Regione Umbria

Giunta Regionale

Evaluation of the regional production system positioning

ROP ERDF 2014-2020

Thematic Objective 1 - Research and technological development

Thematic Objective 3 - Competitiveness of SMEs

Regional Department for Planning, International and European Affairs.
Digital Agenda, Agencies and Investee Companies
Office for Evaluation of Public Investments

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Preface

The methods of access to the Structural Funds have spread the practice of evaluation in all the territories of the European Union: initially, limited evaluation efforts were requested, but today the community evaluation practice has specific structural requirements. Starting from the 2007-2013 planning phase, national and regional evaluation spaces were created, according to the following indications set out by Community Regulations and by national agreements:

1. the evaluation activity must be extended to all regional policy interventions, not only to those co-financed by the European Union;
2. in line with the principle of unitary planning, evaluations must not be focused on sources of funding or on individual programmatic documents, but on territories and intervention policies;
3. the evaluations can be carried out in the times that the Administration deems appropriate and not at defined deadlines;
4. the evaluation activities can be carried out by the subjects that the Administration deems most appropriate, provided that compliance with the criteria of the quality of the evaluation is guaranteed, including impartiality and independence.

Consistent with the above, the Umbria Region has adopted the unit evaluation plan, which defines the key aspects of the evaluation process of greatest interest and supports the strategic elements of regional planning. The principles that inspire the choice of the issues to be assessed are those of strategic regional importance, the resumption of already started evaluation surveys and the acceptance of specific requests formulated by regional operational areas.

In light of these principles, the Regional Evaluation and Verification Board of public investments has deemed it appropriate to carry out an assessment of the positioning of the regional productive structure.

The evaluation was carried out with a particular focus on research and technological development activities and on the competitiveness of small and medium-sized enterprises, for which the Operational Program co-financed by the ERDF has invested a significant amount of financial resources in the interventions referred to in Thematic Objective 1 and Thematic Objective 3, in line with the provisions of the Regional Smart Specialisation Strategy. In fact, it is believed that the companies that conduct research and development represent the excellence of the regional production landscape and generate wealth not only for themselves but also for the rest of the local community. Therefore, their effort to maintain a high level of innovation even in times of crisis must be followed with the greatest attention and supported by public intervention, if we do not want to recede compared to other territories and economies of the country.

Three years after the definition of the regional strategy for the 2014-2020 plan, the Report analyses the topicality of the analyses that guided the Administration in its choices,

through an examination of the competitive positioning of the regional economy starting from the effects that the economic crisis has exerted on the productive structure and on the model of regional development.
In light of the European Commission's guidelines for the post-2020 phase to strengthen the thematic concentration and to further re-launch social inclusion intervention, it is possible to foresee the probable continued focus on research and innovation aspects, with financial instruments playing a parallel central role. The analyses provided in the first chapters of this Report show that these areas also represent priority areas for regional policy for the future, taking into account the large differences with respect to other more competitive and innovative European and Italian regions.

Lucio Caporizzi

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Report Summary

The 2014-2020 Cohesion Policy Plan, in line with the objectives and targets of the European 2020 Strategy, has given a central role to policies aimed at innovation, research and development: in this perspective, the Common Provisions Regulation of the ESI Funds (Reg. EU 1303/2013) has included TO 1 "Strengthening research, technological development and innovation" among cohesion policy, rural development and fisheries instruments in Thematic Objectives (TO). This strategic approach is further strengthened by the inclusion of a specific ex ante conditional, to be met within the first two years for all operational program Managing Authorities, and by the ring fencing principle provided for in Article 4 of the ERDF (EU) Regulation 1301/2013, which provides for the restriction of the thematic concentration on the first four Thematic Objectives (including TO 1 and TO 3). Consistent with these regulatory provisions, the Umbria Region has included, within the general strategy of the ERDF Operational Program, a specific Priority Axis (Axis 1 Research and innovation) which, starting from the characteristics of the context and the need to fill the differences with respect to the targets set by Europe 2020, aims to *support research and innovation aimed at creating "long networks" in the framework of an intelligent specialisation logic, since the low level of innovation found in production processes and the creation of new products penalises the level of competitiveness of the economy, in particular in access to new markets.* Similarly, the ROP ERDF, also in the framework of Axis 3, supports interventions - strongly integrated with the provisions of Axis 1 - to encourage the innovation process of the regional economic system in line with the Regional Smart Specialisation Strategy.
Three years after the definition of the regional strategy for the 2014-2020 plan, the Report analyses the topicality of the analyses that guided the Administration in its choices, through an examination of the competitive positioning of the regional economy starting from the effects that the economic crisis has exerted on the productive structure and on the model of regional development.

Regional positioning and economic crisis

As illustrated in the first chapter of the Report, the economic crisis that began in 2008 has had a particularly unfavourable impact at regional level: **between 2007 and 2016, regional GDP fell by more than 16.0 percentage points in real terms**, demonstrating a much more negative dynamic compared to what was posted in the same period at the national level and in the Central-Northern regions (6 points under the level reached in 2007), and above all compared to EU 28 and the Euro zone values (+14.7% in the same period).
The per capita values even more clearly demonstrate the deterioration of the regional economic parameters with respect to national and European Union trends. GDP per capita with the same purchasing power, which before the crisis was in line with the average

values of the 28-country European Union, posts a gap of 15 percentage points from the average value in 2015: taking 100 as the GDP per capita average at the same purchasing power as **the 28-country EU, regional per capita GDP dropped from 102 points in 2007 to 85 points in 2015**.
The causes of the phenomenon are complex and often difficult to investigate, but among these are certainly some of the structural features that have historically characterised the regional production system. In fact, some of the weaknesses of the regional productive structure have been known for a long time and can be traced back to some characteristics that can be modified only through medium-long term processes.
This especially refers to:

- to a **productive system characterised by small and medium sized businesses** and therefore with less investment capacity (in its human resources as well as in research processes, productive innovation, internationalisation, etc.), as well as by a lower ability to access bank credit, a more fragile financial balance and widespread under capitalisation;
- to an **internal demand that is sustained by significant external transfers**, both in the form of public transfers and in the form of household and corporate indebtedness, so much so that the **degree of dependence**, which causes the imbalance between imports and exports with respect to the total resources, has remained over six percentage point for the entire period, while it has become negative at the national level;
- to a **reduction of the accumulation process**, with gross fixed investments posting a drop of almost 40 percentage points between 2007 and 2015, which is associated with a level of **labour productivity** that is based on values that are the lowest among all Central-Northern regions;
- to a deterioration in the economic condition of the families that has been accompanied by a **growing inequality in the distribution of income**, with the Gini index which posted an increase of 10 percentage points between 2007 and 2015.

The regional productive structure recession has invested, almost without distinction, all the branches of production, but it has been particularly accentuated in some of the main sectors of the regional economy:

- the "rubber and plastic product and other non-metallic mineral product production" sector dropped 44% between 2007 and 2015, compared to a national average of 18.2%;
- the "metallurgical, metal product manufacturing, excluding machinery and equipment" sector recorded a loss of 44.3%, compared to the 14.7% national average, particularly affecting the Terni-Narni area.

Overall, **the Umbrian economy seems to have better defied the impact of the crisis in traditional sectors and services with less specialisation**, while it was strongly

penalised in mass production and specialised and R&D intensive production. The regional development model that has always been based on the traditional Made in Italy sectors on the one hand, and on the other hand, on the strong presence of large companies specialised in mass production sectors, has experienced considerable downsizing of the latter.
This evidence also emerges from the analysis of the specialisation index, calculated on the added value at current prices compared to the average of the central and northern regions. It can, in fact, highlight how:

- the specialisation index for the *traditional goods sector* rose from 1.21 in 2007 to 1.39 in 2015, showing an increasing margin over the period considered. Umbria therefore tends to strengthen in those sectors where innovation originates outside the company and where the innovation process takes place by imitation or by incorporation through the acquisition of a new capital stock;
- the index of specialisation of *mass productions*, characterised by the presence of large companies producing consumer goods or intermediate goods, in which innovation originates both internally and externally to the company, dropped from 1.50 to 0.99, positioning itself in 2007 in line with the central and northern region average;
- the index for *specialised and R&D intensive production,* already limited in 2007 compared to the Centre-North and equal to 0.47, was further reduced, reaching 0.45 in 2015;
- the specialisation index for *traditional services* rose from 0.96 in 2007 to 1.08 in 2015, while it remained constant at 0.83 for specialised services.

These trends were also reflected in **export dynamics**. The general recovery in exports was, in this sense, partially offset by the significant reductions recorded between 2007 and 2017 by the sales of metallurgy products (-38% compared to +4% for Italy), of metal products (-6% compared to an Italian result of +10%), electrical equipment and non-electric household appliances (-60% against +6% of the national average) and non-metallic mineral products (-30% compared to +2% Italian).
The recovery of world demand has allowed, on the other hand, all the Made in Italy sectors to recover the losses incurred in the first years of the crisis, highlighting a trend between 2007 and 2017 that was particularly positive for agricultural products (+68%, with a gap of about 25 percentage points with Italy), food products (+85%, compared with an Italian average of 74%), textile products (+34%) and clothing (+69%), which show a higher dynamics of over 44 and 47 percentage points respectively compared to the national figure.
The effects of the crisis were also reflected in **the labour market, with the unemployment rate rising from 4.6% in 2007 to 10.5% in 2017**. At the same time there has been a deterioration in the quality of job positions, with the increase in the use of contractual forms with higher hourly flexibility (i.e. part time, on-call work, etc.) and, above all, forms of atypical work: between 2007 and 2017 there was, in fact, a reduction in permanent employment, while fixed-term employment increased by 7 percentage points, together with an increase in part-time work, much often involuntary, which now

affects 20.3% of total employees, a situation worse than both the central and northern regions and the national average.

Competitiveness and the regional system of research, development and innovation (Thematic Objectives 1 and 3)

The analyses described in the second chapter of this Report focus more on the areas of reference of the Thematic Objectives 1 and 3 of the ROP, research and innovation, the structure of the regional supply chains, access to credit, the social economy sector and the tourism system, reconfirming the strengths and weaknesses already emerged during the preparation of the Regional Operational Program.
As known, the **research, development and innovation system** continues to be penalised by the lack of demand expressed by companies, which remains far below what is posted in the other regions of the Centre-North. At the regional level, with public spending that is in line or slightly above many Italian regions, the impact of private R&D expenditure on GDP has been the lowest among all the central-northern regions (0.3% against 0.9% of the average of the central and northern regions in 2015). With public spending that can boast centres of excellence, the R&D activities of private companies present, in fact, evident weaknesses, among which we can highlight:

- a *low level of workers employed in R&D activities out of the total number of employees*: only 3.2 units (full-time equivalents) per thousand inhabitants in 2014 (equal to 999 units), compared to an average of 5.2 units per one thousand inhabitants for the Centre-North and of 4.1 units per thousand inhabitants for the national average;
- a *low level of R&D expenditure per company employee,* which amounts to just under € 52 thousand a year in the region in 2014, compared to 95 thousand Euro per year on a national average;
- a *low patent capacity*. The indicator that considers the patents registered at the European Patent Office per million inhabitants shows a strong disparity between the Italian regions, also with reference to the Centre-North area. Umbria, in this context, is positioned at the margins recording about 33 registered patents per million inhabitants, followed only by the Lazio region and the other southern regions.

One of the causes of the low propensity for the Umbrian productive system lies in the characteristic productive specialisation of local companies. This proof is particularly significant if we analyse the production system through a reconstruction of the **main regional production chains** and, above all, by analysing the production chains based on their use of more or less advanced technologies in the production process.
As highlighted in detail in the second chapter, in 2015 the sectors with the highest number of employees are represented by construction, agribusiness, tourism and Made in Italy, to

be understood as a home and fashion system. As a whole, the supply chains that can be traced back to traditional sectors (agribusiness, home and fashion system) and to the tourism and cultural heritage sector absorb about 62 thousand employees, equal to 26% of the total number of regional employees. These sectors are generally characterised by a low level of technology, so much so that in the manufacturing sector, the companies characterised by a low level of technology absorb 13% of total employment (compared to 9% of Italian companies), while only a limited number of employees is employed in high (0.3% compared to 1.1% of the national average) and medium-high technology manufacturing sectors.

This production specialisation is also noted in the field of services where more than half of the employees are employed in companies with low knowledge intensity, while knowledge-intensive companies employ 23% of employees, compared to 26% of the average national.

The ERDF Operational Program of Umbria, in consideration of the main characteristics of the production system described in the first two chapters of the Report, focuses not only on measures and actions aimed at raising the levels of innovation of companies also on specific areas including the **social economy** which, together with the "non-profit world", plays an important role in the Umbrian economic and social system, also confirmed by the recent ISTAT update on the permanent Census of non-profit institutions. In particular, the non-profit sector, as well as being characterised by its traditional relevance in the local production context, also represented an expanding sector in an economic context characterised by a prolonged recession: according to ISTAT data updated to 2015, the non-profit institutions operating in Umbra are 6,781, 8.5 percent more than in 2011, and overall employ almost 178,000 volunteers and 17,828 employees. Compared to the previous Census, the number of volunteers has increased significantly (over 70 thousand more individuals), as well as employees (increased by 18.1%, above the national variation equal to 15.8 percent), with an organisation mainly operating in the culture, sports and recreation sectors (66.6%), in the field of religion (9% compared to 4.3% of the national level), social assistance and civil protection.

The further scope of intervention on which the Axis 3 of the ROP ERDF Umbria is concentrated is represented by the **regional tourism system** which demonstrated the difficulties of development and a loss of competitiveness compared to the other more developed regions and the rest of the country in the period from 2008 - 2016. In fact, although the existing data show an increase in arrivals in the regional hospitality facilities (+10.5%), this increase is much lower than what can be observed at national level and for the regions of the Centre-North. Specifically, the increase in the Umbria region can be seen in non-hotel accommodation facilities (about +25%), while in hotels the increase is significantly lower (+4.6%). The picture of the tourism situation in Umbria emerges with greater clarity, also observing the data on the presences in the regional hospitality establishments, which show a different trend from that of arrivals. The number of visitors, and therefore the days spent by tourists in the regional territory, are still slightly lower than in 2008, even if they have recovered in the last three years. The situation is different for the national average and for that of the central-northern regions for which there is an

increase between 7 and 8 percentage points compared to 2008
The trend at regional level is therefore observed in the growth of short-term tourism, suggesting a lower capacity of the "Umbria system" in developing a tourist proposal that can increase visitors' stay, for example through tourist routes and more complex incoming activities, characterised by a greater interaction between different themes such as landscape, cultural, sports and gastronomy.
In this sense it is necessary to consider the important presence in Umbria of a rich **museum system**, characterised by the presence of 13 state museums (and similar institutions) and 163 non-state, mostly represented by museums or art galleries, which recorded a significant increase in visitors between 2011 and 2015 (almost 13 percentage points), compared to a national average of 6.4%, demonstrating the potential of the territory to provide a tourist offer able to attract substantial tourist flows.

Positioning: the challenges and needs of the territory

The broad analysis of the performance of the main macroeconomic indicators allowed, then, to formulate summary judgements on the **positioning of the regional production system** compared to TO 1 and TO 3 and to the specific Objectives foreseen in the Partnership Agreement and selected by regional planning for the 2014-2020 cycle.
From the set of indicators provided by the ISTAT-DPS database "Territorial indicators for development policies", the analyses have enabled a benchmarking analysis to assess the positioning of Umbria in relation to the specific relevant issues of TO 1 and TO 3.
The analysis served to reconstruct the gap/demand indicators, obtained by comparing the regional situation with the situation of the other central-northern regions. Through this benchmarking activity, the analysis path has been proposed to provide a hierarchical procedure for the needs of the territory, in order to illustrate the correspondence of the regional strategy to the more critical contexts. In addition to the illustration of the individual indicators, the analysis activity proceeded to reconstruct the **synthetic indicators for each specific ROP ERDF Axes 1 and 3 Objective**, associating the indicators of needs able to express the content to each.
As illustrated in the third chapter of the Report, as regards Axis 1, the main critical issues in the competitive positioning of the Umbria region emerge for the specific Objectives 1.1 "Increase in business innovation" and 1.4 "Promotion of new markets for innovation". Specifically, for these objectives there is a low contribution from the private sector in the financing of research and development, as well as a regional labour market that is unable to absorb the human capital present. Improved positioning of the Umbria Region for Objectives 1.3 "Increase in the incidence of innovative specialisations in application areas with a high intensity of "knowledge" and above all and 1.2 "Strengthening of the regional and national innovative system ", thanks in particular to the significant share of public resources destined to support research and development activities, to networks established between companies and to public-private partnerships.

The analysis carried out through the synthetic indicators for the specific objectives of TO 3 shows that the main weaknesses in the positioning of the Umbria region can be found for the specific Objectives 3.2 "Consolidation, modernisation and diversification of territorial productive systems", 3.5 "Diffusion and strengthening of economic activities with a social content" and 3.3 "Increase in the level of internationalisation of production systems ". In the case of the specific Objective 3.2, which takes into account indicators relating exclusively to the tourism sector, as indicated in the Umbria region ROP ERDF 2014-2020, there is a situation that is highly deficient compared to what can be observed in the other regions of the Centre-North, in particular with regard to the capacity of the regional system to develop a type of tourism with high added value. For the specific Objective 3.5, non-profit activities, although widespread in the territory, are found to be still of little relevance, especially from an occupational point of view, while they could be an important lever of development. As regards the specific Objective 3.3, the rather negative performance of Umbria compared to the other regions of the Centre-North is due, in particular, to the low propensity to export in the economic sectors characterised by a more dynamic demand (which moreover do not particularly characterise the Umbrian territory). With regard to Objective 3.4 "Relaunching the propensity to invest in the production system", the situation does not yet seem adequate to the needs of the territory, due to the relatively low levels of productivity recorded in the various economic sectors, also due to the predominant presence of traditional sectors and characterised by less dynamism. Moreover, the low levels of private investment in GDP and the average business expenditures for innovation contribute to Umbria's relatively deficient position and ensure that this specific objective is of primary importance in policies to support regional economic recovery. For the Specific Objective 3.1 "Occupational and productive development in territorial areas affected by the widespread crisis of production activities" alongside the strong use of passive political instruments (especially layoffs) there is also a good vitality from the point of view of the incorporation of new businesses that seem to be able to absorb significant employment shares. Finally, the needs for Objective 3.6 "Improvement of access to credit, business financing and risk management in agriculture" takes an intermediate value due to the possible different interpretation of the indicators related to access to credit and to indebtedness of companies, which according to the particular context of reference and in relation to the real situation of the companies, can be assessed according to different criteria.

The analysis of the positioning of the regional context with respect to the Thematic Objectives 1 and 3 realised in the context of this Report was finally completed with the update **of the strengths and weaknesses framework** reported below.

Thematic Objective 1 Strengthening research, technological development and innovation. Strengths and weaknesses

Strengths	Weaknesses
Potential of the productive system to create forms of associations and collaborations between companies and to carry out R&D activities in collaboration with external subjects	Production specialisation of the regional economy in sectors with lower R&D intensity
High incidence of public R&D expenditure on GDP	Low propensity of private companies to carry out R&D activities
Presence of innovation poles and technological clusters at national level	Presence of an entrepreneurial system prevalently consisting of small and micro businesses unable to sustain the risks typically associated with R&D activities
Presence of public research bodies of excellence	Low patent capacity of companies
High level of education of human resources and low level of early school leaving	Low level of employees employed in R&D by private companies
High entrepreneurial liveliness and the incorporation of businesses in knowledge-intensive sectors	Limited capacity of the regional production system to carry out innovative process and product activities and, above all, to introduce at least one product or process innovation on the market or internally
	Limited survival rate of companies specialised in knowledge-intensive sectors

Thematic Objective 3 Promoting the competitiveness of SMEs. Strengths and weaknesses

Strengths	Weaknesses
Good ability of the traditional Made in Italy sectors to reposition themselves to counter the economic crisis	Difficulties in the local productive system to cope with the economic crisis, especially with regard to high-intensity industrial sectors
High capacity of the productive system to introduce innovations of an organisational and marketing nature	Loss of competitiveness in the productive sector, which has a low level of labour productivity and low business profit margin levels

Strengths	Weaknesses
Good development of a service sector supporting companies	Decline in the propensity to invest by companies
High entrepreneurial liveliness and business incorporation rate	Low degree of trade openings of the manufacturing sector
Presence of a wide and diversified network of subjects operating in the social economy sector	Low ability to export in sectors with dynamic global demand
Strong incidence of non- profit in the local context, also growing in terms of employment	Presence of a high degree of economic dependence
Increase of foreign presence in the Umbrian territory	Low ability to attract foreign capital to the regional system
	Strong fragmentation of the local productive system and lack of ability to support innovative activities
	Presence of territorial areas affected by widespread crisis in production activities
	Presence of greater difficulty in accessing bank credit, especially by SMEs
	Difficulty in accessing risk capital investments - early stage
	Difficulty of development and a loss of competitiveness of the regional tourism system compared to other more developed regions
	Low rate of tourism (days of tourist presence) of hospitality facilities

The framework related to the strengths and weaknesses are also complemented by the analysis of the elements related to **threats and opportunities** that, based on the SWOT method, represent factors exogenous to the regional context, that is, related to the possible evolution of the national and international macroeconomic framework and to the modifications that this evolution exerts on production and sector contexts.

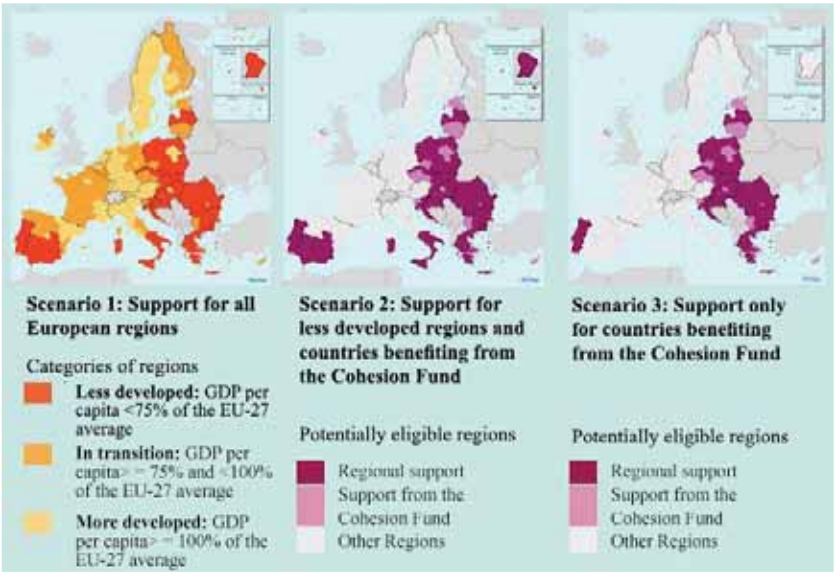
Threats and Opportunities

Threats	Opportunities
Possible increase in interest rates with the lack of expansive monetary policies	Strengthening of economic and monetary union (EMU) and greater integration of fiscal and social policies among Euro zone countries
Appreciation of the Euro exchange rate with negative effects on exporting companies	Development of digital innovation and automation of production processes and National Business Plan 4.0
Possible increase in oil prices with potentially negative effects on household purchasing power and therefore on domestic demand	European, national and regional programming framework strongly encouraging R&D activities in companies
Public finance framework that should present a still restrictive intonation	Experimentation and implementation, at regional level, of the social inclusion strategy through a "bottom-up" partnership approach
Strongly uncertain picture on the evolution of the position of the United States on the rules of international trade with potentially negative effects on world trade growth rates	Establishment of the Regional Labour Agency
Territorial marginalisation of the Umbrian context compared to the most advanced economies of the European Union	
Competition of emerging countries in the production of labour-intensive products and increase in international competition even in productions with a higher technological content	

The regional perspectives in the European framework for the reform of the cohesion policy

Considering that the evolution of the regional context, with particular reference to the areas related to TO 1 and TO 3, are affected by the effects and the structure of the cohesion policy, among the main sources available for the regional development policies and the analysis conducted, this Report has briefly described the potential developments of this policy, which are otherwise closely linked to the definition of the **new Multi-annual Financial Framework** (new EU budget) for the **post-2020 period**. The financial allocation of the main instruments for the development and reduction of the gaps between the European regions, in fact represented by the cohesion policy and the Structural Funds, although it has slightly decreased in the last period, continues to settle on a significant percentage compared to the total Union budget, further targeting spending on strategic

sectors such as the development of research, the strengthening of the competitiveness of production systems, the commitment to the qualification of human capital, etc.
The reflections taking place at the European level on the **future of EU finances** by the main Community institutions and, in particular, by the European Commission, seem to be moving towards a contraction of cohesion policy for the next period, as shown by the **three scenarios envisaged**, based on either maintaining current policy or on concentrating resources limited to the least developed regions and/or Member States, as described in the following figure.



Scenarios to maintain current investment patterns in the future financial framework or a concentration on a limited number of countries are also able to provide guidance on the ***policy*** **priorities assigned by the European Commission**: overall, and in the light of expansive nature assigned to areas such as security, defence or research, there would seem to be a change of direction compared to the past and a tendency towards more centralised policies compared to the integrated political approach and the currently sustained subsidiarity propensity. However, this approach does not seem to be shared by the European Parliament, which in the Resolution of 13 June 2017 on "Building pillars for a post-2020 EU cohesion policy" opposes a reduction in the Union's efforts in relation to cohesion, requiring, on the contrary, reinforced action to reduce regional disparities, competitiveness gaps and still high social inequalities.
Overall, in the new EU multi-annual financial framework - which is likely to be between 1.13% (value that would confirm the current value, net of Brexit) and 1.25% of GDP (as in the period 1993-1999, when the weight of the European budget reached its highest

value compared to GDP) - the cohesion policy envelope could however suffer a slight contraction and, consequently, a revision aimed at reducing duplications and waste, also starting from a governance characterised by greater centralisation of the intervention. In particular, based on the probable scenarios in relation to the future structure of the ESI Funds plan, which will inevitably also affect the Umbrian regional system in terms of consistency and composition of the development strategy necessary to reduce the significant differences highlighted, we can hypothesise a strong **focus on the following topics** and particular aspects:

- **environmental sustainability and climate change**, which is likely to be provided with an important share, equal to 20% of the resources of the EU budget, with consequent reflection also on the cohesion policy, given the importance of implementing environmental interventions at the territorial and local level, also in line with the assets of interest in Umbria;
- the relaunching of issues related to **social inclusion** (with further relevance of the European Social Fund also with respect to the European Regional Development Fund), which, in the overall framework of strengthening the **thematic concentration**, will be accompanied by the probable maintenance in focusing on aspects related to Research and innovation, with a parallel **central role of financial instruments**, which for Umbria, as emerged in the analyses carried out, also represent priority areas for action in the future, considering the large differences compared to other more competitive and innovative European and Italian regions.

Moreover, in consideration of the positions expressed by the EU Parliament and the Committee of the Regions, as well as by numerous other Member States, among which Italy and the Italian regions are expected to **maintain a series of characteristics of the current cohesion policy**, such as for example an approach based on the presence of **ex-ante conditionality**: the next cycle will probably reconfirm the use of this tool, in order to ensure greater orientation to the results of the cohesion policy and the link with economic governance (albeit with reference to this aspect, as described in the previous paragraphs, the positions of the EU institutions are strongly divergent). Similarly, we await the continuation of the process **of strengthening the administrative capacities** of the bodies involved in the cohesion policy, accompanied in parallel, by the process of further simplification of the cohesion policy management system at different levels of governance, also with a view to facilitating the participation of beneficiaries and increase the success of the financed interventions. Finally, this cohesion policy approach will probably not be able to carry out a demanding **revision of the overall architecture** incorporating additional socio-economic indicators, in addition to the per capita GDP, for the allocation of the related resources. The rather narrow times within which it should be possible to define the new multi-annual financial framework for the period 2021-2027 risk, in fact, to prevent the review of the criterion of allocation of funds between the different territories, being a very sensitive issue that certainly requires a period of consultation between the parties involved. In this perspective, the Umbrian regional resources could therefore remain at current or slightly higher levels and, with the same

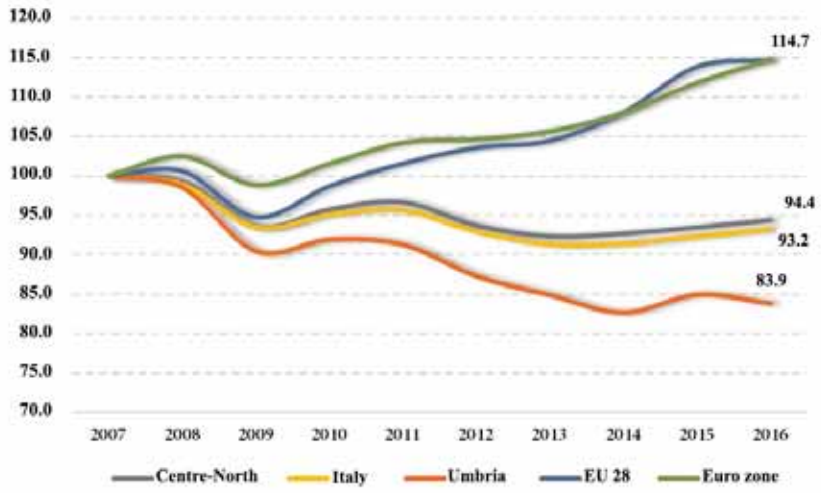
forecast, a reduction in resources from the ESI Funds could be offset by the inclusion of Umbria among the transition regions, or alternatively, from the possible outdating of the category classification (more developed, late and in transition) of the regions themselves.

1 Regional positioning and economic crisis

1.1 The impact of the crisis on the regional economic context

The analysis of the regional context cannot disregard an examination of the effects of the economic crisis on the productive structure and on the model of regional development. Despite the signs of recovery, the economic crisis has produced, in fact, a heavy downsizing of the regional production system.
Between 2007 and 2016, regional GDP fell by more than 16.0 percentage points in real terms, demonstrating a much more unfavourable dynamic compared to what was posted in the same period at the national level and in the Central-Northern regions (6 points under the level reached in 2007), and above all compared to EU 28 and the Euro zone values (+14.7% in the same period).

Chart 1.1 - Gross domestic product at market prices
Chained values with reference year 2010
(Index number 2007=100)

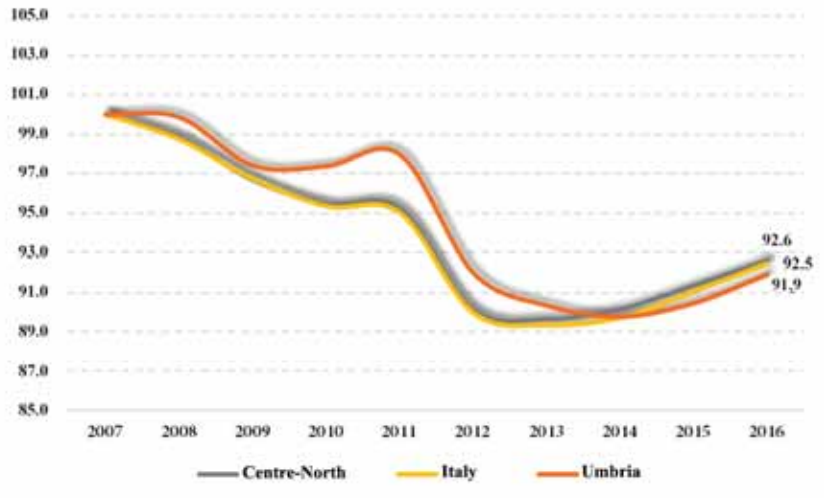


Source: based on ISTAT and Eurostat data

Umbria suffered the economic crisis more intensively than other geographical areas in the first years of the crisis, recording a contraction in GDP of almost 10 percentage points already in 2009, and during the sovereign debt crisis between 2011 and 2014.
This negative performance is largely attributable, as will be seen in the following paragraphs, to the crises in high capital-intensive regional sectors, and in particular in the sectors of: the manufacture of rubber and plastic articles and other non-metallic mineral

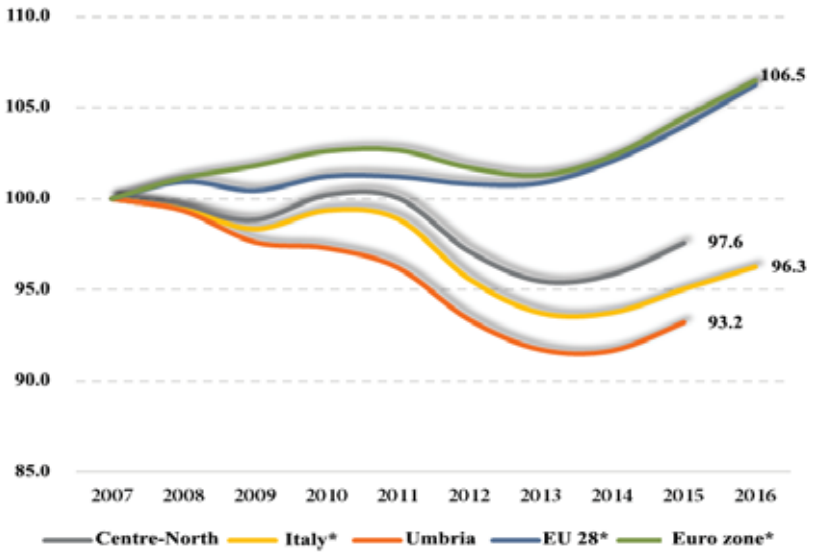
products; metallurgical activities, manufacture of metal products, except machinery and equipment; supply of electricity, gas, steam and air conditioning.
These sectors, which still represented a distinctive element of the regional production structure in 2007, showed a decrease in added value of over 40 percentage points, with a peak of -70% for the electricity supply sector. In any case, these sectors are characterised by high economies of scale, whose trends only partially affect the local productive system, through personnel directly or indirectly employed in the production process, while added value is often distributed nationwide, if not multinational.
The divergent performance shown by the dynamics of added value compared to that relating to the gross disposable income of consumer households is proof, the latter contracting by 8 percentage points between 2007 and 2015, but substantially in line with what was recorded in the national average and in the central-northern regions. Contributing to the performance of households' disposable income, the work of social shock absorbers, with social benefits not in kind increased by more than 20% in nominal terms between 2007 and 2015, compared to a stagnant evolution of real incomes per unit of work and a highly negative employment trend, especially if measured in terms of hours worked.
The divergent trend presented by the added value and the disposable income of households is evident also with reference to the different components of domestic demand: final consumption has, in fact, presented a general trend not very dissimilar from the national average, recording a contraction in real terms of almost 7 percentage points (10 percentage points less than the gross domestic product) in the period included between 2007 and 2015. Dynamics that are the result of limited government spending and a drop-in household consumption of 7.5% in real terms, in line with the evolution of disposable income.
The contraction in disposable income was reflected, in particular, on the items most sensitive to the economic cycle, with purchases of durable goods that showed a drop of over 15 percentage points, against maintained spending on services.

