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GUIDELINES FOR INNOVATION REGIONAL POLICY: ITALIAN AND GERMAN CASES

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ABSTRACT

The paper describes the crucial factors which should be considered in planning innovation policies oriented to increase the regional development and the local High Potentials' knowledge. It identifies some guidelines which have been setteled during the carrying out of the IDEA European project (Innovative Development of European Areas by Fostering transnational Knowledge Development) and which should be followed during the innovation policies' implementation. It presents some essential aspects identified by the economic litterature about this issue and it compares them with the instruments concretely implemented in Alessandria (Italy) and Chenmitz (Germany) regions. The innovation policies accomplished in these two areas have been setted on the 'innovation-by-knowledge' principle, they have been classified as Good Practices by the European Union Commission and they give some general lessons about the 'rules' which should be observed during the implementation of innovation regional policies in EU Countries.

Keywords: Regional innovation policy; Learning by knowledge; Innovation guidelines; High Potentials support; Good Practices

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1. Introduction

Since the last decade, innovation has been recognized as the fundamental driving force of economic growth (Lisbon Council[2], 2000; Bottazzi and Peri, 2003). It has acquired a central role in the policies definition. Nowadays, these policies are increasingly accounted as crucial elements for the Countries' evolution (Morgan, 1997): they have assumed a number of different forms, with dissimilar aims in the short time, but they are joined by common innovation goals in the longer run. Unfortunately, some difficulties still weight on the effectiveness of their results (Hagedoorn, 1996; Morgan, 1997): they are mostly due to the firms' limited resources, to their low absorptive capacity, to the different local contexts in which the policies are implemented, to market failure problems, to trade-off existing among different solutions and to the lack, in the involved Countries, of a co-ordination / co-operation culture, due to barriers between industries and research bodies.

The solution has been an evolution of the policy rationale, from the neoclassical one, optimizing the disequilibria due to market failure phenomena, to the modern one, highlighting the central role of innovation and co-operation among the market actors.

This article presents the theoretical guidelines identified by the European Union during the implementation of innovation policies in some European areas and two empirical examples (Alessandria region[3] - North Italy - and Chenmitz region - East Germany).

Since the last decade, some innovation problems, due to the high disconnection between the school/university system and the firms' world, have risen in several European zones. The answer was the application of 'modern innovation policies', based on the old, but still effective idea of a strong linkage among knowledge spillovers, spatial dimention and innovation processes and on new mainstreams which give central roles to collaborative relationships among the local actors. These policies have set the local innovation paths on continuous labor force training processes, where both the local academic institutions and the firms/Small-Medium Enterprises (SMEs) are involved. These mechanisms have been classified by the European Commission[4] as 'Good Practices' (GP), because they exploit the endogenous regional forces and they concretely assure the evolution of the local 'high-knowledge subjects'. They have been defined '*High Potentials*' (HPs) in several European works (European IDEA project[5], 2010; Ready *et al.*, 2010) and they have been identified with professionals in engineering technology and natural science sectors: "talented people and skilled labor forces that consistently outperform their peer groups in a variety of settings and circumstances – p.80" (Ready *et al.*, 2010). The HPs show a strong capacity to grow and succeed within an organization throughout their careers: they represent "the companies' culture and values in an exemplary manner and they evolve more quickly and effectively than their peer group do (..), holding more senior positions in the organization – p.80" (Ready *et al.*, 2010). They usually are deeply inserted in the local economies and they often hold up the achievement of successful technological transfer processes. Frequently they have leading roles, similar to the Schumpeterian innovative entrepreneur (Schumpeter, 1911-'12, 1928, 1934, 1939), and they are able to replace the strong governance systems often lacking in the Regional Innovation System (RIS). They fit into the systemic nature of innovative processes, creating localized patterns of innovation, capabilities and technological growth (Howells 1996), where the local know-how rises and incremental innovations follow the radical ones, creating a spatial concentration of good practices and the identification of 'innovation islands' (Davelaar and Nijkamp, 1989; Simmie, 1998).

[2] March 2000.

[3] The European concept of 'region' is different by the Italian one: the Italian territory is divided in 20 large regions, which are further divided in smaller provinces. The Alessandria area is a province in the Piedmont region and its most important city is named Alessandria.

[4] Europe 2020 Strategy.

[5] IDEA (Innovative Development of European Areas by Fostering Transnational Knowledge Development) Central Europe project: http://www.idea-strategy.eu

This scrip would to underline how the construction and implementation of policies supporting the HPs' rising should be carefully considered to amplify the probability of local development in the Countries.

2. Innovation Policy Background

Nowadays, in a context of increased globalization and acceleration of the innovation rates in many markets, the European Union and many central National governments have increased their efforts to cope with the larger challenges due to intensified competition in the world economy. They try to ensure a sustainable economic development, driving the Countries through specific innovation policies, in which the link between knowledge and innovation, presented for the first time by Schumpeter (1934, 1939), is further stressed.

