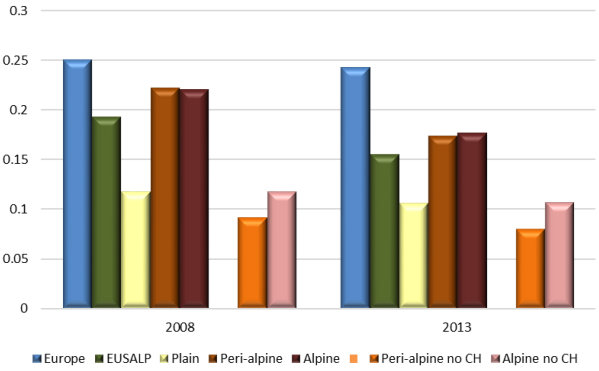
any case, if this effect is taken away, both EUSALP and the single macro-territorial areas show higher productivities with respect to Europe. Between 2008 and 2013 productivity decreases in EUSALP while it remains stable in Europe (Figure 7). This result is due to a double effect: a decrease in GDP and 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).[8]

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. Figure 8 shows the spatial inequality in productivity levels over time in all three macro-territorial areas. Inequality decreases within EUSALP and, 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.

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 (Figure 9). 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

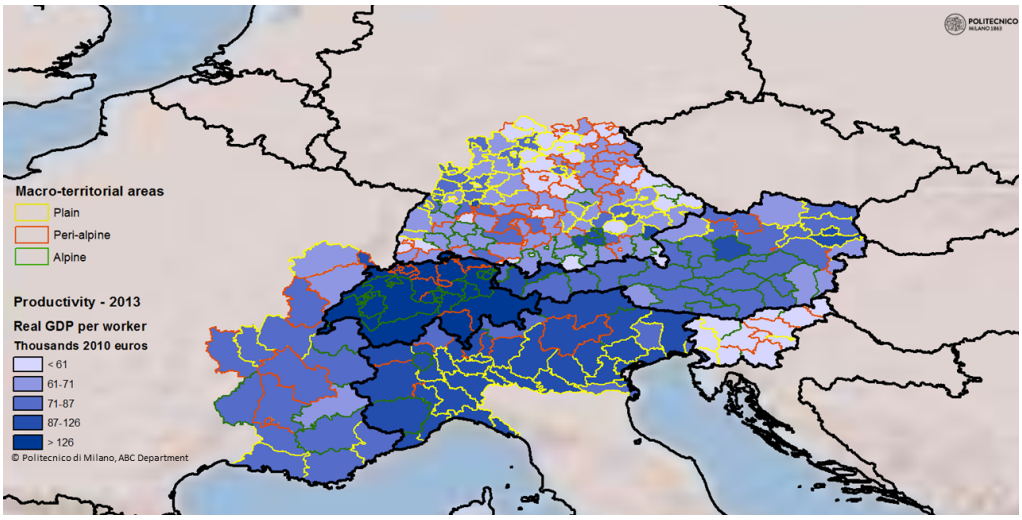
[8] Growth rates of employment during the crisis (2008-2013) are in the following numbers: Europe – 0.55%; EUSALP +0.4%; Plain +0.32%; Peri-Alpine +0.41%; Alpine +0.58%.

Figura 8: *Spatial inequality in real GDP per worker by macro-areas – 2008 and 2013 (Gini coefficients*



Fonte: Eurostat.

Figura 9: *Spatial inequality in real GDP per worker by macro-areas – 2008 and 2013 (Gini coefficients)*



Fonte: Eurostat.

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 philosophy of prioritizing employment levels with respect to productivity during the crisis.

Starting from this overall picture, the interest in identifying the possible sources of the (different) levels of productivity observed emerges. The next section investigates indeed the endowment of territorial growth assets in terms of local assets, and in particular the main sources of competitiveness: innovation, human capital, sectoral and functional dynamics and agglomeration economies.

4 Territorial growth assets

4.1 Innovation Activity

Innovation is widely recognized within the existing literature as one of the main determinants of regional competitiveness.[9] Thus, looking at the innovative capacity of the EUSALP can definitely provide a first interesting interpretation key of the different levels of competitiveness highlighted above.