Chart 1.2 - Gross available consumer household income
Real values - Index number (2007 = 100)



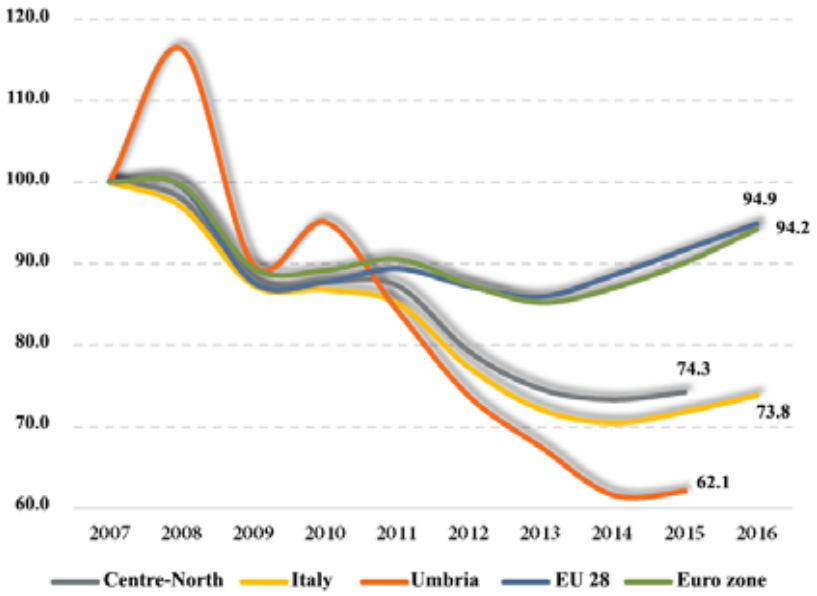
Source: Based on ISTAT data

Chart 1.3 - Internal final consumption
Chained values with reference year 2010
(Index number 2007 = 100)



Source: Based on ISTAT data

Chart 1.4 - Gross fixed investments
Chained values with reference year 2010
(Index number 2007 = 100)

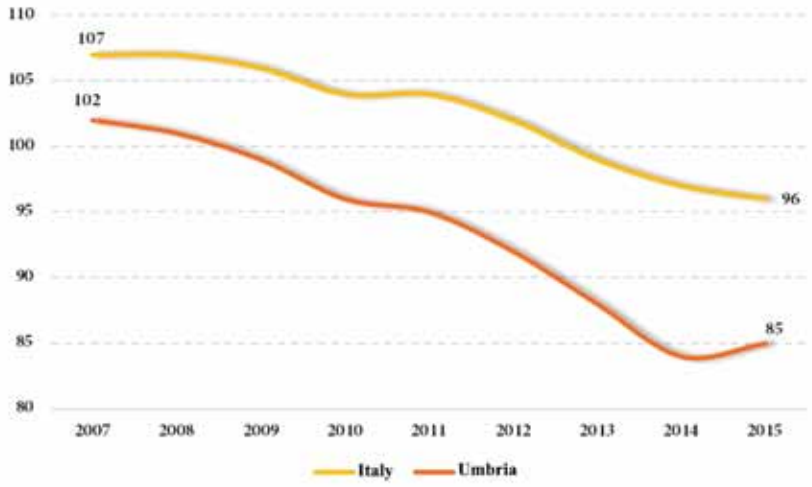


Source: based on ISTAT and Eurostat data

The most significant decline in the regional GDP compared to the national figure was so determined above all by the divergent evolution of the investment dynamics: in the period considered, gross fixed investments recorded a contraction of almost 40%, dropping from the 5.2 billion 2007 to 3.3 billion in 2015 at chain values, compared to a reduction of just over 25 percentage points in the average of the regions of the Centre-North. The economic crisis has affected investments both through the worsening of profit margins of companies and expectations on the dynamics of the future demand of sectors bearing the regional economy, and through a worsening of the conditions of access to the credit market by companies, in general, and small businesses, in particular.
The investment rate - that is, the ratio between gross fixed investment and added value at market prices - posted a continuous contraction during the crisis, dropping from values above 21 percentage points of the 2000-2007 average to a value slightly above 16% in 2015, with the evident consequence of accentuating the obsolescence processes of capital stock - public and private - and of weakening the same future prospects of economic growth.
The per capita values even more clearly demonstrate the deterioration of the regional economic parameters with respect to national and European Union trends. GDP per capita with the same purchasing power, which before the crisis was in line with the 28 country European Union average, shows a gap of 15 percentage points in 2015: 100

percent of GDP per capita at the same 28 country EU purchasing power, regional per capita GDP dropped from 102 points in 2007 to 85 points in 2015, also widening the gap from the national average from 5 points to 11 points between 2007 and 2015.

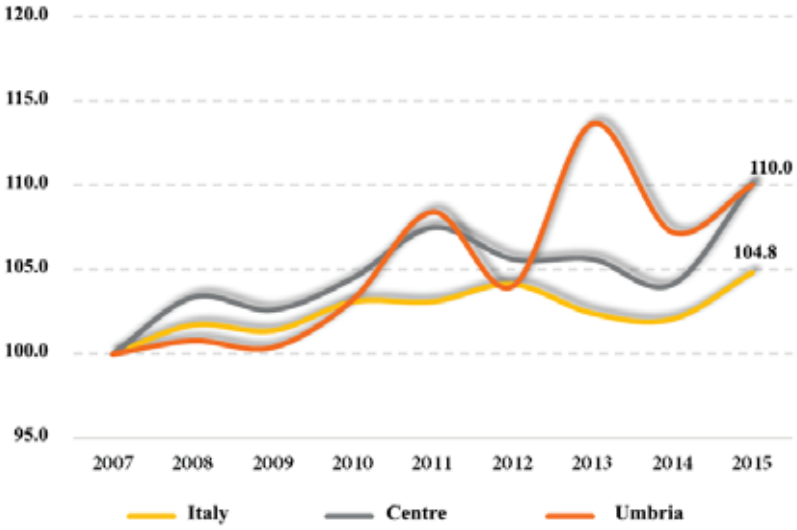
Chart 1.5 - GDP with equal purchasing power per inhabitant
(EU 28 index number = 100)



Source: based on Eurostat data

A deterioration of the economic condition that has been accompanied, even during the period of the economic crisis, by an increase in inequality in the distribution of family income. Although Umbria continues to present an overall level of inequality that is lower than the rest of the country (in 2015 the regional Gini index was equal to 0.27, compared to 0.29 in the central regions and 0.30 of the national average), between 2007 and 2015 the Gini index showed a growth of 10 percentage points, in line with that recorded in the regions of central Italy, but equal to more than twice the national average (+4.8%).

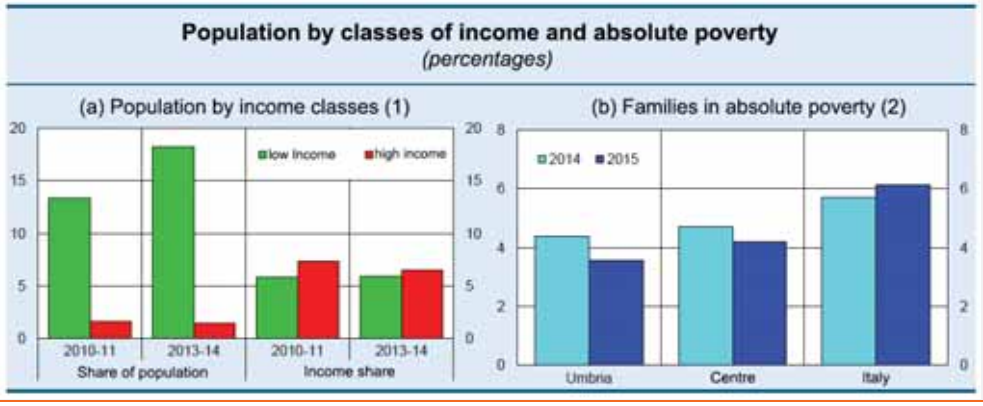
Chart 1.6 – Gini index
(Index number 2007 = 100)



Source: Based on ISTAT data

Box 1 - Population by classes of income and absolute poverty

As emerges from the report on the regional economies of the Bank of Italy, data on distribution by income classes show that the richest population (1.5% of the total) corresponds to 6.5% of total income. In contrast, the less wealthy population (representing 18%) owns just under 6% of income. Between the two-year period 2010-11 and the two-year period 2013-14, the population referable to this class has grown significantly, to the detriment of the average. The absolute poverty indicator shows, however, decreasing values between 2014 and 2015 and better than the national average and the regions of the Centre.

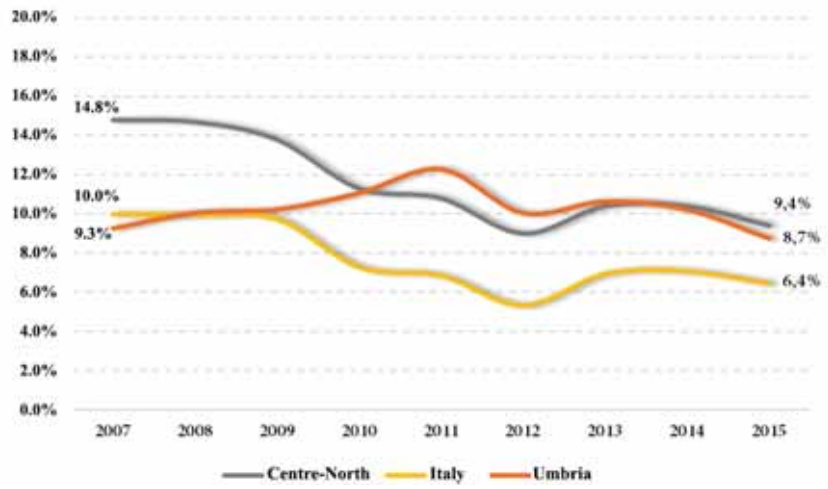


The increase in inequality in disposable income has affected all the developed economies since the early 1980s, exerting a double effect on the development processes:

- from a more cyclical point of view, the growth of inequality, favouring high-income classes with a higher propensity to save, penalises aggregate demand, depressing the prospects for economic growth. A model of development that, in the years preceding the crisis, was accompanied, especially in the United States, by an increase in household debt became unsustainable with the crisis;
- from a structural point of view, the polarisation of income distribution exerts an influence on the same composition of demand and therefore on the same structure of production. In fact, there is a divergence of consumption patterns, with the consumption of the low-income classes that are predominantly insured in more competitive or standardised markets (consumers are more selective of prices and, as a result, businesses have a low mark-up, while the consumption of the high-income classes, where the share of expenditure that is directed to luxury goods is higher, are satisfied in niche markets, which are mostly uncompetitive and where the profit margins of companies are higher.

The analyses described above refer to phenomena that have a profound effect on the positioning of the regional productive structure, with the companies oriented towards the production of inferior goods that face growing competition from emerging countries, while the companies oriented towards the production of luxury goods have the need to concentrate on narrower niche markets and in which the qualitative elements of the goods produced and the new production and organisational processes become determining factors in the competitiveness of the productive system.

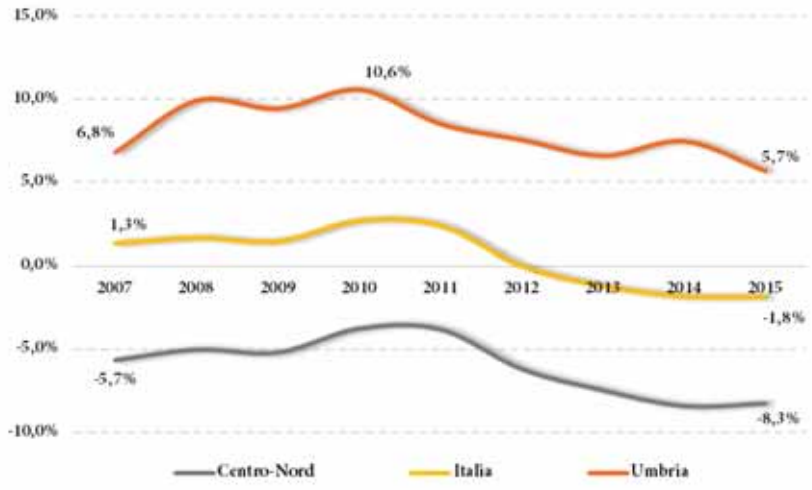
Chart 1.7 - Consumer spending propensity for consumer households
Current prices



Source: Based on ISTAT data

On the other hand, the sectors oriented towards the internal market have been penalised in the last few years by a trend in income from work which was lower than the rate of inflation (+ 11% compared to + 14.5%), with the consequent reduction of workers' purchasing power. Moreover, if in the Central-Northern regions, household consumption was partly sustained by the fall in the propensity to save (from 14.8% in 2007 to 9.4% in 2015), in Umbria the decline of disposable income has been entirely transferred to consumer demand, so much so that the propensity to save has remained essentially stable. The weakness of the regional productive structure is evident if we take into account how domestic demand is sustained by significant external transfers, both in the form of public transfers and in the form of household and corporate indebtedness. The degree of dependency, which reveals the imbalance between imports and exports with respect to total resources, has remained at particularly high levels throughout the period, while it has become negative nationally. Even the decline recorded since 2010, when it had exceeded 10%, appears more determined by the contraction of public transfers connected to the processes of consolidation of public finance than the capacity of the regional productive structure to trigger an endogenous growth process. A virtuous reduction in the degree of dependence would require, on the contrary, the promotion of policies aimed at favouring the sectors most open to national and international competition in order to compensate for the imbalance through an increase in exports of goods and services.

Chart 1.8 - Degree of dependency
(percentages)



Source: Based on ISTAT data

Box 2 - Convergence processes between European regions

Even in comparison with the evolution of the other regions of the European Union, Umbria shows a significant regression: Umbria has lost 46 positions in the regional GDP per capita with the same purchasing power between 2007 and 2015, moving from 109th position in 2007 to 155th position in 2015.

In order to verify whether there was a process of convergence or divergence in per capita income levels among European regions during the period considered, reference was made to a measure of convergence processes that in publications is called "β - convergence" (*).

The β-convergence refers to the concept of absolute convergence, i.e. it requires that both the rate of growth and the level of income converge towards the same values among all countries. This implies that there is a negative correlation between the initial level of per capita income and the subsequent growth rate. This correlation can be examined through a regression function which sets the average growth rate of the economy over a period of time according to the initial per-capita income level. In order for there to be convergence, the initial per capita income coefficient (β) must have a negative value. In simplified form, the regression function can be represented as follows:

$$\hat{Y}_{tn-t1} = \alpha - \beta Y_1 + u$$

where $\hat{Y}_{tn-t1}$ represents the average annual growth rate between period t_n and period t_1; Y_1 represent the level of income pro-capita at time t_1; α represents a constant; β the regression coefficient; u is a margin of error.

The results for the year are shown in the following graph, where the level of GDP per capita in 2007 is shown on the x axis and the change in GDP per capita with the same purchasing power between 2007 and 2015(1) on the y axis. As can be seen, the regression takes the form of a polynomial and non-linear function as was to be expected in the presence of convergence processes between European regions. If it is confirmed that generally the regions with a lower level of GDP per capita show a higher growth (essentially the regions of Eastern European countries), there is a better performance of the regions with the highest growth rate compared to what is shown by the regions that in 2007 were around or just below the average value of the EU 28, so that the regression function takes the form of a *u*. The Umbria region, which in 2007 had a per capita GDP level in line with the EU 28 average, is therefore in the group of European regions which were among the most penalised in the course of the economic crisis, and this probably due to two reasons:

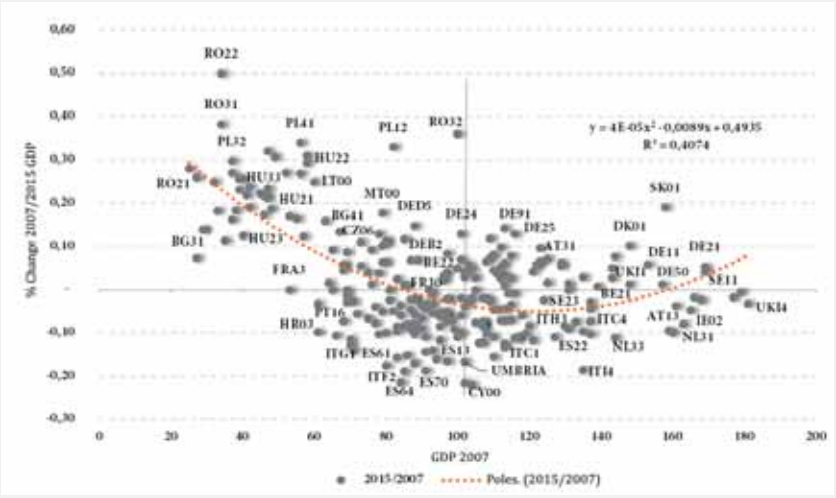
- on the one hand, the austerity policies defined at the European Union level have affected this group of regions. Many of the regions included in this group and which, like Umbria, have shown a particularly negative evolution, belong to the countries most affected by the sovereign debt crisis and subsequent austerity policies. In fact, there are many regions belonging to Spain, Portugal, Italy

and, even if to a lesser extent, to France;

- on the other hand, these regions may have suffered more than others the competition of regions where low labour costs prevail on the one hand and, on the other, the impossibility of repositioning themselves on productions with higher added value where competition of the regions with the highest development rate and where the factors of agglomeration and specialisation become dominant in determining the degree of competitiveness of a region

The understanding of which of the two phenomena mentioned above is prevalent in explaining the dynamics recorded by Umbria in recent years is a decisive element for defining the prospects for future development of the region. If the first aspect prevails, the region could resume a path of economic growth in line with other European regions with the attenuation of public finance consolidation policies. On the other hand, if the second element prevailed in the explanation of regional dynamics, the region could also experience a dynamic lower than the European average in the near future, compressed, on the one hand, by European regions with low labour costs and, on the other hand, from regions specialised in productions with higher added value

Positioning of Umbria among the European Regions
- 2007-2015 convergence



Source: based on Eurostat data

(1) Greek regions, which showed a specific evolution in reference to the sovereign debt crisis and to the policies of saving public finance, were excluded from the analysis.

(*) See Barro R. J. Sala-i-Martin X. (2005). *Economic Growth*. Cambridge Massachusetts, The MIT Press; Islam M. (2003). *What have we learnt from the convergence debate?* Journal of Economic Surveys, Vol. 17, n. 3: 309-362.

1.2 The impact of the crisis on regional economic sectors

The crisis has had a significant, albeit diversified impact on the different sectors of the regional economy. Industry is the sector that has recorded the greatest losses: between 2007 and 2015 the mining industry has lost about 36 percentage points in terms of GDP and the manufacturing sector, a sector that bears the regional development model, has undergone a reduction of 24 percentage points, data significantly worse than recorded in the national average (-13.4% for manufacturing) and in the regions of the Centre-North (respectively -6.6% for the mining industry and -1.2% for manufacturing). Equally significant was the contraction of the construction sector: -36 percentage points between 2007 and 2015, a value that is affected by the crisis that has hit the entire sector at a national level.

Even the service sector, although it showed a greater stamina than the rest of the economy, posted a contraction of the added value of about 6 percentage points, compared to a decrease of 1.6% for the regions of the Centre-North and 2.6% for the national average, penalised by an internal demand that in the region showed a more negative trend compared to that recorded in the rest of the national territory.

The regional productive structure recession has invested, almost without distinction, all the branches of production, but it has been particularly accentuated in some of the main sectors of the regional economy:

- the "rubber and plastic product and other non-metallic mineral product production" sector dropped 44% between 2007 and 2015, compared to a national average of 18.2%;
- the "metallurgical, metal product manufacturing, excluding machinery and equipment" sector recorded a loss of 44.3%, compared to the 14.7% national average, particularly affecting the Terni-Narni area[1].

Particularly unfavourable trends have also occurred in other sectors:

- the mining industry suffered a reduction of 36.1%, compared to a national average of -1.2% and the Centre-North of -6.6%.
- the food, beverage and tobacco industries contracted by 18.3%;
- professional, scientific and technical activities fell by 18.9%.

[1] With the *MISE* Decree of October 7, 2016, the Terni-Narni area was recognised as an area of complex industrial crisis and experienced the approval of a project of reconversion and industrial redevelopment with a financial endowment of about 75 million Euro between regional and state resources.

Box 3 - The prospects for development in the project of reconversion and industrial redevelopment of the complex industrial crisis area of Terni-Narni

The recent approval by the Regional Council of the Program Agreement concerning the "*Industrial reconversion and redevelopment project of the complex industrial crisis area of Terni-Narni*" currently represents a turning point in the implementation of the territorial redevelopment policies of the productive system and support for employment and employment reintegration. The guiding actions indicated in the policy lines of intervention mainly concern the strengthening of the local entrepreneurial system and of SMEs, the support of the specialisation of manufacturing, the innovation and the internationalisation of the local productive sector, the revival of local investments and attractiveness to exogenous ones and support for the creation of new businesses. In this sense, three levers of industrial policies have been identified on which to act:

- to encourage local entrepreneurs and multinationals already present to consolidate production and research in a sector, that of green chemistry, with a strong global demand in which the Terni and Narni area can express a competitive advantage;
- support existing SMEs to direct their activities towards higher added value specialisations and stimulate an environment conducive to the creation of a new remunerative income;
- support resilient companies and those of the metallurgical industry with contributions for the modernisation of their production activities.

Specifically, as stated in the press release of the Regional Council of Umbria concerning the presentation of the Program Agreement, the strategic guidelines for the development of the Program provided by the Coordination and Control Group[2] set up at the MISE are attributable to vertical and horizontal specialisation areas focusing on: *the consolidation of production and research in the green chemistry sector; the encouragement of resilient companies and those of the metallurgical and agri-food chain to promote intelligent manufacturing processes in line with the national "industry 4.0" digital development strategies; energy efficiency and environmental requalification (according to the principles of the "circular economy" and the community objectives of "environmental sustainability" of productive development); orienting and supporting manufacturing SMEs towards higher added value specialisations, improving the environmental compatibility of production activities; facilitate the re-employment and retraining of workers belonging to a specific employment pool; to promote training and scientific actions to support local entrepreneurship, involving the educational scientific centre of Terni and other training institutions; enhance the digital and logistics infrastructures of industrial areas.*

From the employment point of view, priority is given to the re-employment of a particular pool of workers, among which: workers subject to collective redundancies,

[2] The Coordination and Control Group is composed of representatives of the Directorate for Industrial Policy and Competitiveness, of the Directorate General for the stimulation of entrepreneurial activities, by the Region, the Ministry of Labour and Social Policies and by the Administrations concerned, with the task to assist in the definition and implementation of the *PRRI*.

unemployed and no longer perceived as social shock absorbers; unemployed workers and recipients of mobility allowances or "Naspi"; worker earners of shock absorbers in constant working relationship; workers registered in the list referred to in Article 8 of Law 68/99, hired in redundancy to the legal constraints.

The strategic guidelines are in line with the specific characteristics and critical issues of the territorial context, as well as with the regional and national objectives defined at the unitary planning level. And, as such, they seem to represent a real opportunity to boost the economy of the Terni and Narni area - but also by extension to the regional economy - and to support employment and the relocation of workers expelled from the market due to crisis.

The type of tools put in place confirms this orientation: the notice for the expression of interest to invest in the Terni-Narni area promoted by the Ministry of Economic Development (MISE), the Umbria Region and Invitalia[3], requested entrepreneurial initiatives from businesses consistent with the objectives of the PRRI, providing a national and regional facilitating instrumentation strongly based on the development of the industrial policy levers identified above. Specifically, these are investment programs for the production of goods and services (creation and expansion of businesses), investment programs for environmental protection (energy efficiency, energy from renewable sources, recycling and reuse of waste), projects of organisational and process innovation and of industrial research projects and experimental development.

The responses to the notice seem to demonstrate a good degree of matching between the needs of the territory (and the related regional strategy) and the supply of companies, both from the sectoral point of view and of resources and jobs that can potentially be activated. The 212 expressions of interest submitted - for a total of 612.5 million Euro of investments and a forecast of an increase of 2,131 employees - concerned projects in various sectors, with a prevalence in the manufacturing sector. In fact, this sector absorbs 61% of the investments and 44% of the expected employment and therefore seems to respond to the production requalification needs of the most crucial sector of the Terni and Narni area - with a manufacturing weight that is about twice the national average - and more affected by the negative economic situation. Investment in R&D is also significant, finding space and potential for growth in a relatively undeveloped field of the Umbrian economy (44 events totalling over € 65 million). Overall, looking at the core sectors of the local economy, the investment proposals in the sectors of manufacturing, tourism and business services are 128 and collect 76% of total resources (over 467 million Euro). About 65% of these concern small projects (below the threshold of 1.5 million Euro), reflecting the characteristics of the Umbrian entrepreneurial system, mostly made up of small and very small companies. In the threshold between 1.5 million and 20 million Euro, there are 39 proposals that potentially fall within the scope of Law 181/89 on crisis areas, for a total

[3] Organization in charge of defining and implementing the reconversion and industrial redevelopment projects of the complex industrial crisis areas, pursuant to Legislative Decree 83/2012, converted into Law 134/2012.

investment of around 190 million Euro and an additional employment impact of 519 employees. Above the 20 million Euro threshold, 4 investment proposals were received, for over 245 million Euro of investments and 400 employees.
With regard to the total resources allocated, a financial endowment of approximately € 75 million, between resources of the State and the Region of Umbria, is planned for the regional territory which will intervene with 38.8 M Euro for the implementation of the interventions provided for in the Agreement. Of these, 9.8 M Euro will be aimed at investments by SMEs, 4 million for financial instruments, two million for innovative SMEs and start-ups, 6 million for energy efficiency, 7 million for research and development, 7.5 million for active labour policies, 1.6 million Euro for living lab, 350 thousand Euro for interventions for the development of the tertiary sector and 550 thousand Euro for the co-financing of the Alcantara Development Agreement (supported by MISE resources).

On the contrary, there were positive results in the period for the textile and clothing sector (+14%, compared to -10.4% and -12.5% respectively for the regions of the Centre-north and for the Italian average) and, to a lesser extent, in trade, where there was an increase in the added value of 0.6%, against a contraction of -4.3% at the national level and -5.2% in the Centre-north.

Table 1.1- Added value by business sector, branches and divisions (2007-2015)
(period on period percentage changes)

Branch of activity (NACE Rev2)	Umbria	Centre North	Italy
Agriculture, forestry and fishing	**0.7%**	**7.4%**	**2.6%**
Mining	**-36.1%**	**-6.6%**	**-1.2%**
Manufacturing	**-24.1%**	**-10.6%**	**-13.4%**
food, beverage and tobacco industries	-18.3%	6.8%	2.3%
textile, clothing, leather and similar product industries	14.0%	-10.4%	-12.5%
wood, paper, publishing industry	-9.4%	-18.4%	-20.6%
coke and petroleum refining, chemical and pharmaceutical production	-13.9%	3.2%	-4.9%
rubber and plastics products, and other non-metallic mineral products	-44.0%	-13.6%	-18.2%
metallurgy, manufacture of metal products, except machinery and equipment	-44.3%	-11.4%	-14.7%
manufacture of computers and electronic and optical products, manufacture of electrical equipment, manufacture of machinery and n.c.e. equipment	-21.7%	-8.6%	-10.6%
manufacture of transport equipment	-16.3%	-20.7%	-20.4%
manufacture of furniture, other manufacturing, repair and installation of machinery and equipment	-7.2%	-25.5%	-25.8%

Branch of activity (NACE Rev2)	Umbria	Centre North	Italy
electricity, gas, steam and air conditioning supply	-70.2%	-20.9%	-24.3%
water supply, sewerage, waste management and remediation activities	-34.8%	-19.2%	-20.1%
Construction	**-32.2%**	**-32.1%**	**-32.5%**
Services	**-6.1%**	**-1.6%**	**-2.6%**
wholesale and retail, repair of motor vehicles and motorcycles	0.6%	-5.2%	-4.3%
transport and storage	-13.1%	-19.4%	-16.9%
accommodation and catering	-4.8%	-1.2%	-0.3%
information services and communications	-12.6%	4.5%	2.4%
financial and insurance activities	0.2%	5.6%	4.3%
real estate activities	-7.6%	4.3%	3.1%
professional, scientific and technical activities, administration and support services	-16.9%	-7.5%	-9.3%
public administration and defence; compulsory social security	-8.7%	-3.8%	-4.7%
education	0.3%	4.0%	-1.0%
health care and social services	0.6%	4.3%	1.2%
arts, entertainment and recreation	-20.7%	3.8%	-3.8%
other service activities	2.0%	0.4%	0.9%
activities of families and cohabitation as employers for domestic staff, production of undifferentiated goods and services for their own use by families and cohabitants	1.3%	6.3%	5.3%
Total economic activities	**-14.5%**	**-5.6%**	**-6.8%**

Source: based on ISTAT data, territorial economic accounts, December 2017.

The specific characteristics of the regional productive structure can be better analysed by clustering business sectors according to the criteria proposed by Pavitt (1984), a form of clustering defined on the basis of four industrial innovation models ("*supplier dominated*", "*scale intensive*", "*specialised suppliers*" and "*science based*"). This taxonomy uses a wide spectrum of elements and classifies the commodity sectors on the basis of the sources and the nature of innovations, their degree of appropriateness, the intensity of research and development (R&D intensity), the type of knowledge flows (knowledge) and it is therefore a valid tool to provide a picture of the competitive potential of the regional productive structure and, in particular, of its capacity to generate innovation.

Each cluster has specific characteristics - with reference to potential sources of innovation; to the type of innovations; to their degree of appropriateness; at the entry barriers and average size of companies - which can be summarised in the following table.

Table 1.2- Main characteristics of Pavitt clusters

	Average company size	Objectives of innovation	Main external source of innovation	Main internal source of innovation	Appropriateness	Barriers to entry
Supplier dominated	Medium/Small	Cost Saving	Innovations incorporated in the inputs	Learning economies	Low	Low
Scale intensive	Medium/Large	Cost saving and product innovations	Relations with suppliers	R&D	Medium	Medium
Specialised suppliers	Small	Product innovation	Relations with buyers	Learning economies	High	Medium
Science based	Small/Large	Product and process innovations	Relations with research centres and universities	R&D	High	Very high

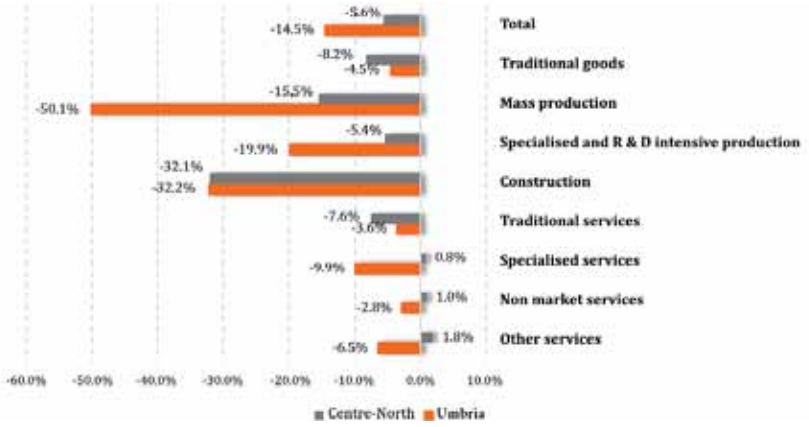
Unfortunately, the sectoral breakdown provided by ISTAT with the territorial accounts does not allow us to faithfully reconstruct the classification proposed by Pavitt. It was therefore necessary to make a series of simplifications, in particular by clustering sectors with specialised suppliers and science-based sectors. Five further clusters have also been added: the construction sector and four clusters for the service sector, according to their degree of specialisation. The following table shows the reconciliation of the business sectors of the NACE Rev2 classification with the proposed taxonomy, subdivided by the following clusters: *Traditional goods (representing an approximation of the supplier-dominated Pavitt cluster) = BTRA, Mass productions (representing an approximation of the "scale-intensive" Pavitt cluster) = LS, Specialised and R &D intensive production (which represents an approximation of the "specialised suppliers" and "science-based" Pavitt clusters) = PSPE/R&S, Constructions = C, Traditional services = STRA, Specialised services = SSPE, Non-market services = SNM, Other services = AS.*

Table 1.3- Bridging table between the NACE Rev2 classification and Pavitt clusters

Branch of activity (NACE Rev2): classification by business innovation model	
Agriculture, forestry and fishing	BTRA
Mining	LS
Manufacturing:	
Food, beverages and tobacco	BTRA
Textile, clothing, leather and similar product industries	BTRA
Wood, paper, publishing industry	BTRA
Coke and petroleum refining, chemical and pharmaceutical production	PSPE/R&S
Rubber and plastics products, and other non-metallic mineral products	LS
Metallurgy, manufacture of metal products, except machinery and equipment	LS
Manufacture of computers and electronic and optical products, manufacture of electrical equipment, manufacture of machinery and n.c.e. equipment	PSPE/R&S
Manufacture of transport equipment	LS
Manufacture of furniture, other manufacturing, repair and installation of machinery and equipment	BTRA
Electricity, gas, steam and air conditioning supply	LS
Water supply, sewerage, waste management and remediation activities	LS
Construction	C
Services:	
Wholesale and retail, repair of motor vehicles and motorcycles	STRA
Transport and storage	STRA
Accommodation and catering	STRA
Information and communication	SSPE
Financial and insurance activities	SSPE
Real estate activities	SSPE
Professional, scientific and technical activities, administration and support services	SSPE
Public administration and defence; compulsory social security	SNM
Education	SNM
Health care and social work	SNM
Arts, entertainment and recreation	AS
Other service activities	AS
Activities of families and cohabitation as employers for domestic staff, production of undifferentiated goods and services for their own use by families and cohabitants	STRA

As can be seen from chart 1.9, all the classifications considered show a reduction in added value, as opposed to the regions of the Centre-North, where the service sector has shown a greater resilience; the reduction is particularly marked with regard to the industrial sectors and, specifically, the mass production sectors (-50.1% compared with -15.5% for the Centre-North) and specialised and R&D intensive production (-19.9% compared to 5.4% in the Centre-North).

Chart 1.9 - Added value (Pavitt classification)
% change 2007-2015
(chain prices with reference year 2010)



Source: Based on ISTAT data

On the other hand, there is a better stability of the industrial sectors linked to the production of "traditional goods" (agriculture, food industry, textiles, wood, etc.), which recorded a decrease in added value lower than observed in the regions of Centre-North (-4.5% compared to -8.2%).

Also with regards to services, at the regional level there is a reduction in added value which is more pronounced compared to the Centre-North for the activities with the highest specialisation (-9.9% compared to +0.8%) and for non-market services (public administration, education, health, etc.), while, on the contrary, traditional services have shown a greater resilience (-3.6% for Umbria, -7.6% for the Centre-North).

Overall, the Umbrian economy seems to have better defied the impact of the crisis in traditional sectors and services with less specialisation, while it was strongly penalised in mass production and specialised and R&D intensive production. The regional development model that has always been based on the traditional Made in Italy sectors on the one hand, and on the other hand, on the strong presence of large companies specialised in mass production sectors, has experienced considerable downsizing of the latter. This evidence also emerges from the analysis of the specialisation index, calculated on the added value at

current prices compared to the average of the central and northern regions through which the following can also be observed:

- the specialisation index for the traditional goods sector rose from 1.21 in 2007 to 1.39 in 2015, showing an increasing margin over the period considered. Umbria therefore tends to strengthen in those sectors where innovation originates outside the company and where the innovation process takes place by imitation or by incorporation through the acquisition of a new capital stock;
- the index of specialisation of mass productions, characterised by the presence of large companies producing consumer goods or intermediate goods, in which innovation originates both internally and externally to the company, dropped from 1.50 to 0.99, positioning itself in 2007 in line with the central and northern region average;
- the index for specialised and R&D intensive production, already contained in 2007 compared to the Centre-North and equal to 0.47, was further reduced, reaching 0.45 in 2015;
- the specialisation index for traditional services rose from 0.96 in 2007 to 1.08 in 2015, while it remained constant at 0.83 for specialised services.