The *knowledge-based economy* theories (Machlup, 1962) have had an important role during the Sixties. Since the Seventies, the governments of most OECD Countries have focalized their attention on knowledge production, education, labor force training and R&D activities, as means to reach higher economic growth (Hagedoorn, 1996; Lundvall, Borràs, 1997). During the Eighties, the connection 'knowledge/innovation' was definitively drawn out (Nelson, Winter, 1982; Morgan, 1997) and the concepts of *technological paradigm* (Dosi, 1982; Freeman *et al.*, 1982) and of innovations as the whole of 'technological possibilities within the horizon of producers' (Schumpeter, 1934: 1026; Hagedoorn, 1996) have been moulded, as the notions of technological regime (Dosi, 1982; Nelson, Winter, 1982), techno-economic paradigm idea (Freeman, 1988) and of a linkage between knowledge and technical changes (Heertje, 1988). The public policies developed in all these periods were reflecting the theoretical evolution of the knowledge/innovation relationship. They were firstly oriented to the provision of R&D infrastructures and to increase the companies' technology transfer mechanisms; subsequently they were addressed to make available innovation inputs, although they were often neglecting themes as the firms' low *absorptive capacity* and high need of innovation support (Tödtling, Trippl, 2005). Since the Nineties, the key role of knowledge and learning activities as stimulus for innovation and local economic development has been definitely pointed out (Kotler, Armstrong, 1993; Stolper, 1994; David, Foray, 1995; Foray and Lundvall, 1996; Howells, 1996; Nelson, 1996; Cooke, 1998; Lundvall, 1999; Foray, 2000; Colombo *et al.*, 2006a). The connection 'knowledge/learning/innovation' has been fully recognized: knowledge elements were tightly inserted in the economic theories, 'learning' was admit as the better solution to increase the Countries' competitiveness (Capello, 2007), the concept of *learning economies (*Lundvall, 1992) rose and innovation was definitively recognized as a strategic key for economic development. In this framework, small size industries were important examples of technical improvement (OECD, 1996): they acquired competitive advantages thanks to the 'learning by using' approach (Lundvall, 1992; OECD, 1996; Lambooy, 2005; Popadiuk, Choo, 2006), mostly relying on incremental, non-R&D based product innovation (Morgan, 1997; Asheim, Coenen, 2005). In this framework, the idea of '*knowledge and new technology based firms'* (NTBF) rose (Autio, 1997a,b., Morgan, 1997): they were characterized by little dimensions (Cohen, Klepper, 1994; Autio, 1997a; Storey, Tether, 1998), they were strongly dynamic (Morgan, 1997) and often they were universities' *spin-off* (Rullani, 1994; Nonaka, Takeuchi, 1995; Antonelli, 2000; Nonaka *et al.*, 2000). They pursued 'innovation and tecnology' as '*new knowledge incorporated into products, services and processes – p.418' (*Afuah, 1998) and knowledge on how to make products and design processes (Morgan, 1997; Lambooy, 2005). The novelty of these definitions was the 'market value' acquired by the knowledge embedded in the commercialized products (Armstrong, 1993) and by the investments in human capital (Lambooy, 2005). Confirming that, the public policies developed in these years gave a central role to learning activities (Lundvall, 1992; OECD, 1996; Asheim, Coenen, 2005; Todtling, Trippl, 2005), trying to counter the firms' deficit of *absorptive capacity* (Cohen, Levinthal, 1990; Daghfous, 2004; Fichman, 2004; Vinding, 2006). They paid specific attention to increase the local actors' interaction and they were strongly directed to create a more innovative and specialized environment, with contiguous, high-level, academic institutes and training courses, which would have solved the local unemployment problems, increasing the social cohesion (Nonaka, Takeushi, 1995; Popadiuk, Choo, 2006).

2.1. Modern Innovation Policy

These new growth theories (on knowledge spillovers - Anselin *et al.*, 1997; Audretsch, Feldman, 1996; Jaffe *et al.*, 1993 -, on knowledge economy – Nonaka, Takeuchi, 1995 - and on the cluster approach - Porter, 1990, 1998; Steiner, 1998; Swann *et al.*, 1998; Enright, 2003) lead to a reinterpretation of the regional innovation policies (Romer, 1986; Lucas, 1988; Krugman, 1991; OECD 1994). The new theories underlined as a correct expenditure of resources in R&D generate new ideas (Bottazzi, Peri, 2003) and the cognitive capabilities of decision-makers are 'deficient' and need to be supported (Lambooy, 2005) rose in the economic literature (Nonaka, Teece, 2001). The knowledge/innovation relationship was interpreted in a new light, which paid more attention to public interventions supporting the firms and Countries' growth. Finally, the Lisbon council (2000) renewed the idea that innovation is the key to remain at the forefront of global economic developments, to sustain the high-wage jobs and preserve social equity. It highlighted the essentiality of public mechanisms of knowledge dissemination, as top-down processes (Howells 1996, 2002; Iammarino 2005).

Following this mainstream, the modern innovation policies result more oriented to support the knowledge diffusion, to increase the local know-how and the systemic capacity of the region to absorb knowledge and to invest in innovation (Oughton *et al.*, 2002). They emphasize the role of HPs (Ready *et al.*, 2010) to overcome the innovation problems often due to SMEs' inability to earn fruits from the innovations proposed (Morgan, 1997) in an autonomous way; they provide new dynamics, oriented towards a wider knowledge diffusion, to increase the quantity and quality of the European human capital (consistently with the Lisbon Agenda, 2008-2010[6]) and to strengthen the European innovation processes and competitiveness. The new innovation policy strengthen the creation of innovative poles, networks and start–up centers, which originate links among the regions and the local universities (Bottazzi and Peri, 2003). They increase the local co-ordination (Oughton *et al.*, 2002), the matching among firms, schools and research institutes (Griliches, 1979) and they emphasize the ways through which knowledge is spread in the market (Anselin *et al.*, 1997): innovative spillovers. They flow in circumscribed zones and they arise by the results of the local R&D (Anselin *et al.*, 1997; Fritsch, Franke, 2004) and by the subjects' interactions and cultural proximity (Fritsch, Franke, 2004). They have been recognized as one of the most important 'unofficial' mean of knowledge diffusion (Fritsch, Franke, 2004), despite the existence, in several cases, of the 'regional innovation paradox' phenomenon (Cohen, Levinthal, 1990; Oughton *et al.*, 2002; Daghfous, 2004; Fichman, 2004; Vinding, 2006) and the evidence that cumulated knowledge usually has a positive impact on the firms' economy only if their absorptive capacity is high (Cowan *et al.*, 2000). Unfortunately, it depends by the intensity of the R&D internally made (Griliches, 1979; Cohen, Levinthal, 1989, 1990; Crepon *et al.*, 1998; Novero, 2011) and it is sensitive to distance (Keller, 2002; Bottazzi, Peri, 2003). This limit highlights further the need of central public policies as impulses to create network structures[7] (Shankerman, 1981; Jaffe, 1986), in which co-operative high-quality activities are carried out (Storper, Harrison, 1991; Harrison, 1992; Fritsch, Franke, 2004; Colombo *et al.*, 2006a), sectorial and territorial specializations are created (Uyarra,2010) and the co-operative relationships inside the RIS are easier (Jorde, Teece, 1990; Fritsch, Franke, 2004). These new policies, which often have regional dimensions (Feldman, 1999; Breschi, Lissoni, 2001; Lamboy, 2005) and which are highly various (patents, projects co-developed with other firms, collaborations firm-university or research centers), should take into consideration the learning mechanisms at local level (Lundvall, 1999). They should be fulfilled through partnerships of local actors and they should try to correct the habit of low investments in knowledge (deriving by its interpretation as 'public good' – Castells and Himanen, 2002). They should stress the building up of spin-off firms (Tödtling, Trippl, 2005), the improvement of the local education/know-how and the reaching of an higher co-ordination among firms and research institutes