In this sense, 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 typologies recently introduced in the literature (Capello e Lenzi, 2013). Innovation patterns were defined as spatial breakdown of the single, logical phases of the innovation path—from invention based on new knowledge, to innovation, ending up to development—built on presence/absence of territorial preconditions for knowledge creation, knowledge attraction and innovation (Camagni e Capello, 2013; Capello e Lenzi, 2013). Five innovation patterns have been identified: 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 centres in applied scientific fields; and 5) a science-based pattern, where knowledge is primarily created by local firms, universities and research centres in science-based fields and general purpose technologies.

The innovation model mostly present in EUSALP is that of 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) (Figure 10). 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.

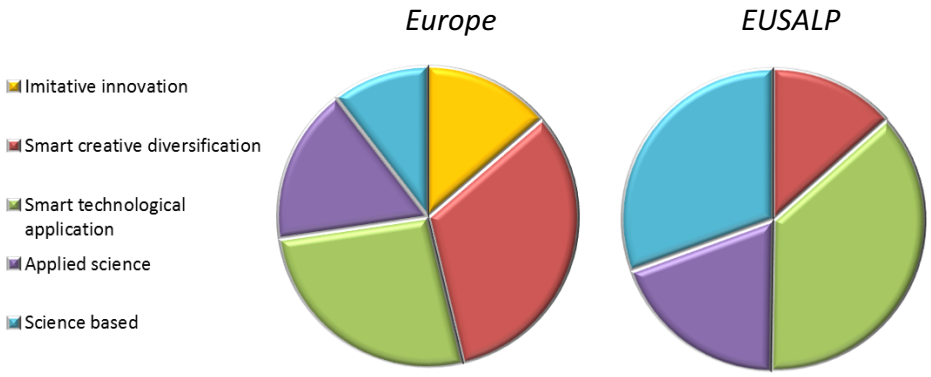
The distribution of the different innovation patterns within EUSALP is shown in Map 11.[10] The patterns seem to be highly dependent on countries, with German areas being mainly characterized by a science-based type of innovative behaviour (5); Austrian and Swiss areas mainly by an applied science one (4) and French, Italian, and Slovenian areas mainly by smart technological application (3) and also creative diversification (2). The innovation pattern data are available only at NUTS2. In order to go at a higher geographical disaggregation level, two additional 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

[9] For a comprehensive overview on the role played by innovation in economic growth, see (Fagerberg *e altri*, 2005; Sterlacchini, 2008).

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

Figura 10: *Alternative innovation patterns in Europe and EUSALP 2002-2004 (data weighted by population)*



Fonte: (Capello e Lenzi, 2013)

leadership in patenting also during the crisis, in spite of a generalized decrease of patenting activity. The strength of the Peri-alpine area results particularly remarkable, while Plain is the weakest within EUSALP, in any case still doubling the average European index. Moreover, the disparity in patenting activity within the single macro-territorial areas is limited, showing very homogeneous internal behaviour (Figure 13).

The situation can be analysed in greater territorial depth. This is done through looking at the NUTS3 level and the result is shown in Map 3. 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.

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 analysed (Figure 14), where the prominence of the Peri-Alpine area emerges with respect to the other two areas.

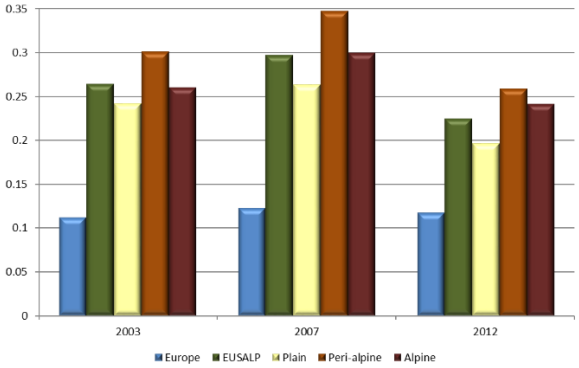
The spatial concentration of GPT research centres is shown in Map 15, where Grenoble in France; Heidelberg, Freiburg, Nuremberg, and Munich in Germany; Geneva and Lausanne in Switzerland; and Graz in Austria show a strong specialization in GPT patenting activity.

The second indicator—market innovation—is represented by *trademarks*. They are recognizable signs, designs and expressions that can be incorporated in a new product or service, mainly in terms of soft aspects related to differentiation (Stoneman, 2010).

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 **??**). This particular kind of innovative capacity increases also during the economic crisis, as is also pointed out in scientific studies (Stoneman, 2016).[11] 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.

