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Innovation in the Adriatic Region

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Chapter 10
Innovation policies in the Adriatic Region

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10.1 INTRODUCTION: THE HETEROGENEITY OF ADRIATIC COUNTRIES AND THE NEED FOR INNOVATION POLICY

Despite being very close geographically, the eight countries of the Adriatic region show very different characteristics between them. These can be detected at different levels: mostly economically, socially, culturally and politically. These differences have been accumulated over the centuries, although in some periods of history almost all the countries were under the same government. Especially during the 20th century, divergences across the eight countries have increased. As the 20th century is the most relevant period of history for technological innovation, it is not strange to also find this heterogeneity in the research and innovation activities in the area, as the previous chapters have clarified.

In order to tackle, and reduce, existing technological gaps, at the beginning of the 21st century the need for coordinated policies in this area has become evident. Indeed, policies are a means to favour, or at least to try to obtain, the catching-up of the latecomers in the area (the whole EU or the Adriatic Region, as in our case). If we think about innovation in the EU, we can recall a long list of instruments aimed at making EU countries closer in terms of their behaviour and achievements. However,

these instruments have not always proved to be efficient. This is mainly due to the fact that innovation is a complex concept. As recently stated in a report by the European Commission (Madelin, 2016), "complexity, chaos and non-linearity have been seen since the 1970s the defining features of our age. But still our advanced societies find it hard to make robust policy for a complex innovation system". We could add that, comparing today's world to that of the 1970s, the geo-political landscape has completely changed. If we look at the Adriatic Region, we no longer find Yugoslavia as a key and unique player; moreover, the role of technological innovation in the area has changed its characteristics since then.

In other words, if in the 1970s a few key actors mostly drove research and innovation, with the State being a major player, today, a wider concept of innovation has been adopted. Innovation is seen as a widespread phenomenon, taking place in large and small organisations, and even during the start-up phase, which often takes place outside the boundaries of large firms. As a natural consequence, areas where economic development has been slow, or even stopped, in this changing phase are now suffering more than the rest of the world. This is the case for the Adriatic Region. As stated by Radosevic (2014), with regards to the Western Balkans (therefore a sub-set of the whole Adriatic Region), these countries are characterised by very low levels of R&D investments and by a low demand for technology. The former being a typical problem since ever (R&D remains the top input for innovation), while the latter is a crucial issue in times of open innovation. To understand these limitations, Radosevic says, "the biggest obstacles are irrelevant policy models and hence there is need for much better knowledge innovation and growth area of the Western Balkans policy-makers and businessmen". In his view, top policies should support:

- Upgrading from production to technology capability;
- Integrate FDI and innovation policy;
- Continue but limit the scope of R&D commercialisation.

However, these types of policy suggestions mostly concern the latecomer countries of the Adriatic Region, not the region as a whole. In general, when devising policy strategy, structural differences between regions and countries must be considered in depth to identify policies and institutions appropriate for the different stages of economic growth that are sensitive to the local conditions (Aghion & Festrè, 2016; Gerschenkron, 1962; North, 1991).

In fact, we should not forget that the Adriatic Region includes four EU Member States and a country, Italy, with a long tradition of top R&D performers and advanced training in research and innovation. The heterogeneity highlighted before is reflected precisely in these figures: the area is home to several top global R&D

performers (European Commission, 2015b), although they almost all belong to Italy; the area includes a substantial number of higher education institutions, but only a few cases are top research universities and, again, they almost all belong to the top country in the area. Moreover, while innovative SMEs appear throughout the entire area, their absolute numbers are not comparable on both sides of the Adriatic Sea. In the PACINNO project, we have tried to measure these indicators in a comparative way[1] and the previous chapters of this book provide evidence of the diverse situation of research and innovation in the area.

Therefore, policies in the Adriatic Region have to deal with heterogeneity and need to provide a comprehensive and comparable answer to it. Over recent years, some attempts for convergence in research and innovation activities in the area have been implemented. This has been driven mostly by the requirements for EU admission, or for having access to EU funding instruments such as the IPA Adriatic or the Horizon 2020 programmes, and by the fact that Slovenia and Croatia have entered the EU. More recently, the implementation of the EU Strategy for the Adriatic and Ionian Region (EUSAIR) can be considered the outcome of previous work in the area. Such macro-regional strategy (together with those regarding the Danube, the Baltic sea and the Alpine regions) are crucial today for the development, on the one hand, of national and regional level policies, and on the other hand, for the direct support of projects involving partners from more than one country in the area.

When dealing with research and innovation policies, however, there is another difficulty to consider. The abovementioned complexity of innovation leads to both positive and negative implications, at the same time, for an area like the Adriatic one. On the positive side, the existence of many different policy tools, developed all over the world or in other EU countries, gives a wide range of solutions that can be adapted to the single situations in the area. On the negative side, such an adaptation is not a straightforward activity. Thus, a critical point for the adoption of innovation policies in the Adriatic Region is the identification of the most appropriate benchmark. Trying to copy policy instruments developed in very advanced innovation areas of the EU (e.g., in Scandinavian countries) might lead to failures simply because of the wrong benchmark. Again, a deeper comparison of innovation indicators is an essential step to avoid this type of mistake.