[6] http://europa.eu/legislation_summaries/employment_and_social_policy/eu2020/growth_and_jobs/c11806_en.htm

[7] Industrial districts (Porter, 1998, Pyke *et al.*, 1990), technological districts (Antonelli, 1986a,b, 2000, 2001; Antonelli, Marchionatti, 1998; Antonelli, Calderini, 1999), firms'clusters (Porter, 1990; Ache, 2002), technopoles (Cooke, 2001 a,b), innovation networks (Camagni, 1991; Grabher, 1993), innovative milieu (Lambooy, 1986, Aydalot and Keeble, 1988; Crevoisier and Maillat, 1991; Ratti *et al.*, 1997).

(Morgan, 1997; Oughton *et al.*, 2002). The technology transfer (TT) mechanisms (Van Oort, 2003; Novero, Rolfo, 2011) usually have an important role in them and they are important means of diffusion of universities' R&D spillovers (Anselin *et al.*, 1997; Cooke *et al.*, 2000; Asheim, Herstad, 2003; Bottazzi, Peri, 2003; Bathelt *et al.*, 2004; Fritsch, Franke, 2004; Asheim, Coenen, 2005). They should allow the realization of high-quality training processes of the local intellectual workforce (Oughton *et al.*, 2002), being more oriented in consolidating the exploitation of existing opportunities than in opening up new possibilities (European Commission, 2008). The new policy have a crucial role in the functioning of the local education systems, in the HPs forging and in balancing the asymmetry existing in the innovation funding: through the support of local actors, they should avoid double - public and private - innovation investments (Fritsch, Franke, 2004) and they should trigger off many positive reaction chains, which start from the exogenous R&D funding and keep with the rise of useful knowledge spillovers (Fritsch, Franke, 2004). They should increase the local competitiveness of the Countries (European Commission, 2008).

3. Two European Cases

A specific application of the just described innovation policies has been achieved in two European areas (the Alessandria region - Italy - and the Chenmitz region - Germany). They have been selected by the Central EU Government to participate to the communitarian IDEA Project (Innovative Development of European Areas by Fostering transnational Knowledge Development - www.idea-strategy.eu), which was oriented to select some *Policy Good Practices* among the European Countries.

3.1. Alessandria region (Italy)

The Alessandria area has more than 400.000 inhabitants (2012) and it is one of the 110 Italian agglomerations at NUTS 2 level of Eurostat territorial repartition (1998). It is located in the Southeast of Piedmont region (North Italy) and it is placed at the centre of the Italian industrial triangle 'Turin-Milan-Genoa'. It is crossed by two important train lines (the European Corridor n°5, *Lisbona-Kiev*, and the European Corridor n°24, *Mediterranean Sea-North Sea*) and its advantageous location has allowed several interconnections with the neighbouring Lombardia, Liguria and Emilia Romagna Italian regions and with some North-West European Countries. It is composed by about 190 municipalities, whose 7 represent the 54,5% of regional population. These characteristics as 'communication node' have strengthen the Alessandria RIS peculiarities:. The region is constitute by different innovative or traditional districts and technological platforms, characterized by excellences in firm / university collaborations and by sectorial specializations. Thy are:

- Alessandria Municipality area: it is an industrial and trading centre, with an important role in the commercialization of agricultural products, wood works, manufacturer products (hats, shoes and jewels) and a great specialization in mechanical and chemical goods (there are 361 technologically advanced SMEs, specialized in the packaging and plastic productions, the most important sectors of the region, and several SMEs working in the household appliance, mechanical and cement construction sectors).
- Acqui Terme Municipality area: it is characterized by several agricultural firms.
- Casale Monferrato zone: here it is possible to find companies operating in wood works, in cement manufactures, in graphic machines and in the publishing industry.
- Novi Ligure area: characterized by several food, mechanical and tertiary firms.
- Ovada Municipality area: an important centre for the wood works and the metal-mechanic industry.
- Tortona Municipality zone: it has a significant role in the railways communication (there are 151 firms working in the logistic and transport sectors).
- Valenza municipality area: the centre of the gold and jewellery Piedmont district.

In these 7 municipalities it is possible to find some important seats of 'Piemonte Orientale' University (Faculties of Law and of Political Science and a seat of Polytechnic of Turin) and some research institutes[8], which attract foreign funds of research, foreign students and which forge high quotes of graduates (Tab.1-2A). These laboratories have consolidated the interactive structure of Alessandria RIS (it has been classified a 'Regional networked Innovation System', the III type in the Asheim and Coenen classification - 2005) and they have concurred, mostly through a large supply of technological services, to its achievement of an high score in the 'Research Programs of National Relevance', a classification used by the Italian University Minister to finance scholastic structures.

The larger part (88%) of Alessandria firms have micro dimensions: they are connected by important communication, transport and commercial ways and they are specialized in the logistic and tertiary sectors (Tab.3-5A). These specializations have contributed to increase the Alessandria commerce with foreign Countries: the exports quote is an important part of Alessandria economy (it is the fourth area in Piedmont region in terms of exports, that means the 10.5% of total regional exports in 2012, mostly made by the stronger sectors: chemical, plastic and rubber - 26.22% of export; machines and mechanical engines - 19.74%; metal products -19.36%; jewellery and gold - 14.36%; electric machines - 6.31%). Unfortunately, although these positive scores, during the last 8 years, the Alessandria economy suffered of a slow rate of development. The international crisis, the little dimension of the local firms and the short-term credit problems have created some competitiveness gaps: in 2009, some of the Alessandria firms asked for large contributions to the local Chamber of Commerce and public bodies for their investments (Tab.6A). Nevertheless, during the 2010-2012, the employment of all the Piedmont region decreased and, peculiarly, the Alessandria economy became worse and worse (Tab.7A). These difficulties can be explained by the high disconnection between the university supply (many academic researches) and the Alessandria SME needs (high demand of applied results) and by the low request of skilled workers / HPs by the Alessandria local industry (its interest in innovation and high abilities was limited by the little dimension of its firms). To fill this firms / universities gap, the local government has realized several initiatives oriented to support the local competitiveness and allowing the HPs rising.