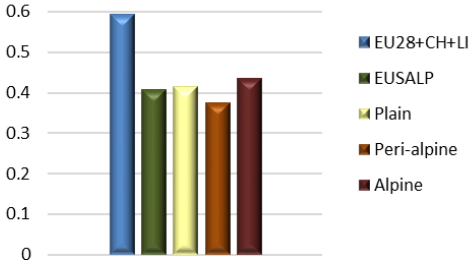
[11] According to the author, one might argue that "soft innovation" has been growing faster than functional innovation.

Figura 11: *Patents per thousand residents, by geographical areas. 2003 - 2007 - 2012*



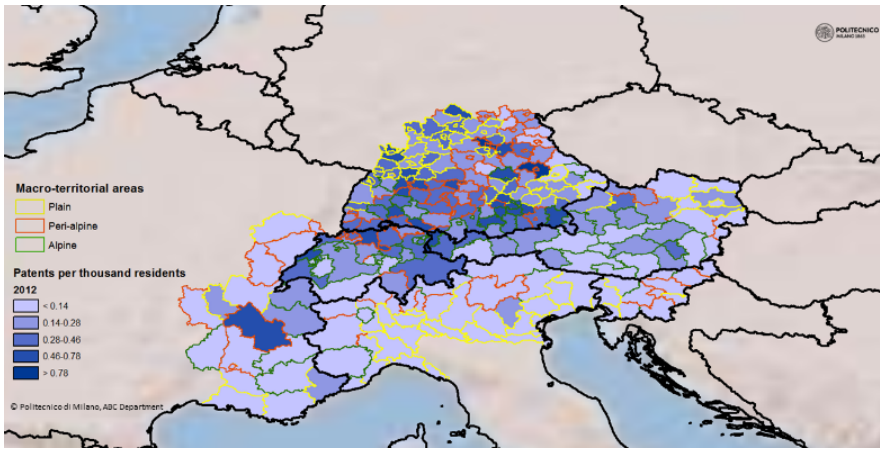
Fonte: Eurostat

Figura 12: *Spatial inequality in patents per thousand inhabitants – 2012 (Gini coefficient)*



Fonte: Eurostat

Figura 13: *Patents per thousand residents in 2012*



Fonte: ???

The Plain registers a relatively better trademarking performance with respect to the Peri-alpine and the Alpine areas in 2003 and 2007 while, interestingly enough, the Alpine region outperforms the other two areas in the most recent year (2013) (Figure 16). The spatial