Table 1.4- Added value: percentage composition and relative specialisation index (Pavitt classification) Years 2007-2015 (current prices)

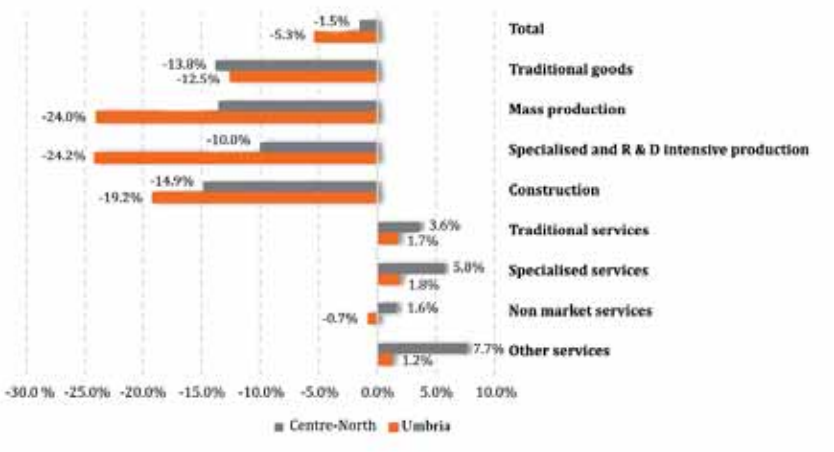
Specialisation index	Umbria		Centre-North		IS Umbria/Centre-North	
NACE_R2/TIME	2007	2015	2007	2015	2007	2015
Traditional goods	10.2%	11.1%	8.4%	8.0%	1.21	1.39
Mass production	13.9%	8.2%	9.3%	8.3%	1.50	0.99
Specialised and R&D intensive production	2.9%	2.7%	6.3%	6.2%	0.47	0.45
Construction	6.1%	5.4%	5.8%	4.6%	1.06	1.17
Traditional services	20.7%	23.3%	21.6%	21.5%	0.96	1.08
Specialised services	27.0%	28.4%	32.4%	34.3%	0.83	0.83
Non- market services	16.5%	18.1%	13.9%	14.5%	1.19	1.25
Other services	2.5%	2.9%	2.4%	2.7%	1.07	1.08
Total	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**1.00**	**1.00**

Source: based on ISTAT data, territorial economic accounts, December 2017.

Even if we look at the trend in employment, the dynamics of the industry shows a lower reduction for traditional goods than in the Central-Northern regions (respectively -12.5% and -13.8%), while for mass production and specialised and R&D intensive production, the regional gap is significant and, in both cases, with a reduction in the number of employees

of around 24%. Also with regard to construction, there was a greater contraction for Umbria compared to the Centre-North (-19.2% of Umbria versus -14.9%).

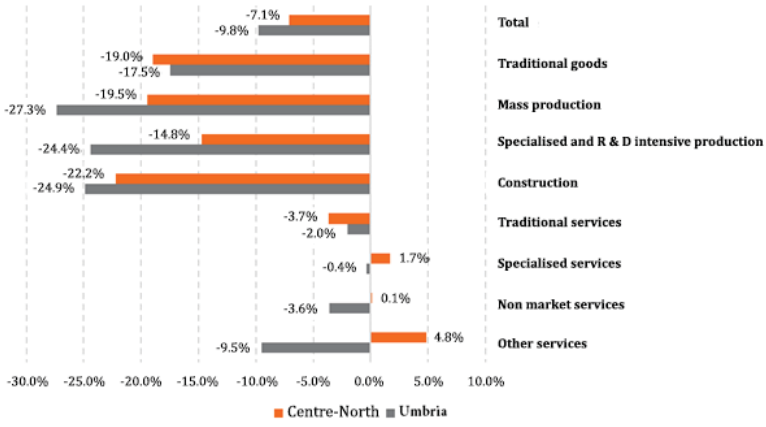
Chart 1.10 - Employment (Pavitt classification)
% change 2007-2015



Source: Based on ISTAT data

On the other hand, sectoral clusters relating to services recorded slight increases - albeit lower than the central-northern average - except for non-market services, which recorded a -0.7% reduction in employment levels.

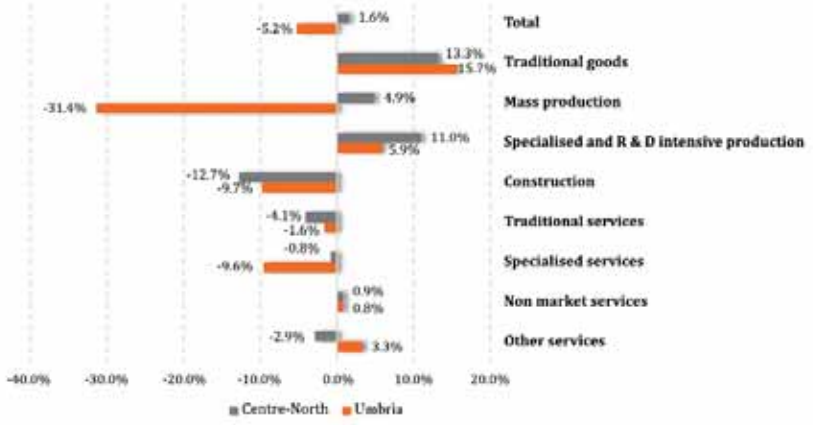
Chart 1.11 - Hours worked (Pavitt classification)
% change 2007-2015



Source: Based on ISTAT data

The effects of the crisis are even more evident if one looks not only at job positions, but at the use of them. In fact, in all the groups considered there is an even greater decline in the hours worked, a phenomenon that in this case has also affected the service sectors. This element would suggest that the economic crisis has been accompanied by a greater use by companies of contractual forms, even involuntary ones, with higher hourly flexibility (i.e. part time, on-call work, etc.) and, consequently, a related deterioration of occupational quality.
The combined dynamics of added value and hours worked have led to an overall negative and worse evolution in labour productivity compared to what has been observed for the other regions of the Centre-North, especially with regard to large-scale production (-31.4% versus an increase of 4.9% for other regions) and specialised services (-9.6% versus -0.8%). It is important to underline that the traditional goods sectors have shown an increase in productivity of over 15 percentage points and traditional services have recorded a reduction of -1.6% compared to -4.1% in the regions of the Centre-North, demonstrating how the stability of these sectors has been accompanied by a process of renewal of local businesses and recovery of margins of competitiveness.

Chart 1.12 - Added value per hour worked
% change 2007-2015



Source: Based on ISTAT data

It is clear, however, that the intensity of the crisis could not fail to be reflected in the profitability of companies: the profit margin has been reduced for all sectors, with the sole exception of non-market services (+6.2%). Compared to the other regions of the Centre-North, better results emerge for Umbria in the construction, traditional services, specialised services and non-market sectors, but negative trends are registered in all the manufacturing sectors, with reductions ranging from -16.2% in the traditional goods sector, to -36.2% for mass production sectors.

Chart 1.13 - Gross profit margin (Pavitt classification)
% change 2007-2015

Source: Based on ISTAT data

1.3 Regional positioning on international markets

The dynamics of exports have suffered significantly from the performance of the local industry, in particular as regards the sales of metals and metal products. The general recovery in exports was, in this sense, partially offset by the significant reductions recorded between 2007 and 2016 by the sales of metallurgy products (-38% compared to +4% for Italy), of metal products (-6% compared to an Italian result of +10%), electrical equipment and non-electric household appliances (-60% against +6% of the national average) and non-metallic mineral products (-30% compared to +2% Italian).
The recovery of world demand has allowed all the Made in Italy sectors to recover the losses incurred in the first years of the crisis, highlighting a trend that was particularly positive for agricultural products (+68%, with a gap of about 25 percentage points with Italy), food products (+85%, compared with an Italian average of 74%), textile products (+34%) and clothing (+69%), which show a higher dynamic of over 44 and 47 percentage points respectively compared to the national figure.

Table 1.5- Umbria Region: exports by sector (2007 - 2017)

Divisions	% change 2007-2017			% incidence			Competitiveness index		
	Umbria	Italy	DIFF	2007	2017	DIFF	2007	2017	DIFF
AA01-Agricultural, animal and hunting products	68%	44%	25%	2.8%	5.7%	2.9%	0.17	0.08	-0.10
CA10-Food products	85%	74%	12%	6.0%	21.0%	15.0%	-0.18	-0.14	0.04
CA11-Beverages	13%	73%	-60%	0.9%	0.1%	-0.8%	0.64	0.83	0.19
CB13-Textiles	34%	-10%	44%	2.8%	1.1%	-1.7%	0.52	0.65	0.13
CB14-Apparel (also in leather and fur)	69%	22%	47%	7.1%	3.5%	-3.6%	0.46	0.66	0.19
CB15-Leather goods (except apparel) and similar	35%	43%	-7%	2.0%	2.6%	0.5%	-0.02	0.21	0.23
CC19-Wood and wood and cork products (except furniture); straw and plaited material products	11%	9%	2%	1.1%	2.0%	0.9%	-0.26	-0.07	0.19
CC17-Paper and paper products	87%	20%	67%	0.9%	1.4%	0.5%	-0.18	0.25	0.43
CE20-Chemicals	6%	34%	-29%	4.6%	5.6%	1.1%	0.10	0.10	-0.00
CF21-Basic pharmaceutical products and pharmaceutical preparations	91%	107%	-16%	1.2%	1.0%	-0.2%	0.77	0.54	-0.23
CG22-Rubber and plastics products	29%	22%	7%	2.8%	4.2%	1.4%	0.02	0.10	0.08
CG23-Other non-metallic mineral products	-30%	2%	-32%	2.6%	0.9%	-1.7%	0.59	0.49	-0.09
CH24-Metallurgy products	-38%	4%	-41%	32.7%	22.4%	-10.3%	-0.02	0.13	0.15
CH25-Metal products excluding machinery and equipment	-6%	10%	-16%	3.0%	2.1%	-0.9%	0.49	0.30	-0.18
CI26-Computers and products of electronics and optics, electro-medical devices, measuring devices and clocks	19%	16%	3%	1.5%	2.0%	0.5%	0.12	0.12	-0.00
CJ27-Electrical equipment and equipment for non-electric domestic use	-60%	6%	-66%	4.4%	2.2%	-2.2%	0.59	0.06	-0.53
CK28-Machinery and n.c.e. equipment	10%	16%	-6%	17.2%	11.8%	-5.4%	0.42	0.39	-0.03
CL29-Motor vehicles, trailers and semi-trailers	137%	32%	105%	2.3%	3.3%	1.0%	-0.13	0.40	0.53
CL30-Other means of transport	23%	15%	8%	1.6%	0.5%	-1.1%	0.68	0.70	0.02
CM31-Furniture	15%	0%	15%	1.7%	0.4%	-1.3%	0.75	0.75	0.00
CM32-Other manufacturing products	215%	38%	177%	0.2%	1.3%	1.1%	-0.58	-0.14	0.44
Total	**7%**	**23%**	**-16%**	**100%**	**100%**	**0.0%**	**0.11**	**0.21**	**0.09**

Source: based on ISTAT - Coeweb data: foreign trade statistics

The analysis of the *competitiveness index*[4], given the difference between exports and imports in relation to the sum of the movements with foreign countries, makes it possible to provide a further evaluation of the commercial dynamics between 2007 and 2017 and the competitive position of the different sectors on foreign markets. Positive index values, i.e. a higher value of exports than imports, denote the existence of a comparative advantage and a capacity of the sector to compete on foreign markets. As can be seen from the table above, the competitiveness index is positive overall and even shows a slight strengthening during the period considered: rising from 0.11 to 0.21. More specifically, we can highlight how:

- the sectors that in the last period available have shown a higher competitiveness index (higher than 0.50) and, therefore, have a high competitive potential on foreign markets, are related to textiles, clothing and furniture;
- a lower degree of competitiveness is recorded for steel products, other metal, chemical and rubber and plastics products, which also showed a negative or slightly positive change in the index over the period;
- recoveries of competitiveness are recorded, however, for motor vehicles, for agri-food, for wood and for paper and paper products.

Further indications on the model of specialisation of the regional economy can be drawn from the evolution of exports and imports, analysing the data at a greater level of disaggregation (5 digits of the Ateco 2007 classification). As can be seen from the following tables, which show the competitiveness index for 2017 (table 1.6) and the change in the competitiveness index between 2007 and 2017 of the product groups (table 1.7, groups that absorb a share equal to at least 1% of total exports in descending order), there are high levels of competitiveness and specialisation of the regional production structure for sectors related to scale production (pipes, conduits, etc., soaps and detergents, etc.) and to the production of traditional goods (knitwear, furniture, other textile products); similarly high levels of competitiveness are also recorded in the group of aircraft, spacecraft and related devices, agricultural machinery and in pharmaceuticals and pharmaceutical preparations. From a dynamic point of view, strong recoveries of competitiveness in the period considered are recorded in the groups of motor vehicles, other first transformation of steel products, wood products, cork, etc., of other food products and other machines for special uses, in addition to footwear and pulp, paper and cardboard.

[4] The competitiveness index assumes the following expression:

$$IC_i = (x_i - m_i)/(x_i + m_i)$$

where x_i are *i* sector exports and m_i are *i* sector imports.

Table 1.6- Competitiveness index 2016

Groups		Competitiveness index
CH242 -	Pipes, conduits, hollow profiles and related steel accessories (excluding cast steel ones)	0.96
CB143 -	Knitwear	0.86
CH243 -	Other first steel transformation products	0.84
CL303 -	Aircraft, spacecraft and related devices	0.81
CB139 -	Other textile products	0.76
CM310 -	Furniture	0.75
CK283 -	Machines for agriculture and forestry	0.75
CE204 -	Soaps and detergents, products for cleaning and polishing, perfumes and cosmetics	0.73
CF212 -	Medicines and pharmaceutical preparations	0.60
CB141 -	Apparel excluding fur	0.57
CA107 -	Bakery and flour products	0.57
CK284 -	Metal forming machines and other machine tools	0.56
CL291 -	Motor vehicles	0.48
CK282 -	Other general-purpose machines	0.48
CJ271 -	Motors, generators and electrical transformers; equipment for electricity distribution and control	0.46
CI265 -	Measurement, testing and navigation instruments and apparatus; watches	0.43
CK281 -	General-purpose machines	0.43
CA108 -	Other food products	0.41
CL293 -	Parts and accessories for motor vehicles and their engines	0.35
CH259 -	Other metal products	0.28
AA011 -	Non-permanent agricultural crop products	0.27
CB152 -	Footwear	0.21
CG222 -	Plastic products	0.18
CC171 -	Pulp, paper and cardboard	0.08
CK289 -	Other machines for special uses	0.07
CC162 -	Wood, cork, straw and plaited material products	0.06
CH241 -	Steel industry products	0.04
CE201 -	Basic chemicals, fertilisers and nitrogen compounds, plastics and synthetic rubber in primary forms	-0.16
CA104 -	Vegetable and animal oils and fats	-0.33

Source: based on ISTAT - Coeweb data: foreign trade statistics

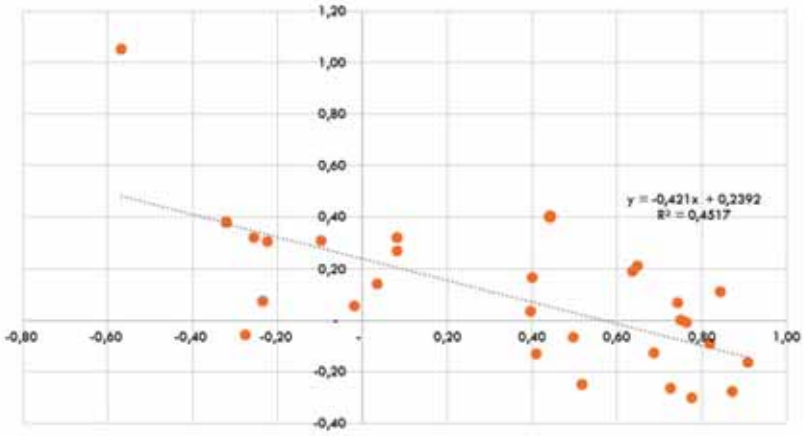
Table 1.7- Change in the competitiveness index 2007-2016

Groups		Change 2007-2016
CL291 -	Motor vehicles	1.05
CH243 -	Other first steel transformation products	0.40
CC162 -	Wood, cork, straw and plaited material products	0.38
CA108 -	Other food products	0.32
CK289 -	Other machines for special uses	0.32
CB152 -	Footwear	0.31
CC171 -	Pulp, paper and cardboard	0.31
CL293 -	Parts and accessories for motor vehicles and their engines	0.27
CB143 -	Knitwear	0.21
CB141 -	Apparel excluding fur	0.17
CG222 -	Plastic products	0.14
CH242 -	Pipes, conduits, hollow profiles and related steel accessories (excluding cast steel ones)	0.11
CE201 -	Basic chemicals, fertilisers and nitrogen compounds, plastics and synthetic rubber in primary forms	0.08
CL303 -	Aircraft, spacecraft and related devices	0.07
CH241 -	Steel industry products	0.06
CI265 -	Measurement, testing and navigation instruments and apparatus; watches	0.04
CM310 -	Furniture	0.00
CA107 -	Bakery and flour products	-0.01
CB139 -	Other textile products	-0.01
CA104 -	Vegetable and animal oils and fats	-0.06
CK281 -	General-purpose machines	-0.07
CE204 -	Soaps and detergents, products for cleaning and polishing, perfumes and cosmetics	-0.09
CK284 -	Metal forming machines and other machine tools	-0.13
CH259 -	Other metal products	-0.13
CK283 -	Machines for agriculture and forestry	-0.16
AA011 -	Non-permanent agricultural crop products	-0.25
CJ271 -	Motors, generators and electrical transformers; equipment for electricity distribution and control	-0.26
CF212 -	Medicines and pharmaceutical preparations	-0.27
CK282 -	Other general-purpose machines	-0.30

Source: based on ISTAT - Coeweb data: foreign trade statistics

Overall, the region has also shown a capacity to expand its production diversification over the last few years. As can be seen from the following chart, which relates the variation recorded by the competitiveness index of the groups considered between 2007 and 2017 and the value of the 2007 index, the sectors that presented a lower or negative index value generally posted higher improvement, with the result of expanding the number of sectors in which the region tends to present good margins of competitiveness on international markets.

Chart 1.14 - Competitiveness index 2017 and
% change in competitiveness index 2007-2017



Source: based on ISTAT - Coeweb data: foreign trade statistics

Box 4 - Foreign trade and international business activities

The ISTAT ICE Report of 2017 provides some indicators relating to the degree of international openness of Italian regions, such as the degree of penetration of imports (the ratio between imports of goods and services and internal demand) and the propensity to export, measured as a ratio between exports of goods and services and regional GDP, and in terms of export value per employee. All the indicators show that the central and northern regions are more integrated into international trade than those in the South. In this context Umbria seems not to align itself with the neighbouring regions, but to tend to results similar to those recorded in the South. In terms of penetration of imports, the region showed significantly reduced data between 2013 and 2015, with a ratio equal to 13.6 in 2015 compared to 23 in the central regions. From the point of view of the propensity to export, the ratio between exports of goods and services and GDP was instead equal to 18.4, versus 25.2 of the other regions, as well as the value of exports per employee, which amounted to 22,238 Euro compared to the 19,398 average value of central Italy.

Breakdowns and regions	Penetration of imports			Propensity to export					
	Relationship between imports of goods and services and internal demand			Relationship between exports of goods and services and GDP			Exports of goods and services per employee (values in Euro)		
	2013	2014	2015	2013	2014	2015	2014	2015	2016
North-western Italy	34.4	34.1	35.0	35.5	35.6	35.9	29,035	29,458	29,269
Piedmont	29.7	30.5	33.3	38.2	39.0	40.2	28,303	29,217	28,366
Valle d'Aosta	8.3	9.0	8.8	20.4	21.8	21.7	17,667	17,753	17,243
Lombardy	37.7	37.2	37.8	37.1	36.8	36.8	31,390	31,732	31,580
Liguria	22.9	20.9	20.1	18.2	19.0	18.9	15,509	15,277	16,520
North-eastern Italy	28.3	28.9	30.3	37.1	37.9	39.3	29,177	30,725	30,872
Trentino Alto Adige	18.4	18.7	19.2	22.7	23.1	23.9	19,729	20,491	20,459
Veneto	32.2	32.7	34.6	39.6	40.3	42.3	29,912	31,919	32,109
Friuli-Venezia Giulia	30.0	30.8	32.6	39.6	40.9	42.9	29,978	31,615	33,251
Emilia-Romagna	26.7	27.6	28.4	37.9	38.6	39.6	30,525	31,765	31,513
Central Italy	21.5	21.9	23.0	24.2	25.0	25.2	18,711	18,839	19,398
Tuscany	25.4	24.6	25.4	34.2	34.4	34.8	25,053	25,448	25,692
Umbria	12.7	13.1	13.6	18.6	18.0	18.4	10,903	11,111	11,238
Marche	21.8	22.3	22.3	31.2	32.3	29.5	21,086	19,593	20,752
Lazio	20.4	21.4	22.9	17.4	18.6	19.1	15,048	15,419	16,101
South	15.2	14.7	14.0	12.8	12.5	12.9	7,926	8,183	8,100
Abruzzo	13.7	14.5	15.5	22.5	23.3	24.2	15,567	16,638	17,947
Molise	7.2	7.0	10.2	6.2	6.6	8.8	3,888	5,218	5,205
Campania	11.5	12.2	13.2	11.4	11.2	11.6	7,280	7,517	7,418
Apulia	13.2	13.6	13.1	12.5	12.6	12.4	7,683	7,517	7,213
Basilicata	6.0	7.9	23.3	9.6	11.4	26.7	6,872	16,104	24,144
Calabria	2.2	2.1	2.3	1.5	1.6	2.1	961	1,320	1,466
Sicily	22.2	20.2	15.6	14.3	13.2	11.8	8,578	7,661	6,390
Sardinia	28.0	25.0	21.5	18.6	16.5	16.7	9,861	9,723	8,852
Total regions	25.7	25.7	26.4	28.2	28.6	29.2	21,261	21,789	21,858

Source: Ice elaborations on ISTAT and Bank of Italy data

Another interesting fact noted by the ICE is the analysis of the degree of dependence of regional exports on the number of sectors and products. To this end, the Herfindahl-Hirschman index (HH) was used as a measure of the degree of concentration of regional exports, considering the data on foreign trade for different levels of disaggregation of the product types. The following table shows the values of the Herfindahl-Hirschman index at the regional level, with reference to the year 2016, where data with a lower value indicate a greater diversification of export commodities and those with the highest value indicate a greater concentration. Overall, the Northern regions show a very low level of concentration index by sector and product, indicating a more differentiated export structure based on a wide variety of commodity categories. Even Umbria seems to position itself on a sufficiently high level of differentiation, unlike other central regions that show instead a greater concentration of sectors, such as Abruzzo, Molise and Lazio.

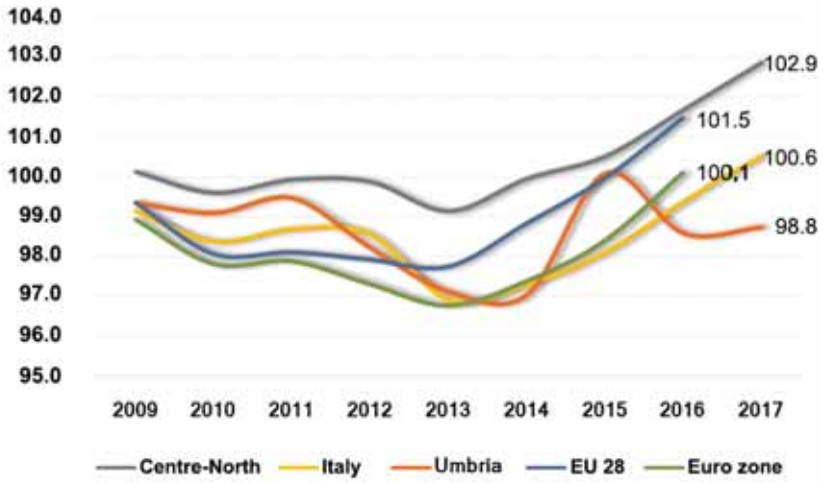
Region	HH regional merchandise concentration index		
	Under Ateco sections	Ateco categories	Products
Apulia	0.103	0.044	0.032
Liguria	0.108	0.037	0.023
Lombardy	0.111	0.012	0.002
Trentino Alto Adige	0.111	0.024	0.012
Veneto	0.122	0.015	0.003
Marche	0.126	0.051	0.023
Umbria	0.128	0.028	0.010
Campania	0.130	0.043	0.016
Piedmont	0.134	0.030	0.007
Friuli-Venezia Giulia	0.139	0.034	0.020
Tuscany	0.143	0.030	0.012
Emilia-Romagna	0.144	0.021	0.007
Calabria	0.170	0.059	0.028
Lazio	0.190	0.151	0.058
Molise	0.207	0.139	0.111
Abruzzo	0.264	0.194	0.098
Sicily	0.309	0.224	0.057
Valle d'Aosta	0.344	0.156	0.075
Sardinia	0.667	0.664	0.150
Basilicata	0.705	0.677	0.275

Source: based on ISTAT data

1.4 The dynamics of the Umbrian labour market

The regional labour market also shows signs of the economic crisis that began ten years ago and has not yet recovered. The latest data available (2017) show a total of 354,803 jobs, a figure below the levels reached before the 2007 crisis. Specifically, in the last year there was a slight recovery (0.2%), after the 1.5% employment decrease between 2016 and 2015, when the number of employed in Umbria seemed to have returned to the levels in 2007, partly due to the detaxation measures on new contracts with increasing protections, which contributed, albeit limited, to the increase in employment.
With this in mind, the regional evolution is characterised by the presence of a clear delay compared to what occurred in the other regions of the Centre-North, in which the level of employment had already returned to 2007 levels in 2014 to then further increase in the following two years.

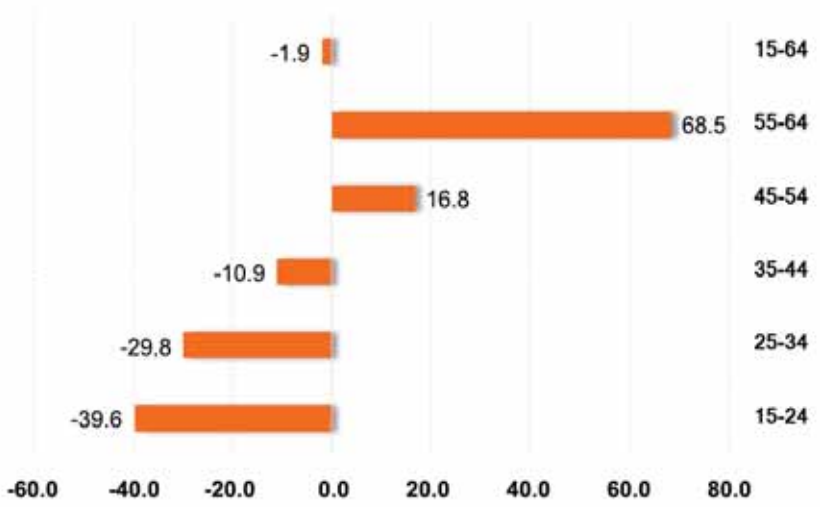
Chart 1.15 - Employment evolution 2007-2017
(Index number 2007 = 100)



Source: based on ISTAT and Eurostat data

Overall, the trends in the labour market in Umbria have had a differentiated and specular impact on young and adult workers, accentuating the difficulties in employment for the younger age groups. In Umbria, employment has, in fact, decreased dramatically among the young population, especially between the ages of 15 and 24 (-40% approximately) and between 25 and 34 (-29.8%). In absolute terms, the employed in the first age group decreased by almost 10 thousand, while they fell by more than 26 thousand individuals for the second. The negative picture is also reflected in the subsequent class, while the situation is reversed from the age of 45: the reforms that affected the pension system, with the consequent rise in the retirement age, have led to an increase in the market for the most advanced age, so that the employment of the class aged 55 and over has registered an increase equal to even 68.5%, a value corresponding to over 26 thousand units.

Chart 1.16 - Umbria - Employment by age group (% change 2007-2017)



Source: based on ISTAT data - Labour force survey

From the point of view of the various economic sectors present in the territory, the construction sector (-30.4%) and industry (-15.6%) contributed most to the decline in employment. This data is in line (even if the values are more accentuated at the regional level) with what can be observed at the national level, while there is a considerable divergence for the agricultural sector which is experiencing a very strong expansion in the regional territory (+32,6%), while there is a contraction at the national level (about 4%). The result can also be linked in part to job search difficulties in the most advanced sectors that has led many people to "rediscover" the agricultural sector, also undertaking new economic activities. However, the moderate size of this sector should be borne in mind, so that the absolute increase in employment is equal to about 3,500 units, a modest figure if compared to the loss of over 9 thousand units registered by the construction sector and over 13 thousand units of the industry sector, construction excluded.

Chart 1.17 – Umbria: Labour force by economic sector
(% change 2007-2017)

Source: based on ISTAT data - Labour force survey

The detailed examination of the evolution of employment by contract type also provides indications on the strength of the demand for work in the territory. Specifically, there was a replacement of full-time work with part-time work in the period between 2007 and 2017: full-time workers are declining by almost 9 percentage points in the regional territory, while there is a real explosion of part-time work, for which employment increased by over 46%, passing from 49,198 to 72,094 units. The increase in part-time work, which can sometimes be considered a positive element when it suggests the entry into employment of previously excluded population groups (think for example of female workers), is indicative of a deterioration conditions of the regional labour market in this case. In Umbria, part-time work now accounts for 20.3% of total employment, a situation worse than both the central and northern regions and the national average.
With regard to the other categories of employees, the number of independent workers decreased, while there was a slight increase for employees. The figure follows the observable trend also for the other territorial aggregates (Italy and Central-North), although in the latter the trend is more marked. Furthermore, for Umbria, the growth in fixed-term workers is parallel to the decrease in open-ended contracts (which are down by 0.4%).

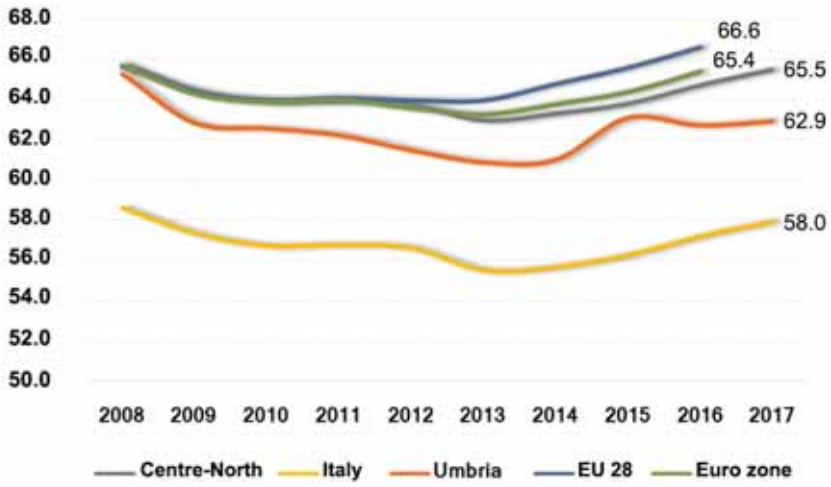
Table 1.8 - Region of Umbria: Employed by type of contract 2007-2016 (percentages)

Type of contract	% change 2007-2017 Umbria	Umbria		Centre-North		Italy	
		2007	2017	2007	2017	2007	2017
Independent Contractors	-7.1	25.6	24.1	25.9	22.4	26.1	23.2
Employees	0.8	74.4	74.2	74.1	77.6	73.9	76.8
of which open-ended	-0.4	*84.2*	83.3	*88.6*	86.0	*86.8*	86.0
of which temporary	7.0	*15.8*	16.7	*11.4*	14.0	*13.2*	18.2
Full-time	-8.8	86.3	79.7	85.6	81.0	86.4	81.3
Part-time	46.5	13.7	20.3	14.4	19.0	13.6	18.7

Source: based on ISTAT data - Labour force survey

The employment rate of those aged 15-64, for the Umbria Region, consequently shows a rather negative trend in recent years. It is possible to observe, similarly to what previously seen for the number of employees, an important trend reversal in 2015, probably also partly explained by the effects of the detaxation measures for new hires, while in 2016 the share of employees reduces again, to then slightly rise in 2017, reaching 62.9%. As emerges from the analysis of the employment rate, since 2013 the trend is recovering and somewhat similar in relation to other reference aggregates (Centre-North, Italy, EU 28, Euro zone), but underlines the particular difficulties still present with regard to access to the labour market in the Umbrian regional territory. The figure for the Umbria Region is however higher than the national average, equal to 58%, while it is below the value of the Centre-North (65.5%) and those of the EU 28 and the Euro zone (66.6% and 65.4% respectively).
The employment rate of the male component (71%), although down by 2.7 percentage points in the period, maintains a persistent yet fairly limited gap in comparison with the values of the Centre-North (73.1%) and the average of the EU 28 (71.8% in 2016). On the other hand, the female employment rate is still very low compared to the EU 28 average (at 61.3%) and shows a slight decrease in the period considered (from 55.6% in 2007 to 55.1% in 2016). The decrease posted in the gap between the male and female employment rate (-2.2 percentage points) is, therefore, more attributable to the negative trend in male employment than to a real improvement in the employment conditions of the female component.

Chart 1.18 - Employment rate 2007-2017
(percentages)

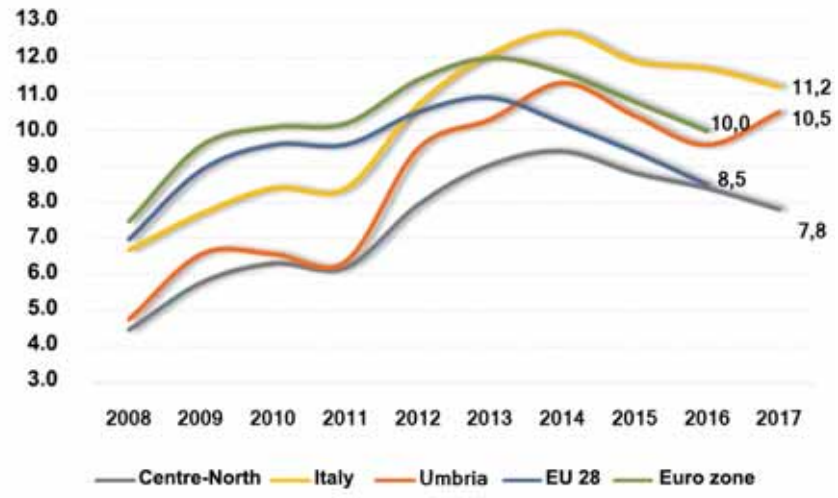


Source: based on ISTAT data - Labour force survey

The negative dynamic shown by job demand was also reflected in the number of job seekers. In 2017 the number of unemployed stood at 41,762 units (20,909 men and 20,853 women), more than double the figure recorded at regional level in 2007 (17,394 units). The unemployment rate thus rose from 4.6% in 2007 to 10.5% in 2017, given that it is lower than the national rate (11.2%), but higher than that of the other reference aggregates.