3.2. Chemnitz region (Germany)

The Chemnitz area is one of the 3 urban district (Chemnitz, Dresden, Leipzig) of the Free Federal State of Saxony and Chemnitz municipality is a modern large city at the heart of Europe (the fourth largest city in the East-Germany), very close to some new EU members (the Czech Republic and Poland). Almost 250,000 habitants live in the city in 2013 and they rise to 1.6 million considering all the Chemnitz administrative region. Chemnitz city developed thanks to some important trade centers, international airports and to its location near the homonymous river and an efficient network of roads. Economically, the city has been strongly shaped by the historical heritage of Saxon industry: in the 1877 Chemnitz introduced the patent system (Tab.8A) and, at the end of 18th century, Chemnitz became an industrial-technological center (Tab.9A), with a growing internal zone developed as an engineering center (Competence Center Mechanical Engineering of Chemnitz/Saxony e.V.). In the 21st century the area acquired a driven-role in the export quotes (12 mld of € in 2008, in Chemical, Pharmaceutical, Elettric and electronic products - Source: http://www.invest-in-saxony-anhalt.com/IMG) and in 1995 several firms (in a predominantly SME structure) were born in the surrounding area: next to the older Siemens, some firms working in the computer (IBM), motor-vehicles (Volkswagen) and iron / steel sectors (ThyessenKrupp) rose. In the 21st century the local inventive talents knew the high-tech developments (microsystem technology and RFID applications) and in recent years, Chemnitz has become a center of innovation in East Germany. Nowadays, it supports technology-oriented start-up, it supplies excellent technical equipment for new business and it promotes the technology transfer between academic R&D activities and firms production, most of all in its traditionally

[8] Alessandria Agro-Energetic district (EnergEtica), Innovation Pole on Renewable and Bio-fluid energies (Polibre), Photovoltaic Village, Scientific/Technological Park in Scrivia Valley, ProPlast Consortium (a technological pole, operating in plastic materials) and BioSolar Lab (a laboratory on bio-energies of the Polytechnic of Turin).

stronger economic sector: the automotive industry. It still has deep roots in the city and two thirds of the suppliers in Saxony are located in Chemnitz and surrounds, where there are more than 250 companies working in automotive engineering. In the last years, the local per-capita wealth increased in Chemnitz zone and several shopping centers rose in the center of the city: the area has taken full advantage by its proximity to eastern states of Europe for cross border trade in products and services and, in 2010, the growth of the Chemnitz GDP (57% - Source: Statistisches Landesamt des Freistaates Sachsen, June 2013) outstripped most of the East-Germany zones (it had a value per capita of 46*103 €, compared to $26*10^3$ € in Berlin). Since the German reunification, the Chemnitz general unemployment rate has dramatically fallen (from the 16.7%, in 2000, to 12.7%, in 2010) and the business was enlivened by the allowance of labor forces from the nearby Czech Republic and Poland (46% of employees).

Nowadays Chemnitz is one of the ten fastest growing cities in Germany: the area represents one of the most important microsystem technology clusters in Europe, also because of the intensive micro-technology research performed by the Chemnitz University of Technology. Although these winning points, in the last period, some wealthy districts of the Chemnitz Land suffered from sustainability problems and they were demanding more attention to local government: it started to support the area development through collaborations with several research Centers of the local University of Technology (Tab.10 A) and with proper innovation policies.

4. Regional Innovattion Policy

The innovation policies planned by both Alessandria and Chemnitz areas were in accordance with the theoretical guidelines previously explained: they followed the 'innovation by knowledge' principle. They eased the innovation process, strengthening the knowledge spreading in the local contexts and making available the proper imputs.

4.1. Alessandria policies

In the Alessandria region, both firms and public labor institutions are highly oriented towards continuous workforce training processes and they have recognized the crucial role in knowledge spreading in the economic tissue of the local scholastic and regional academic institutions. To confirm this, some local firms and other public bodies started to collaborate with the Alessandria University in different important experiences: they managed together several training courses, which have been qualified as 'high education apprenticeship contracts' and 'high training and apprenticeship masters', which enabled to reach a university degree, or a PhD, or an high technical qualification by the Alessandria students. They supported the HPs' development (in 2005, the number of graduates older than six years was specifically high - Tab.11A).

The apprentices trained in these courses had to be younger than 30 years old and they were selected by university professors and by experts belonging to the firms in which they would have been inserted. The most followed courses were of 2 types: master of First Level, for apprentices with a 3 year University degree, and master of Second Level, for apprentices with an ordinary 4 or 5 years University degree. They were oriented to form professional figures more sticking to the firm's needs and available for innovative and experimental labor positions. The topics of these training courses were defined by the firms and the University, in collaboration: usually they were about scientific and technological topics (sustainable mobility, advanced logistic, multimedia industries, airspace, agro-alimentary and life science, biotechnologies, nanotechnologies, new materials and alternative energies). These masters implied classes lessons and the realization of a project work, during the firm-training period. The firms' advantages deriving by hiring the apprentices are economic and legal (for example, the reduction, during the apprenticeship contract, of the employer's contributions and the possibility to hire the apprentices at work levels lower than their real position in the firm).

In 2005 the Alessandria University worked at the realization of the FIxO (Training & Innovation for Employment) national project. It involved different actors (university, Job Placement offices, local research

institutes, work agencies and local employment offices), it covered the period January 2006 / December 2013, it was oriented to discover HPs, to lower the period between the end of their university studies and the start of a work, to ease the realization of the 'Italy 2020'[9] strategic objectives and to reduce the unemployment rate among the newly-graduates. The FIxO project contemplated apprenticeship periods and the realization of innovative, spin-off firms (in the 2008, 10 spin-off firms arose in different fields). In the same period the university created the Industrial Liaison Office too, thanks to which the university departments of "Medicine and Medical Sciences" realized 6 patents (Tab.12A).