Figura 14: *General Purpose Technologies (GPT) – 2012*

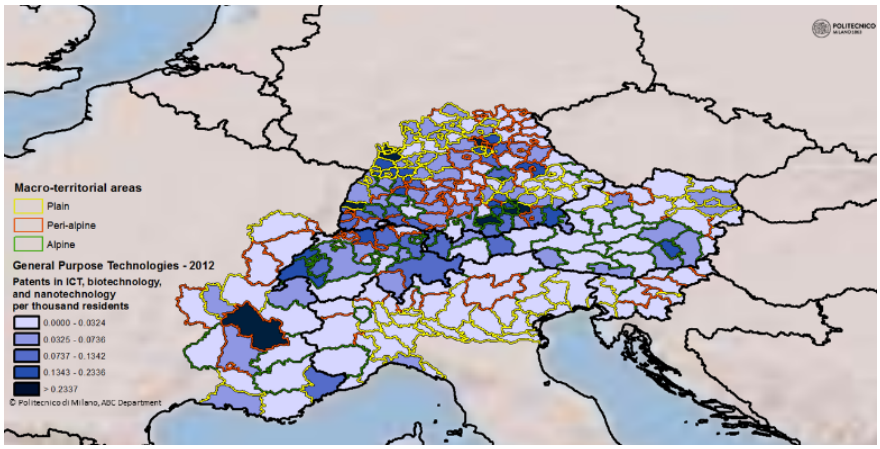


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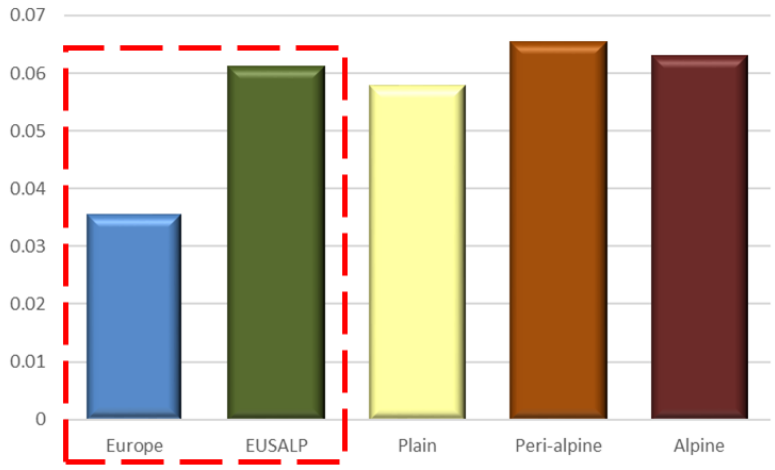
Figura 15: *General Purpose Technologies (GPT): patents in ICT, biotechnology, and nanotechnology per thousand residents – 2012*



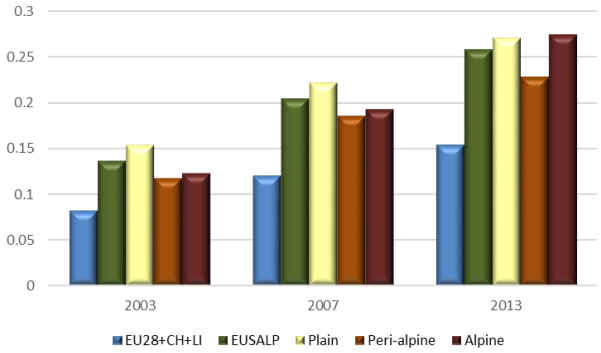
Fonte: Eurostat

distribution of trademarking activity is more homogeneous within EUSALP than in the rest of Europe (Figure 17). 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.

Also for market innovation a micro-territorial focus seems appropriate (Map 18). 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.

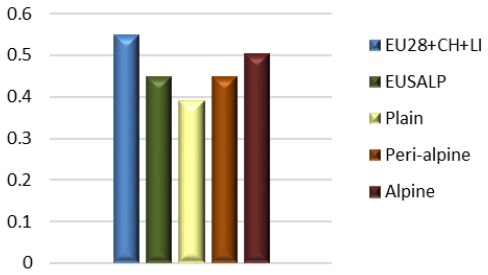
All in all, the relevant innovation activity—both in terms of knowledge generation through patents and market innovation through trademarks—could be one of the sources of greater EUSALP productivity with respect to the rest of Europe. If one compares productivity levels (Figure 7) with the patenting and trademarking activities (Figures 11 and 16) overall finds a

Figura 16: *Trademarks per thousand residents 2003 – 2007 – 2013*



Fonte: Eurostat

Figura 17: *Spatial inequality in trademarks per thousand inhabitants by geographical areas – 2013 (Gini coefficient)*



Fonte: Eurostat

possible explanation in the links between innovation and competitiveness. The characteristics of the three macro-territorial areas are in this sense strikingly similar, although a significant differentiation emerges among the single NUTS3 regions inside each macro-area (innovation activity is spatially concentrated).

Since innovative capacity is often linked to the availability of qualified human capital, the next section studies this additional characteristic of the EUSALP macro-region.

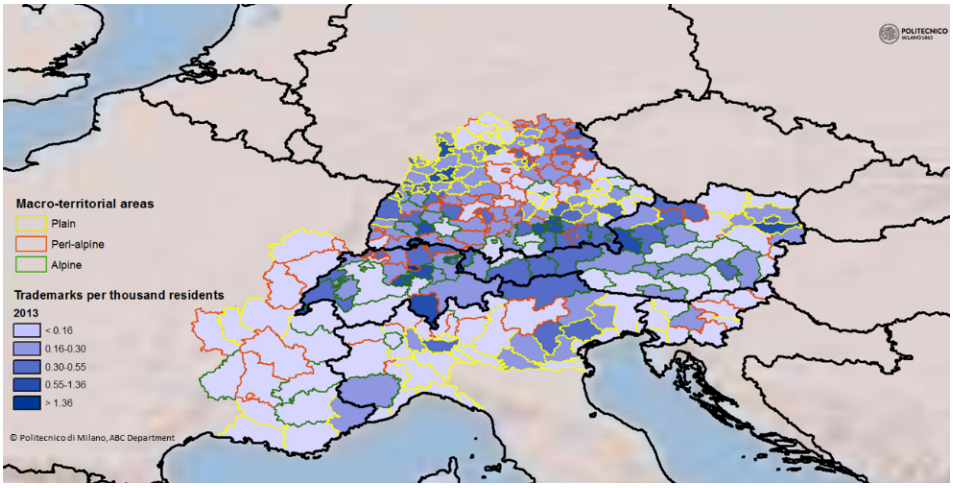
4.2 Human Capital

Another possible determinant of the different levels of productivity highlighted above is certainly human capital, that is widely recognized within the relevant literature as a fundamental asset for local development and growth and as strictly linked to innovation (Lucas, 1988; Rodriguez Pose e Crescenzi, 2008).