It is mainly the male component that affects the trend of the overall figure, growing from 2.9% in 2007 to 9.5% in 2016, while the female unemployment rate rose from 6.9% to 11.8%. Contrary to what we observed for employment, for the unemployment rate we can highlight a different trend for the Umbrian territory compared to the other territorial divisions of reference: in fact, if for the latter the most critical moment seems to have been reached around 2014, and subsequently a more or less marked trend reversal is observed, at a regional level there is a new increase only between 2016 and 2017 (from 9.6% to 10.5%).

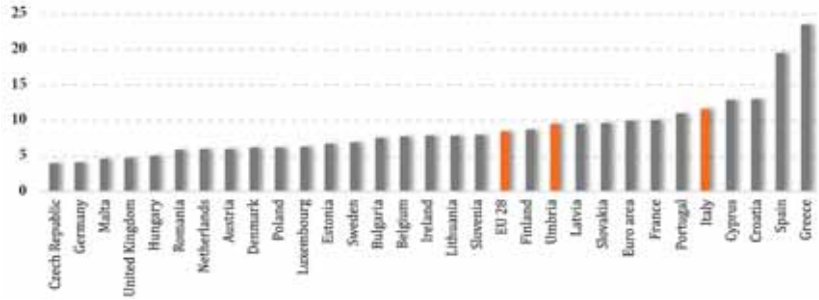
Chart 1.19 - Unemployment rate 2007-2017
(percentages)



Source: based on ISTAT data - Labour force survey

Moreover, with reference to the European Union countries, Umbria is in a better position than the countries of southern Europe, but the unemployment rate in 2016 is much higher than that of the Northern countries and several Eastern countries (the Czech Republic has the lowest unemployment rate in Europe, equal to just 4%). However, it should be kept in mind that the very high values of Greece and Spain tend to skew the EU average upwards.

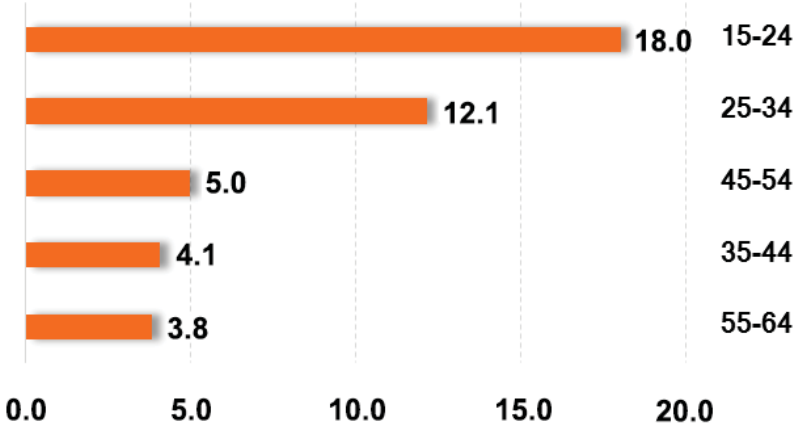
Chart 1.20 - Unemployment rate EU 28 (2016)
(percentages)



Source: based on Eurostat data

A further characteristic of the Umbrian labour market is represented by the substantial generation gap, as indicated in the following figure, which clearly shows how the younger sections of the population have been particularly affected by the difficulties in the labour market: between 2007 and in 2017 the share of unemployed between the ages of 15 and 24 has increased by 18 percentage points and now affects almost one in three young people. A strong increase also affected young people aged between 25 and 34, among whom the unemployed now account for 18%. Increases in the unemployment rate for the more mature age groups are more moderate, though present. The fact that almost half of the unemployed (49.4%) have been looking for a job for at least 12 months is also a cause for concern: in particular for men this share has increased from 31.4% to 52.4%.

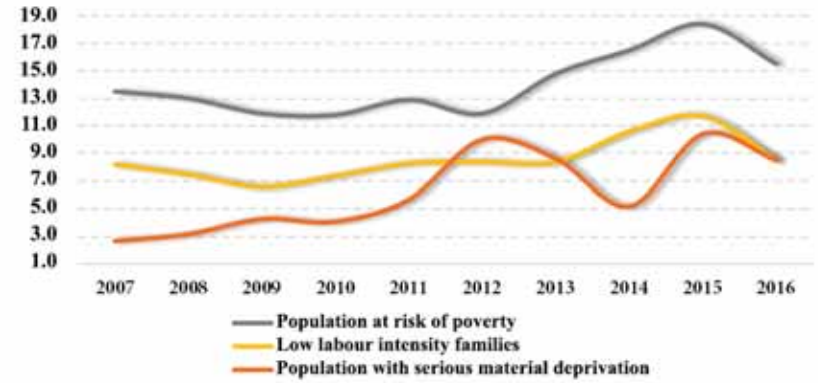
Chart 1.21 – Umbria: change in unemployment rate by age group (2007-2017)



Source: based on ISTAT data - Labour force survey

Clearly the difficulties in seeking and maintaining work have been reflected in the region's levels of poverty and social exclusion. In fact, the population at risk of poverty in the regional territory has grown in the period 2007-2016 from 13.5% to 15.5%, while the situation described by the indicator concerning the population suffering from severe material deprivations is even more serious, rising from 2.7% to 8.5%. The figure on households with low labour intensity remains rather stable (8.5% compared to 8.2% in 2007), suggesting a widespread use of precarious and poorly paid work that, together with the support provided by family ties, allows families to "survive", but causing widespread poverty and the impossibility of access to some goods and services that are now considered fundamental. It should however be noted that the trend seems to have improved for the three indicators considered in the last year.

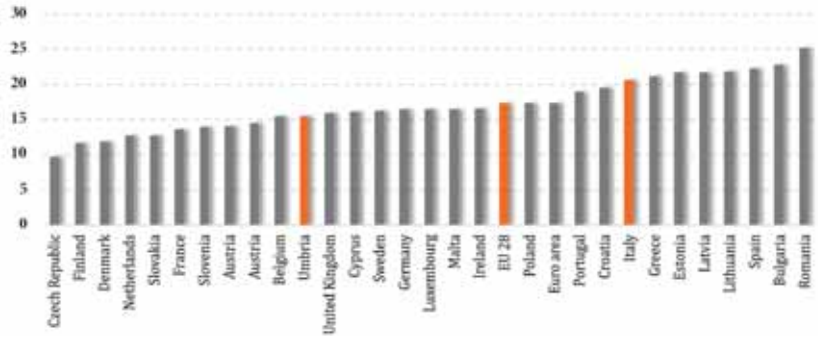
Chart 1.22 – Umbria: Poverty indexes (2007-2016)



Source: Based on ISTAT - I.Stat data

From the point of view of the population at risk of poverty, the European comparison shows that Umbria is in any case in a good relative position, better than the national average (20.6%) and the EU 28 average (17.3%). The situation is comparable with that of countries such as Belgium and the United Kingdom and better than many southern European countries.

Chart 1.23 - Population at risk of poverty in the EU 28 (2016)

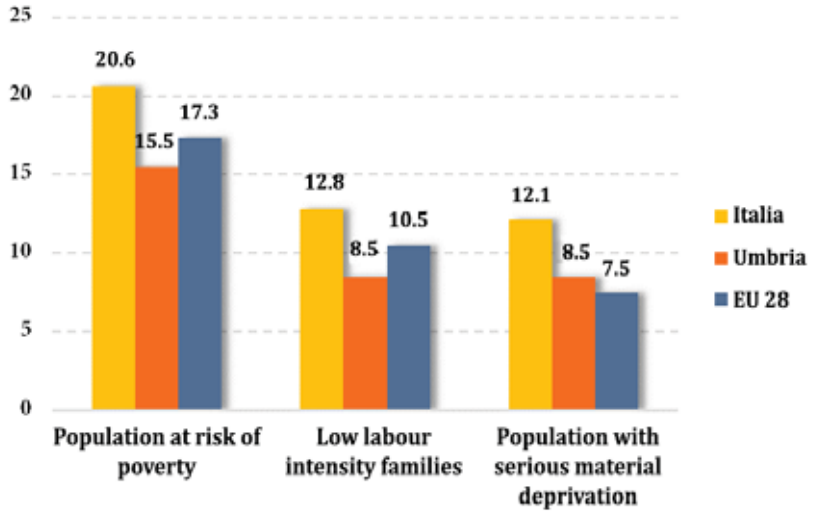


Source: based on Eurostat data

In comparison with Italy and the EU 28, the condition found in the Umbrian regional territory is always better in relation to the population at risk of poverty and to the families with low labour intensity, while it is slightly worse than the EU 28 for the population that suffers serious material deprivations. The economic difficulties of the last few years have, therefore, significantly influenced the situation of the labour market and regional social

inclusion, while the use of social safety nets and the support deriving from the families have allowed to partially contain the effects.

Chart 1.24 - Poverty indexes in Umbria, Italy and EU 28 (2016)



Source: based on Eurostat data

Box 5 - Recent dynamics of the regional economy

The following table summarises the main developments recorded by the Umbrian economy in 2017, as shown in the analysis of data relating to the sample surveys conducted by the Bank of Italy and *Unioncamere*. On the whole there was a general progress and signs of recovery in some of the areas most affected by the economic recession of the last decade.

Sectors	
Companies	The production of goods and services has increased: from the sector point of view, the increase in production was more widespread among metal companies (+9.4% compared to 2016 according to *Unioncamere*, thanks to the recovery achieved by the steel mills in Terni), of mechanics (+1.7%), agro-food (+3.1%) and in the steel sector, which recovered part of the decrease accumulated in the period of the crisis. Good results were also recorded for the electrical industries (+5.7%, given *Unioncamere*) and electronics. The activity of construction companies, on the other hand, remained weak. The services sector showed signs of improvement, benefiting from the expansion of the demand for durable goods, especially of automobiles. The growth in tourist flows, in progress since 2014, was instead abruptly interrupted following the seismic events of 2016 and there are no signs of recovery yet.

Accumulation of capital	In the industrial sector there was an increase in investments. The improved financial conditions of the companies have contributed to this, thanks to the increased profitability and easing of the credit supply conditions, as well as the new tax incentives of the Industry 4.0 Plan (hyper-depreciation and super-amortisation of tangible and intangible capital assets, tax credit for research and tax deductions for start-ups and innovative SMEs). Investment intentions seem overall favourable for the near future thanks to the recent approval of the program agreement for the industrial reconversion and redevelopment project of the complex industrial crisis area of Terni-Narni.
Foreign trade	After a period of contraction, regional exports increased (+5% compared to 2016, Bank of Italy data), with growth mainly due to the recovery in sales of metals and metal products (+34.2%). The textile and clothing and transport sectors have also made a positive contribution, which has benefited from the buoyancy of motor vehicle demand.
Labour market	Employment did not benefit from the improvement in the production environment, remaining stable overall compared to the previous year. Against the further decrease in the number of self-employed (-6.1% compared to 2016, Bank of Italy data) the number of employees started to rise again (+2.3%), but through the use of less stable contract forms, mostly temporary. The unemployment rate started to rise again (reaching 10.5% according to Bank of Italy data) due to greater participation in the labour market.
Household income and consumption	The disposable income of Umbrian families increased in 2016 (+1.5% compared to 2015, *Prometeia* data), driven by the contribution from employment. Consumption also shows an increase, in line with the national figure: household spending on durable goods has increased (6.3% according to the *Findomestic Consumer Observatory*), in particular cars, and for services, which have recovered the recession in previous years.

2 Competitiveness and the regional system of research, development and innovation (Thematic Objectives 1 and 3)

2.1 The Regional System of Research and Development (Thematic Objective 1)

The 2014-2020 Cohesion Policy Plan, in line with the objectives and targets of the European 2020 Strategy, has given a central role to policies aimed at innovation, research and development: in this perspective, the Common Provisions Regulation of the ESI Funds (Reg. EU 1303/2013) has included TO 1 "Strengthening research, technological development and innovation" among cohesion policy, rural development and fisheries instruments in Thematic Objectives (TO). This strategic approach is further strengthened by the inclusion of a specific ex ante conditional, to be met within the first two years for all operational program Managing Authorities, and by the ring fencing principle provided for in Article 4 of the ERDF (EU) Regulation 1301/2013, which provides for the restriction of the thematic concentration on the first four Thematic Objectives (including TO 1 and TO 3). Consistent with these regulatory provisions, the Umbria Region has included, within the general strategy of the ERDF Operational Program, a specific Priority Axis (Axis 1 Research and innovation) which, starting from the characteristics of the context and the need to fill the differences with respect to the targets set by Europe 2020, aims to *support research and innovation aimed at creating "long networks" in the framework of an intelligent specialisation logic, since the low level of innovation found in production processes and the creation of new products penalises the level of competitiveness of the economy, in particular in access to new markets.* Similarly, the ROP ERDF, also in the framework of Axis 3, supports interventions - strongly integrated with the provisions of Axis 1 - to encourage the innovation process of the regional economic system in line with the Regional Smart Specialisation Strategy.

2.1.1 The regional system of research

Although over the last decade the regional system of research and development and innovation has presented some positive results, total expenditure - public and private - stands at values distant from those recorded by the other regions of the Centre-North and above all from the national targets defined within the scope of the Europe 2020 objectives: in 2014, total expenditure on *intra-muros* R&D amounted to about 200 million Euro, which represents only 0.97% of the regional GDP, compared to a national target of 1.53 percent.

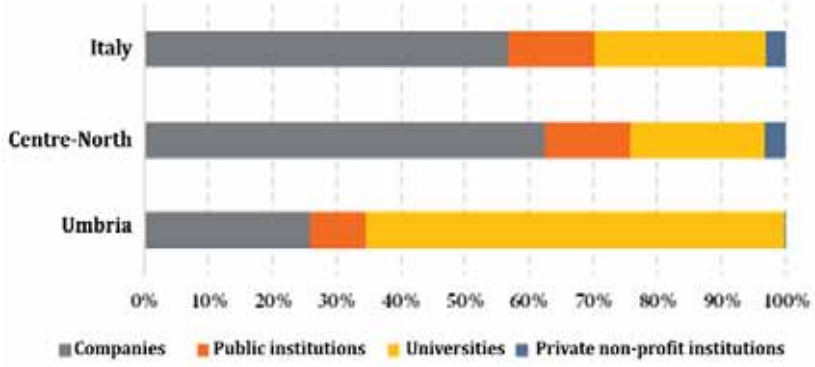
Table 2.1- R&D indicators. Territorial comparisons

Indicators			*Change from 2007*
Incidence of public expenditure on R&D – **2015** *Expenses for research and development of Public Administration and University on GDP (%)*	**Umbria**	0.7	-
	Centre-North	0.5	-
	Italy	0.6	-
Incidence of private expenditure on R&D – **2014** *Spending on R&D in the private sector (private non-profit companies and institutions) as a percentage of GDP (at current prices)*	**Umbria**	0.3	+0.1
	Centre-North	0.9	+0.2
	Italy	0.8	+0.2
Incidence of business expenditure on Research and Development – **2015** *Expenditure on research and development of public and private enterprises on GDP (%)*	**Umbria**	0.3	+0.1
	Centre-North	0.9	+0.2
	Italy	0.8	+0.2
Graduates in science and technology – **2012** *Graduates in scientific and technological disciplines per a thousand inhabitants aged 20-29* (%)	**Umbria**	12.2	-1.0
	Centre-North	16.1	+1.1
	Italy	13.2	+1.0
Research and Development employees – **2014** *R&D employees (unit expressed in equivalent full-time per 1000 inhabitants)*	**Umbria**	3.2	-
	Centre-North	5.2	0.7
	Italy	4.1	0.5
Companies that introduced product and/or process innovations - **2012** *Companies with at least 10 employees who have introduced technological innovations (product and process) in the three-year reference period as a percentage of the total number of companies with at least 10 employees*	**Umbria**	30.5	+3.6*
	Centre-North	35.5	+2.8*
	Italy	33.5	+2.8*

Source: ISTAT, Indicators for development policies. (2008 reference year instead of 2007)*

The low propensity for research in the regional system is entirely determined by the demand expressed by the companies, which remains far below what is demonstrated in the other regions of the Centre-North. At the regional level, with public spending that is in line or slightly above many Italian regions, the impact of private R&D expenditure on GDP has been the lowest among all the central-northern regions (0.3% against 0.9% of the average of the central and northern regions in 2015). Contributing to this result is the productive specialisation of the regional economy in sectors with lower R&D intensity, and the presence of an entrepreneurial system mainly consisting of small and micro businesses unable to sustain the risks typically associated with R&D, the long times of return of the investments associated with them and the greater difficulty in accessing capital markets.

Chart 2.1 - Institutions R&D expenditure (% composition)



Source: based on ISTAT data - Research and development in Italy

As can be seen from the chart, over 60% of the total regional R&D expenditure is carried out within the university institutions, while private spending absorbs just over 25% of the total expenditure. Values that at the level of the Centre-North are substantially reversed. With public spending that can boast centres of excellence, the R&D activities of private companies present, in fact, evident weaknesses, among which we can highlight:

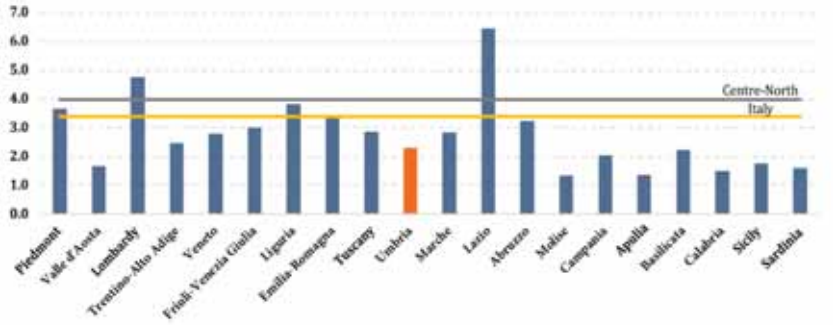
- *low level of workers employed in R&D activities out of the total number of employees*: only 3.2 units (full-time equivalents) per thousand inhabitants in 2014 (equal to 999 units), compared to an average of 5.2 units per one thousand inhabitants for the Centre-North and of 4.1 units per thousand inhabitants for the national average;
- a *low level of R&D expenditure per company employee*, which amounts to just under € 52 thousand a year in the region in 2014, compared to 95 thousand Euro per year on a national average;
- a *low production specialisation in high-tech sectors* (i.e. the number of employees in high-tech manufacturing sectors and in the high-knowledge and high-tech services sectors, as a percentage of total employment), which is equal to 2.3% in Umbria, below the national average (3.4%) and, above all, very distant compared to the central and northern regions (4%);
- a *low patent capacity*. The indicator that considers the patents registered at the European Patent Office per million inhabitants shows a strong disparity between the Italian regions, also with reference to the Centre-North area. Umbria, in this context, is positioned at the margins recording about 33 registered patents per million inhabitants, followed only by the Lazio region and the other southern regions.

Table 2.2- Employees, overall expenditure and per capita spending on R&D by institutional sector (Employees expressed in full-time equivalent, expenditure expressed in Euro) - 2014

Items	Public institutions / PA	Private non-profit institutions	Companies	Universities	Total
			Umbria		
Employees	251	2	999	1,627	2,879
R&D expenditure	17,373,000	104,000	51,937,000	131,193,000	200,607,000
Expenditure per employee	69,215	52,000	51,989	80,635	69,679
			Italy		
Employees	38,506	6,454	129,271	75,235	249,467
R&D expenditure	2,959,783,000	661,798,000	12,343,773,000	5,815,921,000	21,781,275,000
Expenditure per employee	76,866	102,541	95,487	77,303	87,311

Source: based on ISTAT data - Research and development in Italy

Chart 2.2 - Production specialisation in high technology sectors (total) - 2016



Source: based on ISTAT data - Research and development in Italy

It should be noted, however, that the share of the companies that have carried out R&D activities in collaboration with other entities (in particular, using research infrastructures and other R&D services from public or private entities), compared to the total number of companies that have conducted *intra-muros* research activities, is equal to about 19.0%, positioning almost at the level of the average of the regions of the Centre-North (20.0%) and slightly below the national average (20.6%), a sign of a certain potential of the Umbrian productive system to create forms of associations and collaborations between companies, but also, probably, of a certain effectiveness of the policies undertaken at regional level based on the funds of the cohesion policy during the previous 2007-2013 plan cycle. Actions

aimed at promoting the aggregation of networks of companies aimed at supporting research and technology transfer programs.
In particular, support for regional innovation centres aimed at encouraging more structured research and innovation activities on strategic technological areas on which Umbrian companies - due to their dimensional characteristics, financial availability and often even for cultural reasons - struggle to carry out significant research and experimentation activities. The four Innovation Poles of the Umbria Region were identified with the intervention of the ROP ERDF 2007-2013 (Axis 1 and Axis 3), namely:

- Innovation pole for energy efficiency and renewable sources (consisting of assisted SMEs for technical and scientific support from the University of Perugia and research centres - INFN);
- Innovation hub of genomic, genetics and biology (consisting of small businesses, university spin-offs and research centres);
- Advanced mechanical and mechatronic pole (composed of partners, including companies, operating above all in the main automotive, aerospace, advanced mechanics and social technologies sectors)
- Special materials and micro - nanotechnologies hub (mainly composed of companies producing plastics and rubber).

The Region has also joined national initiatives of wider impact, including the Technological District of Umbria and national technological clusters. In particular, the Technological District of Umbria (DTU) was established in 2006 by an agreement between the Region, the Ministry of Economy and Finance and the Ministry of Education, University and Research to support the capacity for innovation of the regional productive system in the metallurgical sectors (fusion and/or refining of ferrous and non-ferrous metals), micro and nanotechnologies and advanced mechanics and mechatronics, while for the national technological clusters, the Region has adhered to the MIUR for the development of clusters (in particular, of green chemistry and agri-food) and for the preparation of project ideas for Smart Cities and Communities and Social Innovation.

2.1.2 Business innovation activity

More positive results are recorded if one looks at the innovation activity of companies, demonstrating how the Umbrian companies, while not directly carrying out research and development activities, are able to promote forms of innovation through incorporation or imitation.
On the basis of ISTAT data related to the *Statistical Survey on innovation in enterprises,* it should be noted that almost half of the companies in Umbria with 10 or more employees carried out innovation activities (49.3%) in the three-year period 2012-2014, meaning activities aimed at the introduction of new products, processes, organisational or

marketing methods, against about a little over 47% of the 2010-2012 period and 46.6% recorded on average in the regions of the Centre-North.
The highest propensity for innovation shown by Umbrian companies with more than 10 employees compared to the rest of the national territory is essentially determined by the greater ability of regional companies to introduce organisational innovations and, above all, marketing, a feature also influenced by the regional sector specialisation model.
The ability of regional companies to carry out innovative process and product activities is much lower. The same economic crisis and the substantial fall of investments have, in fact, significantly affected the attitude of companies to innovate in the "strict sense" (meaning to introduce process/product innovations). The number of companies that have carried out innovative process/product activities dropped from 31.6 percent in the 2010-2012 three-year period to 29.4 percent in 2012-2014, a value that is positioned below the national average (31.9 percent) and the average of the regions of the Centre-North (34.3 percent).
The crisis has particularly affected the number of companies that in the three years have succeeded in completing innovative activities, with the introduction of at least one product or process innovation on the market or internally. The "success" companies fell between the 2010-2012 three-year period and the 2012-2014 three-year period by more than 6 percentage points and are positioned at values well below the average of the Central and Northern regions (23.8%, against the 30.8% average of the Centre-North).

Table 2.3- Indicators of innovation activity of companies with 10 or more employees
2012-2014 average (% values)

	Umbria	Centre-North	Italy
Companies with innovative activities *(companies that have carried out activities aimed at introducing product, process, organisational or marketing innovations*	49.3	46.6	44.6
Companies with innovative product/process activities *(companies that have carried out activities aimed at introducing product or process innovations)*	29.4	34.3	31.9
Companies that have introduced at least one product or service innovation (*companies that have successfully introduced at least one product or process innovation*)	23.8	30.8	28.5

Source: based on ISTAT data - Statistical survey on innovation in companies

Overall, in 2014 Umbrian companies with 10 or more employees invested over 145 million Euro in innovative activities, with a significant reduction compared to 2012 (-27%) and, moreover, by presenting an average expenditure per employee (equal to 3,500 Euro) very far from the group of five Central-Northern Regions (Lombardy, Lazio, Piedmont, Emilia-Romagna and Veneto) where two-thirds of national spending are concentrated.
Despite this data, in 2015 Umbria presents a birth rate of companies in the areas of knowledge-intensive sectors above the Central-Northern data (8.7%, against 8.4%) and just below the national level (9%): in fact, according to that reported by the *Confindustria - Cerved* study[5], in 2017 the Region posted an innovation index (presence of innovative SMEs and innovative start-ups) above the national average, with the Province of Perugia placing ninth in the innovation ranking among the 20 provinces of the Centre-North (41 companies, with an index of 0.24).

2.2 The characteristics of the regional productive structure (Thematic Objective 3)

As indicated in the ERDF Regional Operational Program, Umbria is characterised as an economic system distinguished by "a high number of micro-enterprises allocated in labour intensive sectors, which favour the introduction of labour without increasing the marginal efficiency of capital and positioned on the less profitable part of the "value chain". Umbria, based on the *Unioncamere* data of the company register updated as at 30 June 2017, there are 94,615 registered companies of which 80,234 are active, 1.6% of the total number of companies active in Italy, although down about 1.3 percent compared to the previous year (more markedly than at the national and central-northern levels), experienced an improvement in the context conditions, with a substantial consolidation of the growth of the regional economy. In fact, as reported by the Business Update of the economy of the Bank of Italy in Umbria[6], *turnover increased more intensively than in 2016, with a larger increase among mechanical and chemical companies and with the recovery of part of the decrease accumulated during the crisis phase by the steel sector[7]; similarly, for the services sector, there have been signs of improvement, even though tourism has continued to be impacted by the effects of the 2016 earthquakes.*

5 See *Confindustria*, Cerved, CENTRAL-NORTH SME REPORT - 2017.
6 See Bank of Italy, Regional Economies. The economy of Umbria. Business update, November 2017.
7 As indicated in the aforementioned report, in effect, in the first part of 2017, according to a specific Bank of Italy survey: *the trend was particularly favourable for the metal and metal products industry, thanks to the recovery achieved by the Terni steelworks of a part of the turnover lost in the crisis period. In the mechanical and chemical sectors, sales growth was widespread and the long phase of decline for cement factories was interrupted.*

Table 2.4- Active companies by sector
(units and percentage variations on the corresponding period)

Industries	2015		2016	
	Active at the end of the Period	Variations	Active at the end of the Period	Variations
Agriculture, forestry and fishing	16,612	-1.2	16,722	0.7
Industry in the strict sense	8,282	-0.8	8,239	-0.5
Construction	11,526	-2.9	11,260	-2.3
Trade	20,645	0.1	20,509	-0.7
of which: retail	11,904	-0.4	11,790	-0.1
Transport and storage	2,062	-2.8	2,030	-1.6
Accommodation and catering services	5,515	1.2	5,562	0.9
Finance and business services	11,107	1.9	11,251	1.3
of which: real estate activities	3,175	1.0	3,202	0.9
Other services and other n.c.e.	5,314	1.5	5,350	0.7
Unclassified companies	93	-	116	-
Total	**81,156**	**-0.4**	**81,039**	**-0.1**

Source: Bank of Italy based on Infocamere-Movimprese data

Overall, Umbria has an average birth rate of enterprises in line with the rest of the regions of the Centre-North (in 2015, equal to 6.8 percent Umbrian against the average value of 6.7 percent) even if below the national level (7.3 percent). At a territorial level, in the two Umbrian provinces (Perugia and Terni), the rate of evolution[8] varies between 0.1 of the regional capital and 0.9 of Terni, with a mortality level of the companies in the various territories of the region, however lower than the national one. Moreover, the local regional units are mainly concentrated in the Perugia area, as well as the relative number of employees, while the average size of the enterprises is between 3 and 4 employees, an equivalent feature for both provincial contexts.

[8] Indicates how many extra-agricultural companies in a given period of time are registered in the Business Register of the Chambers of Commerce, Industry, Agriculture and Crafts, every 100 existing at the beginning of the period and is the difference between the gross registration rate and the mortality rate.

Table 2.5- Umbria Region: entrepreneurial system
(local units and employees in absolute value, rates and percentage shares)

	Perugia	Terni	Umbria
Evolution rate (a) (c)	0.1	0.9	0.3
Gross registration rate in the business register (a) (c)	5.5	6.6	5.8
Mortality rate (a) (c)	5.4	5.7	5.5
Total local units (b) (d)	54,604	17,051	71,655
Total local units (provincial share)	76.2	23.8	100.0
Employees of local units (b) (d)	182,370	55,333	237,703
Employees of local units (provincial share)	76.7	23.3	100.0
Medium size	3.34	3.25	3.32

Source: based on Infocamere and ISTAT data
(a) For 100 companies. - (b) Statistical Register of local units. - (c) Year 2016. - (d) Year 2015

The high industrial incidence in the two provinces is attributable to the small and very small enterprises that make up the backbone of the Umbrian manufacturing industry: over a quarter of Umbrian manufacturing employees[9] work in companies with a size of less than 10 employees; another 32% are employed in companies with 10-49 employees. Overall, small businesses (up to 50 employees) occupy 59% of manufacturing employment, about 5 percentage points above the national average.
An element that, on the one hand, demonstrates the liveliness of the local entrepreneurial system and, on the other hand, is an element of weakness in the regional economic system, in consideration of the greater vulnerability that small businesses have compared to medium and large ones, both during the shocks from foreign demand and in the phases of falling domestic demand. The recessionary phases that regional productions have experienced in the two-year period 2008-2009 and in 2011-2014, have in fact hit the level of demand of small businesses, causing growing economic and financial difficulties[10].

9 ISTAT, ASIA Archive, 2015 last year available.

10 According to information from the Bank of Italy (Financial Statements office), the economic and financial vulnerability of small businesses is constantly higher than that of medium and large companies. It was noted that the profitability of small businesses remained negative even in the economic recovery phase, while it was positive for medium and large companies. The other constraint that hinders the development of small businesses derives from the high level of indebtedness (leverage of the last five years has fluctuated around 55%, 15 points above that of large companies). In a context of low or negative profitability, the vicious circle determined by the high levels of indebtedness associated with higher average interest rates - due to the rating attributed to the higher risk - leads to a higher share of operating results absorbed by financial charges.

The characteristics of the regional productive structure are, in particular, described below, articulating the analyses according to the specific objectives of Axis 3 "Competitiveness of SMEs" of the ROP ERDF 2014-2020 in order to highlight the contextual elements pertaining to each of them. We refer to:

- *production chains and the analysis of the technological level of Umbrian companies* Specific Objective 3.4 "Relaunching the propensity to invest in the production system" is aimed at promoting the recovery of the competitiveness of the production structure through a targeted relaunching of investments in the areas of intervention and on the basis of the S3 guidelines, in order to stimulate supply chains and networking between companies;
- the *credit markets*. Specific Objective 3.6 "Improving access to credit and corporate financing" is aimed at ensuring liquidity and access to funds for the small and very small regional business system;
- the *social economy sectors.* Specific objective 3.5 "Dissemination and strengthening of economic activities with a social content" focuses on non-profit companies or institutions, which put in place public services and goods otherwise not insured by the for-profit entrepreneurial system;
- the *tourism and museum system*. Specific objective 3.2 "Consolidation, modernisation and diversification of territorial production systems" is aimed at promoting the differentiated repositioning of businesses and tourist destinations, as well as strengthening existing tourism products, developing and marketing new products and new services associated with emerging or consolidating tourism segments.

2.2.1 Production chains and technological level of Umbrian companies

The production chains represent the set of production activities carried out for the transformation of raw materials into a finished product. In this sense, the analysis of supply chains allows for a more articulated understanding of the industry and the other regional economic sectors, allowing us to understand the integrated structure of the production system, its potential, as well as to consider the characteristics of the regional economic structure in a view in line with the degree of integration required by the Regional Smart Specialisation Strategy.
The following table reconstructs the Umbrian supply chain system based on the method suggested by MISE[11], which traces the value chain of the main products/services, including all the activities that contribute to the creation, transformation, distribution, marketing and supply of that product/service, associating the ATECO sectors to individual supply chains starting from a 5-digit disaggregation[12]. It is worth pointing out

11 Department for Enterprise and Internationalisation - Production and Territory Companies: First Analysis (June 2012).
12 See the Appendix for the classification of the 2007 ATECO sectors to the corresponding supply chains.

that the sectors that can be traced to a specific supply chain represent about 70% of the regional employees[13] (162,843 employees out of a total of 237,703 employees).
According to this aggregation, in 2015 the sectors with the highest number of employees are represented by construction, agribusiness, tourism and *Made in Italy*, to be understood as a home and fashion system. As a whole, the supply chains that can be traced back to traditional sectors (agribusiness, home and fashion system) and to the tourism and cultural heritage sector absorb about 62 thousand employees, 38% of all supply chain employees and 26% of the total number of regional employees.
In line with what has been described with regard to the regional production context, the dynamics of the production chains overall show negative results in the period between 2012 and 2015: negative trends are recorded in the chemical chain (-15.3%), construction (-12.8%) and metallurgy and steel working (-12%), as well as in the home system (-19.6%) and packaging (-19.4%). On the other hand, there were positive results for agribusiness, which grew by 0.9%, and for healthcare (+5.4%), while greater stability, albeit in the presence of a negative trend, is found in the tourism sector, transport and the fashion system, the latter able to absorb more than 13 thousand employees in 2015.

Table 2.6- Production chains: number and % variation 2007-2015
of Umbrian company employees by production chain

Supply chain	2012	2013	2014	2015	2015/2012
Agribusiness	25,806.8	26,015.0	25,775.7	26,037.7	0.9%
Chemical	1,122.8	1,111.7	981.9	951.4	-15.3%
Construction	46,656.8	44,397.8	41,537.7	40,662.9	-12.8%
Energy	2,207.2	2,092.6	2,166.9	2,173.7	-1.5%
ICT	6,801.1	6,729.1	6,562.9	6,175.0	-9.2%
Instrumental mechanics	6,550.9	6,285.0	6,045.4	6,223.8	-5.0%
Media/audio-visual	3,493.7	3,341.2	3,234.8	3,235.4	-7.4%
Metallurgy and steel working	6,078.1	5,967.1	5,758.1	5,349.6	-12.0%
Means of transportation	8,775.6	8,332.7	8,086.0	8,042.3	-8.4%
Packaging	1,271.7	1,156.5	990.5	1,024.4	-19.4%
Health care	13,485.5	13,767.9	13,326.5	14,207.6	5.4%
Home system	11,881.4	10,685.0	10,042.2	9,552.2	-19.6%

[13] ISTAT: Statistical register of local units (ASIA-UL).

Supply chain	2012	2013	2014	2015	2015/2012
Fashion system	14,251.1	13,701.9	13,143.5	13,077.9	-8.2%
Transport	12,287.1	12,085.8	11,900.6	11,525.0	-6.2%
Tourism and cultural heritage	13,883.5	13,344.1	13,695.3	13,603.9	-2.0%
Total	**174,553.1**	**169,013.3**	**163,247.7**	**161,842.6**	**-7.3%**

Source: Based on ISTAT data

As anticipated, the analysis of supply chains makes it possible to reconstruct a picture of the production system useful for assessing regional performance from the point of view of some strategic objectives, including the degree of progress in terms of Smart Specialisation Strategy - S3. Among the other dimensions of the S3 we can consider, for example, the analysis of the technological level of the Umbrian chains, through the breakdown of the production system according to the Eurostat/OECD classification that groups the sectors based on the use of more or less advanced technologies in the production process[14].

