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# The institutional framework of Industrial policies

Patrizio Bianchi\*<sup>o</sup> and Sandrine Labory\*

## Abstract

This paper argues that the institutional framework of industrial policies derives from the analysis of industries as systems. Industries are embedded in specific institutional frameworks with which they co-evolve.

However, industrial systems are primarily organised at local level: industries may be global but in the sense that they constitute global networks of local systems.

The institutional framework of industrial policy derives from this result: industrial policy acts at different levels, primarily the local one with regional policies, but also national and supranational.

The paper argues that regional industrial policies are key policies to favour industrial development, and performing regions are those that combine dynamic capabilities (pool of resources: raw materials, infrastructure, competencies and knowledge, human capital) and an institutional system characterised by governance and leadership. This is illustrated with the case of the Emilia Romagna region in Italy. Dynamic capabilities both favour the development of local firms and attract firms and resources (financial, human) from outside the region. Governance is taken in the sense of Stoker (1998) of a collective decision-making process, involving all stakeholders. We add that leadership is also essential in such a framework. Finally, the success of industrial policy depends not only on the local institutions but also on their relationship with the wider institutional framework.

Keywords: industrial policy, institutional framework, regions, Emilia-Romagna.

JEL codes: L52, O25, O18.

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## 1. Introduction

Industrial policy has been widely debated in the last ten years or so. The debate initially focused on whether industrial policy was good or bad. However, there has been growing consensus, at least among policy-makers and in a part of economists, that industrial policy is required to face the globalisation challenges (Chang, 2010; Cimoli et al. 2009; Rodrik, 2008; Hausmann and Rodrik, 2007). In the last years and especially since the financial crisis the key issues of what industrial policy and how it should be implemented have been increasingly raised, without clear results so far. This paper attempts to go forward in this discussion by making two propositions regarding the definition of industrial policy: first, industries are complex systems and policy must take this into account; second, although not exclusively, the regional (territorial) level is a key level at which to define and implement industrial policy. The institutional framework for industrial policy derives from these propositions.

Industrial policy as delineated in this paper could be more appropriately called industrial development policy, thus indicating the necessary dynamics of policy: structural changes require a long time, and policies have to be defined as processes which evolve through time as implemented measures are evaluated and adjusted if not effective.

As stressed by Labory (2006), industrial policy has been selective until the 1970s, in the sense that governments directly intervened in markets, by selecting and sustaining champions, and by also directly taking ownership of firms.

The 1980s and 1990s have seen the development of neoliberal policies, characterised by privatisation and liberalisation, and industrial policies abandoned in favour of competitiveness policies, aimed at providing the conditions for the competitiveness of firms rather than directly intervening.

At the turn of the new century, globalisation challenges and the difficulty of industries to make structural adjustments (Bianchi and Labory, 2011), induce a resurgence of industrial policy. Industrial policy is pragmatic in that it all possible measures are considered, provided they can have a positive effect on industrial development, including favouring specific industries and favouring cross-fertilisation (technological transfer) in the industrial system. Entrepreneurs do not always have all the information about new technologies and neither have the absorptive capacity to adopt them in their industrial activities. Public authorities can help information sharing by favouring relationships within the industrial system (Pilat, 2013). Governments can therefore have a role as catalysers of industrial development, as stressed in 1990 by Commissioner Bangemann in the European Union (Bangemann, 1990). However, as shown by practical experiences of industrial policies around the world (Korea: Chang, 2010; Ahn, 2013; Latin America, for instance Zahler et al. 2014), only if they have a good knowledge of the strengths and weaknesses of the territory and of the new technologies. Policy-makers cannot obtain this information on their own, but have to dialogue with the firms located in the territory, with experts and scientists which can help identify possible development paths. The issue is then what is the most appropriate territorial level to identify strengths and weaknesses, and capabilities, to identify development paths and orientate industrial development towards them.

Whereas the literature on industrial policy tends to consider only the national level of policy-making, We argue in this paper that the regional level has a key role, because it has sufficient proximity to information and knowledge about the capabilities of the territory, and it can exploit sufficient related variety, in the sense of possibly of exploiting synergies across different sectors. Too local would reduce the distance even more to information but would tend to be too specialized, while higher levels might be distant from information and knowledge and might face too much variety.

The role of the region is key but its action has to be integrated within a national (and/or supranational) institutional framework that favours both the development of regional systems and their integration and synergies where possible. The national industrial development system is a system of systems, where some systems might be in competition, which is good as long as it favours innovation, while others might collaborate or exploit different kinds of synergies.