In 2010, the Alessandria ConfAPI (Small Firms' Confederation) organized an important project, named 'Tecnogate' (it was directed to increase the firms' internal research and innovation) and the local Proplast Consortium (205 members: 179 firms; 13 faculties; 10 trade associations and 3 public bodies), in collaboration with the Turin Polytechnic, realized some initiatives for the diffusion of the local know-how and the increase of HPs' opportunities (new engineering courses, focalized on the plastic materials, and some masters in different topics, as polymeric and plastic material engineering, jewels engineering, painting products engineering and environmental jurisprudence. All these courses and masters were linked to the previous High Training and Apprenticeship contracts). At the same time, a new public body, the 'Alessandria Consortium for the Development of the Scientific and Technological Culture' was created (it collaborated with the local industries and trade associations for the local development) and the Alessandria University managed the 'Alessandria 2011' event. It was a Three-day meeting helping the new young workers to enter in the labor market; it contemplated the foundation of several research laboratories[10], the realization of seminars about work orientation, some firms collaborations, purposive to the Alessandria 2018[11] Strategic Plan and the 'Bip Virtual Fair', virtual career day allowing the newly graduated to meet the most important local and national firms.

Lastly, the local authorities created several scientific and technological parks, which promoted collaborations and joint-ventures among local research centers and some firms: an example is the *CTS* - City of Technology and Science - Consortium, which supported the foundation of about 100 new firms. Concluding, all the over mentioned initiatives have been recognized as *Policy Good Practices* by the European Community, because they have allowed the creation of new strong networks of professional relationships among the regional firms and the local research centres and they have indirectly strengthened the local Regional Innovation System (see SWOT analysis, Tab.13A).

4.2. Chenmitz policy

Many initiatives planned by the Chemnitz region to support the local innovation and to increase the area knowledge can be described analyzing some collaborations between firms and scholastic system, too. These regional activities of networking offer the HPs advanced knowledge in the field of co-operative studies and they allow their attainment of specialized qualifications in vocational education. They have a practical relevance within the European educational environment: they preview pilot R&D projects in specific topics and they have increased the connections firms/schools, supporting the students' recruiting, their practical training and the creation of qualified networks of SMEs/private education institutions (Tab.14A). These

[9] Project of the Italian Ministries of Labour and Social Policy and of Instruction, University and Research.

[10] Two laboratories working in empiric research (Labores S.r.l. and LaST S.r.l.); a consulting society in the sectors of new polymeric materials (the Detech S.r.l); the InfoLearning S.r.l. and the Advanced Software Information Systems S.r.l. which offer computer services for the remote training and the use of e-learning platforms; the OZ Fuel Cells S.r.l. which develops, projects and executes the hydrogen cells technology; the Mybatec S.r.l. and the Mybasol S.r.l., which work in the development of innovative agricultural products realized to find pathogenic organisms in the cultivations; the NoToPharm S.r.l., oriented to increase the quality of the therapeutic approach to immunologic pathologies and the CAGE Chemicals S.r.l., which offers high level services for the research in the sector 'Molecular Immaging' for the clinical diagnostic.

[11] Alessandria 2018 was a local public association working for the firms technological innovation, the firms internalization, the human capital training and the financial capital development. It had a Strategic Agenda, whose objectives were the strengthening of the area innovative network and the development of cultural and commercial initiatives.

policy practices include support to students in finding job through Career Services[12] made in collaboration with the regional SME, some projects increasing the amount of students staying in the region and some initiatives sustaining unemployed people in their reintegration in the labor market. Usually, all these experiences are mostly successful in the regional technological sectors (computer manufacturing, electronics and optical products) and in sectors of electrical equipment, machineries and vehicles. They involve different public institutions (Intermediary, Qualification or Policy Institutions), some industry networks and some labor market bodies/Job Agencies.

All these initiatives operate to attract, to find, to bind, to develop and to support the local growth and the HPs' specialization and they are interlinked, influencing each other in a direct or indirect way. Some examples are:

- 'Day of industrial culture': a day to inform people about the "winning features" of the city, its industrial history and its opportunities in technical business. During this day, people are enabled to see their chances in the local fields of production (these experiences are addressed not only to pupils and students but to all habitants of Chemnitz).
- 'Week of open companies', during which local corporations open their doors to pupils, which can get information about the advantages of an apprenticeship in local corporations.
- 'Girl's day' (Technical University of Chemnitz), during which the girls can get in contact with high technology and increase their interest in technical studies.
- 'Night of science': it is arranged by several European universities, to inform pupils about technical studies and to attract HPs.

The Chemnitz area is characterized by several additionally internal factors (an attractive living environment, high salaries, skilled education) which keep the local intellectual resources (HPs) in the region. Additionally, the regional government has arranged several marketing activities (fairs, information days at university and visits of the companies) to increase the attractiveness of the region and of local SMEs. A specific utility has been recognized to:

- the SIT fair - Fair for Industry and Technology in Saxony;
- IT-Alliance: a co-operation, in recruitment activities, among the Technical University of Chemnitz and companies of the IT branch;
- Alliances of Mechanical Engineering, where projects/tasks/problems solved are presented;
- the website 'Chemnitz attracts!', in which the advantages and possibilities for people working in the region are presented, as well as the ones for supporting corporations in finding HPs;
- the online job platform 'Chemnitz zieht an!' ('Chemnitz is booming') useful to look for skilled people;
- a job portal, offered by the Chemnitz city, showing and promoting Chemnitz' potential.

In addition, a specific project (the VERNETZUNG project, which means 'to net') was developed to support the local innovation and competitiveness and to increase the HPs' knowledge. It was focused on the strengthen of the university/company networks and of recruitment initiatives (a web page has been set up, in order to ensure transparent information, to increase the opportunities for companies, their recruitment mechanisms, their management of co-operative activities and to decrease the barriers between university research and business in companies).

Concluding, as the Alessandria case, also the Chemnitz region's policies have been considered *Good Practices* by the European community and they can be taken as examples of strategies for local development.

5. Policy Comparison and General Lesson

Both Alessandria and Chemnitz zone are potentially highly innovative European areas. New policy mechanisms, accounted as 'Good Practices', have been recognized in them by the European Commission:

[12] The Career Services offer additional qualifications in the fields of soft skills and they support the student's career entry.

they are strategies increasing the HPs' connections and know-how and they are oriented to improve the local knowledge, to allow an easier exchange of information among the local actors, to support the regional innovative development and to construct an integrated work environment (which should answer to the future firms' needs).