The taxonomy considered aggregates manufacturing companies[15] through a four-level technological scale and service companies by two levels of intensity of knowledge: *High-technology Manufacturing Industries (HT), Medium-high technology Manufacturing Industries (MHT), Medium-low technology Manufacturing Industries (MLT), Low technology Manufacturing Industries (LT), Knowledge intensive services[16] (KIS), Less knowledge intensive services (LKIS).*

As shown in the following charts, about 73% of Umbrian employees were employed in service companies in 2015 and more than half in low-knowledge firms, with a higher percentage compared to the Italian figure (49%). On the other hand, knowledge-intensive companies posted 23% of employees employed, compared to 26% of the national average. As far as manufacturing is concerned, the highest number of employees is found in low-tech companies (13%, compared to 9% of Italian companies) and, to a lesser extent, medium-low technology, while only a limited number of employees are employed in high (0.3% compared to 1.1% of the national average) and medium-high technology sectors.

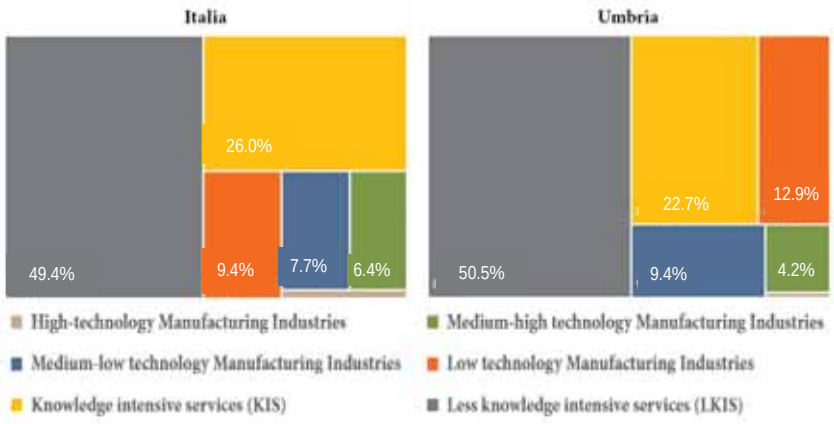
14 See http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Glossary:High-tech.

15 Construction, mining, energy and water supply sectors are excluded from classification. The connecting tables between the ATECO sectors and the Eurostat/OECD classification for the technological intensity of the manufacturing sectors and of the market services are given in Appendix I.

16 Unlike the previously mentioned indicator used by DPS Production specialisation in the high-tech sectors, which is given by the number of employees in the high-tech manufacturing sectors and in the sectors of knowledge-intensive and high-tech services as a percentage of total employed, the cluster of the Knowledge intensive services, includes the NACE codes Rev 2 59-63 and 72 of the DPS indicator, also codes 50-51, 58, 64-66, 69-71, 73-75, 78, 80 and 84-93 (see Appendix II).

This concentration of employees in low-tech and low-knowledge sectors reflects what was previously found in the analysis of the production system according to Pavitt's taxonomy: the preponderance of sectors linked to traditional goods and services seems to be closely linked to a lower technological level, unlike sectors with higher specialisation which imply a higher technological level.

Chart 2.3 - 2015 composition of Umbrian and Italian company employees by technological level



Source: Based on ISTAT data

The following table shows the dynamics of Umbrian workers by company size classes and technological level between 2007 and 2015. In this sense, it emerges that the employment of workers in the high and medium-high tech sectors decreased overall during the period (respectively -16.9% and -11.3%), above all due to the decline in employment recorded for companies with more than 50 employees. This is the case of companies belonging to the complex crisis area of Terni - Narni for which, as previously seen, the PRRI has been approved. On the other hand, industries with lower technology experienced an overall lower reduction of the number of employees (-7.6%) - partly linked to the results of Made in Italy - and an increase in employees in companies with more than 250 employees.
As far as services are concerned, on the contrary, there is a greater level of employment and an increase in the number of employees in knowledge-intensive services (+2.2 per cent), which particularly concerned large companies. A slight increase in employment in large companies also occurred in the low-intensity sectors of knowledge, although the overall trend was negative (-4.0%).
The general negative trend also involved Italian companies which, however, experienced a smaller and more homogeneous contraction compared to technological levels. In this sense, the negative impact of the period seems to have had a more uniform impact on each of the

sectors considered from the technological point of view, unlike Umbria which suffered the effects of the crisis, in particular in some sectors with greater use of technologies, such as metallurgy and steel industry.

Table 2.7- 2007-2015 % change in the composition of Umbrian company employees by size class and technological level

Technology level	0-9	10-49	50-249	250 and higher	Total
High-technology Manufacturing Industries	-11.4%	80.9%	-44.3%	0.0%	-16.9%
Medium-high technology Manufacturing Industries	1.4%	-14.2%	-1.8%	-31.9%	-11.3%
Medium-low technology Manufacturing Industries	-8.1%	-12.5%	-13.4%	13.3%	-8.5%
Low technology Manufacturing Industries	-6.8%	-11.4%	-10.7%	4.9%	-7.6%
Knowledge intensive services (KIS)	-2.2%	1.3%	-10.7%	188.7%	2.2%
Less knowledge intensive services (LKIS)	-4.1%	-5.3%	-3.4%	2.9%	-4.0%
Total	**-4.0%**	**-6.8%**	**-8.5%**	**16.7%**	**-4.0%**

Source: Based on ISTAT data

Considering therefore the system of the Umbrian chains from the point of view of the technological level, some indications are obtained regarding the condition of the Umbrian companies and the progress in terms of achieving the objectives set by S3. The composition of Umbrian company employees in 2015 shows that the sectors that use the highest level of technology and knowledge are those of ICT, instrumental mechanics and health care. On the other hand, the low-tech and low-intensity supply chains are those of traditional goods and services, such as agribusiness and Made in Italy (home system and fashion system), as well as tourism and transport. Changing perspective, one can then consider the technological composition of the individual supply chains: in manufacturing most of the workers in the supply chains are employed in companies with low and medium-low technology, while companies with high or medium-high levels find themselves in agribusiness, in ICT, in instrumental mechanics, in chemicals, in means of transport and in the home system. From the point of view of services, given a greater number of employees in companies with low intensity of knowledge, there are significant percentages of employees employed in sectors with high knowledge in ICT, media/audio-visual, metallurgy and steel industries, health care and tourism.

Table 2.8- Production chains: Composition of Umbrian company employees by production chain and technological level

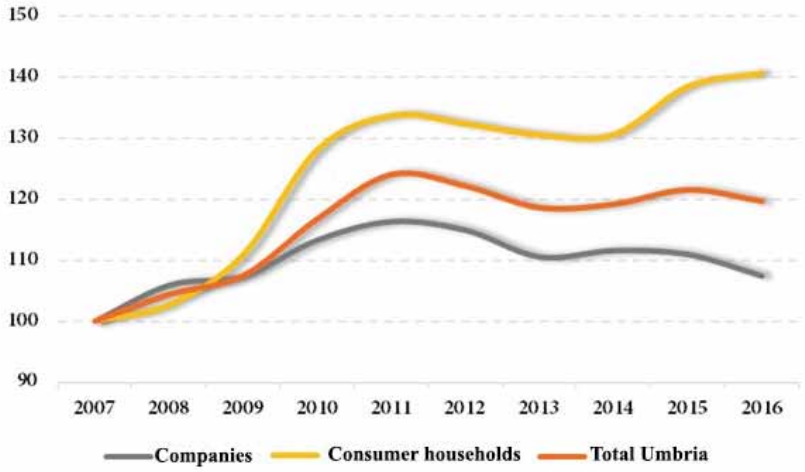
	Manufacturing				Services		Total
	HT - Manufacturing	MHT - Manufacturing	MLT - Manufacturing	LT - Manufacturing	KIS - Services	LKIS - Services	
Agribusiness		0.8%	0.2%	7.4%	0.2%	13.1%	21.7%
Chemical		0.4%	0.4%			0.1%	0.8%
ICT	0.4%	0.0%	0.2%		3.6%	1.0%	5.2%
Instrumental mechanics		3.0%	1.8%			0.5%	5.2%
Media/audio-visual	0.0%			1.4%	1.3%	0.0%	2.7%
Metallurgy and steel working			3.0%		0.9%	0.6%	4.5%
Means of transportation		1.0%	0.2%			5.6%	6.8%
Packaging			0.2%	0.5%		0.2%	0.9%
Health care	0.1%			0.6%	9.3%	2.0%	12.0%
Home system		0.3%	1.5%	3.9%	0.1%	2.2%	8.0%
Fashion system			0.0%	8.0%		2.9%	11.0%
Transport					0.0%	9.7%	9.7%
Tourism and cultural heritage					1.3%	10.1%	11.5%
Total	**0.5%**	**5.6%**	**7.4%**	**21.7%**	**16.9%**	**47.9%**	**100.0%**

Source: Based on ISTAT data

2.2.2 The credit markets

The ERDF Operational Program, considering that "*access to credit, a subject of particular interest in a system of small and very small enterprises in which capital procurement takes place practically exclusively with that of debt, is a structural problem that will be difficult to resolve without "extraordinary" interventions and policies*", proposes interventions for the improvement of access to credit under Axis 3, as well as measures to relaunch the propensity to invest in the system and actions to increase the level of business internationalisation. With this in mind, analysing the characteristics of the credit system, allowing the analysis of some more general aspects that directly or indirectly influence the credit access capacity of operators in the Umbrian production system, helps to identify the conditions that also determine the positioning of the region in the broader national and European scenario.

Chart 2.4 – - Loans by customer business segment
(Index number 2007 = 100)



Source: based on Bank of Italy data

In particular, the slowdown in investments that characterised the economic environment can generally be traced back mainly to two components, the first relating to economic conditions and lack of operator confidence, the latter to the contraction of bank credit. Verifying the impact of these two factors, however, it emerges that while it is clear how the context has influenced the process of capital accumulation since the outbreak of the crisis, the evidence regarding an effective reduction of credit supply by of the banks has only partially emerged in Umbria and from 2011. In fact, the issue of loans maintained rather stable levels and higher than the pre-crisis levels, so much so that in December 2016 the volume of loans was 20.2% higher than the 2007 figure. The credit crunch began to emerge with evidence only from 2011, when the credit supply started to contract both for public administrations (-6.9%) and for businesses (-7.7%).
Specifically, between 2011 and 2016, the decline in loans was particularly pronounced in the sectors most exposed to the crisis and in those sectors, that already had a greater perception of risk: industry and construction (respectively -7.3% and -25.1%), as well as the production families (-12.6%). The specific weight of the industry on the local economy and the concentration in a few large corporate groups has defined a close correlation between the crisis of companies belonging to sectors such as metallurgy and chemicals with industry performance and, consequently, on the level of risk perceived by banks in the provision of credit to these companies. In this sense, the credit crunch observed in these sectors was not found - or only partially - in other sectors such as

services (which recorded only a slight reduction of -0.4%) or for household consumers, who instead witnessed a 5.2% expansion of the credit offer between 2011 and 2016.

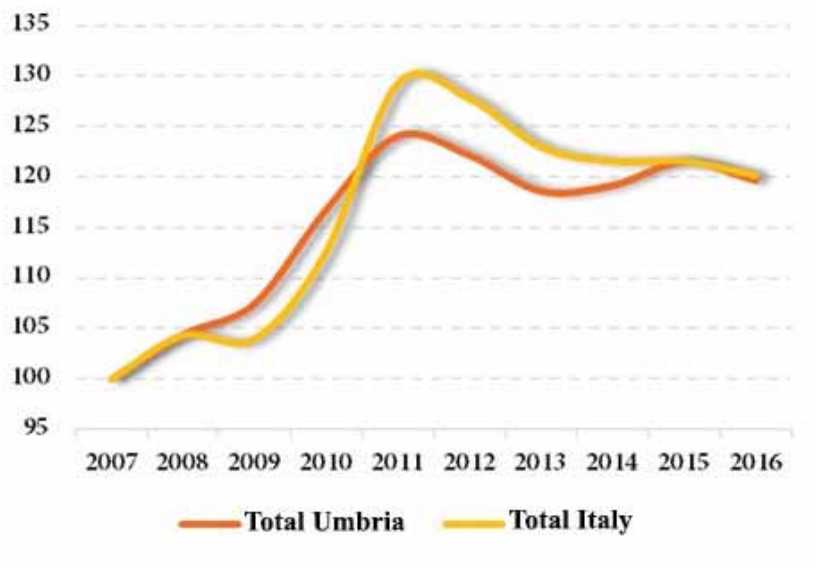
Table 2.9– Loans by customer business segment
(amounts in millions of Euro - figures as of December 31st)

Loans by sector	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2016 2007	2016 2011
Public administrations	0.4	0.4	0.4	0.4	1.0	0.9	0.9	0.8	0.9	0.9	141.7%	-6.0%
Financial institutions	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	162.5%	113.0%
Companies	10.4	11.1	11.2	11.8	12.1	12.0	11.5	11.7	11.6	11.2	7.4%	-7.7%
- industry	4.1	4.3	4.2	4.4	4.5	4.4	4.2	4.3	4.3	4.1	1.1%	-7.3%
- construction	1.8	1.9	2.0	2.3	2.4	2.3	2.2	2.2	2.0	1.8	1.6%	-25.1%
- service	4.2	4.4	4.6	4.7	4.8	4.8	4.7	4.7	4.7	4.8	14.7%	-0.4%
Production families	1.7	1.7	1.7	1.8	1.9	1.8	1.8	1.8	1.7	1.6	-2.6%	-12.6%
Consumer households	5.2	5.4	5.8	6.7	7.0	6.9	6.8	6.8	7.2	7.3	40.7%	5.2%
Total Umbria	**17.8**	**18.5**	**19.1**	**20.7**	**22.0**	**21.7**	**21.1**	**21.2**	**21.6**	**21.3**	**19.7%**	**-3.6%**

Source: based on Bank of Italy data

The comparison with the national average as at 31 December 2016 shows a substantial alignment of Umbria with the figure for Italy, with an increase in loans from 2007 of around 20%. The trend in the period, however, was different and the lower growth of the regional data between 2007 and 2011 resulted in a smaller impact of the contraction in the following period (-3.6% for Umbria compared to -7% of Italy).

Chart 2.5 - Loans (index number 2007 = 100)



Source: based on Bank of Italy data

The contraction of bank credit was also accompanied by a reduction in subsidised loans, which rose from € 284 to € 80 million between 2007 and 2016, penalising trade (-95.7%), crafts (-88.2%), construction (-75%) and industry, in particular credit granted to small and medium-sized enterprises.

Table 2.10- Subsidised loans by category of incentive laws
(amounts in millions of Euro - figures as of December 31st)

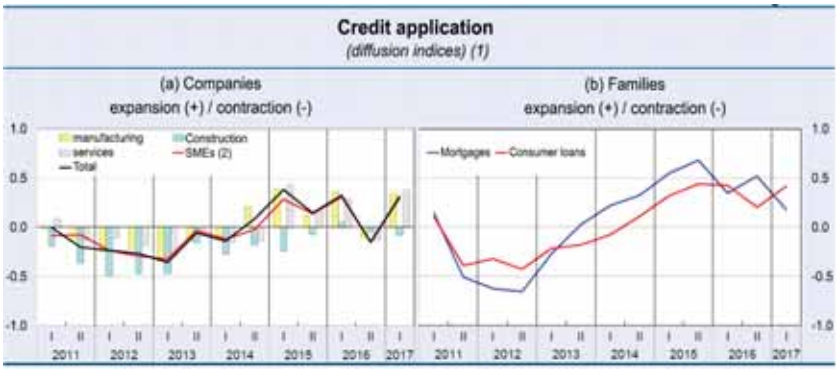
Loans by sector	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2016 / 2007	2016 / 2011
The South and depressed areas	9	0	1	0	0	0	0	0	0	0	-100.0%	
Industry												
- medium and small businesses	42	36	26	29	22	15	12	13	10	8	-69.0%	-103.1%
- other	5	8	18	20	18	19	6	6	6	7	20.0%	-98.9%
Trade, financial and insurance activities, transport and communications	23	24	19	4	3	1	1	1	0	0	-95.7%	-131.9%

Loans by sector	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2016 2007	2016 2011
Agriculture, forestry and fisheries	17	14	9	8	6	6	6	6	6	6	-64.7%	-110.8%
Construction and housing	56	55	43	26	21	18	16	14	13	10	-75.0%	-103.6%
Crafts	34	34	17	13	11	8	6	4	3	2	-88.2%	-108.0%
Natural Disasters	1	1	1	1	0	0	0	0	0	0	-100.0%	
Other	96	82	83	72	66	56	48	54	54	48	-43.8%	-100.7%
Short term	1	0	0	0	0	0	0	1	1	0	0.0%	
Total Umbria	**284**	**253**	**217**	**173**	**147**	**123**	**94**	**98**	**92**	**80**	**-65.5%**	**-100.4%**

Source: based on Bank of Italy data

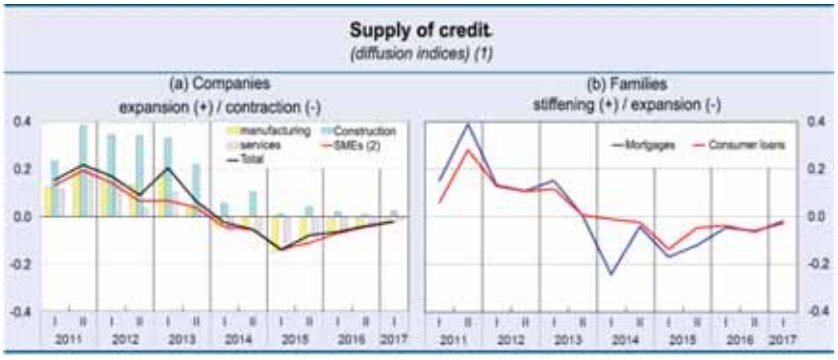
The assessments regarding the trends of the regional credit system are also reflected in the Regional Banking Lending Survey (RBLS), a survey conducted by the Bank of Italy with the collaboration of the European Central Bank, aimed twice a year at a sample of about 350 banks, on the supply policies and on the credit demand of companies and families. As can be seen from the following graphs, the contraction of credit starting from 2011 - and the relative expansion recorded since 2014 - has concerned both supply and demand. The decline of the latter can be explained both by the negativity of the regional production context and by the relative climate of lack of confidence of the companies, and by the disincentive determined by the more stringent constraints put in place by banks for access to loans. The indications on the determinants of credit demand reveal, on the other hand, that the requirement was mainly aimed at compensating the liquidity difficulties of the companies, through debt restructuring and the support of working capital, while the demand for investments has showed a negative dynamic.
From the supply side, the results of the survey show that starting from 2011 the banks have tightened credit conditions, deriving both from choices within financial institutions and from the need to adapt to the new standards envisaged by Basel III for the supervision of banking sector risk. Starting in 2014, these restrictions began to ease, although a condition of general prudence on the part of banks, especially towards the construction sector, characterised by a higher risk, remained. Also for families, the RBLS confirms what has been observed previously: compared to a contraction following 2011, as early as 2013 families have recorded an expansive phase of credit both from the point of view of demand and from the supply that has benefited from the expansive orientation of monetary policy.

Chart 2.6 - Credit demand trend



Source: Bank of Italy

Chart 2.7 - Credit supply trend



Source: Bank of Italy

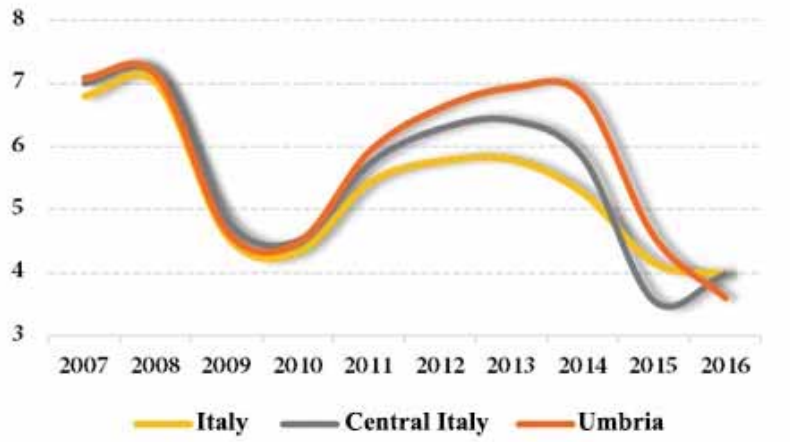
In general, the selectivity of financial intermediaries was manifested mainly through:

- the use of higher spreads for the riskiest positions;
- the increase in costs associated with financing, beyond the interest rate;
- the request for greater guarantees;
- the reduction of the quantities supplied.

From the point of view of interest rates, it should be noted that since 2011 there has been a considerable tightening of credit conditions for all economic activities and manufacturing activities. Between December 31, 2010 and the same period of the following year, interest rates increased by about one and a half percentage points for total economic activities (from 5.19% to 6.56%), to then continue up to 7.61% at December 31, 2013. After this date, the rate trend started to fall, reaching 5.11% in December 2016,

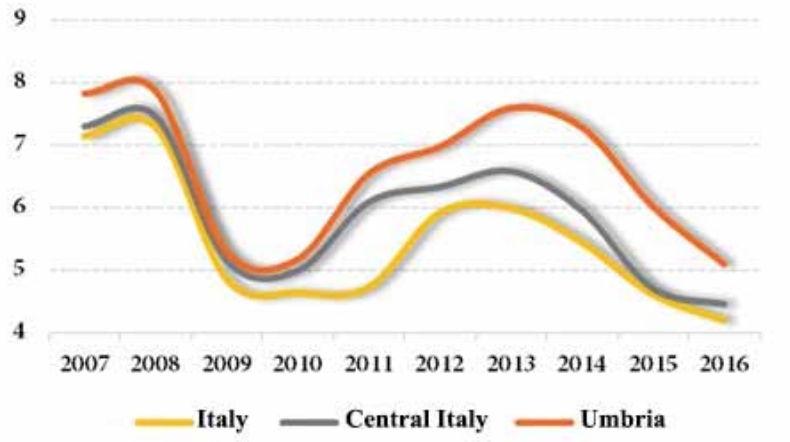
slightly lower than in 2010. Similar dynamics were recorded for rates relating to the manufacturing sector, which at the end of the period stood at 3.59%. The territorial comparison with the other Italian regions shows that Umbria showed rates throughout the period above the Italian average and in the central regions, with a significant gap starting from 2011 which seems to be slowly aligning with the other regions in the last period.

Chart 2.8 - Actual interest rates: self-liquidating and revoked risks - Manufacturing



Source: based on Bank of Italy data

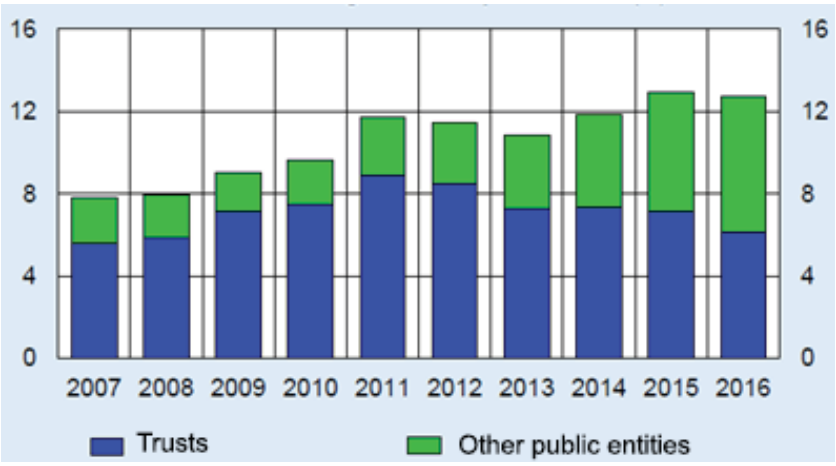
Chart 2.9 - Actual interest rates: self-liquidating and revoked risks - Total businesses



Source: based on Bank of Italy data

As noted in the Report on Regional Economies of the Bank of Italy, the increased demand for guarantees was associated with a greater difficulty of *Confidi* - the collective guarantee consortia - to cope with the increase in the portion of non-performing debts, so much so that a reduction in the guarantees given is recorded.

Chart 2.10 - Degree of coverage:
impact of collective and public guarantees
on total personal guarantees



Source: Bank of Italy

On the other hand, the use of the Guarantee Fund for SMEs has had greater impact over the last few years, which has now become an important instrument supporting business credit, through the substantial contribution provided by public funds.

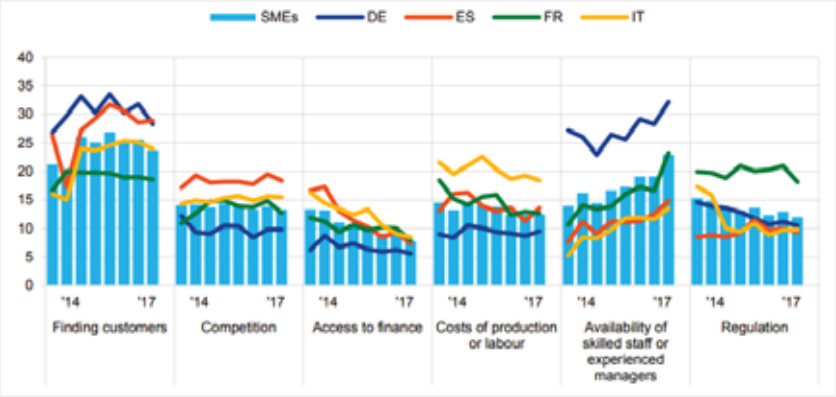
Box 6 - Demand analysis: the SAFE survey

From the point of view of credit demand, although not available at the regional, but only national level, useful information can be derived from the results of the SAFE Survey on the Access to Finance of Small and Medium-sized Enterprise, conducted by the European Commission and European Central Bank in all European countries. The survey was conducted between 2009 and 2017 on small and medium-sized enterprises, as well as large ones in terms of comparison, on a sample, for the latest survey for the period April 2017 - September 2017, of 11,202 European companies.

In general, the SAFE survey reveals that between 2014 and 2017 the perception of the companies interviewed with respect to access to credit has substantially changed: between 2014 and 2015 the incidence of difficulty in accessing loans was one of the factors of greater severity, overcoming the problems related to the outlet markets for businesses and only remaining below the problems

related to production and labour costs. However, this trend has been attenuated over the last two years and is progressively in line with the perceptions recorded in other European countries.

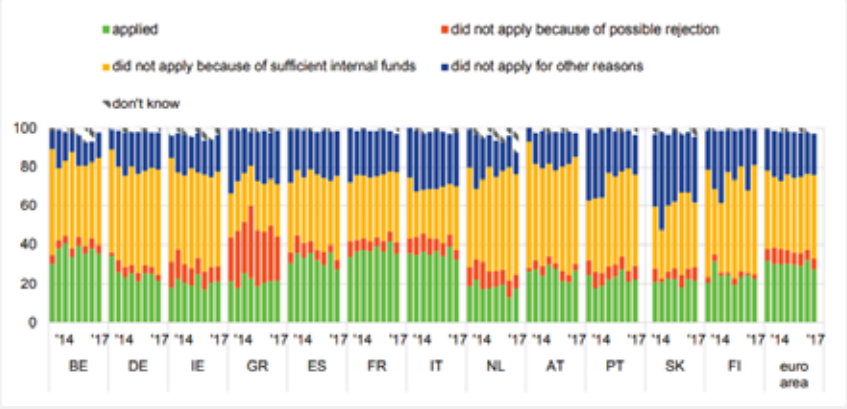
Greater problems faced by SMEs in the Euro Area



Source: European Central Bank

Looking specifically at bank loan applications, we note that most of the companies interviewed did not make requests: most of the companies interviewed claimed to have sufficient internal funds available, while, to a lesser but relatively significant and growing number of companies that claimed not to have turned to bank credit for the risk of receiving a possible refusal. Perception which is more pronounced in those countries most affected by the effects of the crisis and which, therefore, may have suffered the most from the precautionary conditions posed by banking institutions (Greece, Portugal, Ireland and, albeit to a lesser extent, Italy and Spain), whereas this reason is generally reduced for countries that have had a greater resilience in the face of the crisis (Germany, Austria, Finland and Belgium).

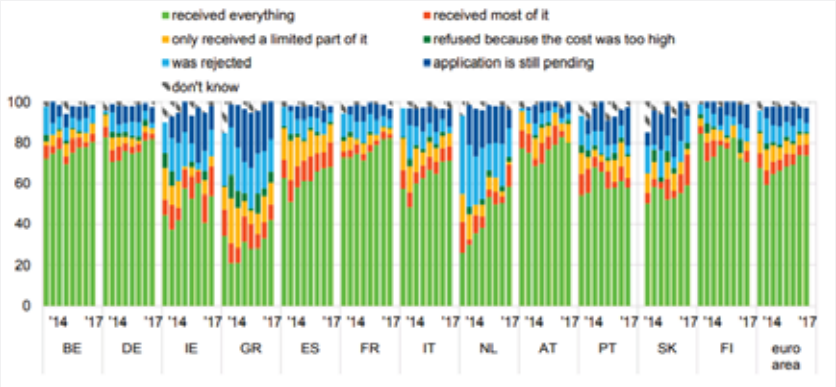
Applications for bank loans by SMEs in the Euro area



Source: European Central Bank

In fact, the perception regarding the possibility of receiving a refusal would seem to be reflected in the data on the responses received by SMEs to the request for credit: in Italy more than half of the SMEs that have turned to the financial institutions have obtained the total amount requested, while the remaining part received a refusal or received only a part of what was requested. For some companies the cost of debt was significant, causing them to decline the loan. This trend would seem to improve, however, in the last period, with a progressive reduction of refusals or partial loans. The following chart shows that the credit restriction is less marked for the countries that have suffered the negative economic situation to a lesser extent and which have a significantly higher level of acceptance of applications than the countries of the Mediterranean area.

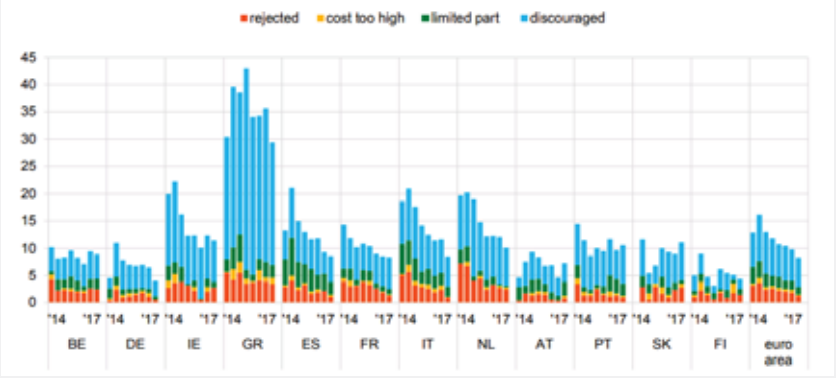
Responses to applications for bank loans by SMEs in the Euro area



Source: European Central Bank

By adding barriers to access to credit to the picture, there is an effect of discouragement on the part of businesses in addressing the banking system which appears, in relative terms, proportionally more significant than the actual share of refusals, a distortion of the credit market that tends to accentuate the degree of unsatisfied demand.

Obstacles to obtaining bank loans for SMEs in the Euro area



Source: European Central Bank

Excluding those "discouraged" and companies that did not need bank credit, most companies said they had difficulty accessing credit as a result of the high cost of debt (interest and price) and the lack of inadequacy of guarantees given. There is also share of Italian companies that believes there is a general lack of credit supply - albeit slightly down in the last period - comparable to that of some of the countries most affected by the effects of the economic crisis and the banking crisis (Greece and Ireland).

Reasons why bank loans do not represent
a significant source of financing for SMEs in the Euro area

Source: European Central Bank

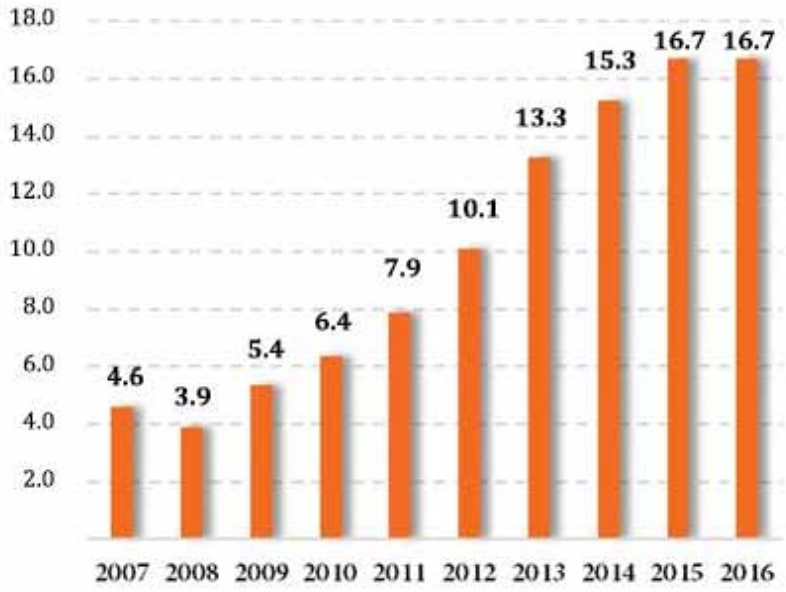
The climate of caution that has characterised the supply of credit by the banks, both in terms of interest rates charged and in terms of greater guarantees required, can be partly explained by observing the data relating to the situations of non-performing loans.

Table 2.11- Non-performing loans
(amount in millions of Euro)

Non-performing loans	Amount	Number of loans granted
2007	819	10,178
2008	726	9,100
2009	1,022	10,214
2010	1,319	12,458
2011	1,738	14,991
2012	2,192	16,470
2013	2,794	20,657
2014	3,233	20,904
2015	3,607	21,126
2016	3,548	21,613

Source: based on Bank of Italy data

Chart 2.11 - Non-performing rate



Source: based on Bank of Italy data

In fact, the deterioration in credit is evident if we consider the significant increase in non-performing loans compared to the amounts, which reached € 3,548 million in 2016, and the number of loans (21,613, compared to 10,178 recorded in 2007). Also in relative terms, the non-performing rate - given by the amount of non-performing loans on total loans - increased steadily from the beginning of the period, from 4.6% in 2007 to 16.7% in 2016. In general, it is noted that the increase in non-performing loans, even though it had already occurred at the beginning of the period considered, has acted as a deterrent to the offer policies of banking institutions only from 2011, when non-performing loans were associated with a contraction in the supply of credit.

2.2.3 The social economy sector in Umbria (social enterprises)

The ERDF regional plan, for the 2014-2020 cycle as part of the Thematic Objective 3 strategy, as well as focusing on strengthening local production systems in terms of innovation, focuses in particular on specific sectors, including businesses with a social content, highlighting its potential contribution to the region's competitiveness and setting the *increase in the qualification of social enterprises and the social economy dimension* as their goal.

Starting, therefore, from the data of the ISTAT census on non-profit institutions in 2011, in Umbria there were 6,249 non-profit institutions (equal to 2.1% of the national total) that employed more than 9,500 people and collaborated with almost 107 thousand volunteers. Within this context, even if there are no high figures in terms of absolute values for Umbria, even compared to other regional realities, the "non-profit world" undoubtedly plays an important role in the Umbrian economic and social system, confirmed also by the recent ISTAT update on the permanent Census of non-profit institutions.