Our analysis contributes to the literature in different ways. First, it considers dynamic aspects of industrial evolution and industrial policy, starting from structural changes. Second, it makes proposition in order to move forward in the resolution of the “how?” question of industrial policy, as previously mentioned.

This paper is structured as follows. The second section argues that industrial policy is aimed at favouring industrial structural changes and reviews the major structural changes arising in industry in the last decades, to highlight that industries are now essentially organised as networks forming overall systems that should be taken into account in industrial policy design. The third section shows that the view of industries as systems implies that the regional level of implementation of industrial policy is key. The fourth section illustrates these arguments with the case of the industrial policy of the Emilia Romagna region and highlights that governance and leadership are key features of the institutional framework. The last section concludes.

## **2. Industrial policy and structural change**

Our view of industrial policy is dynamic: industrial policy is a process aimed at favouring structural change in industry, namely both upgrading of existing industries and development of new ones (Bianchi and Labory, 2011). Labory (2006) and Bianchi and Labory (2011) review definitions of industrial policy as well as their theoretical rationale and this definition is in line with most literature (Rodrik, 2008; Cimoli et al., 2009; Warwick, 2013; O’Sullivan et al., 2013).

Defining appropriate industrial policy therefore starts from an analysis of the structural changes occurring in industry. Bianchi and Labory (2011, 2013) provide such an analysis by reviewing major structural changes arising in industries in the last thirty years. Without going into details, a major change that has occurred is the transformation of the organisation of production into global value chains. Although the phenomenon is extremely varied across firms and across sectors (Contractor et al., 2010), overall the evidence is that trade in intermediate products has dramatically increased in the last decades due to the diffusion of a model of production organisation whereby firms focus on core competencies and outsource and/or offshore less value-added intensive phases of their production process, constituting global value chains (Gereffi, 1994; Sturgeon, 2008).

Outsourcing refers to the externalisation of some activity to external suppliers, which might be located at home or abroad. Offshoring is the relocation of operations from the home country to a foreign location where the activities are performed by either a subsidiary of the company or a foreign independent firm (Contractor et al., 2010). The decision to outsource and/or to offshore depend on a number of factors, including (1) efficiency, namely access to lower-cost inputs in the foreign country (especially labour); (2) knowledge creation, in that the location of the activity in a foreign location may provide access to a wider knowledge base for the firm, in particular when the foreign location is an excellence centre in R&D or design; (3) access to the foreign market may be eased by the offshoring decision.

The management literature shows that this reorganisation of production implies a deeper division of labour than in the past, in the sense that the value chain is divided into very small pieces. As argued by Contractor et al. (2010, p. 1419), “companies are engaged in a micro-analysis and dissection of their value chains into finer slices than ever before”. Large groupings such as R&D, marketing and assembly are no longer relevant, since these functions are divided into dozens or hundreds of sub-activities. Thus for instance pharmaceutical companies divide their R&D function into basic research, which is often realised together with universities, preparation of test batches trying different compositions of medicine, as well as clinical trials. The last two functions are often outsourced or offshored, while the basic research is kept in the firm (Frost and Sullivan, 2007).

As a result, firms are organised as complex networks of divisions and various kinds of suppliers which are located in different territories. Each territory focuses on a module or a set of activities in which it has a competitive advantage. The firm creates and maintain competitive advantages by managing a global network, creating relationships with suppliers located at home or abroad, in a dynamic manner, as the network evolves following product upgrading or renewal. What is interesting is that offshoring does not regard only efficiency motives, whereby firms locate in low labour cost countries. It also regards research and development, design and marketing, so that local suppliers inserting in global value chains are likely to better-off if they develop capabilities in knowledge creation and innovation. In addition, in this context suppliers are likely to be better-off if they come to control a strategic phase of the production process, or at least develop a comparative advantage in such a strategic phase, such as chips for smartphones or logistics in other sectors.

The location choice depends on factors of attraction that the territory displays. First, tangible resources, such as infrastructure, natural resources, as well as physical capital. Second, intangible assets, such as the knowledge base accumulated through time, the individual intangible resources such as innovation capabilities, individual competencies, as well as collective intangible assets created by specific institutions and society.

The main result is complexity. Firm managers have to organise complex networks of inventors, designers and suppliers of production modules and sets of activities, in a complex set of relationships both internal and external to the firm. In addition, in many sectors firms are also related to their competitors in complex ways: for instance, they form joint ventures to develop specific parts or components of the product (for instance, joint venture between car makers to make engine or other automobile parts), or they share the same supplier of particular input, even a key input such as in the case of the supply of chips by Qualcomm and Intel to different computer or smartphone manufacturers.