This script analyzes the different policy instruments applied in these two regions to identify some standard strategies, which could be universally followed during the definition of new innovation policies. The cases here analyzed are different (Tab.1), because of the disparities existing between the Italian and German regions economic starting conditions and the following developments, but all the *Good Practices* implemented appear joined by their primary targets: to spread knowledge and know-how in the regional areas and to sustain the innovation transfer and the human capital mobility.

More specifically, the *Good Practices* managed by the two observed RIS were carried out by different actors (networks of public and private subjects, universities, academies, work associations, institutions for business development, training and working agencies, firms and SMEs), but they were both oriented to harmonize the differences within the single regions in terms of knowledge, agreements and co-operative development. They would create an integrated know-how, representing the territory advantage, and, at the same time, they give an important added value to the social and economic differences of each area.

Tab.1: Good Practices (GP) carried out in the analyzed European Countries

Good Practice 1: high training and apprenticeship masters, realized by the universities in collaboration with firms – ITALY
Good Practice 2: collaborations among technologically advanced firms and local universities in student's projects – ITALY / GERMANY
Good Practice 3: collaborations among triple helix actors in training courses and innovative transfer actions – ITALY / GERMANY
Good Practice 4: a web site working for the development of human resources - GERMANY
Good Practice 5: support to newly graduates in the research of work positions – ITALY / GERMANY
Good Practice 6: collaborations 'Industries / Universities' to 'make' the right High Potentials – ITALY
Good Practice 7: public initiatives of promotion of the firms' production – GERMANY

Source: Internal elaboration

- The first GP is represented by different training experiences implemented in Italy ('high education apprenticeship contracts', 'high training and apprenticeship masters', FIxO Project, etc..) by the Alessandria University, the Turin Polytechnic, the Confindustria Association and the Proplast Consortium. They allowed the reaching of Ph.D. qualifications or further specializations by students after their University degree and they increased the HPs' knowledge. Their programs, defined in collaboration with several industries of the area, were more innovative than the University programs.
- The second experience is represented by the R&D initiatives realized both by Italian and German firms and directed to improve the SMEs/HPs contacts and the students' entrepreneurial abilities.
- In the third case, several firms/university networking experiences are included. On the Italian side: courses, training periods, meetings, seminars for work orientation and supports to spin-off firms. On the German side: Career Services of Technical University and several projects increasing the connections among firms, university and research centers in the clusters.
- An example of the fourth GP is available in Chemnitz region, which created a web-site presenting the strengths of the territory, its advantages and its appeal for HPs. The web-site shows instruments useful to find HPs: it facilitates the contacts between companies and traineeships candidates, giving HPs the opportunity to interact with firms.

- The fifth GP offers support to young graduated to look for specific work positions (employment offices provide selected job offers, according to the faculties' profiles and the enterprises' needs, to set up connections between newly graduated and industry). They were realized by both Italian and German institutions. On the Italian side: the FIxO Project and Alessandria 2011 initiatives. In the German case: 'Weeks of Open Companies' and different Career Services.
- Among the sixth GP there are different initiatives of Alessandria government (training courses of university, Confindustria and ProPlast Consortium): they are specifically focalized on HPs training.
- The seventh GP is represented by initiatives of public promotion, in which local corporations open their doors to pupils, the girls learn about technical studies, some exhibitions and lectures are realized about the firms' daily business and some internships/projects are offered to students.

All these Good Practices have been defined in conformity with one of the most important principle of economic theory: 'innovation by knowledge'. Additionally, the literature highlights the policies should monitor and assess the regulatory context suitability, they should be directed towards setting up the right incentives, they should control the subsidies for private or public provision (Bottazzi, Da Rin, 2002) and they should carefully use the public funds: quite all these points are satisfied by the described cases. The only exception is for the last aspect, which specifically lacks in the Italian economic context, because of the general decline of technological big firms, the low turnover of skilled management and the low creation of new firms (Colombo *et al.*, 2006b).

Furthermore, according to the literature, the modern innovation public policy should solve the market failure problems related to firms 'locked-in' in particular technological paradigms, they should generate incentives to develop technological alternatives in order to make easier for firms to move away from technological lock-in, they should correct the firms 'learning failures' (i.e. the firms might not be able to learn rapidly and effectively) and they should rectify the still low integration of several innovative organizations (firm, research institution, etc.) with learning organizations. They should ensure the industrial system achieves a balance between the exploration of new possibilities and the exploitation of old ones and they should balance the level of new technological knowledge (if it is too weak, it may reduce the discovery incentives, if it is too stringent, it may limit their spread). The innovation public policy should design the competences and co-ordinate the actors in managing different market problems (Grilli, Mariotti, 2006), they should stimulate entrepreneurship among the academic staffs and finally they should support the formation of R&D networks, industry/university interfaces and bridging institutions (European Commission, 1993[13]).

All the policies here analyzed follow these mainstreams (they are shifted from linear to more interactive actions - Johnson, 1996), although they are different each other, because of the discrepant economic heritages of the two observed regions and their different educational systems. The existence of these differences has been previewed by the economic literature (Lundvall, Borras, 1997) and theoretically it seems impossible to identify some general 'Best practice recipes' for network policies or instruments. However, some general lessons can be learnt from the examples described above:

- The majority of these initiatives are developed at regional or even at local level: this is the frameworks in which collaborative relationships among the actors can be more easily built.
- All the policy are realized through collaborations between private and public bodies, because the cost /risk for individual organizations of engaging in networking activities is very high (Lundvall, Borras, 1997).

Further, observing the two presented cases, the Alessandria experience results more oriented towards the HPs creation. It focus on learning and training actions of students which can potentially develop high capacities. Such a policy architecture implies an higher attention to the culture diffusion and it could be

[13] http://europa.eu/documentation/official-docs/white-papers/pdf/growth_wp_com_93_700_parts_a_b.pdf

useful where the scholastic system is not very advanced yet (it is not able to offer courses fitting with the firms' needs).

On the contrary, the East-German experiences are more oriented to increase the links between university and firms. The choice of this policy could be right in Countries where the scholastic system is generally efficient (the German local schools are able to forge students with high potentialities) and the most important problem is the firms/students meeting phase.