Analysing this particular resource in terms of share of tertiary graduated people, we notice that in EUSALP the value is slightly lower with respect to the rest of Europe (Figure 19). 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 20).

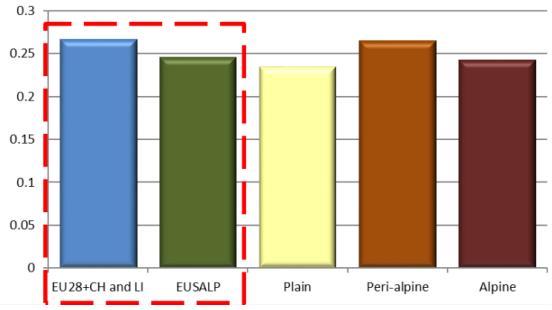
Thus, in this specific case, the outstanding productivity and innovative capacity noted

Figura 18: *Trademarks per thousand residents in 2013*



Fonte: Eurostat

Figura 19: *Share of tertiary educated people by geographical areas in 2011 (pop. 15-64)*



Fonte: Eurostat

above seem not to be reflected in a particularly high rate of educated human capital.[12] Given these results, we move on to investigate the specific sectoral and functional specializations characterizing EUSALP as a whole, as well as its different macro-areas.

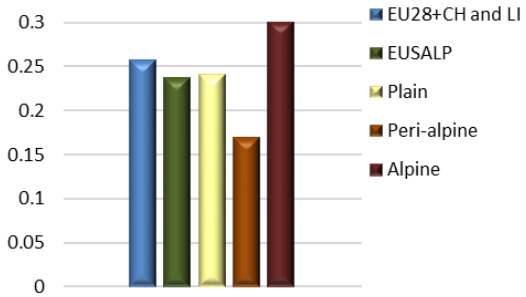
4.3 Sectoral and functional specialization

Sectoral and functional specialization are critical characteristics to be taken into account, as well. They determine, indeed, the peculiar production structure of an area and, as a consequence, deeply affect local performance.

Overall, and possibly quite unexpectedly, EUSALP is not specialized in agriculture (Figure 21), 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 22).

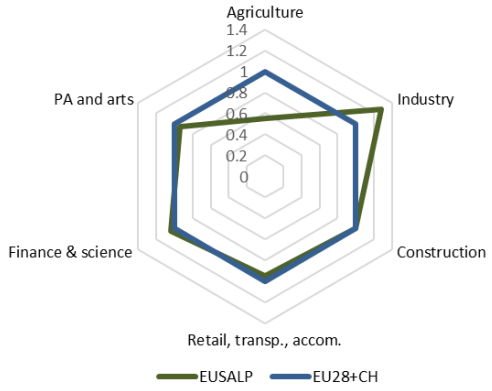
[12] This would probably deserve a more in depth analysis on the specific fields of higher education that are represented within EUSALP and in the reference area. Unfortunately, such fine data are not available.

Figura 20: *Spatial inequality in tertiary educated people by geographical areas in 2011 (pop. 15-64) (Gini coefficient)*



Fonte: Eurostat

Figura 21: *Sectoral specialization: EUSALP vs. Europe - 2013*



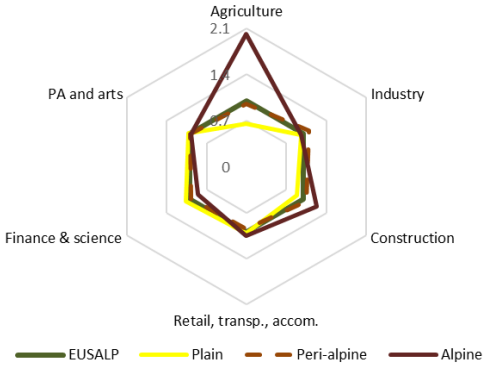
Fonte: : Eurostat and Swiss Federal Statistical Office.