Industries should therefore be envisaged as complex systems, made of different firms and their networks, which often interlock.

However, the industrial system is not just made of the firms and their interlocking networks. Firms have relationships with other institutions which are key in their activity: university and education institutions providing both labour and research capacity; government institutions at local, regional and higher levels which determine standards, fiscal rules and all the legal framework within which they operate; business associations, consumer organisations, and so on. The relationships with other institutions also constraint the choices available to firms, and firms often try to influence the institutional environment.

In this sense firms have to manage coordination problems, and we agree with Hall and Soskice (2001, p. 6) that the firms’ success “depends substantially on its ability to coordinate

effectively with a wide range of actors". Firms aim at developing core competencies and dynamic capabilities and they do so by developing relationships both internally (employees) and externally (suppliers, stakeholders, trade unions, government, business association).

### **3. Industrial policy: The primary role of the region**

#### **3.1. National versus local**

The organisation of industry as global networks of local industrial systems implies that industrial development primarily starts at local level. We will argue here that policy has a role in spurring industrial development at local level, and that the relevant local level is the regional one.

The "local" level, or the territory, indeed has to be defined: does it mean the level of a city, an urban area or a region? The industrial system is embedded in a territory, which width and frontiers vary. The industrial system embeds in a territory where there is a strong sense of identity. In the territory, the effects of history and institutions are fundamental.

We mentioned in the previous section the important role of attraction that territories have to play in the globalised industrial system, namely when firms organise production on a global scale. Institutional thickness (Amin and Thrift, 1994) favours the development of the territory as an actor in the globalisation process of the economy. This institutional thickness has tended to be taken for granted at local level, as for instance in the literature on industrial districts where it was argued that the social capital resulting from the cohesive local community was simply there for the firms in the district to take advantage of. However, institutions are also influenced by policy action, and regarding districts the national laws favouring SMEs and entrepreneurship as well as the strong focus on social policies in a region such as Emilia Romagna (Rinaldi, 2002) certainly contributed to develop this institutional thickness.

Nowadays the challenge is that products are more knowledge-intensive and the creation of the necessary knowledge base for product creation and development requires an intense exchange in complex networks of the firm and other firms, other institutions such as universities, in the region and in the rest of the country, and abroad. Globalisation also involves large migration flows and industrial districts in Italy have experienced massive arrival of immigrants who have to be integrated to the local community. In the Emilia-Romagna region, the action of the government in this direction starts with the schools, where specific programmes for the integration of immigrants' children have been implemented.

The territory is then not so much a specific area where resources have to be optimally allocated, but rather an area where agents interact through the institutions and in so doing generate the necessary resources for development.

The nature of local institutions is therefore fundamental for development. The nature of institutions means their number, structure, their objectives and strategies and their diversity, as well as the intensity of relationships, the nature of power relations, the feeling of belonging stemming from the environment, and so on. The governance system of the institutions and the leadership exercised by key members are also fundamental, as we will show in section 4.

Today the division of labour is not on a national scale but spread over the world; in each part of the world one can find both "high" and "low" phases of the added value chain, depending on the competitive capacity of both single firms and local productive systems.

Territories therefore have to specialise in specific tasks or set of tasks, at different stages of the production process. Competition is not only at the final stages of production, i.e. on the

final market, but also at intermediary levels. Controlling strategic phases of the production process is a strategy for firms to take dominant position.

In this context, industrial policy at territorial level allows to:

- exploit agglomeration economies through a flexible organization based on the flexibility of SMEs and on scale economies at industry or economy level;
- lower the costs of the transactions which arise both internally and externally to the firm through a process of identification and cooperation between the social actors;
- relate the instruments of policy and of organisation with those of the market, in a culturally-homogenous environment, thereby generating government methods that are specific and adequate to the territorial reality;
- develop potential resources thanks to the social mobilization which stems from the sense of belonging;
- favour innovation processes supported by cumulative and collective knowledge processes that do not exclusively depend on the specific R&D investment;
- use non market oriented activities which, in addition to improving the quality of life of the local populations, create a connected network (social capital, participation) which also favours the market oriented activities.

Industrial development is made of structural changes which arise from the bottom, from the territory: structural changes and development at wider levels cannot be understood without knowledge of the local level. The regional or national industrial systems are thus made of many different local systems, that may be in competition and/or present potential synergies, complementarities.