Concluding, still nowadays, it is difficult to present policy models of general validity and to end up innovation policy recommendations (Lundvall, Borras, 1997), but surely, the two presented cases can inspire other European regions. It is important to consider the region internal potentiality and then decide which example to follow to forge HPs and to increase the local firms' competitiveness.

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8. Tables

Tab.1A : Foreign funds for research (2012)

ITALIAN UNIVERSITY	% on total funds
Geneva	74
Turin	70
Naple	68
Florence	66,7
Rome	66,4
Alessandria	65

Source: Research Programs of National Relevance (2012)

Tab. 2A: Number of Graduates in the Alessandria Faculties (2010)

Faculties	Students		Total graduates on students	
	Total	*Women*	Total	*Women*
Interfaculty	102	*42*	4.9%	*4.8%*
Economics	183	*91*	12.6%	*15.4%*
Law and Juridical studies	828	*521*	12.0%	*12.3%*
Engineering	353	*58*	10.2%	*6.9%*
Medical and surgery	254	*179*	16.1%	*18.4%*
Mathematical, Physical and NAtural Sciences	954	*412*	17.8%	*20.4%*
Political Sciences	580	*327*	16.4%	*15.6%*
Total	3254	*1630*	14.4%	*15.5%*

Source: ISTAT, 2010

Tab. 3A: Firms of tertiary sector in Alessandria province

Areas	2006	2007	2008	2009	2010	Variation 2009/2010
Alessandria Province	1.554	1.610	1.625	1.722	1.749	1,57%
Piedmont Region	23.787	24.457	24.900	25.749	25.902	0,59%
Italy	261.253	269.530	275.398	293.002	295.674	0.91%

Source: Firm Register, ISTAT 2014

Tab. 4A: Firms of Alessandria province belonging to tertiary sector and realizing R&D activities (2010)

Areas	Computer and linked activities	% on Piedmont	R&D	% on Piedmont	Services to the firms	% on Piedmont
Alessandria Province	460	6,57%	21	8,33%	1.268	6,80%
Piedmont Region	6.999	100%	252	100%	18.651	100%
Italy	91.297		3.942		200.435	

Source: Firm Register, Union of Chamber of Commerce of Cuneo, 2010

Tab. 5A: Piedmont region and Alessandria province

		Employees (in thousands of people) – 2010		AL / Piedmont	Added Value at base prices (in millions of Euro) – 2006		AL / Piedmont
AREAS		**Piedmont Region**	**Alessandria Province**		**Piedmont Region**	**Alessandria Province**	
Agricolture		76.1	9.4	12,40%	1711.12	217	12,70%
Industry	*Construction*	*128*	*13.2*	*10,30%*	*6135.5*	*608.5*	*9,90%*
	Total	627.1	59.5	9,50%	31942.6	2882	9%
Services	*Commerce, Transport, Communications, Hotels*	*484.1*	*51.4*	*10,60%*	*24159.8*	*2582.2*	*10,70%*
	Monetary and financial brokerage, entrepreneurial and real estate activities	*319.6*	*23.5*	*7,40%*	*30128.1*	*2611.6*	*8,70%*
	Others services	*509.7*	*47.4*	*9,30%*	*19099.9*	*1797.9*	*9,40%*
	Total	1313.4	122.3	9,30%	73387.8	6991.7	9,50%
TOTAL		2016.6	191.2	9,50%	107041.5	10090.7	9,40%

Source: ISTAT, 2011

Table 6A: Firms' investments in Alessandria sample

Investiments			
2009	*2010*	*2011*	*2012*
78,70%	83,90%	51,20%	38,50%
Types of investments (2009)			Cases
Equipments and machineries			7
Patents			1
Software			1
R&D			3
Others			9
Total			21

Source: Alessandria Chambre of Commerce, 2011

Tab. 7A: Unemployment and innovation growth indexes

		Piedmont Region	Alessandria Province
Unemployment rate (people 15-64 years old)	2006	5.1%	5.2%
	2007	5.2%	6.2%
	2008	6.3%	6.1%
	2009	7.8%	7.2%
	2010	8%	6,2%
	2011	8,50%	6,9%
	2012	10,5%	11,1%
	2013	11,9%	11.7%
	2014	12.9%	13.4%
Enterprise growth rate	2012 / 2013	-1,6%	-0,9%
Innovative start-up	2013	85	3

Source: ISTAT, 2014

Tab. 8: Chemnitz last patents

Date	Application number	Technische Universitaet Chemnitz patents
11/14/13	20130299296	Switchable coupling, for passenger vehicle auxiliary assemblies
11/14/13	20130299297	Switchable coupling system between a driving element and an output element
10/03/13	20130255812	Fluidic actor comprising deformable arrangement and long storability
03/14/13	20130062768	Method for the production of a substrate having a coating comprising copper.
03/01/12	20120048022	Micromechanical sensor having a bandpass characteristic
11/24/11	20110284975	Microstructure, method for producing the same device for bonding a microstructure

Source: Chemnitz Patents Archive - http://www.faqs.org/patents/assignee/technische-universitaet-chemnitz/

Tab. 9A: The Chemnitz most significant industries

The Chemnitz most significant industries:
Service and manufacturing industry : production of tools, machinery, chemicals, vehicles and textiles.
Automotive / Motor industry
ICT
Mechanical engineering
Plant/construction
Microsystem technology
Metal processing and heavy industry

Source: Wikipedia (2009)

Tab. 10A: Chemnitz University of Technology

Total Students	**Students from foreign Countries (70 different locations)**
10.000	750
7 faculties	**7 research profiles**
Faculty of Natural Sciences	New Materials
Faculty of Mathematics	Life Cycle Production
Faculty of Mechanical Engineering	Microelectronics & Micro-electromechanical systems
Faculty of Electrical Engineering and Information Technology	Customer orientation in value chain networks
Faculty of Computer Science	Communication, Media, Technology
Faculty of Economics and Business Administration	Modeling, Simulation, High Performance Computing
School of Humanities and Behavioural / Social Sciences	Applications & development of systems

Source: http://www.tu-chemnitz.de/index.html.en

Tab. 11A: Instruction levels in Alessandria Province (2005)