Table 2.12- Territorial distribution of non-profit institutions in Umbria Census 2011

Regions	Social cooperatives	Recognised associations	Unrecognised associations	Foundations	Other non-profit institutions	Total
Umbria	183	1,549	4,097	96	324	6,249
Perugia	135	1,086	3,176	76	247	4,720
Terni	48	463	921	20	77	1,529
Italy	11,264	68,349	201,004	6,220	14,354	301,191
Centre-North	6,672	49,947	148,989	5,228	11,038	221,874

Source: Based on ISTAT data

The non-profit sector, as well as being characterised by its traditional relevance in the local production context, also represented an expanding sector in an economic context characterised by a prolonged recession: according to ISTAT data updated to 2015, the non-profit institutions operating in Umbra are 6,781, 8.5 percent more than in 2011, and overall employ almost 178,000 volunteers and 17,828 employees. Compared to the previous Census, the number of volunteers, in particular, has grown significantly with over 70 thousand individuals, as well as employees increased by 18.1% (above the national variation of 15.8%). percent).

The relevance of the sector is also evidenced by the ratio of the number of institutions to the resident population: Umbria shows a high incidence, equal to 76.1 institutions per 10,000 inhabitants, higher than the level registered with respect to other regions of the Centre (62.8). Most of these non-profit institutions work in the culture, sports and recreation sectors (66.6%, almost as at the national level where the sector stands at 64.9%), but other relevant sectors of interest are religion (9% compared to 4.3% of the national level), social assistance and civil protection (7.2% against 9.2% national), union relations and representation of interests (4.2%), education and research (2.5%, compared to 4% in Italy), economic development and social cohesion (1.7%) and health care (2.6%). Despite the reduced importance, the latter sectors still occupy a substantial part of non-profit workers, with particular reference to the social assistance and civil protection sector, with over 5,300 employees, of economic development with 2,754 employees, in addition to the health and education and research sectors (respectively 904 and 840 employees).

In 2015, the non-profit sector in Umbria confirms itself to be mainly made up of recognised and unrecognised associations (5,584 units equal to 82.3 percent of the total), a legal form which, moreover, gathers the largest share of volunteers and 87.8 percent of the total human resources present, followed by social cooperatives that, although they represent only 3.7 percent of the total (253 units), employ more than 8,000 paid workers (with only 506 volunteers); foundations (117, equal to 1.7 percent) with a significant number of volunteers (8,988) compared to a very limited number of employees, equal to 672; institutions with other legal form (827, equal to 12.2 percent). These - represented mainly by civilly recognised ecclesiastical bodies, committees, mutual aid societies, health or educational institutions, social enterprises with a legal form of enterprise - employ over a thousand workers and employ over 6,700 volunteers. Compared to 2011, social cooperatives recorded a strong growth (+38.8%) while the growth rate for foundations is more contained (+21.9%), the highest increase is however found among institutions with other legal form (almost tripled compared to the previous survey), against a reduction in the number of associations (-1.1%). As already indicated, over two thirds of non-profit institutions are represented by associations, which employ only 13.4 percent of workers; in terms of comparison, social cooperatives, the traditional area of social-work inclusion, especially in the sector of social welfare services, despite being 3.7% of the total of all the institutions surveyed, employ over 70% of employees. Even in the other legal forms envisaged by the civil code, the paid personal structural component has a significant importance (9.5%). This aspect is particularly evident in the Italian non-profit sectors considered "classic" (those of education, health and above all social assistance) which, even if they represented only 10.6% of all institutions, involved the 62.6% of employees.

Table 2.13- Non-profit institutions by sector of core business and legal form in Umbria Year 2015 (Percentage values)

Core business	Legal form				
	Association	Social cooperative	Foundation	Other legal form	Total
Culture, sport and recreation	95.0	0.3	0.7	4.0	100
Education and research	52.9	8.1	20.3	18.6	100
Health care	88.1	7.4	2.3	2.3	100
Social assistance and civil protection	72.4	19.8	4.9	2.9	100
Environment	75.4	n.a.	n.a.	n.a.	100
Economic development and social cohesion	6.1	93.9	0.0	0.0	100
International cooperation and solidarity	83.0	0.0	0.0	17.0	100
Religion	10.3	0.0	0.0	89.7	100
Other businesses	-	9.6	28.8	61.6	100
Total	**82.3**	**3.7**	**1.7**	**12.2**	**100**

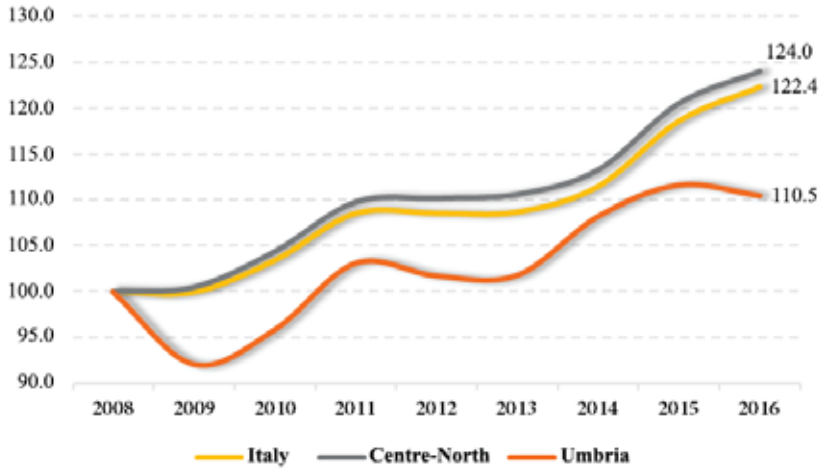
Source: Based on ISTAT data

In particular, then, in consideration of the legal framework and related specialisation of the sector, it can be noted that in Umbria the associations (recognised and unrecognised) are relatively more widespread than the regional composition, in the sectors of culture, sport and recreation and development cooperation. On the other hand, social cooperatives, coherently with the guidelines of the institutive law, are "specialised" in the sectors of economic development and social cohesion, which include labour integration cooperatives (93.9%, compared to a regional value equal to 3.7%), social assistance and civil protection, education and research and health care. Similarly, foundations are relatively more present in the sectors of education and research (20.3% in the sector, compared to their regional spread of 1.7%), while institutions with other legal form (ecclesiastical bodies, committees, mutual aid societies, educational institutions, etc.) are mainly active in the areas of religion and education and research.

2.2.4 The tourism and museum system

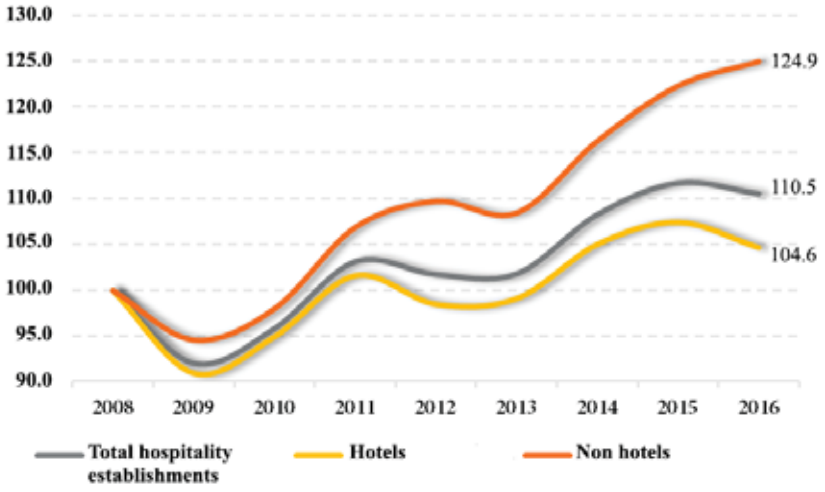
As emerged from the previous analyses, tourism, within the articulated service sector, represents an area of particular importance in the regional context, and in this sense the ROP ERDF among the objectives of TO 3 specifically proposes the increase of the rate of innovation in the tourism sector enterprises and, overall, the increase in the quality of flows and growth in tourist spending.
In the 2008-2016 period, the regional tourism system posts the difficulties of development and a loss of competitiveness compared to other more developed regions and Italy. On the one hand, the existing data show an increase in arrivals in the regional hospitality facilities (+10.5%) although this increase is much lower than what can be observed at national level and for the regions of the Centre-North. Specifically, the increase in Umbria can be seen in non-hotel accommodation facilities (about +25%), while in hotels the increase is significantly lower (+4.6%) in addition to being more unstable.

Chart 2.12 - Arrivals (index number 2008 = 100)



Source: Based on ISTAT data

Chart 2.13 - Arrivals by type of hospitality facility
(Index number 2008 = 100)

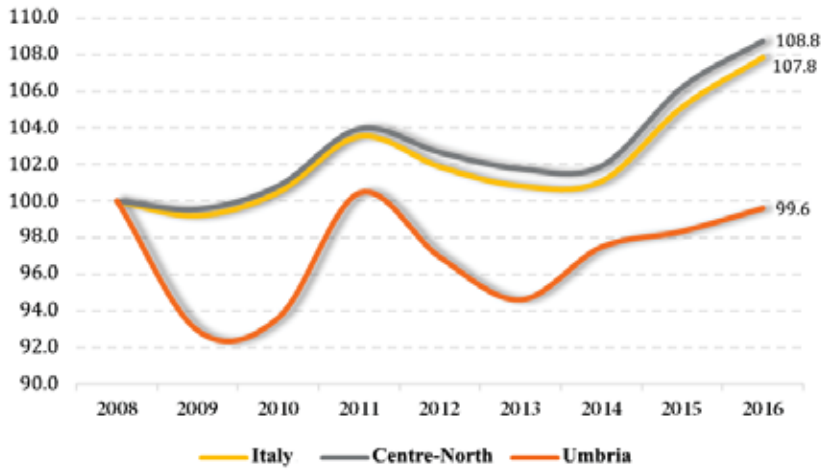


Source: Based on ISTAT data

The picture of the tourism situation in Umbria emerges with greater clarity, also observing the data on the presences in the regional hospitality establishments, which show a different trend from that of arrivals. The number of visitors, and therefore the days spent

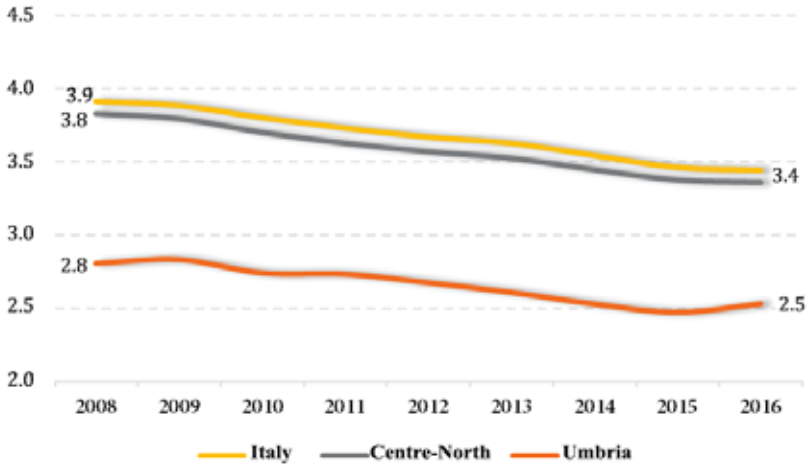
by tourists in the regional territory, are still slightly lower than in 2008, even if they have recovered in the last three years. The situation is different for the national average and for the Central-Northern regions, for which there is an increase of between 7 and 8 percentage points compared to 2008, also due to the performances sustained in the last three years in this case.
We can therefore observe the tendency to short-term tourism at the regional level, suggesting a lower capacity on the part of the "Umbria system" in the elaboration and proposal of tourist solutions that can attract tourists for longer periods, for example through tourist itineraries and more complex incoming activities, characterised by a greater interaction between different themes such as landscape, culture, sports and gastronomy. The difficulties are evidenced explicitly by the average stay of tourists in Umbrian accommodations, equal to 2.5 days, while one day more is the average of the regions of the Centre-North and Italy, although the trend towards shorter stays is a phenomenon that is widely observable even on the national territory.

Chart 2.14 - Trend in tourist presences
(index number 2008 = 100)



Source: Based on ISTAT data

Chart 2.15 - Average stay of tourists



Source: Based on ISTAT data

Also, the rate of tourism, which measures the days of tourist presence in accommodation facilities in relation to the number of inhabitants, is quite low in Umbria, equal to 6.7%, roughly the level of 2008 (6.9%) and lower than 2007 (7.3%). The figure is however in line with the national one (6.6% in 2016) but lower than the average for the regions of the Centre-North (which is slightly up to 8.1%).

The Umbria Region has therefore failed to fully cope with the economic crisis that has also affected this sector by developing a tourism characterisation that can compete with other Italian regions as well. In fact, we can imagine that the economic crisis has led to a restriction of demand, especially at the national level, so that the regions with the greatest tourist vocation have managed to catalyse the existing demand (thanks to a renewal of the offer or the intrinsic strength of the their territory from the tourist point of view[17]), while the weaker regions from the tourism point of view have not managed to develop a valid alternative tourist offer able to attract visitors outside the most recognised traditional circuits.

A positive point to note is the increase in foreign presence in the Umbrian territory (+4%), which, however, failed to make up for the simultaneous decline in national presences (-2.8%) in the period 2008-2016. The observable difference in the national territory, also characterised by the decrease in the number of Italian tourists (-3.9%), consists of a much stronger increase in foreign presences (+23.3%), a real boom that has verified especially

[17] Just think of cities such as Rome, Venice and Florence, by their nature able to attract most of the tourist flows in Italy.

since 2011. Finally, from the point of view of the type of accommodation facilities, an element of reflection that can be highlighted consists in the lesser attractiveness of the holiday farms present in the region in reference to Italian tourists: between 2008 and 2016 the number of visitors is down by about 17% while national level the presence in this type of facility is increasing by 18%, rather surprising and significant given the traditional "green" characterisation of the Umbrian territory, also from the point of view of tourism promotion.

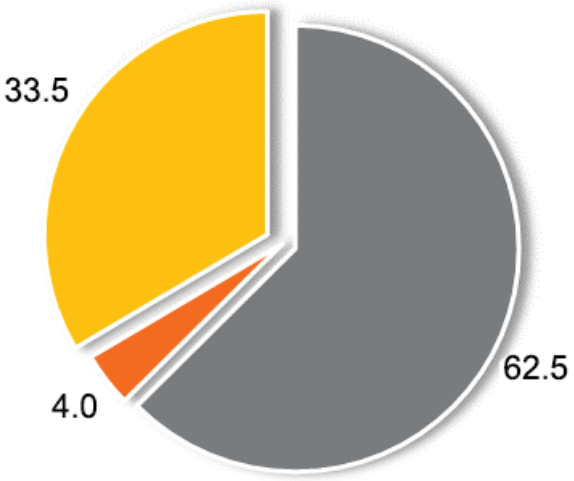
The Umbrian museum system

The museum system of the Umbria region is quite rich and is characterised by the presence of 13 state museums (and similar institutions) and 163 non-state museums (data to 2015, resulting from a joint survey of ISTAT, MiBACT and Regions). Among state museums there are 6 museums or art galleries, 4 archaeological areas or parks and 3 monuments or monumental complexes. Non-state sites are mostly represented by museums or art galleries: 134 out of 163. Overall, museums and similar institutes operating in the art sector represent 32.4% of the total, while almost 20% of the sites are active in the archaeology sector.

The 6 eco-museums in the regional territory must also be taken into consideration, recognised by regional law no. 34 of 2007. The eco-museums are an important recent evolution in the national panorama and have undergone particular attention by the regional administrations as instruments for the conservation and enhancement of the environment, the landscape and historical-cultural heritage of the local territory and in particular the rural one. The eco-museums are therefore an important tool to encourage the expansion of tourism that is attentive to respect for the territory and are an opportunity for development for local communities far from the main tourist flows.

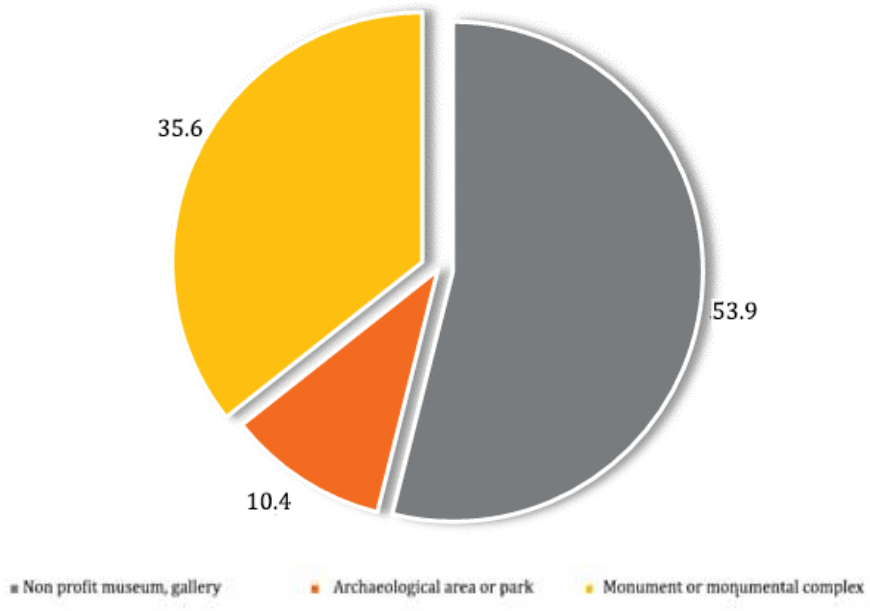
Overall, in 2015, museum employees in the Umbrian territory amounted to 698, of whom 488 were internal and 210 external. As many as 44.5% of internal workers are employed in the 13 state museums, while almost all external employees are employed in non-state museums (202 out of 208).

Chart 2.16 - Umbria -% visitors by type of museum site (2015)



Source: Based on ISTAT data

Chart 2.17 - Italy -% visitors by type of museum site (2015)



Source: Based on ISTAT data

Positive notes emerge from the number of museum visitors present in the regional territory. In fact, between 2015 and 2011 visitors grew by almost 13 percentage points, against a national average of 6.4%: in particular, museums, galleries and monuments attracted increasing shares of visitors (increases of over 20 percentage points), while archaeological areas and parks have experienced a sharp decline (-58.8%), despite the presence of renowned sites of interest, such as the archaeological sites of Carsulae and Otricoli and the pre-Roman necropolis. From the comparison with the situation that can be observed at a national level in 2015, cultural tourism in Umbria is more oriented towards museums and art galleries, to the detriment of the monumental areas and above all the archaeological ones. The overall increase in visitors to Umbrian museum sites could strengthen the hypothesis of a tendency to decrease the duration of tourist stays, in favour of visits carried out even within a single day, so as to result in a decline in hotel and other accommodation facility stays.

3 Positioning: the challenges and needs of the territory

The analysis of the regional context, illustrated in the previous paragraphs, highlights the presence of critical elements in the regional economic structure that invest both structural factors and short-term factors. In fact, Umbria has been hit by the economic crisis more strongly than many of the central and northern regions, highlighting negative dynamics for most macroeconomic indicators and for many of the aspects most closely related to research, innovation and to development.
In order to formulate summary judgements on the positioning of the regional production system compared to TO 1 and TO 3 and to the specific objectives of the Partnership Agreement selected by the regional plan for the 2014-2020 cycle, two different types of analyses have been carried out:

- the **first** used a purely **statistical approach**, through which a set of indicators representative of the regional context conditions was compared with a reference benchmarking. The comparison was made with reference to the areas of intervention of the Thematic Objectives 1 and 3 and with reference to the specific Objectives identified by the ROP;
- the **second** used a **more descriptive approach**, through which the weaknesses, the strengths, the opportunities and the threats of the regional socio-economic structure (SWOT analysis) related to TO 1 and TO 3 of the ROP ERDF were identified and which tend to exert a direct impact on them.

3.1 Regional positioning with respect to the areas of intervention of ROP ERDF 2014-2020 Thematic Objectives 1 and 3

The description and illustration of an overall summary and explanatory picture of the regional production system, also aimed at highlighting the critical aspects and the most positive aspects present in the Umbrian territory compared to the regions of the Centre-North, involved the use of a specific methodological approach, briefly summarised below.

- **Identification of specific indicators**. As part of the first phase of the analysis, the main statistical indicators for research/innovation and the competitiveness of companies were identified with reference to Thematic Objective 1 and Thematic Objective 3. Considering that the definition of a system of context indicators - and therefore the subsequent mapping of needs - presents considerable difficulties in many cases, experience has suggested limiting the choice of indicators to the most applicable ones, looking more at the concrete needs of the orientation of the programmatic choices than to the purely theoretical adequacy of the same indicators. The system must, in fact, be based on a set of indicators capable of immediately

expressing the critical conditions or the opportunities that the territorial context offers to planning regional policies, but at the same time deducible from reliable statistical sources available in a systematic form in the last year currently available. On the basis of these considerations, it was decided to use the set of indicators provided by the ISTAT-DPS database "Territorial indicators for development policies"[18];

- *Benchmarking*. Following the selection phase of the most representative indicators of needs, we have moved on to the **quantification of a gap indicator** obtained from the comparison between the regional situation and the situation of the other Italian regions. The comparison between the regional situation and a reference benchmarking to be taken for the different indicators - and consequently their quantification - represents a fundamental aspect of the analysis procedure used. Specifically, the values of the other Italian regions that, together with Umbria, fall within the most developed regions (Piedmont, Valle d'Aosta, Lombardy, Liguria, Trentino Alto Adige Friuli Venezia-Giulia, Emilia-Romagna, Marche, Tuscany and Lazio), territorial aggregate of reference for European regional policy, have been taken as reference for the construction of benchmarking. Moreover, in order to make the values assumed by the indicators that present different scales comparable (i.e. with denominator or GDP or population, etc.), the demand indicators have been reconstructed through a variability **standardisation procedure**. The standardisation makes the variables homogeneous and therefore expressible through a number that indicates, within a scale of values between zero and one, the relative position of Umbria with respect to the situation of the other regions taken into consideration. In particular, the formula adopted makes it possible to return the position of Umbria, for each indicator, in relation - at the same time - to the best and worst result recorded by the more developed regions;
- **Quantification of need.** The last phase of the analysis has therefore allowed us to quantify needs **(F) -** which has taken the formula reported in the following scheme, which highlighting the extent of the differences between the situation found at the regional level and the situation relative to the other more developed regions, has also allowed to envisage a "classification" of the different levels of needs, highlighting the aspects on which it would be most necessary to intervene.

18 See ISTAT-DPS: Indicators for development policies.

Quantification of Needs (F)

F = (maximum value - regional value) / (maximum value - minimum value)

The value of the indicator varies between 0 and 1. It assumes value 1 when the region has the minimum value among all the regions considered; it takes on value 0 when the region presents the maximum value among all the regions considered. Therefore, the higher the indicator, the worse its regional relative situation is.
If the indicator taken as reference is the type for which a low value corresponds to a better context, (such as, for example, the share of workers who receive passive labour policy subsidies, for which obviously a low value is indicative of a good condition of the labour market), then we proceed by reversing the order for the calculation with the formula below:

F = (regional value - minimum value) / (maximum value - minimum value)

In both cases, the interpretation of the value of F remains unchanged: the closer F is to 1, the worse the regional situation is compared to that of the other regions taken as reference and vice versa.

Before proceeding with the presentation of the results of this year, it should be pointed out that the analysis of the needs expressed by the socio-economic context is only one of the criteria that can be considered in the evaluation of the choices of public policies, since other decisions also act on the final decision factors of a political, economic, regulatory nature not directly attributable to considerations of an "objective" nature. Furthermore, the fact that recourse to the ERDF should not be limited to funding interventions aimed at addressing critical situations, as well as supporting initiatives that can act on the factors necessary to trigger and/or consolidate virtuous processes of sustainable development should not be underestimated.

The following table shows the results of the analysis for **Thematic Objective 1 Strengthening research, technological development and innovation (Axis 1 of the ROP ERDF)**. It is possible to point out how the most critical situation for Umbria, expressed by maximum need values (equal to 1), the low level of expenditure of the private sector and of the enterprises (public and private) for the research and development activities compared to the GDP, representative of a value that in both cases is the lowest among all the regions of the Centre-North. Critical issues also emerge from the point of view of the labour market in sectors in which research and innovation activities are more relevant. In fact, Umbria shows the highest level of needs in relation to the share of researchers employed in companies out of the total number of employees of companies, while however high values of needs are obtained for the share of R&D employees (calculated on one thousand inhabitants) and for the share of employees in the

technology-intensive and knowledge-intensive sectors of production, reflecting a low demand for highly qualified human resources by regional companies.
On the contrary, it is interesting to note that Umbria has a good position as regards the number of graduates in science and technology (especially for women). The indicator of needs related to "*Graduates in science and technology*" has a contained value of 0.36. It therefore appears that there is a certain degree of mismatch between the supply of labour and the demand expressed by the companies, unable to absorb the potential human capital expressed in the area.
The need indicator is also low in terms of the birth rate of knowledge-intensive businesses, suggesting the existence of a favourable and active business environment. It should be noted, however, that the existence of a significant gap in the survival rate of existing companies compared to other areas of the country (the indicator of specific needs is equal to 0.84), denotes that the greater entrepreneurial vivacity is part stifled by the difficulties that companies encounter to stay alive and grow in the medium to long term.

Table 3.1- Need indicators: Thematic Objective 1
Strengthening research, technological development and innovation

Indicators Thematic Objective 1	**Umbria**	**Centre North**	**Need Index**
Researchers employed in companies on the total number of employees *(Number of researchers as a percentage of the number of employees)*	0.2	0.4	**1.00**
Incidence of private sector R&D expenditure on GDP (*Private sector R&D spending (private non-profit enterprises and institutions) as a percentage of GDP - current prices)*	0.3	0.9	**1.00**
Incidence of business spending on R&D *(Expenditure on research and development of public and private enterprises on GDP - percentage)*	0.3	0.9	**1.00**
Patent intensity *(Patents registered in the European Patent Office (EPO) - number per million inhabitants)*	33.3	85.5	**0.95**
Production specialisation in high-tech sectors (total) *(Employed in high-tech manufacturing sectors and in the areas of knowledge-intensive and high-tech services as a percentage of total employment)*	2.3	4.0	**0.87**
R&D workers *(Research and development workers - units expressed in full-time equivalents per thousand inhabitants)*	3.2	5.2	**0.84**
Three-year survival rate of companies in knowledge-intensive sectors	45.0	49.2	**0.84**
Share of employees in knowledge-intensive sectors in industrial and service companies *(Employees in knowledge-intensive sectors as a percentage of total employees, in local units of industrial and service companies)*	14.3	18.8	**0.84**

Indicators Thematic Objective 1	Umbria	Centre North	Need Index
Production specialisation in high-tech sectors (males) *(Employed in high-tech manufacturing sectors and in the areas of knowledge-intensive and high-tech services as a percentage of total employment - males)*	3.0	4.8	**0.83**
Production specialisation in high-tech sectors (females) *(Employed in high-tech manufacturing sectors and in the areas of knowledge-intensive and high-tech services as a percentage of total employment - females)*	1.5	3.0	**0.83**
Incidence of total R&D expenditure on GDP *(Total R&D expenditure as a percentage of GDP - at current prices)*	1.0	1.4	**0.71**
Companies that have carried out R&D activities in collaboration with external subjects *(Companies that have carried out R&D activities in collaboration with external subjects on the total of companies carrying out R& D - percentage)*	44.8	-	**0.54**
Graduates in science and technology (males) *(Graduates in scientific and technological disciplines for a thousand inhabitants aged 20-29 (males) - percentage)*	13.5	19.3	**0.50**
Companies that have carried out R&D activities using research infrastructures and other R&D services from public or private entities *(Percentage of total enterprises with intra-muros R&D activities)*	18.9	20.0	**0.49**
Birth rate of companies in knowledge-intensive sectors	8.7	8.4	**0.38**
Graduates in science and technology *(Graduates in scientific and technological disciplines for a thousand inhabitants aged 20-29 - percentage)*	12.2	16.1	**0.36**
Graduates in science and technology (females) *(Graduates in scientific and technological disciplines for a thousand inhabitants aged 20-29 (females) - percentage)*	10.8	12.8	**0.31**
Incidence of public expenditure on R&D on GDP *(Public Administration and University expenditure on research and development on GDP - percentage)*	0.7	0.5	**0.29**

Source: based on ISTAT-DPS data - Territorial indicators database for development policies

A similar procedure has been implemented for **Thematic Objective 3 Promoting the competitiveness of SMEs (Axis 3 of the ROP ERDF)** In this case, the main problems are found in the scarce competitiveness of the local production system. The indicator of labour productivity needs is, in fact, for all the economic sectors taken into consideration (except trade) close to 1, indicating a level of regional productivity that is among the lowest in all the regions of the Centre-north.

A negative situation is also recorded in access to credit and in corporate financing: the active interest rates are, in fact, higher than those applied in the other regions of the

Centre-North, and this obviously constitutes a factor that contributes to compromising the competitiveness of the regional production system, both for existing companies and for the attraction of investments outside the regional area. On the other hand, this negative situation does not seem to be compensated by the ease of obtaining financial resources through other channels, such as the risk capital of companies, especially for new companies: the data on the need for the value of investments in risk capital in the early stage (initial start-up phase of a company) is indeed very high (equal to 0.96). Again, with reference to aspects related to the credit system, the picture appears better if we consider the indicators relating to the bank loans of non-financial companies (level of general indebtedness of companies) and the risk of loans (given by the default rate of the same). The low level of need that can be found in relation to the share of exposures between € 30,000 and € 50,000 must be interpreted as a renewed ability of the Umbrian companies to meet the needs of liquidity, and certainly constitutes a positive sign.

On the other hand, a lack of competitive potential emerges with regard to the capacity of the production system to penetrate international markets, especially with reference to sectors in which world demand appears to be more dynamic, such as the most technological and innovative sectors. The degree of economic dependence (net imports on GDP) is very high and more in line with that highlighted by the southern regions than those of the Centre-North.

Among the aspects in which the positioning of the Umbria region is better in relation to the regions of the Centre-North is the share of workers who receive passive labour benefits, such as unemployment benefits (need index of 0.19), the ability of new businesses to absorb significant amounts of regional employees and thus create new jobs. Finally, an intermediate situation in comparison with the other more developed regions in Italy is related to the capacity for innovation of companies (product and/or process technological innovations) and the turnover rate of the regional companies as a whole (while previously, the low capacity for survival of knowledge-intensive companies was experienced).

Table 3.2- Need indicators: Thematic Objective 3
Promoting the competitiveness of SMEs

Indicators Thematic Objective 3	Umbria	Centre North	Need Index
Labour productivity in the manufacturing industry *(Added value of the manufacturing industry per work unit in the same sector - chained thousands of Euro, reference year 2010)*	57.8	72.4	**1.00**
Labour productivity in business services *(Added value of Business Services by work unit of the same sector - chained thousands of Euro, reference year 2010)*	102.4	118.3	**1.00**
Financing capacity *(Differential rates on cash loans with the Centre-North - percentage)*	0.6	0.0	**1.00**

Indicators Thematic Objective 3	Umbria	Centre North	Need Index
Labour productivity in tourism *(Added value of the Tourism sector by Work unit in the same sector - chained thousands of Euro, reference year 2010)*	34.0	39.1	**1.00**
Labour productivity in industry in the strict sense *(Added value of industry in the strict sense for the same sector work unit - chained thousands of Euro, reference year 2010)*	60.7	76.4	**0.98**
Value of investments in risk capital - *early stage (Risk capital investments - early stage as a percentage of GDP)*	0.0	0.0	**0.96**
Regional average expenditure for business innovation *(Regional average expenditure per innovation per employee in the total population of companies - thousands of Euro current)*	1.9	3.6	**0.94**
Intensity of capital accumulation *(Gross fixed capital investments as a percentage of GDP - percentage)*	16.2	17.1	**0.94**
Degree of economic dependence *(net imports as a percentage of GDP - percentage)*	6.0	-7.6	**0.92**
Ability to export to dynamic global demand sectors *(share of the value of exports in sectors with global demand dynamic on total exports - percentage)*	16.9	31.0	**0.92**
Employees and non-profit institutions that carry out activities with a social content *(per thousand inhabitants)*	16.0	20.5	**0.92**
Employees employed in local units of Italian companies with foreign control *(Employees of local units of Italian companies with foreign control as a percentage of total employees)*	4.5	8.5	**0.90**
Labour productivity in trade *(Added value of the Trade sector by Work unit in the same sector - chained thousands of Euro, reference year 2010)*	46.9	56.2	**0.89**
Private investments on GDP *(Private investments as a percentage of GDP - chained values Private investments as a percentage of GDP - chained values)*	14.7	15.6	**0.89**
Incidence of the tourism sector *(added value of the tourism sector/total added value)*	4.0	3.6	**0.85**
Share of workers receiving passive labour policy benefits: Redundancy Fund and Solidarity Contracts *(Percentage share of job positions for which subsidies from the Wage Supplement Fund were paid or Solidarity contracts signed on total job positions)*	4.6	3.1	**0.83**

Indicators Thematic Objective 3	Umbria	Centre North	Need Index
Weight of cooperatives *(Employees of cooperatives on total of employees - percentage)*	3.6	4.0	**0.81**
Degree of trade opening of the manufacturing sector (*total Export + Import of intermediate goods of the manufacturing sector as a percentage of GDP - current Euro values)*	20.6	35.3	**0.76**
Ability to export *(Value of exports of goods to GDP - percentage)*	17.2	28.3	**0.75**
Gross registration rate in the register of companies *(Companies registered on the total number of companies registered in the previous year - percentage)*	5.7	6.0	**0.74**
Incidence of ISO 14001 environmental certification *(Sites of organisations with ISO 14001 environmental certification on the total number of certified organisation sites - percentage)*	16.4	14.2	**0.72**
Bank loans to non-financial corporations on GDP	64.7	66.7	**0.70**
Labour productivity in the food industry *(Added value of the food, beverage and tobacco industries on the ULAs of the same sector - chained thousands of Euro - 2010 reference year)*	62.1	77.0	**0.67**
Birth rate of companies *(ratio between companies born per year and companies active in the same year - percentage)*	6.8	6.7	**0.58**
Innovation rate of the production system *(Difference between birth rate and mortality rate of enterprises - percentage)*	30.5	35.5	**0.54**
Net turnover rate of companies *(Difference between birth rate and company mortality rate - percentage)*	-1.5	-1.6	**0.50**
Net registration rate in the register of companies *(Companies registered less companies closed on the total number of companies registered in the previous year - percentage)*	-1.3	0.1	**0.47**
Capacity to develop business services *(Business units in the Business services sector out of the total ULA of the services to be sold - percentage)*	31.0	34.6	**0.46**
Loan risk *(cash loan default rate - percentage)*	4.1	3.9	**0.44**
Employees of new companies *(Employees of companies born in the last three years as a percentage of total employees)*	2.2	2.0	**0.31**
Share of workers receiving passive labour policy benefits: Unemployment benefits and social insurance	7.9	7.5	**0.19**

Indicators Thematic Objective 3	Umbria	Centre North	Need Index
for employment *(Percentage of workers receiving social security benefits for employment (Aspi) and unemployment benefits for all employees)*			
Share of total credit between 30,000 and 500,000 Euro used by businesses *(Value of global loans between 30,000 and 500,000 Euro used by companies as a percentage of the total value of global credit lines used by businesses - average of the four quarters)*	20.6	13.8	**0.12**

Source: based on ISTAT-DPS data - Territorial indicators database for development policies

In the subsequent development of the analysis, we proceeded to associate some indicators (and consequently also the needs expressed by them and already quantified in the first phase of analysis) with the specific Objectives selected by the Umbria Region in the ROP ERDF 2014-2020 in relation to the Thematic Objectives 1 and 3, in order to better correlate the analysis on the regional productive positioning with the policies already planned and undertaken within the OP.
Following is the process of association of the synthetic needs indicators with the specific objectives of the ROP, which is characterised by several phases, summarised in the following figure.