### **3.2. Local versus regional levels**

The view of industries as complex systems has two major consequences regarding the relevance of the regional level of industrial policy. First, complexity is reduced by looking at a more limited territorial level: the important assets, the key relationships and the knowledge base of industrial activities and innovation potential are easier to grasp. However, and this is the second aspect, industrial development at local level is still the result of a complex system of interactions between a variety of actors, from firms to their suppliers, universities and schools, local authorities, and so on.

The first aspect implies that the local level is more likely to have the appropriate knowledge to make relevant decisions about industrial development policies. More precisely, the local level will be able to identify lack of resources or intangible assets that have to be developed to make the territory more attractive.

The second aspect implies that to be effective, industrial policy must be defined and implemented in a process involving all local stakeholders. This involvement indeed allows to get all the necessary information and to mobilise all actors towards the chosen development path.

Local systems have socio-cultural and institutional specificities that can act as constitutive elements of endogenous development processes. The economic sphere, which is made of firms and sectors that in their functioning go beyond the locality, is interconnected to the social and institutional spheres through a daily action which is one of the main pillar of a virtuous evolution of cooperation models (Axelrod, 1984). The local level is therefore the best level at which participative policies can be implemented. Participative policies are here intended as policies which mobilise and involve stakeholders. Legitimacy of the government is key for the involvement of local stakeholders.



These policies will differ according to the situation: for instance when the local system is characterised by a cluster of local firms participative policies are easy and straightforward to implement. The local system may be characterised by the presence of large external firms which dominate the local firms, but even in this case participative policies are possible to implement, aiming at favouring the embeddedness of the external leader into the local system. The local policies can create a territorial characterisation which can make the large firm aware of the importance of the local elements for the efficiency and quality of local production, thereby inducing it to make long-term investments and commit to remain and embed in the local system.

However, industrial policy should not be implemented at too local a level, for several reasons. First, in an open economy characterised by global production processes the very local level might be characterised by local egoism and lack of capacity to relate to the outside world. Accessing global markets or inserting into global value chains also requires a capacity to set up relationships with firms and institutions in distant locations, for which an appropriate knowledge and competence base is key. Second, the very local level is likely to be characterised by limited related variety, the local production systems covering few sectors and competencies while it has been shown that the capacity to exploit related variety is key for regional development (Boschma, 2005). Related variety means a variety of sectors but which can exploit complementarities, such as mechanical engineering and electronics developing the robotics sector, or cultural and creative industries providing new designs for more traditional sectors.

Variety however should not be too high or dispersed, otherwise complementarities will not emerge. The regional level may therefore offer the appropriate level of related variety.

Industrial development requires a critical mass of the territory which appears to be more likely at the regional level. The region provides the appropriate set of collective goods and intangible assets that are necessary to spur development processes which have been started at local level or to upgrade and reconvert development processes which have become mature. The competitiveness of the regional system then stems from the productive capacity of its local economic systems, from the innovative capacity of its metropolitan area(s) and from the quality of its interconnection networks (of services and infrastructure). The more these networks are dense and distributed in the whole region, the more numerous the interactions and the more synergies are possible at regional level.

At a time when the national level is losing legitimacy, while the supranational level remains weak, and the local level is inevitably partial, the regional level could be the appropriate regulating level, creating consensus between the various social and economic groups and interests, substituting the national level in these areas where both cultural identification and sharing of objectives are most important (welfare, industrial relations, etc.). The region appears to be the level which is close enough to local authorities to be legitimate in terms of identity and culture (collective intangible assets), but also distant enough to avoid egoistic localism.

This does not mean however that there is no role for higher levels of policy-making. In a context where regional industrial policies have a primary role, the national industrial policy should both structure the national industrial system (favouring relationships between regions with infrastructures, research projects, ...) and also favour synergies between the various local (regional) systems (sharing of information, favouring collaboration between regions, especially for those projects which critical mass may be wider than a single region, such as for instance the development of clean technology or renewable energy).

At supranational level (when a framework exists such as in the EU) industrial policy should first and foremost aim at creating a wider system comprising the different countries in the framework. More precisely, in Europe what is lacking is the idea of creating a European industrial system. Industrial policy has been essentially left to countries acting in isolation, each designing its own policy given own constraints (especially fiscal constraints). More collaboration is needed between countries. More synergies could be realised. As a start some truly European industrial projects could be done. The Airbus project is a successful example. A European project on renewable energy could be interesting since it would also have political effects (energy independence) as well as favouring the sustainability of development.