Within EUSALP the picture of sectoral specialization—based on a location quotient of industrial employment—is only slightly differentiated with respect to the average (Figure 22). 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. The Peri-alpine area registers instead a slight specialization in industry, finance and science, while the Plain in finance and science (Figure 22).

In order to better understand the dynamics of the sectors of specialization in the three macro-territorial areas, Figures 18a, 18b, and 18c report a shift-share analysis (Perloff, 1957) with respect to Europe, based on employment indicators.

In order to better understand the dynamics of the sectors of specialization in the three macro-territorial areas, Figures 23a, 23b, and 23c report a shift-share analysis (Perloff, 1957) with respect to Europe, based on employment indicators. The charts allow to separate out two distinct sources for growth in a sub-area: i) a growth due to the competitiveness of its sectors (a *supply, differential, or competition 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*). In particular, when industries lay above the 45 degrees' line in Figure 23 we fall under case i, since these industries register a higher employment growth with respect to Europe.

Figura 22: *Sectoral specialization: The three macro-areas vs. EUSALP - 2013*



Fonte: : Eurostat and Swiss Federal Statistical Office.

"Dynamic" sectors at the European level (with an employment growth rate higher than the average), locate on the right of the vertical line in Figure 23. When they have a large share of employment in the region, they generate a positive mix effect (case ii).[13]

As can be observed from the figures, in all three cases the number of sectors registering a higher employment growth with respect to their European average 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 industrial specialization of the EUSALP and the relatively large size of the sector 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. 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. Apart from these cases, the overall trend of employment growth in the specialization sectors can provide indeed a good explanation of the positive competitiveness performance within EUSALP.

[13] For a thorough explanation of shift-share analysis the reader can refer to (Capello, 2016, , ch. 4, pp. 106-111).

Figura 23: *Sectoral specialization: The three macro-areas vs. EUSALP - 2013*

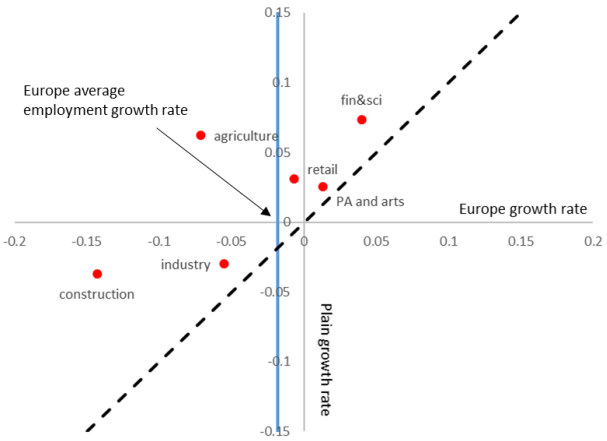
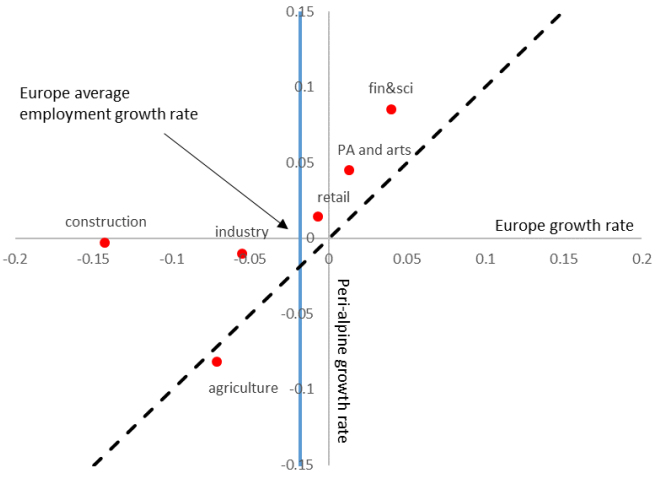


Figure a. Regional sectoral employment dynamics.
Plain *with respect to Europe (2009-2013)*

Data source: Eurostat.

Figure b. Regional sectoral employment dynamics.
Peri-alpine *with respect to Europe (2009-2013)*



Data source: Eurostat and Swiss Federal Statistical Office.