Figure 3.1 - Intervention priorities identification process

Table 3.3- Specific objectives of the 2014-2020 ROP ERDF of the Umbria Region: Thematic Objective 1 Strengthening research, technological development and innovation

	Specific objectives
1.1	Increase of business innovation activity
1.2	Strengthening of the regional and national innovative system
1.3	Increase of the incidence of innovative specialisations in knowledge-intensive application areas
1.4	Promotion of new markets for innovation

Source: ROP ERDF 2014-2020 of the Umbria Region

In order to construct a synthetic indicator that would allow a more effective and synthetic understanding of the critical issues that emerged for each specific Objective, only the most representative indicators were selected and, at the same time, were not excessively correlated with each other (i.e. in order not to distort the actual level of a context variable such as the share of graduates in science and technology, instead of considering the overall indicator and those by gender, we chose to consider only the overall one in order not to overlap it in the construction of the synthetic indicator). Below are the **only basic indicators taken as reference for the construction of the synthetic needs indicators for the specific objective of TO 1**, indicating the values of the context indicators of Umbria, the average values of the central-northern regions and the indicators of normalised need.

The synthetic indicators, by specific Objective, were then weighted according to their number, thus identifying the average value of needs associated with each of them (sum of the values assumed by the need indicators divided by their number).

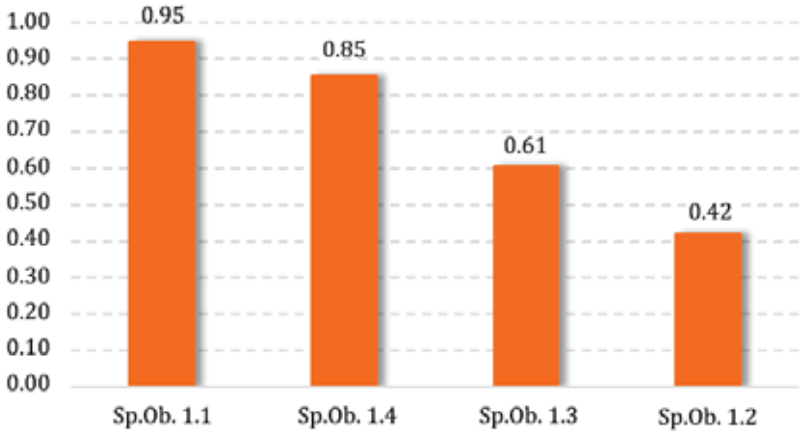
Table 3.4- Need indicators for the specific objective of the ROP ERDF 2014-2020. Thematic Objective 1 Strengthening research, technological development and innovation

Specific objectives	Basic indicators	Umbria	Centre-North	Need indicators
1.1	Impact of private sector R&D spending on GDP	0.3	0.9	**1.00**
1.1	Patent intensity	33.3	85.5	**0.95**
1.1	Researchers employed in companies on the total number of employees	0.2	0.4	**1.00**
1.1	R&D personnel	3.2	5.2	**0.84**
1.2	Companies that have carried out R&D activities in collaboration with external subjects	44.8	n.d.	**0.54**
1.2	Companies that have carried out R&D activities using research infrastructures and other R&D services from public or private entities	18.9	20.0	**0.49**
1.2	Incidence of public R&D expenditure on GDP	0.7	0.5	**0.29**
1.2	Graduates in science and technology	12.2	16.1	**0.36**
1.3	Three-year survival rate of companies in knowledge-intensive sectors	45.0	49.2	**0.84**
1.3	Birth rate of companies in knowledge-intensive sectors	8.7	8.4	**0.38**
1.4	Production specialisation in high-tech sectors	2.3	4.0	**0.87**
1.4	Share of employees in knowledge-intensive sectors in industry and service companies	14.3	18.8	**0.84**

Source: based on ISTAT-DPS data - Territorial indicators database for development policies

At the overall specific objective level, the main critical issues in the competitive positioning of the Umbria region emerge for specific Objectives 1.1 "*Increase in business innovation" and 1.4 "Promotion of new markets for innovation*", which show higher need indexes at 0.80. Specifically, for these objectives there is a low contribution from the private sector in the financing of research and development, as well as a regional labour market that is unable to absorb the human capital present.
Improved positioning of the Umbria Region for Objectives 1.3 and above all 1.2, thanks in particular to the significant share of public resources destined to support research and development activities, to networks established between companies and to public-private partnerships.

Chart 3.1 - Need indicators for specific Objective - TO 1



Source: based on ISTAT-DPS data - Territorial indicators database for development policies

The same procedure was followed for the specific Objectives related to ROP TO 3 below.

Table 3.5- Specific objectives of the 2014-2020 ROP ERDF of the Umbria Region: Thematic Objective 3 Promoting the competitiveness of SMEs

	Specific objectives
3.1	Occupational and productive development in territorial areas affected by widespread crisis in production activities
3.2	Consolidation, modernisation and diversification of local production systems
3.3	Increase in the level of internationalisation of production systems
3.4	Relaunch of the propensity to invest in the production system
3.5	Dissemination and strengthening of economic activities with a social content
3.6	Improved access to credit, business financing and risk management in agriculture

Source: ROP ERDF 2014-2020 of the Umbria Region

Also in this case, synthetic indicators have been reconstructed, using the aggregations between specific Objectives and Need Indicators summarised in the following table.

Table 3.6- Need indicators for the specific objective of the ROP ERDF 2014-2020. Thematic Objective 3 Promoting the competitiveness of SMEs

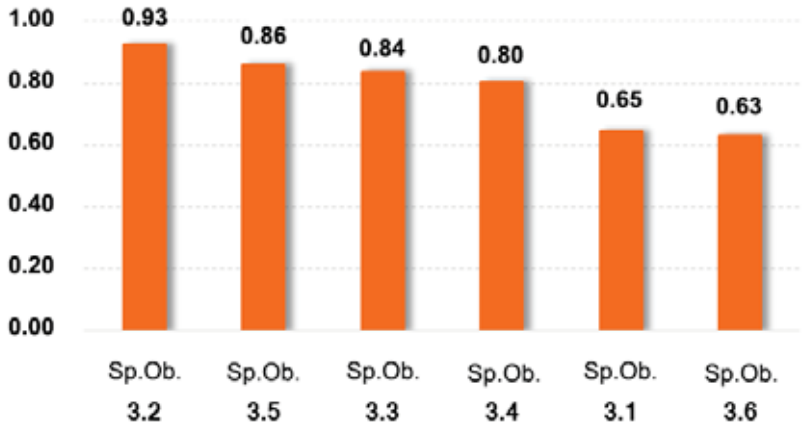
Specific objectives	Basic indicators	Umbria	Centre-North	Need indicators
3.1	Share of workers receiving passive labour policy benefits: Redundancy Fund and Solidarity Contracts	4.6	3.1	**0.83**
3.1	Net registration rate in the business register	-1.3	0.1	**0.47**
3.1	New company employees	2.2	2.0	**0.31**
3.1	Employees employed in local units of Italian companies with foreign control	4.5	8.5	**0.90**
3.1	Impact of ISO 14001 environmental certification	16.4	14.2	**0.72**
3.2	Labour productivity in tourism	34.0	39.1	**1.00**
3.2	Impact of the tourism sector	4.0	3.6	**0.85**
3.3	Ability to export in sectors with dynamic global demand	16.9	31.0	**0.92**
3.3	Ability to export	17.2	28.3	**0.75**
3.3	Degree of economic dependence	6.0	-7.6	**0.92**
3.3	Degree of trade openings of the manufacturing sector	20.6	35.3	**0.76**
3.4	Intensity of capital accumulation	16.2	17.1	**0.94**
3.4	Private investments on GDP	14.7	15.6	**0.89**
3.4	Regional average spending for business innovation	1.9	3.6	**0.94**
3.4	Innovation rate of the production system	30.5	35.5	**0.54**
3.4	Bank loans to non-financial corporations on GDP	64.7	66.7	**0.70**
3.4	Labour productivity in manufacturing	57.8	72.4	**1.00**
3.4	Labour productivity in trade	46.9	56.2	**0.89**
3.4	Labour productivity in business services	102.4	118.3	**1.00**
3.4	Labour productivity in the food industry	62.1	77.0	**0.67**
3.4	Capacity for developing business services	31.3	34.9	**0.46**
3.5	Weight of cooperatives	3.6	4.0	**0.81**
3.5	Employees and non-profit institutions that carry out activities with a social content	16.0	20.5	**0.92**
3.6	Financing capacity	0.6	0.0	**1.00**
3.6	Value of risk capital investments - early stage	0.0	0.0	**0.96**
3.6	Funding risk	4.1	3.9	**0.44**
3.6	Share of global credit between 30,000 and 500,000 Euro used by companies	20.6	13.8	**0.12**

Source: based on ISTAT-DPS data - Territorial indicators database for development policies

The analysis carried out through the synthetic indicators for each specific objective of TO 3 reveals that the main critical issues in the positioning of the Umbria region can be found for the Specific Objectives 3.2, 3.5 and 3.3. In the case of the specific Objective 3.2, which takes into account indicators relating exclusively to the tourism sector, as indicated in the Umbria region ROP ERDF 2014-2020, there is a situation that is highly deficient compared to what can be observed in the other regions of the Centre-North, in particular with regard to the capacity of the regional system to develop a type of tourism with high added value.

For specific Objective 3.5, non-profit activities, although widespread in the territory, are found to be still of little relevance, especially from an occupational point of view, while they could be an important lever of development. As regards the specific Objective 3.3, the rather negative performance of Umbria compared to the other regions of the Centre-North is due, in particular, to the low propensity to export in the economic sectors characterised by a more dynamic demand (which moreover do not particularly characterise the Umbrian territory). With regard to Objective 3.4 "*Relaunching the propensity to invest in the production system*" the situation does not yet seem adequate to the needs of the territory, due to the relatively low levels of productivity recorded in the various economic sectors, also due to the predominant presence of traditional sectors and characterised by less dynamism. Moreover, the low levels of private investment in GDP and the average business expenditures for innovation contribute to Umbria's relatively deficient position and ensure that this specific objective is of primary importance in policies to support regional economic recovery.

Chart 3.2 Need synthetic indicators for specific Objective - TO 1



Source: based on ISTAT-DPS data - Territorial indicators database for development policies

For the Specific Objective 3.1 "Occupational and productive development in territorial areas affected by the widespread crisis of production activities" alongside the strong use

of passive political instruments (especially layoffs) there is also a good vitality from the point of view of the incorporation of new businesses that seem to be able to absorb significant employment shares. Finally, the need for Objective 3.6 assumes an intermediate value due to the possible different interpretation of the indicators related to the access to credit and to the indebtedness of the companies, which according to the particular context of reference and in relation to the actual situation of the companies, can be evaluated with different criteria.

3.2 SWOT analysis

The analyses, reported in previous chapters and paragraphs, have highlighted the main characteristics of the productive system of Umbria, with reference to the specific context conditions of research and innovation and with respect to the recent general developments found in the other more developed regional realities and at national or Community levels. This analysis, in addition to highlighting the main factors/elements that unite/distinguish Umbria from other European regions - compared to the Thematic Objectives 1 and 3 of the 2014-2020 cohesion policy - has allowed us to identify the main strengths and weaknesses of the Umbrian system, associated, according to the SWOT method, to the main opportunities and overall threats.
The main elements of strength and the critical aspects of the regional economic system, which derive directly from the analyses illustrated in the previous chapters, are summarised in the following table.

Table 3.7– Thematic Objective 1 Strengthening research, technological development and innovation. Strengths and weaknesses

Strengths	Weaknesses
Potential of the productive system to create forms of associations and collaborations between companies and to carry out R&D activities in collaboration with external subjects	Production specialisation of the regional economy in sectors with lower R&D intensity
High incidence of public R&D expenditure on GDP	Low propensity of private companies to carry out R&D activities
Presence of innovation poles and technological clusters at national level	Presence of an entrepreneurial system prevalently consisting of small and micro businesses unable to sustain the risks typically associated with R&D activities
Presence of public research bodies of excellence	Low patent capacity of companies
High level of education of human resources and low level of early school leaving	Low level of employees employed in R&D by private companies
High entrepreneurial liveliness and the incorporation of businesses in knowledge-intensive sectors	Limited capacity of the regional production system to carry out innovative process and product activities and, above all, to introduce at least one product or process innovation on the market or internally

Strengths	Weaknesses
	Limited survival rate of companies specialised in knowledge-intensive sectors

Table 3.8– Thematic Objective 3 Promoting the competitiveness of SMEs. Strengths and weaknesses

Strengths	Weaknesses
Good ability of the traditional Made in Italy sectors to reposition themselves to counter the economic crisis	Difficulties in the local productive system to cope with the economic crisis, especially with regard to high-intensity industrial sectors
High capacity of the productive system to introduce innovations of an organisational and marketing nature	Loss of competitiveness in the productive sector, which has a low level of labour productivity and low business profit margin levels
Good development of a service sector supporting companies	Decline in the propensity to invest by companies
High entrepreneurial liveliness and business incorporation rate	Low degree of trade openings of the manufacturing sector
Presence of a wide and diversified network of subjects operating in the social economy sector	Low ability to export in sectors with dynamic global demand
Strong incidence of non-profit in the local context, also growing in terms of employment	Presence of a high degree of economic dependence
Increase of foreign presence in the Umbrian territory	Low ability to attract foreign capital to the regional system
	Strong fragmentation of the local productive system and lack of ability to support innovative activities
	Presence of territorial areas affected by widespread crisis in production activities
	Presence of greater difficulty in accessing bank credit, especially by SMEs
	Difficulty in accessing risk capital investments - early stage
	Difficulty of development and a loss of competitiveness of the regional tourism system compared to other more developed regions
	Low rate of tourism, (days of tourist presence) of hospitality facilities

More complex is the identification of those elements, which on the basis of the SWOT method, are exogenous to the regional context, and which can potentially constitute a source of opportunity or threat to the regional economy. These factors are, in fact, connected to the possible evolution of the national and international macroeconomic framework and to the changes that this evolution has on the productive and sectoral contexts.

Even if any analysis tending to predict the future development of the national and international economy entails an inevitable degree of arbitrariness and wide margins of approximation, it is possible to identify some threats that could have a significant impact on the regional economy in the coming years. Among these, threats the most relevant are undoubtedly:

- the possible **increase in interest rates**, as a consequence of the end of expansive monetary policies, with potentially negative effects on the most vulnerable countries and on highly indebted households and businesses;
- the possible continuation of the **appreciation of the Euro exchange rate** against the dollar, with negative effects on the most export-oriented companies, and **of oil prices**, which usually demonstrate inversely proportional dynamics to the dollar, with potentially negative effects on the purchasing power of households and therefore on domestic demand;
- a **public finance framework** that should present a still restrictive intonation, as a consequence of the need to respect the European constraints on fiscal compact;
- strongly uncertain framework on the evolution of the position of the United States on the rules of **international trade** with potentially negative effects on world trade growth rates.

These are all elements that could have a negative effect on national and international economic growth, further accentuated if we take into account how all the imbalance factors that were at the origin of the recent economic crisis are still present:

- an excessive level of indebtedness both in the public sector and especially in the private sector, which is accompanied by a distribution of income that tends to concentrate more and more in favour of the higher income deciles;
- strong imbalances in the current accounts of several countries, primarily in the United States, which would require an increase in the propensity to save for their adjustment with negative effects on the level of consumption and GDP growth.

There is, therefore, the possibility that macroeconomic conditions will deteriorate in the course of 2019/2020 or, at the very least, maintain a limited growth path, not sufficient to allow the regional economy to quickly return to the levels reached before the beginning of the last recessionary phase.

These are all elements that are associated with the factors that already distinguish and penalise regional economic development, starting from the **territorial marginalisation of the Umbrian context** compared to the most advanced economies of the European Union, and to the **ever-increasing competition from emerging countries** in the production of high labour-intensive products and an increase in **international competition** even in productions with a higher technological content.

Given these critical elements of the economic situation exogenous to the regional context, some elements, if they are achieved, could represent **opportunities** for future regional economic development. In the first place, the possible **strengthening of the European monetary union**, could represent an opportunity for the regional economy if this evolution is not limited to the completion of the banking union, but is accompanied by a

strengthening of economic policy coordination and a greater integration into fiscal and social policies that avoid forms of downward competition both on the labour market and in the field of corporate taxation.
On the other hand, the digital innovation and automation of production processes, promoted at the national level also through the **National Business Plan 4.0**, will represent an opportunity for the regional economy, not only if local businesses will be able to intercept the new channels of innovation, but also if productivity increases, which may be due to their introduction, becoming an increase in income and therefore in higher domestic consumption.
The attention paid to innovation is part of a **highly motivating European, national and regional policy framework with respect to R&D activities in companies**, including the provision of specific integrated actions with the ESF aimed at supporting the regional S3 at the regional level (i.e. through the SMART Alert and ITS paths). Similarly, **experimentation and implementation, at a regional level, of the social inclusion strategy through a "bottom-up" partnership approach",** may lead to the creation of innovative tools able to reconcile increasingly complex and differentiated social needs, with the budgetary needs of Public administrations.
Also, the recent establishment of the **Regional Labour Agency**, in which the Regional Law no. 1 of 14 February 2018 requires the management of the employment centres, completing the phase of transfer of skills and personnel from the provinces to the regional agency, will be an opportunity for the regional economy only if it will actually strengthen the centres for employment system and raise the quality of services for individuals and businesses.

Table 3.9- Threats and Opportunities

Threats	Opportunities
Possible increase in interest rates with the lack of expansive monetary policies	Strengthening of economic and monetary union (EMU) and greater integration of fiscal and social policies among Euro zone countries
Appreciation of the Euro exchange rate with negative effects on exporting companies	Development of digital innovation and automation of production processes and National Business Plan 4.0
Possible increase in oil prices with potentially negative effects on household purchasing power and therefore on domestic demand	European, national and regional programming framework strongly encouraging R&D activities in companies
Public finance framework that should present a still restrictive intonation	Experimentation and implementation, at regional level, of the social inclusion strategy through a "bottom-up" partnership approach
Strongly uncertain picture on the evolution of the position of the United States on the rules of international trade with potentially negative effects on world trade growth rates	Establishment of the Regional Labour Agency
Territorial marginalisation of the Umbrian context compared to the most advanced economies of the European Union	

Threats	Opportunities
Competition of emerging countries in the production of labour-intensive products and increase in international competition even in productions with a higher technological content	

4 The regional perspectives in the European framework for the reform of the cohesion policy

4.1 The priorities of the next multi-annual financial framework and discussions on the cohesion policy

The evolution of the regional context, with particular reference to the areas related to competitiveness and the research and development system previously analysed, is affected by the effects and the structure of the cohesion policy, which is one of the main sources available for regional development policies. The financial and regulatory framework of this policy, in full implementation phase for the first three years of the 2014-2020 cycle (also with the approach of the first effective evaluation of the results achieved, through the verification of the reference frameworks of the effectiveness of the implementation of Operational Plans) is, however, at the centre of the general assessment in view of the definition of the new Multi-annual Financial Framework (new EU budget) for the post-2020 period.

The White Paper on the Future of Europe published by the Commission on 1 March 2017, the background documents that followed it and the European Parliament resolution on "*Building pillars for a post-2020 EU cohesion policy*", fostered the institutional debate on the challenges facing the European Union and on the political and financial approaches to address them. This debate focused on the assessment of the adequacy of the current budget with respect to the dynamics of the territorial contexts and the challenges that the European Union will have to face for the next period: in this regard it is necessary to consider that the main issues under discussion reflect the current trends, such as the digital revolution and globalisation, demographic change and social cohesion, economic convergence and climate change, which at the same time are associated by the same community institutions with the objective of ensuring prosperity, stability and security, in particularly in a context such as the current one, uncertain and rapidly changing from an international point of view.

Box 7 - Areas and priorities of the debate on the reform of the EU Budget (EU Commission Communication 98/2018)

In the final Commission Communication COM (2018) 98 "*A new and modern multi-annual financial framework for a European Union capable of efficiently achieving its post-2020 priorities*" the main scenarios and directions behind the definition of the financial framework have been outlined for the next period. In light of the context outlined above, it was noted that the current situation was defined in a period of severe economic and financial crisis, when public finances in many Member States were under pressure. On the contrary, today's context seems to envisage a moderate economic recovery, moreover differentiated according to the territories, and

therefore the political priorities identified by the Commission seem to be in partial discontinuity with respect to the past.

SECURITY

Security is identified by the Commission as one of the key priorities in terms of effective management of migration, countering terrorism and addressing cyber threats. Specifically, the Commission identified the strengthening of external borders and the reinforcement of the European border and coastal guard established in 2016 as crucial. In this regard, the Commission proposes three scenarios:

- make the most of the current European border and coastal guard, which would require a budget of around € 8 billion over seven years, equivalent to around 0.8% of the current multi-annual financial framework;
- an improved EU border and coastal guard with a fully integrated EU border management system, a revised legal framework, an expanded mandate and a strengthening of the Agency's operational capacity. This scenario would require a budget of around 20-25 billion Euro over a seven-year period, equivalent to around 1.8-2.3% of the current multi-annual financial framework;
- a comprehensive EU border management system that would require 100,000 staff members and a substantial EU equipment stock and would require around € 150 billion over a seven-year period, corresponding to around 14% of the current multi-annual financial framework.

DEFENCE

In terms of defence, the Commission identifies greater responsibility on the part of the European Union in integrating the contribution of the Member States and in collaborating to develop the defence capabilities necessary to address common security needs. The budget for the period 2017-2020 currently grants € 90 million for defence research and € 500 million for industrial development under the European Defence Fund set up in June 2017, while for the next financial framework the following scenarios are identified:

- a budget of at least € 3.5 billion for the research section of the Fund, taking into account the current national budgets for defence research and the high costs of developing state-of-the-art defence technologies;
- € 7 billion in the period 2021-2027 to co-finance part of the development costs of the defence industrial sector, which would allow a total investment to be mobilised for the development of defence capabilities of at least € 35 billion over a seven-year period, equal to 14% of national defence capacity expenditure;
- a separate financing facility of the European Defence Fund of around € 10 billion for the period 2021-2027, which can help cover all areas of EU security and defence action, currently not covered by the budget due to the limits imposed by the Treaties. This would be comparable to a maximum amount of € 3.5 billion in the current period.

CLIMATE CHANGE

Two years after the Paris agreement, the Commission reiterates the EU's commitment to the fight against climate change and the transition to a modern, clean and circular economy, also taking into account commitments made in the context of sustainable development objectives of the United Nations.
The European Parliament, in its resolution of 13 June 2017, underlines, in this regard, the objective supported by all the EU institutions to allocate at least 20% of the EU budget to climate change actions and emphasises the role of the ESI funds in this area, as well as in investments for the green economy and for renewable energy.

MOBILITY OF THE YOUNG

In supporting the European single market social economy, the Commission indicates how the EU budget should aim for the full implementation of the European pillar of social rights, support for young people and mobility of European citizens, as well as increasing employment opportunities and skills development. On the subject of training and mobility, the current Erasmus+ 2014-2020 program has a budget of € 14.7 billion (around 1.3% of the total of the current multi-annual financial framework), which is sufficient to guarantee opportunities of learning mobility for less than 4% of young people living in Europe. According to the Commission, there is a need to intensify mobility and exchanges also through a strengthened, inclusive and expanded Erasmus+ program. Depending on the level of ambition, the Commission proposes two different scenarios:

- double the number of Erasmus+ participants to reach 7.5% of young people across Europe, which would require an investment of 30 billion Euro in the next multi-annual financial framework;
- offer 1 out of 3 young people the opportunity to participate in a learning experience abroad under Erasmus+. This measure would require a budget of 90 billion Euro for the period 2021-2027.

DIGITAL TRANSFORMATION OF EUROPE

The European Commission assigns particular importance to the connectivity of the digital, energy and transport infrastructure, as a key element for territorial, social and economic cohesion in Europe. In the Communication on the financial framework, there is a delay in Europe in this area and a gap in digital investments, which has the priority to unlock on-line opportunities and complete the digital single market. EU support for European data infrastructure, connectivity and digital skills currently amounts to around € 35 billion over the seven-year period, provided through the European Regional Development Fund (€ 17 billion), the research and innovation framework program (€ 13 billion), the European Social Fund (€ 2.3 billion), the Connecting Europe Facility (€ 1 billion) and the Creative Europe program (€ 1 billion). In view of the priority given to digital transformation and the risks associated with maintaining or reducing spending in this area, the prospect of the future is to double the amount currently invested in the digital economy and bring it to around

€ 70 billion in the period 2021-2027: this would involve investment in smart growth in areas such as high-quality data infrastructure, connectivity and cybersecurity, services in the fields of e-health, e-government and mobility, as well as progress in the area of supercomputing, next-generation internet, artificial intelligence, robotics and big data.

RESEARCH AND INNOVATION

Research and innovation are considered essential elements in the next financial framework to improve productivity and boost competitiveness. The Union currently spends almost € 80 billion on the Horizon 2020 framework research and innovation program covering the period 2014-2020. There are three scenarios identified by the Commission for the next period:

- maintain or reduce current levels of investment, which would have a domino effect on national and private investment and undermine efforts to achieve the Europe 2020 target of investing 3% of gross domestic product in research and development;
- increase investment in the framework program by 50% to reach € 120 billion, through which, according to the Commission's estimates, 420,000 new jobs could be created by 2040 and the gross domestic product could increase by around 0.33% during the same period. This will continue the upward trend of the recent EU budgets for research and innovation and ensure the funding of an acceptable proportion of high quality projects and progress in priority areas such as the digital, energy and healthcare sectors and of the climate;
- double the funding of the framework program up to 160 billion Euro. This, according to the Commission's estimates, could allow for the creation of about 650,000 new jobs by 2040 and increase the gross domestic product by about 0.46% over the same period, allowing the Union to emerge among the major international players in sectors such as bacteria, infectious diseases, buildings and intelligent and non-polluting vehicles, decarbonisation technologies, the circular economy, automated and connected automobiles and solutions for plastic waste.

ECONOMIC AND MONETARY UNION

The main functions identified by the Commission in December 2017 to strengthen the Euro area and the Union as a whole are: to support structural reforms at the national level; facilitate convergence for Member States about to join the Euro area; create a backstop mechanism for the banking union; develop a stabilisation function bringing together various funds and instruments at EU and Euro area level to help maintain investment levels in case of severe asymmetric shocks. According to the Commission, these functions require greater synergy with the European Investment Bank and with the possible future European Monetary Fund, while, from the point of view of the budget, the following should be foreseen:

- a budget line of at least € 25 billion over a period of seven years to ensure a critical

mass and help avoid a concentration of funding on only a few Member States;

- the development of a stabilisation function, relying on back-to-back loans guaranteed by the EU budget, on loans from the European Monetary Fund, on a voluntary insurance mechanism based on national contributions, as well as on grants charged to the European budget. The amounts charged to the EU budget, although they do not necessarily have to be very high, should be large enough to reduce, for example, the burden for interest on loans and provide incentives to support the proper implementation of the support scheme.

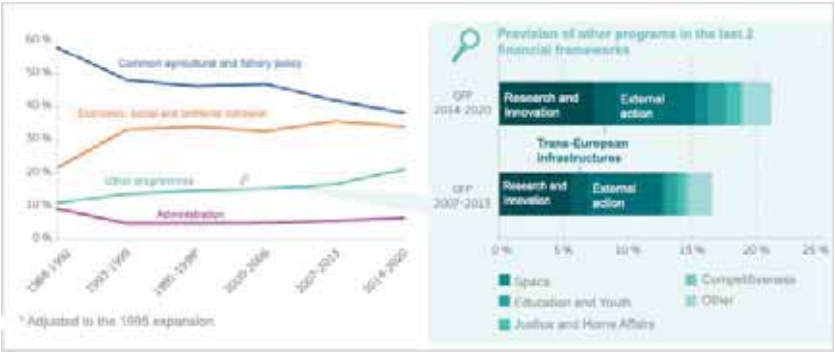
COMMON AGRICULTURAL POLICY

In the financial framework for the period 2014-2020, the common agricultural policy mobilises around € 400 billion to finance market measures, direct payments for farmers and rural development programs to promote the sustainability of agriculture and rural economies. Compared to past purposes, a better use of direct payments - which represent around 70% of the total - is currently under discussion, and that currently set that 80% of the resources go only to 20% of total farmers. One of the main suggestions made by the Commission is to reduce and better direct payments, in line with the objectives of the common agricultural policy, by orienting payments on the expected results, such as the sustainability of agricultural production in mountainous or less profitable regions, focus on small and medium-sized farms, investment in sustainable and resource efficient production systems or better coordination with rural development measures. The scenarios identified by the Commission, although analysed in an integrated way and considering the underlying better balance of the remaining budget, for example with greater attention to small and medium-sized farms and better coordination with rural development measures, are as follows:

- maintain the level of expenditure of around 400 billion Euro for the common agricultural policy over the period, equivalent to around 37% of the current multi-annual financial framework, which would allow, through a better orientation of interventions, to increase support in particular for small and medium-sized farms, with positive repercussions for rural areas;
- a 30% reduction in support for the common agricultural policy which would amount to around 120 billion Euro over the period of the next multi-annual financial framework, or around 11% of the current multi-annual financial framework. Such a scenario could lead to a decline in average agricultural income above 10% in a number of Member States and potentially more drastic reductions in income in certain sectors;
- a 15% reduction in support for the common agricultural policy which would amount to around € 60 billion over the period of the next multi-annual financial framework, or around 5.5% of the current multi-annual financial framework. In this scenario, the decline in average agricultural income would be more limited but could still significantly affect certain sectors depending on the choices made.

In the general framework of the EU budget, the cohesion policy is currently the Union's main investment policy: it promotes economic, social and territorial cohesion and aims at reducing disparities between regions and between Member States, representing an important factor in the creation of jobs, sustainable growth and innovation. The budget of the main development tools and to reduce existing disparities between the regions of Europe, in fact, represented by cohesion policy and the structural funds, although slightly diminished in recent years, continues to require a significant proportion of the total EU budget, targeting more spending toward strategic areas such as the development of research, boosting the competitiveness of production systems, commitment to the qualification of human capital, etc. The importance of cohesion policy as a valuable tool in supporting investment was also noted during the financial and economic crisis: as indicated by the EU Commission, *with the national budgets of many Member States put under strong pressure, from 2008 the EU budget and, in particular, cohesion policy has become an important source of stable investments to promote growth and have proved to be even the only source in some Member States.*

Figure 4.1: Performance of the main sectors of the EU budget



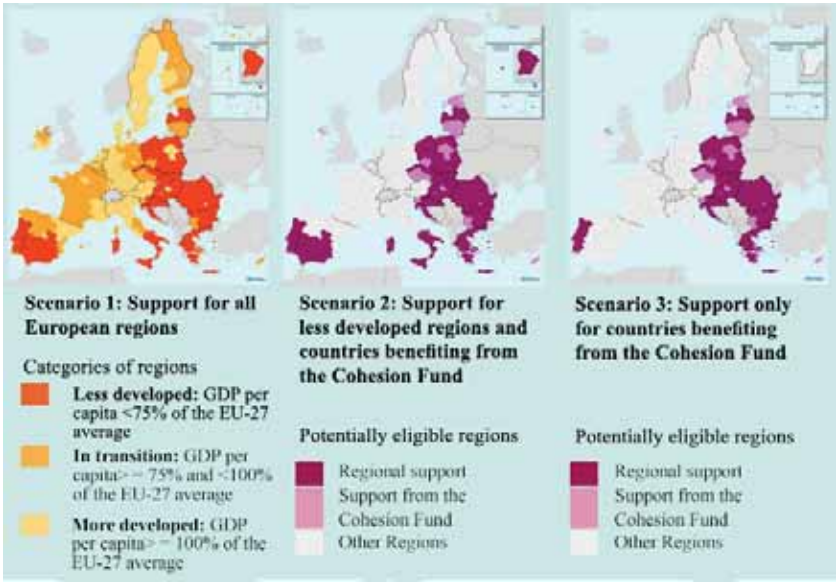
Source European Commission, Discussion paper on the future of EU finances, 2017

Given the initial framework, and in the light of the discussion paper on the future of EU finances and in the February 2018 Communication (see Box 7), the European Commission's guidelines seem to be moving towards a reduction in the cohesion policy for the next period, as shown by the three scenarios proposed, based either on maintaining current policy or on concentrating resources limited to less developed regions and/or Member States:

- according to the Commission, if eligibility for support from the European Regional Development Fund, the European Social Fund and the Cohesion Fund should be maintained for all Member States and for all regions, efficiency gains should be achieved by modulating the intensity of aid and better targeting the support offered. Maintaining current levels of expenditure, amounting to around € 370 billion and almost 35% of the multi-annual financial framework, would allow continued

investment in all regions in areas such as innovation, industrial transformation, the transition to clean energy, climate action and improvement of job opportunities;

- if the European Regional Development Fund and the European Social Fund were to cease to support the more developed and transition regions, it would result in a reduction of around € 95 billion over the period, equivalent to more than a quarter of the current allocations for these funds. This equates to around 8.7% of the current multi-annual financial framework. In a similar scenario, support would be granted to regions of Austria, Belgium, Denmark, Finland, mainland France, Germany, Ireland, the Netherlands and Sweden as well as to many regions of Italy and Spain;
- if the support were further limited to the countries benefiting from the Cohesion Fund, investment would also be made for the less developed regions of France, Italy and Spain. This would amount to a reduction of around € 124 billion over the period, equivalent to around 33% of the current allocations and around 11% of the current multi-annual financial framework.



Scenarios to maintain current investment patterns in the future financial framework or a concentration on a limited number of countries seem to provide guidance on the policy priorities assigned by the European Commission: overall, and in the light of expansive nature assigned to areas such as security, defence or research, there would seem to be a change of direction compared to the past and a tendency towards more centralised policies compared to the integrated political approach and the currently sustained subsidiarity propensity.

However, this approach does not seem to be shared by the European Parliament whose resolution of 13 June opposes a reduction in the Union's efforts in relation to cohesion policy. On the contrary, it requires reinforced action to reduce regional disparities, competitiveness gaps and social inequalities which remain high despite the cohesion policy itself partly contributing to mitigating the impact of the recent economic and financial crisis in the EU. Furthermore, Parliament underlines how the premise of regional, economic and social growth and convergence cannot be achieved without good multilevel governance, cooperation and effective participation of partners at national, regional and local levels.
The following table summarises the main scenarios that the European Commission has formulated for the allocation of political priorities in the post-2020 financial framework. In absolute terms, the largest share of expenditure continues to be attributed to the Cohesion Policy and the Common Agricultural Policy, although, as noted above, the Commission has also proposed downsizing scenarios due to greater rationalisation of resources. On the contrary, expansive scenarios are identified with regard to security and defence, as well as for the mobility of young people and research and innovation.