#### **4. An example: the case of the industrial policy of the Emilia-Romagna region in Italy**

In this section, we illustrate the previously mentioned points with the case of the Emilia Romagna (ER) region in Italy. The case is not meant to demonstrate the point, since it is only one case among many, as well as a particularly successful case which may not allow to highlight particular features that may be useful to also consider less successful regions. For the purpose of this paper an illustration is enough, but a more systematic examination of regional industrial policies, on the basis of the reflections of this paper, is left for future research.

##### **4.1. Industrial policy in the ER region since the 1980s**

The particular success of the ER region in Italy is that it has transformed from an industrial system focused on industrial districts in traditional sectors in the 1980s to a regional innovation system. We argue that industrial policy has been key in allowing this transformation. While Bianchi and Labory (2011) already discuss this case, we extend the analysis in this paper to consider more deeply its institutional framework.

First, the national institutional framework is important to consider to understand the industrial development path of the region. In particular, the national government policies carried out since WWII have favoured the creation of SMEs, but not their growth. Thus in 1956 the Artisan Act defined the boundaries of artisanship not by a list of activities as in other countries, but by the size of firms. Artisan firms were granted benefits such as soft loans, loan guarantees, lower tax and employers' contributions, and welfare benefits at reduced premium. In addition, the law 300 of 1970 protects workers, but only applies to firms with more than 15 employees. Lastly, the reform of the banking system after WWII favoured the decentralisation of the banking system and the creation of small banks useful for SMEs. As a result, Italian SMEs did not have an incentive to grow, and industrial development has arisen via the creation of small firms by former employees of SMEs, which would work in collaboration with their former employer and would thus allow to expand industrial activities without increasing firm size. This pattern has been shown to be typical of industrial districts (Brusco, Becattini, Dei Ottati).

In the ER region, industrial development has been promoted first by providing real business services, starting essentially in the 1980s. Real services centres were set up, providing services on corporate strategy, organisational development and management, financial and

administrative systems, production and service management, research activities, management of human resources, all activities that SMEs typically have difficulties in structuring (Bellini, 1985, Bianchi et al., 1986).

Regarding the availability of skills for these firms, the regional government created, already in the 1980s, technical schools which provided the intermediate skills necessary to SMEs: it trained people after compulsory school and before university, working in close collaboration with local firms so as to provide appropriate training.

In addition, social services were also provided to households, to favour the participation in the labour market: public transport, infant-day centres, low-cost housing, and so on.

Already in the end of the 1980s the regional government questioned the sustainability of the industrial district model asking whether it would withstand the increasingly global competition. It therefore decided to orientate regional industrial development towards new paths, characterised by the upgrading of old sectors and the creation of new ones.

For this purpose, the Conference for the Economy and Labour (Conferenza per l'economia e il lavoro) was created in 1993, aiming at gathering regional stakeholders together with the regional authorities in order to debate about the future economic challenges of the region and the possible policies to successfully meet them.

Real services continued but in a new institutional framework: formerly carried out by ERVET, a regional agency which turned into an independent agency although with participation of the regional government. The agency ASTER was created to promote technological transfer. It was reorganised in 2001 as a consortium gathering all the regional actors of the innovation system: universities, research centres, business associations and the regional government. The industrial policy of the region was characterised by a strong emphasis on networking: ensuring the creation of dense relationships between all regional stakeholders to favour knowledge creation and diffusion, and also to exploit related variety.

From the end of the 1990s the industrial policy of the region started to be formalised in three year plans, starting in 1999, following the reform of the Title V of the Constitution which gave higher autonomy to regions to implement policies. The plan is updated every year and allows the resources to be pooled in a common fund, as well as avoiding the scattering of actions in the different regional sectors and ensuring coherence.

The result has been a sustained regional growth rate, as shown by Table 1.

**Table 1. Growth rates in some selected regions, %**

	1971-80	1981-89	1990-99	2001-2012 (cumulated)
Emilia-Romagna	4.1	1.7	1.9	2.8
Piedmont	2.8	2.0	1.1	- 2.6
Lombardy	3.2	2.7	1.2	6.5
Veneto	3.7	3.1	2.2	0.7
Tuscany	3.3	1.9	1.1	3.8
Italy	3.8	2.3	1.4	1.6

Source: Istat, Industry Census, 1981, 1991, 2001, 2011.