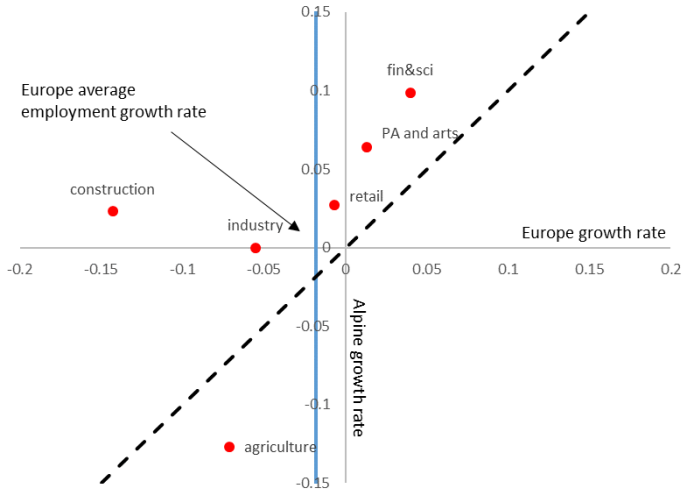
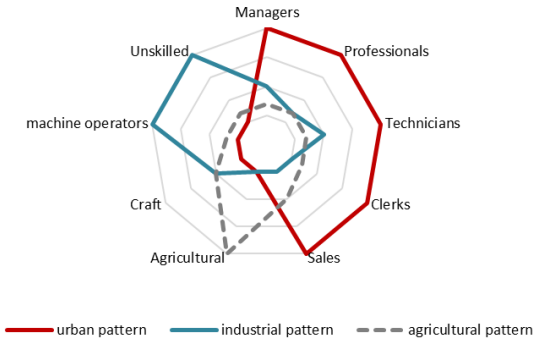


Figure c. Regional sectoral employment dynamics.
Alpine *with respect to Europe (2009-2013)*

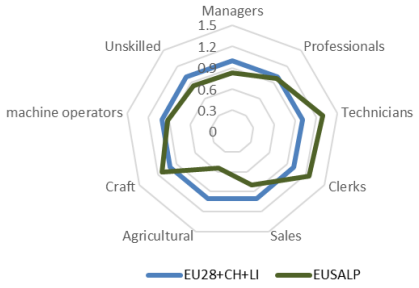
Fonte: : Eurostat and Swiss Federal Statistical Office.

Figura 24: *Functional specialization: abstract patterns*



Fonte: : ???.

Figura 25: *Functional specialization of EUSALP with respect to Europe*



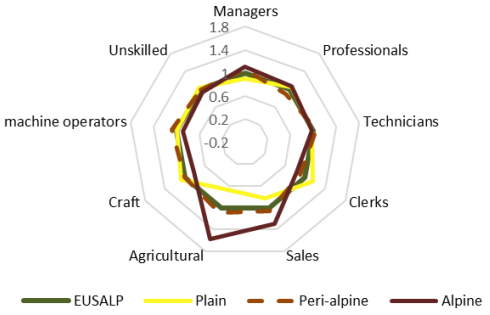
Fonte: : Eurostat, Swiss Federal Statistical Office, German Federal Statistical Office.

The functional specialization also plays a role; in fact, analysing the types of occupations present in a given area can provide very useful information on its characteristics in terms of the functional structure of the local labour market. In this particular case, a theoretical framework can be useful to interpret the emerging picture, graphically represented in Figure 24. We can, indeed, identify three theoretical functional specialization patterns:

- an urban pattern (mainly characterized by high-skilled functions),
- an industrial pattern (mainly characterized by industrial functions), and
- a pure agricultural pattern.

Having this abstract framework in mind, and comparing this theoretical chart to the one with real data for EUSALP on occupation of the labour force, according to the ISCO classification (Figure 25), we can see how EUSALP mainly shows industrial characteristics with respect to Europe. Fitting quite well into our conceptual framework for functional specialization, 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 26).

Figura 26: *Functional specialization of macro-territorial areas with respect to EUSALP*



Fonte: : Eurostat, Swiss Federal Statistical Office, German Federal Statistical Office.