Table 4.1- Proposals by the European Commission on the post-2020 multi-annual financial framework (Meuro)

Scenarios	Scenario 1	Scenario 2	Scenario 3
Security	8	20-25	150
Defence	3.5	7	10
Mobility of the young	30	90	
Digital transformation of Europe	35	70	
Research and Innovation	80	120	160
Common agricultural policy	400	280	340
Cohesion policy	370	275	246

Source: European Commission final COM (2018) 98 "A new and modern multi-annual financial framework for a European Union capable of efficiently achieving its post-2020 priorities"

Below are some considerations on the probability of realising the scenarios:

- in terms of security and defence, given a shared need among the European institutions to increase the share of expenditure, a significant acceleration as that identified in the third scenario seems unlikely. The governance of these policies, despite the progress and evolution of the international debate, is still strongly linked to the territorial specificities - especially with regard to border management - and therefore largely entrusted to the member states. The most likely scenarios, according to the progress of the near future in political convergence on both themes, would therefore seem to be the first or the second;

- as regards the mobility of young people, it is believed that a viable degree of progress of commitments is between the current share and the first scenario (30 billion): although the priority assigned to this item of expenditure is sensitive, the real possibility of applying an expense that allows one out of three students to access the mobility programs must be considered, also given the degree of significant divergence at national level from the point of view of the education and training systems;
- among the scenarios formulated within the digital transformation of Europe (the first to maintain current levels of expenditure, the second of acceleration), it would seem plausible to increase the share of resources included between 35 and 70 billion Euro (first and second scenario). Indeed, there is a real need to promote homogenisation between European regions in terms of data infrastructures, connectivity and digital skills in order to make the European Union and its member states more competitive with the international framework;
- also in the area of research and innovation, expenditure is expected to increase, identifiable at most with the level envisaged in scenario 2 (€ 120 billion). In fact, this investment quota would allow for the financing of an acceptable share of high quality projects, with the relative effects in terms of employment and GDP growth, and would seem more coherent - compared to scenario 3 - with overall European Union spending capacity;
- in the light of the European Commission's findings regarding the effectiveness of direct payments under the Common Agricultural Policy, a reduction in the financing share would seem likely due to a greater rationalisation of expenditure. Considering, as seen above, that 80% of direct payments currently go to 20% of farmers, a change in the payment system would seem plausible in order to focus spending on other areas (sustainability of production in mountainous or less profitable regions, attention to agricultural SMEs, etc.). However, considering the need for "experimentation" of the changes in this direction, it would not seem very plausible to reduce the resources that could exceed what was envisaged in scenario 3, which would bring the resources for the Common Agricultural Policy to be between € 400 billion. (current share) and € 340 billion (scenario 3);
- finally, from the point of view of the Cohesion Policy, due to the importance of the role of this policy in reducing regional disparities and the importance of cooperation and participation at national, regional and local levels - as described in the objections posed by the European Parliament - substantial changes in the level of spending are not assumed likely to be made in the next period, and therefore the most likely policy scenario is the first (€ 370 billion in expenditure).

4.2 First guidelines and consideration on the upcoming reform of EU cohesion policy

With more specific focus on the post-2020 perspectives of the cohesion policy at the European level, it should be emphasised that some proposals put forward by the European Commission at the general EU level will certainly also have an impact on the cohesion policy.
This is the case, for example, of the commitment to the contrast and resilience to climate change, and more generally to environmental sustainability issues for which the Commission plans to allocate at least 20% of the EU budget. Likewise, this commitment, already present in the current programming period, will be maintained for the cohesion policy, where, depending on the type of region, 20%, 15% or 12% of the ERDF amount is reserved for actions relating to the reduction of carbon emissions.
Another relevant point to pay attention to is that related to the theme of social inclusion, the fight against poverty, education: social issues will presumably be given greater importance, implying an increase in EU public spending in this direction, and this consideration could result in a greater relevance of the European Social Fund, to the detriment of the European Regional Development Fund, which could be cut, especially for regions that are not among the least developed.
Further investments in public goods managed directly at European level, such as the European Fund for Strategic Investments (Junker Plan), Horizon 2020, Mechanism for Connecting Europe and Erasmus+ are also expected, to the detriment of resources distributed at the level regional management of investments in public goods.
The Commission then highlighted some specific critical points concerning the recent development of the cohesion policy and its overall effects:

- as a result of the economic crisis that has raged in Europe over the last few years, the cohesion policy has played a role in countering the decline in investment, by increasing co-financing rates in the EU budget. This intervention helped to sustain the overall level of investments, but very often placed itself as a substitutive resource for national budgets;
- the need to increase flexibility in the use of financial resources for cohesion is identified, in order to respond more quickly to changes in the context and to unexpected shocks. The current policy has not always proved to be effective in adapting to changes that have taken place from the socio-economic point of view, with a consequent limitation on the impact obtained and on the achievement of the pre-established results;
- it is considered necessary to strengthen the system of ex ante conditions aimed at promoting the process of convergence between the governance systems through which the different Administrations involved in the cohesion policy operate at different levels. In fact, fragmentation causes slowdowns and unevenness in the ability to implement interventions in the various territories, posing itself as an obstacle to the process of European convergence;

- one last note is the complexity inherent in the governance of the cohesion policy, for which the level of bureaucracy that characterises it has assumed too high proportions. We therefore hope for radical reforms in the sense of simplifying the process of managing and implementing this policy, to make it easier and more effective.

Starting from these observations, the European Commission has therefore identified some possible proposals for reforming the European cohesion policy, even if still formulated at a rather general and non-detailed level:

- first of all, the need to increase the level of flexibility of the cohesion policy is reiterated. One hypothesis could be to create a sort of initially unallocated reserve of financial capacity, to be mobilised in case of unforeseen needs. The objective can also be achieved through an external fund (such as the existing one for adaptation to globalisation) with the necessary flexibility to intervene in support of the cohesion policy;
- the cohesion policy must then find a more rapid implementation and effectiveness, also with a view to increasing the visibility of its effects for citizens. To this end, we generally think of simpler and faster procedures for planning, implementation of interventions and closure of operational programs, supported by more stringent rules in relation to the automatic redemption of financial resources in case of scarce management capacity of expenditure by the Administrations holding the Programs;
- it is considered necessary to continue to support the strengthening of the administrative capacity of the bodies involved in the management of European resources. In this regard, greater direct involvement of the Commission could be envisaged in order to facilitate the coordination of the instruments available to strengthen administration (such as the PRAs);
- it is also considered essential to increase the levels of national co-financing of the cohesion policy, so as to make the Administrations responsible for the Programs more responsible. In this context of greater effort required by national and regional authorities, the European Commission goes even further, questioning the need to finance the most developed countries and regions: the assumption of a net cut of resources in favour of these territories seems, however, unlikely and not feasible in the next programming period of the European cohesion policy;
- the need to ensure greater uniformity in the management of the Funds is achieved through the creation of a single Investment Fund (a very unlikely assumption) or the definition of a single set of rules common to the Funds: this would simplify the management of the Funds and the participation by the beneficiaries;
- changes are then hoped for as regards the system for allocating the resources of the cohesion policy, integrating the existing criterion based on GDP per capita with other socio-economic criteria and indicators, which take into account critical aspects for the development of the EU such as demography, social inclusion, unemployment and climate change;

- an ever-increasing recourse to financial instruments (guarantees, loans, equity, etc.) is also called for in order to limit the disbursement of public resources and to mobilise more private resources, also expanding the areas of operation of these instruments. In particular, it is possible to bring together all the existing financial instruments in a single Fund able to provide the different types of support. This would also be accompanied by the hypothesis of centralisation in the management of financial instruments by a single institution, probably the EIB, able to coordinate their operation and ensure complementarity between the various devices. However, grants will not be eliminated, but will be addressed more specifically to those interventions that are not able to generate income (i.e. basic research, certain types of infrastructure projects, mobility of students and workers, etc.);
- finally, as already briefly mentioned, the European Commission plans to organise a simplification process covering all aspects related to the European administration, thus also involving cohesion policy, to reduce the excessive bureaucracy present in the EU. The thought goes, in fact, to the reduction of the existing regulatory complexity, also through the merger of programs that pursue similar objectives. This could be achieved by defining a single set of rules for all processes or applying similar rules for the same type of projects. This could reduce the administrative burden for beneficiaries of Community resources, improving the perception and visibility of EU action. The simplification process should also concern the individual Member States, for which the rationalisation of the management and control systems of the programs and the institutional set-up is very important.

The guidelines and options emerging from the documents proposed by the Commission on the future of EU finances have also been the subject of debate in the European Parliament, which with the Resolution of 13 June 2017 on "Building pillars for a EU post-2020 cohesion policy" has specifically defined, at this stage, the position on the overall picture. In particular, in the specific reference to the proposal to strengthen management at central level (and therefore at the European Commission level) for investments in public goods, it has been partly reduced by the Parliament, thus making a substantial transition from a "widespread" management model at a territorial level to a decidedly centralised one highly unlikely. It should be noted, in this case, that the lack of appreciation of the parliamentary body, shared also by the local authorities concerned, who also reiterated that the programs managed directly by the Commission, and in particular the European Fund for Strategic Investments (EFSI), must not jeopardise the territorial dimension of cohesion and replace the ESI funds, also in terms of financial resources allocated (the EFSI, in fact, is conceived as an instrument that can have synergies and complementarity with the cohesion policy, but clearly distinct from this).
The central point for the European Parliament is that the governance model of EU policies and in particular the cohesion policy must remain multilevel, based on the principle of partnership and subsidiarity between Community, national and regional/local levels. Linked to this aspect, there is also the opposition of the EU

parliamentary body to consider the Commission's hypothesis to include macroeconomic conditions for the next programming period, which, being referred to at Member State level, also tends to reduce the territorial dimension of the cohesion policy[19]. The Parliament reiterates, in fact, the relevance of the territorial aspect, inviting, among other things, to consider the NUTS III dimension (in Italy corresponding to the provincial level) in the territorial classification for the cohesion policy and also underlining the importance of strengthening the role of cities and urban areas. While this last observation seems to be in line with the developments of European policies in favour of cities (especially with the Amsterdam Pact of May 2016, which establishes the EU Urban Agenda), the hypothesis of referring to the NUTS level III, on the other hand, appears decidedly unrealisable.

4.3 The perspectives of the cohesion policy for the Umbrian regional context

As previously described, the European Union's budget will probably be between 1.13% (value that would confirm the current value, net of Brexit) and 1.25% of GDP (as in the period 1993-1999, when the weight of the European budget has reached its highest value compared to GDP), with the inevitable redefinition of the rules that govern the formation of the overall structure both in relation to the revenue side and to that of the individual spending categories. This revision of the financial framework therefore necessarily influences the reform of the cohesion policy for the next programming cycle: indeed, as already illustrated, the complexity of the negotiations on the instruments of the regional employment policy derives from the contingent need to make the reform compatible within a multi-annual financial framework renewed and modified with respect to the new requests for intervention determined by the evolution of the continental and international geopolitical context.
In this perspective, in fact, the cohesion policy could undergo a slight contraction and, consequently, a revision aimed at reducing duplications and waste, also starting from a governance characterised by greater centralisation of the intervention (more important weight of direct funds and the use of financial instruments such as FESI, etc.). In particular, the positions and proposals expressed by the European Commission regarding the "perspectives of cohesion policy", as previously reported, are part of the broader debate over the future post-2020 composition of the EU budget and relative specific role of the same cohesion policy, object of particular interest due to the multiplicity and diversity of actors and stakeholders involved in its management and, in a sense, representative of the plurality of facets and complexity of management of interventions that have profound influence on the Union as a whole and in the individual territories that compose it.

[19] The opinion of the Italian Government and of the regional authorities agrees on this point, insisting on respect for the principle of subsidiarity and multilevel partnership.

Overall, the first indications emerged from the analysis previously carried out on the documents relating to the formation of the new Multi-annual Financial Framework (realised taking into account not only the guidelines expressed by the EU Commission, but also the position expressed by the European Parliament and the Member States), allow for the description of likely scenarios in relation to the future structure of the programming of the ESI Funds, which will inevitably also affect the Umbrian regional system in terms of consistency and composition of the development strategy, necessary to reduce the indicated significant differences and, above all, in relation to the competitiveness factors of the regional context.

Firstly, it is possible to state that attention to the issues of environmental sustainability and climate change will be very important: 20% of the resources of the EU budget will be most likely allocated to these issues. As a consequence, this commitment will also be reflected in the cohesion policy, given the importance of implementing environmental measures at local and regional level. The position is common to that of the Parliament, which insists on the importance of also using the ESI funds in this key, improving the system for monitoring spending dedicated to these issues.

Another point that will certainly be at the heart of post-2020 European policies is the focus on social policies, inclusion, training, support for employment. The importance of the European Social Fund will therefore grow and this cannot happen without a parallel reorganisation of the European Regional Development Fund, as also pointed out by the European Parliament in the aforementioned Resolution of June 2017, which underlines the importance of the ESF in supporting the employment of young people, the inclusion of vulnerable people, the fight against poverty.

The proposal to consider additional socio-economic indicators as well as per capita GDP for the allocation of Cohesion Policy resources is of great interest. However, the rather narrow times within which it should be possible to define the new multi-annual financial framework for the period 2021-2027 risk to prevent the review of the criterion of allocation of funds between the different territories, being a very sensitive issue that certainly requires a period of consultation between the parties involved.

From the point of view of the type of resources allocated through cohesion policy funds, the role of financial instruments will certainly be strengthened: however, these instruments cannot be applied to all areas of the cohesion policy (and in particular to those that do not they generate sufficient income to guarantee the assumption of high risks) and their use will probably be limited to those sectors in which they are more effective than subsidies[20].

With reference both to the endowment of the ESI funds and to the general approach of the instruments, which will also be affected by the progressive change in the political context determined mainly by the renewal of the Community bodies (election of the European Parliament, scheduled for 2019, and redefinition of the European

[20] This opinion on financial instruments is shared by the European Parliament, the Italian Government and the Conference of Regions and Autonomous Provinces which, while recognising the validity of financial instruments as complementary opportunities for the achievement of the programming objectives, consider that these should be used with caution and should not reduce the use of subsidies excessively.

Commission) and from the course of the negotiations related to Brexit, it is possible in any case to state how the changes will probably be contained, also in consideration of the positions expressed above and reported by the EU Parliament and the Committee of the Regions, as well as by numerous other Member States including Italy and the Italian regions. In this sense, a series of characteristics of the current cohesion policy is expected to be maintained, such as an approach based on the presence of ex-ante conditions: in general, the next cycle will probably see the use of this instrument reconfirmed in order to ensure greater orientation to the results of the cohesion policy and the link with economic governance (although with reference to this aspect, as described in the previous paragraphs, the positions of the EU institutions are strongly divergent). Similarly, we await the continuation of the process of strengthening the administrative capacities of the bodies involved in the cohesion policy, accompanied in parallel, by the process of further simplification of the cohesion policy management system at different levels of governance, also with a view to facilitating the participation of beneficiaries and increase the success of the financed interventions[21]. Furthermore, the cohesion policy, as recognised by all the institutional actors involved, should further consolidate the result-oriented nature, an aspect on which the commitment was already reinforced in the current 2014-2020 programming period: results to be obtained due to the cohesion policy must be as precise as possible and clearly perceivable, both by the Administrations holding the Operational Programs and by the beneficiaries of the interventions[22].

From this point of view, the architecture of the cohesion policy, with the specific criteria of territorial division, although revised, can hardly substantially alter the current distribution, probably allowing Umbria to maintain its share of financial resources for development, obviously considering the potential changes in the overall governance of the cohesion policy and the contextual orientations of the national government. In general, the Umbrian regional resources could remain at current or slightly higher levels. The same forecast of a reduction in resources from the ESI Funds could be counter-balanced by the inclusion of Umbria among the transition regions, or alternatively, by the possible removal of category classifications (more developed, late and in transition) for regions, through the introduction of a linear positioning mechanism (with the effect of avoiding so-called "*transitional support*").

In relation to the strategic areas of intervention, taking into account the overall shared orientation of the European Commission to strengthen the thematic concentration and to further relaunch the intervention in favour of social inclusion, it is possible to foresee the probable continued focus on research aspects and innovation, with a parallel central role of financial instruments, which for Umbria, as emerged in the analyses reported in

21 In this regard, it should be recalled that the application of the simplified costs could be extended to the operations financed by the ERDF and the harmonisation of the rules relating to the different ESI Funds may go in the right direction of the simplification of management.

22 A possible new element that is also being studied at the moment is the inclusion of "direct impact indicators", referring to projects and able to measure the immediate effects and direct benefits for the direct recipients of the interventions, reinforcing the orientation to cohesion results.

the first chapters of this Report, also represent priority areas for action in the future, considering the large differences with other more competitive and innovative European and Italian regions.

In general, even for Umbria the possible downsizing of the cohesion policy could be offset by direct action of the national budget more relevant than the current structure (provision for greater co-financing of the Member States), in any case accompanied by a framework of Community interventions on a wider and more varied number of sectors considered most relevant in the current period (border protection, counter-terrorism, climate change mitigation, etc.).

APPENDIX

Appendix I Bridging tables between the classification of production sectors by technological level and ATECO 2007 classification

Table 1 - Classification of manufacturing industries by level of technology - NACE Rev 2

Manufacturing	NACE Rev 2	
High Tech	21	Manufacture of basic pharmaceutical products and pharmaceutical preparations
	26	Manufacture of computers and electronic and optical products; electro-medical equipment, measurement equipment and watches
Medium-high technology	20	Manufacture of chemicals and chemical products
	From 27 - 30	Manufacture of electrical apparatus and equipment for non-electric domestic use; Manufacture of machinery and equipment n.c.e.; Manufacture of motor vehicles, trailers and semi-trailers; Manufacture of other means of transport
Medium-low technology	19	Manufacture of coke and refined petroleum products
	From 22 to 25	Manufacture of rubber and plastic products; Manufacture of other non-metallic mineral processing products; metallurgy; Manufacture of metal products (except machinery and equipment)
	33	Repair, maintenance and installation of machines and equipment
Low-tech	From 10 to 18	Food industries; Beverage industry; Tobacco industry; Textile industries; Packaging of clothing items; Packaging of leather and fur articles; Manufacture of leather and similar articles; Wood and wood and cork products (except furniture); Manufacture of articles of straw and plaiting materials; Manufacture of paper and paper products; Printing and reproduction of recorded media
	From 31 to 32	Manufacture of furniture; other manufacturing

Source: Eurostat

Table 2 - Classification of activities of knowledge intensive services - Nace Rev.2

Services	NACE Rev 2	
Knowledge-intensive services	From 50 to 51	Sea and water transport; Airplane transport
	From 58 to 63	Publishing activities; Film production activities, video and television programs, musical and sound recordings; Programming and transmission activities; Telecommunications; Software production, IT consulting and related activities; Information and communication services
	From 64 to 66	Financial and insurance activities
	From 69 to 75	Legal activities and accounting; Business management and management consulting activities; Architectural and engineering studies, testing and technical analysis; Scientific research and development; Advertising and market research; Other professional, scientific and technical activities; Veterinary services
	78	Job recruitment, selection and employment activities
	80	Surveillance and investigation services
	From 84 to 93	Public administration and defence, compulsory social insurance; Instruction; Health and social assistance; Health and social assistance; Artistic, sporting, entertainment and entertainment activities

Source: Eurostat

Table 3 - Classification of activities of low intensity of knowledge services - Nace Rev. 2

Services	NACE Rev 2	
Knowledge-intensive services	From 45 to 47	Wholesale and retail trade; repair of motor vehicles and motorcycles
	49	Land transport and transport via pipelines
	52 and 53	Warehousing and transport support activities; Postal services and courier activities
	55 and 56	Hotel and catering activities
	68	Real estate activities
	77	Rental and leasing activities
	79	Travel agency, tour operator and other reservation service and related activities
	81	Building services and landscape activities
	82	Office administrative, office support and other business support activities
	From 94 to 96	Activities of membership organisations; Repair of computers and goods for personal and household use; Other personal service activities
	From 97 to 99	Activities of households as employers; undifferentiated goods- and services-producing activities of households for own use; Extra-territorial organisations and boards

Source: Eurostat

Appendix II Bridging table between supply chains and ATECO 2007 classification

1) Agribusiness - Ateco 2007	Description
A	AGRICULTURE, FORESTRY AND FISHING (*)
10	FOOD INDUSTRY
11	BEVERAGE INDUSTRY
12	TOBACCO INDUSTRY
20.15	Manufacture of fertilisers and nitrogen compounds
20.2	MANUFACTURE OF PESTICIDES AND OTHER AGRO-CHEMICAL PRODUCTS
20.15	Manufacture of fertilisers and nitrogen compounds
20.2	MANUFACTURE OF PESTICIDES AND OTHER AGRO-CHEMICAL PRODUCTS
25.73.1	Manufacture of manually operated tools; interchangeable parts for machines and tools
28.30.1	Manufacture of agricultural tractors
28.30.9	Manufacture of other machines for agriculture, forestry and animal husbandry
28.93	Manufacturing of machinery for food, beverage and tobacco (including parts and accessories)
33.12.6	Maintenance and repair of agricultural tractors
46.14.0	Agents involved in the sale of machinery, industrial plants, ships and aircraft, agricultural machinery, office machinery, telecommunications equipment, computers and their peripherals
46.17	Agents involved in the sale of food, beverages and tobacco
46.21	Wholesale of grain, raw tobacco, seeds and animal feeds (fodder)
46.22	Wholesale of flowers and plants
46.23	Wholesale of live animals
46.3	WHOLESALE OF FOOD PRODUCTS, BEVERAGES AND TOBACCO PRODUCTS
46.61	Wholesale of agricultural machinery and accessories and implements, including tractors
47.11	Retail sale in non-specialised stores with food, beverages or tobacco predominating
47.2	RETAIL SALE OF FOOD, BEVERAGES AND TOBACCO IN SPECIALISED STORES

47.81	Ambulant trader in food and beverage products
55.20.52	Accommodation activities related to farms
74.90.1	Agricultural consulting
77.31	Renting of agricultural machinery and equipment
2) Construction - Ateco 2007	**Description**
08	OTHER ACTIVITIES OF MINING FROM QUARRIES AND MINES
09.9	SUPPORT ACTIVITIES FOR MINING FROM QUARRIES AND MINES OF OTHER MINERALS
22.21	Manufacture of plastic plates, sheets, tubes and profiles
22.23	Manufacture of plastic articles for construction
23.1	MANUFACTURE OF GLASS AND GLASS PRODUCTS
23.2	PRODUCTION OF REFRACTORY PRODUCTS
23.3 (net of 23.31)	MANUFACTURE OF CLAY BUILDING MATERIALS
23.5	MANUFACTURE OF CEMENT, LIME AND PLASTER
23.6	MANUFACTURE OF CONCRETE, CEMENT AND PLASTER PRODUCTS
23.7	STONE CUTTING, MODELLING AND FINISHING
23.9	MANUFACTURE OF ABRASIVE PRODUCTS AND NON-METALLIC MINERALS NCE
25.1	MANUFACTURE OF METAL CONSTRUCTION ELEMENTS
71	ARCHITECTURAL AND ENGINEERING STUDIES; TECHNICAL TESTING AND ANALYSIS
77.32	Renting of construction and civil engineering machinery and equipment
3) Defence/aeronautics (ISTAT data do not censor public administration and defence code 084)	**Description**
20.51	Manufacture of explosives
25.4	MANUFACTURE OF WEAPONS AND AMMUNITION
30.3	MANUFACTURE OF AIR AND SPACE CRAFTS AND RELATED MACHINERY
30.4	MANUFACTURE OF MILITARY COMBAT VEHICLES
33.11.03	Repair and maintenance of weapons, weapon systems and ammunition
33.16	Repair and maintenance of aircrafts and spacecrafts
47.78.5	Retail sale of arms and ammunitions, military articles

84.22	Natural defence
84.24	Public order and national safety
4) ICT	**Description**
26.1	MANUFACTURE OF ELECTRONIC COMPONENTS AND BOARDS
26.2	MANUFACTURE OF COMPUTERS AND PERIPHERALS
26.3	MANUFACTURE OF TELECOMMUNICATIONS EQUIPMENT
26.51	Manufacture of measuring, testing and navigational instruments and apparatus (other than optical)
28.23	Manufacture of office machinery and equipment (except computers and peripheral equipment)
33.13	Repair and maintenance of electronic and optical equipment
46.5	ICT EQUIPMENT WHOLESALE
47.4	RETAIL SALE OF COMPUTER EQUIPMENT AND TELECOMMUNICATIONS (ICT) IN SPECIALISED STORES
58.2	SOFTWARE PUBLISHING
61	TELECOMMUNICATIONS
62	PRODUCTION OF SOFTWARE, CONSULTING AND RELATED ACTIVITIES
63	ACTIVITIES OF INFORMATION SERVICES AND OTHER COMPUTER SERVICES
95.1	COMPUTER AND COMMUNICATION EQUIPMENT REPAIR
5) Instrumental mechanics	**Description**
25.73	Manufacture of tools
27.9	MANUFACTURE OF OTHER ELECTRICAL EQUIPMENT
28.1	MANUFACTURE OF GENERAL PURPOSE MACHINES
28.24	Manufacture of power-driven hand tools
28.29	Manufacture of other machinery
28.4	MANUFACTURE OF METAL FORMING MACHINERY AND MACHINE TOOLS
28.9	MANUFACTURE OF OTHER SPECIAL PURPOSE MACHINES
33.12	Repair and maintenance of machinery
33.2	INDUSTRIAL MACHINE AND EQUIPMENT INSTALLATION
33.14	Repair and maintenance of electrical equipment
46.61	Wholesale of agricultural machinery, equipment and supplies

46.62	Wholesale of machine tools
46.63	Wholesale of mining, construction and civil engineering machinery
46.64	Wholesale of machinery for the textile industry and of sewing and knitting machines
46.66	Wholesale of other office machinery and equipment
6) Media / audio-visual	**Description**
18	PRINTING AND REPRODUCTION OF RECORDED MEDIA
26.4	MANUFACTURE OF AUDIO AND VIDEO CONSUMER ELECTRONIC PRODUCTS
26.7	MANUFACTURE OF OPTICAL AND PHOTOGRAPHIC EQUIPMENT
26.8	MANUFACTURE OF MAGNETIC AND OPTICAL SUPPORTS
46.43.2	Wholesale of recorded media, audio, video (Cd, Dvd and other media)
46.43.3	Wholesale of articles for photography, cinematography and optical
47.63	Retail sale of music and video recordings in specialised stores
58 (net of 58.2)	PUBLISHING ACTIVITIES
59	MOTION PICTURE, VIDEO AND TELEVISION PROGRAMME PRODUCTION, SOUND RECORDING AND MUSIC PUBLISHING ACTIVITIES
60	PROGRAMMING AND BROADCASTING ACTIVITIES
73.1	ADVERTISING
74.2	PHOTOGRAPHIC ACTIVITIES
77.22	Renting of video tapes and disks
7) Health	**Description**
21	MANUFACTURE OF BASIC PHARMACEUTICAL PRODUCTS AND PHARMACEUTICAL PREPARATIONS
26.6	MANUFACTURE OF IRRADIATION, ELECTRO-MEDICAL AND ELECTRO-THERAPEUTIC EQUIPMENT
32.5	MANUFACTURE OF MEDICAL AND DENTAL INSTRUMENTS AND SUPPLIES
46.46	Wholesale of pharmaceutical goods
47.73	Retail sale of pharmaceuticals in specialised stores
47.74	Retail sale of medical and orthopaedic goods in specialised stores
Q	HEALTHCARE AND SOCIAL ASSISTANCE
8) Home system	**Description**

16.1	SAW MILLING AND WOOD PLANNING
16.2	MANUFACTURE OF WOOD PRODUCTS CORK. STRAW AND PLAITING MATERIALS
17.24	Manufacture of wallpaper
23.31	Manufacture of ceramic tiles and cladding
23.4	MANUFACTURE OF OTHER PORCELAIN AND CERAMIC PRODUCTS
25.71	Manufacture of cutlery
25.99	Manufacture of other fabricated metal products nce
27.5	MANUFACTURE OF DOMESTIC APPLIANCES
31	FURNITURE MANUFACTURE
32.91	Manufacture of brooms and brushes
46.15	Agents involved in the sale of furniture, household goods, hardware and ironmongery
46.44	Wholesale of porcelain, glassware and cleaning material
46.47	Wholesale of furniture, carpets and lighting equipment
47.53	Retail sale of carpets, bedside carpet and wall and floor coverings (carpet linoleum) in specialised stores
47.54	Retail sale of electrical household appliances in specialised stores
47.59	Retail sale of furniture, lighting equipment and other household articles in specialised stores
74.10.1 (data not)	Fashion design and industrial design
95.22	Repair of household appliances and home and garden equipment
95.24	Repair of furniture and home furnishings; upholstery workshops
95.29	Repair of other personal and household goods
9) Fashion system	**Description**
13	TEXTILE INDUSTRY
14	MANUFACTURE OF APPAREL; MANUFACTURE OF LEATHER AND FUR ARTICLES
15	MANUFACTURE OF LEATHER AND SIMILAR
22.19	Manufacture of other rubber products (SHOE SOLES)
26.52	Manufacture of watches and clocks
32.1	MANUFACTURE OF JEWELLERY, COSTUME JEWELLERY AND RELATED ITEMS; PROCESSING OF PRECIOUS STONES
32.50.5	Manufacture of frames for glasses of any kind: standard fitting of common glasses

46.16	Agents involved in the sale of textiles, clothing, fur, footwear and leather goods
46.24	Wholesale of hides, skins and leather
46.41	Wholesale of textiles
46.42	Wholesale of clothing and footwear
46.48	Wholesale of watches and jewellery
47.51	Retail sale of textiles in specialised stores
47.71	Retail sale of clothing in specialised stores
47.72	Retail sale of footwear and leather goods in specialised stores
46.76.1	Wholesale of raw and semi-processed textile fibres
47.77	Retail sale of watches and jewellery in specialised stores
47.82	Ambulant retail sale of textile products, apparel and footwear
74.10.1	Fashion design and industrial design

10) Tourism cultural heritage	**Description**
55	ACCOMMODATION
56.10.1	Catering; catering connected to farms
79	TRAVEL AGENCY, TOUR OPERATOR AND OTHER RESERVATION SERVICE AND RELATED ACTIVITIES
90	CREATIVE, ARTS AND ENTERTAINMENT ACTIVITIES
91	LIBRARY, ARCHIVES, MUSEUMS, OTHER CULTURAL ACTIVITIES
93.2	RECREATIONAL AND ENTERTAINMENT ACTIVITIES
96.04.2	SPAS

11) Energy	**Description**
05	COAL MINING (EXCLUDING PEAT)
06	EXTRACTION OF CRUDE PETROLEUM AND NATURAL GAS
09.1	SUPPORT ACTIVITIES FOR PETROLEUM AND NATURAL GAS EXTRACTION
19	MANUFACTURE OF COKE AND REFINED PETROLEUM PRODUCTS
27.1	MANUFACTURE OF ELECTRIC MOTORS, GENERATORS AND ELECTRIC TRANSFORMERS AND ELECTRICITY DISTRIBUTION AND CONTROL DEVICES
27.2	MANUFACTURE OF ELECTRIC BATTERIES AND ACCUMULATORS

27.3	MANUFACTURE OR WIRES AND WIRING DEVICES
27.4	MANUFACTURE OF ELECTRIC LIGHT EQUIPMENT
D	ELECTRICITY, GAS, STEAM AND AIR CONDITIONING SUPPLY
12) Finance	**Description**
K	FINANCIAL AND INSURANCE ACTIVITIES TOTAL FINANCE SUPPLY CHAIN
13) Chemical supply chain	**Description**
08.91	Mining of chemical and fertiliser minerals
20.12	Manufacture of dyes and pigments
20.13	Manufacture of other inorganic basic chemicals
20.14	Manufacture of other organic basic chemicals
20.16	Manufacture of plastics in primary forms
20.17	Manufacture of synthetic rubber in primary forms
20.3	MANUFACTURE OF PAINTS, VARNISHES AND SIMILAR COATINGS, PRINTING INK AND SYNTHETIC ADHESIVES (GLUE)
20.5	MANUFACTURE OF OTHER CHEMICAL PRODUCTS
20.6	MANUFACTURE OF SYNTHETIC AND ARTIFICIAL FIBRES
22.21	Manufacture of plastic plates, sheets, tubes and profiles
22.29	Manufacture of other plastic products
46.75	Wholesale of chemical products
14) Metallurgy and steel industry	**Description**
07	MINING OF METAL ORES
24.1	STEEL INDUSTRY
24.2	MANUFACTURE OF TUBES, DUCTS, CABLE PROFILES AND RELATED STEEL ACCESSORIES (EXCLUDING STAINLESS STEEL ACCESSORIES)
24.3	MANUFACTURE OF OTHER INITIAL STEEL PROCESSING PRODUCTS
24.4	PRODUCTION OF PRECIOUS METALS AND OTHER NON-FERROUS METALS, NUCLEAR FUEL TREATMENT
24.5	FOUNDRIES
25.2	MANUFACTURE OF METAL TANKS, RESERVOIRS, RADIATORS AND CONTAINERS

25.3	MANUFACTURE OF STEAM GENERATORS (EXCLUDING CENTRAL HEATING METAL HOT WATER BOILERS)
25.5	METAL FORGING, PRESSING, STAMPING AND ROLL FORMING; POWDER METALLURGY
25.6	METAL PROCESSING AND CLADDING; MACHINING
25.9 (excluding 25.99)	MANUFACTURE OF OTHER METAL PRODUCTS
33.11	Repair and maintenance of fabricated metal products
46.72	Wholesale of metals and metal ores
46.74.1	Retail sales or iron and in other metal articles
46.77.1	Wholesale of metal working scraps and by-products
15) Transport vehicle supply chain	**Description**
22.11	Manufacture of rubber tyres and tubes; re-treading and rebuilding of rubber tyres
28.15	Manufacture of bearings, gears and transmission parts (excluding hydraulic ones)
29	MANUFACTURE OF MOTOR VEHICLES, TRAILERS AND SEMI-TRAILERS
30.1	SHIP AND BOAT BUILDING
30.2	MANUFACTURE OF RAILWAY AND TRAMWAY LOCOMOTIVES AND ROLLING STOCK
30.9	MANUFACTURE OF TRANSPORT EQUIPMENT NCE
33.15	Repair and maintenance of ships and boats (excluding their engines)
33.17	Repair and maintenance of locomotives and tramway rolling stock (excluding their engines)
45.1	MOTOR VEHICLE SALES
45.2	MOTOR VEHICLE MAINTENANCE AND REPAIR
45.3	MOTOR VEHICLE PART AND ACCESSORY SALE
45.4	SALE, MAINTENANCE AND REPAIR OF MOTORCYCLES AND THEIR PARTS AND ACCESSORIES
16) Transport and logistics supply chain	**Description**
49	GROUND TRANSPORT AND TRANSPORT VIA PIPELINES
50	SEA AND WATER TRANSPORT
51	AIR FREIGHT

52	WAREHOUSING AND SUPPORT ACTIVITIES FOR TRANSPORTATION
17) Packaging supply chain	**Description**
16.24	Manufacture of wooden containers
17.21	Manufacture of corrugated paper and board and of paper and cardboard packaging
22.22	Manufacture of plastic packing goods
25.92	Manufacture of light metal packaging
46.76	Wholesale of packaging goods
82.92	Packaging and packaging activities on behalf of third parties

Source: Ministry of Economic Development - Department for Enterprise and Internationalisation