Firms size has tended to grow, but at a slow rate although more than in the rest of Italy. A particular phenomenon appearing in the last 10 to 15 years is the creation of formal groups between SMEs (Cainelli et al., 2006).

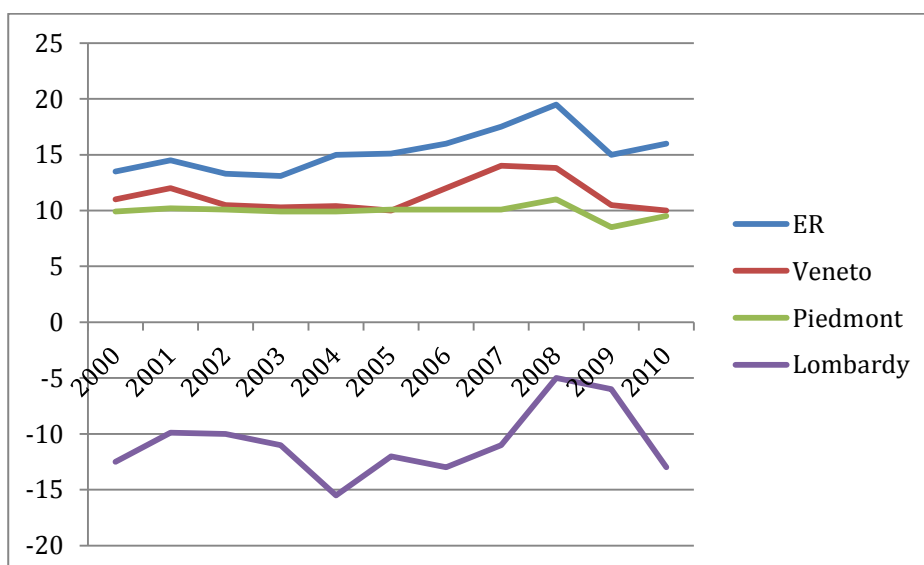
**Table 2. Firm size in the manufacturing sector in the ER region: comparing with Italy (2011) (% of firms)**

	ER	Italy
0-9	77.6	82.5
10-49	19.1	15.2
50-99	1.7	1.4
100-499	1.4	0.9
500 and more	0.2	0.1

Source: Istat, [www.istat.it](http://www.istat.it)

In terms of exports the ER region remained the most competitive region in the North of Italy (Figure 1)

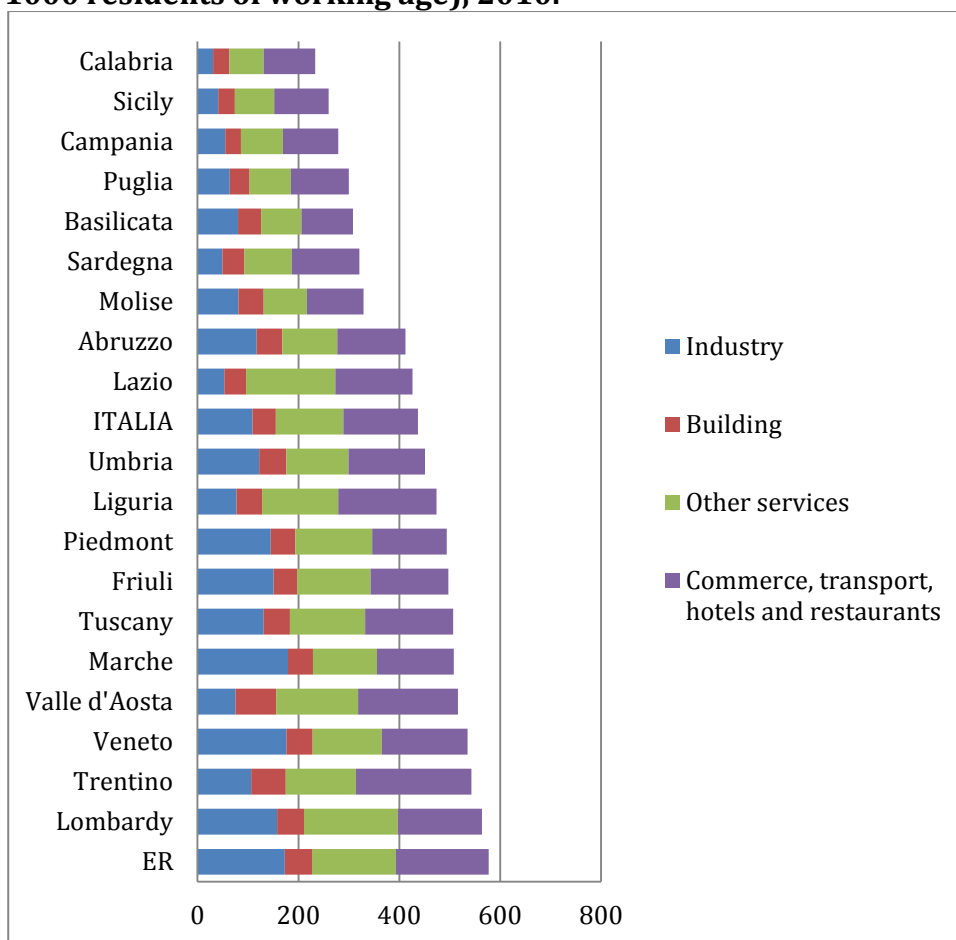
**Figure 1. Value of net exports in million euro**