Figura 27: *Indicators of agglomeration*

Figure a. Population density (inhabitants per km^2) - 2014

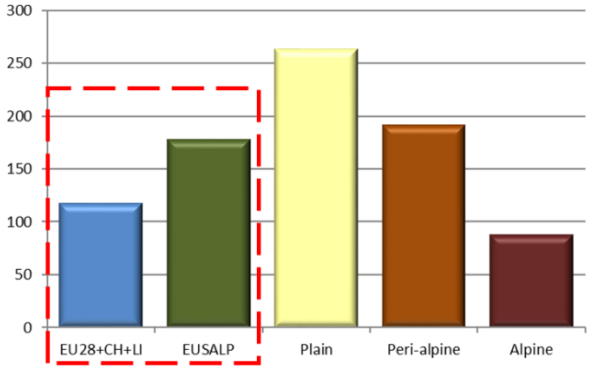
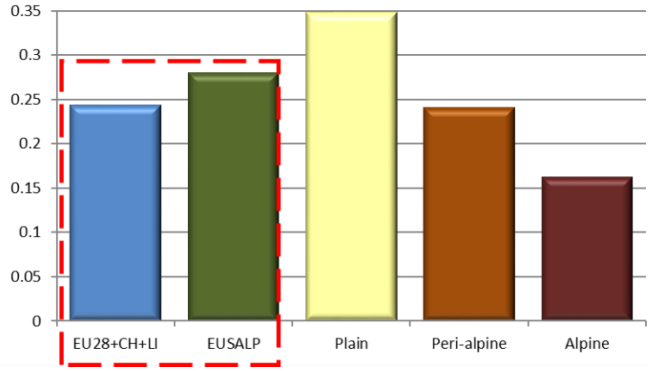


Figure b. Share of population in largest municipality – 2011



Fonte: Eurostat.

4.4 Agglomeration economies

Mentioned in the literature as important sources of local competitiveness, agglomeration economies could be one of the sources of productivity in EUSALP. Two rough indicators—population density and share of population in largest municipality—are built in order to capture agglomeration effects. 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 27a and 27b).

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.

5 Conclusions and policy implications

To our knowledge, this work represents the first empirical analysis to highlight the most relevant territorial assets for the competitiveness of the young European macro-region of EUSALP. The ultimate aim of the present paper is, in this sense, to present a clear and rich picture of the endowment of territorial capital in EUSALP, in order to be able to provide policy suggestions based on a smart specialization perspective. In particular, in this study the richness of economic potential of the area clearly emerged: EUSALP is a wealthy and dynamic region, which managed to go through the crisis without too much hardship and was able to recover in 2013, reaching the GDP levels and overcoming the employment levels of 2008. The area as a whole presents many potentialities and the strength of its 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. 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;
- 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;
- a wealthy *Plain area*, presenting large and medium-large urban settlements generating agglomeration economies on which the competitiveness of the economic fabric relies.

The macro-territorial and overall strengths that were highlighted within the present work could be exploited in order to further reinforce the general competitiveness of the macro-region. In particular, this could be done through complementarities and synergies, in order to finally favour a smart specialization strategy for the area (McCann e Ortega-Argilés, 2014; Boschma, 2014; Iacobucci e Guzzini, 2016). The three macro-areas analysed are widely homogeneous internally, even if, in some specific cases—like R&D facilities and financial centres—the location of the related activities is 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;
- *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; and
- *complementarity between research in bio-technologies and agricultural activities*, to the advantage of the Alpine and the Plain areas.

The study shows also possibilities in terms of "wide area synergy networks", linking firms acting in similar sectors and favouring the achievement of 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; and
- *touristic services*, integrating through new organizational and logistic innovations spatially proximate areas, and/or complementary in the typology of services provided (lake/see/mountain/cultural tourism).

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 a 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. Beyond political will, which is in the hands of policy-makers, a crucial precondition for achieving this result lies in the psychological attitude of people and organizations within the macro-region.

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Crescita economica e innovazione in EUSALP

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Sommario

Nel corso dell'ultimo decennio l'Unione Europea ha dedicato attenzione e risorse alla costituzione di cosiddette *strategie macro-regionali*, con l'obiettivo finale di unire determinate aree transnazionali sulla base di una prospettiva funzionale anziché amministrativa. Questo lavoro è il primo studio volto ad evidenziare i punti di forza e di debolezza della più giovane macro-area, EUSALP, in termini di *performance* e risorse territoriali. L'analisi è svolta grazie alla realizzazione di una base dati originale, raccolta a livello NUTS3. Data l'eterogeneità geo-morfologica della macro-regione, l'identificazione di tre distinte aree macro-territoriali (pianura, peri-alpina e alpina) consente un'analisi più significativa, con l'obiettivo finale di fornire alcuni suggerimenti di policy per migliorare la competitività dell'intera regione attraverso una strategia di *smart specialization*.

Classificazione JEL: *R10, P25*

Parole Chiave: *strategie macroregionali, EUSALP, competitività macroregionale..*