Indicator	value	Year
Population >=6 years	401.611	2001
Alumns	49.136	2005
Alumns / Habitants	11,45%	2005
Nursery Schools / Alumns	403 / 9660	2005
Elementary Schools (classes) / Alumns	965 / 15753	2005
Italian middle school (first three years of secondary school) : classes / Alumns	465 / 9895	2005
Secondary schools (classes) / Alumns	665 / 13828	2005
A: Alumns / classes	19,67	2005
B: Certificated of the elementary schools and of the first three years of secondary schools	240.748	2001
C: Certificated with a diploma	103.894	2001
D: Graduateds	26.497	2001
E: Without a certificate	27.530	2001
F: Illiterates	2.942	2001
G: D_Graduates / B_Certificated in elementary and first three years sec,school	11.0%	

Source: ISTAT (2005)

Tab. 12A: Piemonte Orientale University Patents (2011)

Deposit number	Title	Department
MI2003A001127	Antibody against HGF-R and their use	Medical Sciences Department
TO2004A000760	Treatment of vascular system	Medical Sciences Department
Provisional N° 60/787183	Use of a Polymer	Clinical and Sperimental Medicine Department
TO2006A000614	Differential diagnosis for sclerodermia	Clinical and Sperimental Medicine Department
TO2006A00833	Micro-well with conves bottom	Medical Sciences Department
TO2006A000848	DNA study	Medical Sciences Department

Source: Piemonte Orientale University web site

Tab. 13A: Alessandria province SWOT analysis (2011)

Strength	**Weakness**
Entrepreneurial tissue	*Entrepreneurial tissue*
Presence of few big companies and several SMEs which create a district structure and sustain innovation	Decrease, in the middle-long term, of individual firms. Too pulverized entrepreneurship.
Qualified university structures / Availability of qualified staff and highly skilled employees	Many artisan and micro firms
Creation of synergies between university and firms against the brain-drain phenomenon	SMEs' low technological level and innovation gaps
Important logistic structures and trade associations	Low insertion of the local specialists and experts of the Mathematics, Information Technology, Natural Science and Technology
Increase of firms operating in innovative and technologically advanced sectors	Economic crisis in several industries (above all cold sector)
Increase of employment, since the '90, in the tertiary sector	Low financial resources
Thriving province entrepreneurship, increase of stock companies	
Good reputation of local companies, which are mostly acting in traditionally niches of their branch	
Accessibleness of the local industrial system to foreign units, increase of international trade	
Several technologically advanced medium firms, operating in foreign markets	
High level of firms' attraction, low level of firms' delocalization	
Several sectorial specializations	
Articulate industrial structure / reconversion of some territories	
Increasing amount of patent registrations	
Urban tissue	*Urban tissue*
Strategic geographical location	Incomplete motorways
Regional financing for high technological standard of machines and equipment	Isolated productive centres
	Low integration between transport and territorial plans
Infrastructural competitiveness	Infrastructural competitiveness
Good interconnection in all the Province and among the productive areas, thanks to efficient transport networks (streets, railways, port, airport) and to the rationalization of the Province traffic	Traffic congestion
International airports	Ways and motorways not always available

Closed sea ports	Low interconnection railways/ports
Environmental tissue	*Environmental tissue*
Good landscapes	Transformation of old landscapes in productive areas.
Cultivation of grapevine / presence of wood	Air, acustic and land pollution
Requalification of specific areas because of the pollution	
Opportunities	**Threats**
Infrastructural competitiveness	*Infrastructural competitiveness*
Creation of new infrastructures / rationalization of the infrastructural system	Bad interconnection between port and train systems
New links in the 24 Corridor	Congestion of tyre and iron systems
	No innovation in the port system
Environmental tissue	*Environmental tissue*
Traffic rationalization	Increase of emissions
Economic tissue	*Economic tissue*
Creation of new opportunities through the national and international trade	Increase of international competition
Creation of innovative ICT systems	Basilea 2 impact (on SMEs)
Base for a future oriented qualification in new technological fields	Delocalization phenomena
Cross-border co-operation in new markets	Deindustrialization of productive areas / unemployment increase
Increase of the Province specialization	Low local GDP development
Developing SMEs' specialization in innovation	Lack of financial sustain
Development of job chances in SME	Missing instruments to bind existing potentials
Co-operation experiences in R&D of SME/University	Draining of knowhow and qualified people
Local science Park Activities supporting SMEs in safeguarding highly skilled employees	Demographic dimension (birth rate, leaving young people, old age employees…) and ageing of the human workforces
High number of students	Excessive traditionalism and slowness in manager substitution
Right instruments to bind local firms	Discrepancy between the high number of employees for specialised levels of qualification and of offered work positions

Source: internal elaboration, 2014

Tab. 14 A: Chemnitz University

International Office		**Academic Exchange Service**
Activities	„Studying in Germany'	Integrated international Master's and Postgraduate Course „Mathematics' in Germany.
	„Study and Internship abroad'	Dual degree system which offers Internationally acknowledged Bachelor's and Master's Degree (since 2007)
	„Support of scientist mobility'	Postgraduate Degree
Interdisciplinary Bachelor's and Master's Courses in „Computational Science':		
Mathematics	Media Communication	Economics
Computer Science / Natural Sciences	Technology	Journalism

Source: http://www.tu-chemnitz.de/index.html.en

Sommario

L'articolo descrive i fattori chiave che devono essere considerati durante la pianificazione di politiche per l'innovazione orientate allo sviluppo regionale ed all'incremento della conoscenza degli High Potentials. Esso identifica le linee guida definite durante lo svolgimento del Progetto Europeo IDEA (Innovative Development of European Areas by Fostering transnational Knowledge Development), che dovrebbero essere seguite nelle fasi di definizione ed implementazione delle politiche per l'innovazione.

Sono presentati due casi specifici - Provincia di Alessandria, Italia, e Provincia di Chenmitz, Germania – e gli strumenti in essi analizzati sono confrontati con i capisaldi presentati dalla letteratura sull'argomento. Le politiche per l'innovazione applicate nei 2 casi sono state costruite sulla base sul concetto "Innovazione attraverso la conoscenza", sono state classificate come "Buone Pratiche" dalla Commissione Europea e possono avere un ruolo di spunto, suggerendo alcune regole generali che dovrebbero essere osservate durante la definizione delle politiche per l'innovazione in Paesi Europei con caratteristiche analoghe ai Paesi analizzati.