Source: Istat data (Italian National Statistical Office).

The region is the most dense in terms of employment (employees in local units relative to the resident population) and in employment in the manufacturing industry relative to other sectors, as shown in Figure 2.

**Figure 2. Employment in local units as a share of resident population (employees per 1000 residents of working age), 2010.**



Source: ISTAT (2013).

The current industrial policy of the region is based on the region's most important sectors in terms of specialization, namely mechanical engineering, food, building, health industry and cultural - creative industries. A competence map of the region in these various sectors has been carried out, in order to identify the need for support and the potential synergies and complementarities across sectors.

Education and training policies are also closely integrated with industrial development policies.

One example is the biomedical cluster of Mirandola. This cluster is characterised by the presence of large multinationals which stayed and even increased their productive capacity even after the 2012 earthquake (Labory and Facchini, 2014). The regional industrial policy provides support to the development of this biomedical cluster by sustaining innovation, technological transfer and training. For instance the Democenter-sipe is a centre for technological transfer which brings together institutions, business associations, banks and more than 60 firms of the cluster. It is part of the Rete Regional Alta Tecnologia (high tech regional network) which is based on the campus of the engineering faculty of the University of Modena, located near the cluster, and favours the collaboration between firms and university. It promotes innovation in existing firms but also new innovative firms creation by supporting the creation of spinoffs from universities. The "Tecnapolo" or technopole, which belongs to the regional high tech network, and acts together with Aster to favour collaboration and innovation in the sectors of life sciences, mechanical engineering and new materials, ICT and

design, also favours the creation of new firms from university innovation. The regional government has also created a biomedical technical institute in life technologies, located at the heart of the cluster, in Mirandola, and is in charge of higher education to provide specific competencies required in the cluster.

#### **4.3. Taking account of the institutional framework: the importance of governance and leadership**

The above discussion implies that the success of industrial policy appears to be dependent on the relationship between the production system and the governance system. The political governance influences how decisions are made in a local community, how much actors are involved in the decision process. The political governance influences social representations and the common vision that is created, according to whether it is authoritative, democratic, hierarchical or not.

The governance determines the level of collective trust, which allows cooperation and exchange of ideas, hence innovation. Innovation in turns often transforms social relations. Collective trust is the basis of social capital.

The governance of a territory is thus the structure made of agents and institutions, determining rules and routines that govern local relations. This structure also determines how local (regional) policies are defined: how debates are organised, how the objectives of collective action are defined, how negotiations are made between the local actors.

The territory is thus a set of relations, not only functional relations (exchange and production), but also hierarchical (power and dominance) and social (cohesion, trust, cooperation, sense of belonging).

The role of institutions is more that something that can be summarised into variations in transaction costs. North (1990) defined institutions as rules of the game, humanly devised constraints. The New Institutional Economics (Williamson, 1985) reduces institutions to constraints on individual behaviour and social organisation can be considered with a mere calculus of transaction costs (Rutherford, 1994).

Our view of the importance of the consideration of institutions refers more to the old institutional economics, of Veblen, Ayre and Commons for whom institutions constraint individual behaviour but also mould and enable individual habits, preferences, values and actions. Hodgson (2006, p. 8) views institutions as “systems of established and prevalent social rules that structure social interactions”.

Institutions are not only a legal or social framework which add to economic activities, they also frame and co-evolve with economic activities (Parsons, 1940).

Governance is an old notion but which has experienced renewed interest in the 1990s parallel to the diffusion of bottom-up approaches to policy-making. Although primarily discussed in political science, it has been widely used in management and economics (notion of corporate governance), development studies and public administration.

We refer to governance here in the sense of a collective decision-making process. The bottom-up approaches which diffused in the 1990s, particularly regarding industrial policy (Bianchi and Labory, 2009), imply the involvement of stakeholders in the decision-making process, so that decisions are made by mobilising and agreeing with all actors in the network or system. This is in contrast to the top-down process where central governments impose their rules. Jessop (1998, p. 32-33) argues that the term governance has been used again in the 1990s due to a need to distinguish between government and governance.

When the industry is considered as a system, the government is one actor among many actors in the network. Governance is then key because it represents the coordinating process between different actors, social groups and institutions in order to reach objectives that are discussed and defined in a collective manner in fragmented and uncertain environments. Chhotray and Stoker (2009, p. 3) also claims that “governance is about the rules of collective decision-making in settings where there are a plurality of actors and organisations and where no formal control system can dictate the terms of the relationship between these actors and the organisations”.

Stoker (1998) makes five propositions for a theory of governance:

1. Governance refers to a complex set of institutions and actors that are drawn from but also beyond government;
2. Governance recognizes the blurring of boundaries and responsibilities for tackling social and economic issues;
3. Governance identifies the power dependence involved in the relationships between institutions involved in collective action;
4. Governance is about autonomous self-governing networks of actors
5. Governance recognizes the capacity to get things done which does not rest on the power of government to command or use its authority. It sees government as able to use new tools and techniques to steer and guide.

Governance is in fact a way to address problems not by simplifying reality but by making it complex (proposition 1). Industrial systems are extremely complex and industrial policy cannot be defined by simple actions decided top-down. Rather, all stakeholders have to be involved (proposition 2), although they may have different interests (proposition 4). In a complex decision-making process legitimacy and leadership are essential. The government authorities involved in the governance process manage the debates, weigh the pros and cons, the various alternatives, and make the final decisions. They cannot do it in an authoritative manner because the complexity of the system implies that no single actor, public or private, has the knowledge and resource capacity to tackle problems unilaterally (proposition 3). We claim that leadership is also essential, which is in proposition 5, although not explicitly envisaged by Stoker.

Leadership is essential to the success of the policy implemented by specific institutional frameworks. Policy-makers have to discover new needs and solutions, deal with high uncertainty, and resolve collective action problems. They are catalysts for policy innovation. The literature on industrial policy has highlighted that industrial policy is essentially a process favouring structural changes over long term periods (Hausmann and Rodrik, 2007; Bianchi and Labory, 2011). Leadership is essential to set priorities, provide resources, coordinate different levels of government, coordinate actors, sectors and networks to obtain the information which is disseminated among them. Vision is also necessary (Bianchi and Labory, 2011), to orientate industrial development towards specific paths, especially in the context of complexity and uncertainty.

The rapid reconstruction after the two seisms that affected the industrial core of the ER region in May 2012 is certainly a proof of the existence of governance and leadership in the region. The way the emergency was managed (governance), as a collective decision-making process involving the local stakeholders (the mayors of the affected cities) together with a regional coordinator (the President of the region was head of the emergency committee) involving leadership, namely rapid decision making and priority setting (priority was given to



the reconstruction of the schools as an important element of social cohesion, for which a plan was already adopted a month after the earthquake, followed by the restart of industrial activities and support to firms affected by the earthquake. This leadership and governance was so efficient and effective that the multinationals located in the Mirandola biomedical clusters, which could have chosen to delocalise their facilities to other, lower cost and more secure countries in terms of natural disasters, chose to rebuild their plant in the Mirandola cluster and most of them took even advantage of the need for reconstruction to increase production capacity (Bianchi and Labory, 2014; Labory and Facchini, 2014)!

## 5. Conclusions

This paper has discussed the institutional framework of industrial policy. It has argued that first, industries are complex systems and policy must take this into account; second and related, the regional level is a key level at which to define and implement industrial policy. The case of the industrial policy carried out in the Emilia Romagna region since the 1980s shows that not only industrial policy seems to have been a key determinant of the transformation of the regional industrial system from a strong focus on industrial districts in traditional sectors to a regional innovation system, but that the institutional framework of industrial policy should be characterised by primary role of the regional level, in a bottom-up process, guaranteeing coherence between policy levels and where governance and leadership appear to be important elements.

Future research will extend the analysis to other regional cases in order to confront the findings in the specific case considered in this paper to other cases, not only of successful regions but also of failing cases, in Europe and in the rest of the world.

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