Also, selecting appropriate benchmarks is becoming very difficult. This is not only because policy tools are increasing, but also because innovation policy mixes are increasingly converging. As reported in Veugelers (2015), there is "a relative homogeneity of policy mixes in EU countries, despite the fairly wide and stable differences in their innovation capacities". In other words, if all countries adopt the same

1 The main output on this comparability can be found at: http://www.adriaticinnovationmap.eu/.

innovation policy mix, it is difficult for latecomer countries, as many in the Adriatic Region are, to find and select an appropriate policy for their situation.

Now for the PACINNO project specificity: as shown already in the rest of the book, the PACINNO project analysis has mostly aimed at the comparability of innovation across Adriatic countries. In the methodological chapter, and across all chapters from 2 to 9, we have mostly dealt with innovation indicators to assess this comparability. Of course, as shown in the text, besides comparability, the indicators were also aiming at highlighting the specific endowments of each Adriatic country. The same concept applies here for comparing innovation policies, especially taking into account the Adriatic Region as a whole. That is, the joint analysis of EU Member States and non-Member States, of lesser and greater industrialised areas and of higher and lower innovation capacities. This is in line with the EUSAIR and distinguishes our project from other studies mostly targeting the Western Balkan countries, and eventually their cooperation in innovation with some EU Member States (e.g., in the WBC-Inco project).

In the following part of this chapter, we present the current situation in terms of research and innovation policies implemented in the Adriatic Region, at both the national and, in few cases, the sub-national level. After introducing a novel taxonomy for mapping innovation policies, we give an overview of those adopted in the area. We then report some best practices identified within the PACINNO project. We conclude with selected innovation policy recommendations for the Adriatic Region.

10.2 A NOVEL TAXONOMY FOR INNOVATION POLICIES IN THE ADRIATIC REGION

In order to identify and classify research and innovation policies conducted in the Adriatic Region, a first activity in the PACINNO project has been the search for an adequate taxonomy of these policies. This activity has been conducted mainly using desk research and has targeted European Commission documents in the first instance.

The first taxonomy used is the one put forward by the European Commission in the report "Lessons from a Decade of Innovation Policy (2013). It is characterised by a very operative distinction of policies. The main policy objectives are identified as follows:

- Enhancement of skills for innovation;
- Support to investment in technology and research;
- Enhancement of innovation competencies of firms;

- Linkages within the innovation systems;
- Framework conditions for innovation.

These categories, in any case, are not perfectly balanced. This happens because the evolution of taxonomies, and consequently of policy instruments, follows almost directly the evolution of economic research in the topic. The result is that, if in some cases they include one or two instruments, in some others (especially linkages) they include a wide range of tools. For example, linkages policies include very different tools such as collaborative projects (on R&D that might also be included in another category), technology transfer, clusters and science parks, mobility of researchers, and so on. This wide set of tools has been considered problematic for the analysis of the Adriatic Region. It would have meant putting very different tools in the same category that have been adopted in countries with different innovation characteristics.

In addition, the categorisation of policy tools by their 'objective' has been considered to be inadequate for the Adriatic Region as they can be misleading when looking at a heterogeneous area. As will be shown in the rest of this chapter, policies have been categorised according to their 'content'; in other words, 'R&D' has been preferred as a category, as it has a common and worldwide definition. While the taxonomy by the EC, which was probably set-up with experiences from advanced countries, is somehow ambiguous in some definitions.

A second relevant taxonomy is the one presented by Edler and Georghiou (2007). This taxonomy presents several categories of policies and each one has a clear reference to the policy tool to be adopted. However, the macro-categorisation of these policies distinguishes between demand-side and supply-side measures. This distinction, in the case of the Adriatic Region, can be difficult to apply, as in some countries it is very difficult to assess it[2].

In fact, in some countries (especially Albania and Montenegro) very few innovation policies have been identified and they are also quite broad in scope. For instance, policies regarding technology transfer or the development of incubator and science parks in Montenegro are included in very wide national strategies (Strategy For Scientific-Research Activity of Montenegro 2008-2016; Regional Development Strategy of Montenegro 2014-2020). Since the main aim in PACINNO has been the comparability of the eight countries, the Edler-Georghiou taxonomy has been considered too complex for such an objective.

2 One of the reasons why demand side policies are rarely detected in the geographic area under scrutiny (with the notable exception of Italy) is linked to the fact they have been put in place only recently in the more advanced countries (OECD, 2011a) and to the fact that, to be successfully implemented, they need relevant efforts in terms of public finance and of efficiency of the administrative apparatus.

In terms of list of policies, the TrendChart list has also been considered. The ERAWATCH/TrendChart is an inventory of policy tools launched in EU countries since the 1990s, and it includes the start/end date, the typology and the budget set for them. A recent work by Veugelers (2015) has provided an extensive, albeit descriptive, analysis on innovation policies in the EU. It shows that, although 28 policy tools are listed in the TrendChart, only six of them receive at least 5% of the total budget. In other words, ancillary policy instruments can be many, but the most relevant ones account for 70% of the total budget and are limited to the following ones:

- Funding for specific public research programmes;
- Funding for public-private collaboration;
- Financial instruments (loans);
- Direct business innovation support;
- Direct business R&D support;
- Tax incentives.

Again, it is relevant to mention that all these taxonomies have been developed looking at the most advanced countries, especially in the EU. Scholars usually refer to the best practices conducted in Scandinavian countries or in Germany and France. However, these are not always fully transferrable to a peculiar and heterogeneous area such as the Adriatic Region. Therefore, using some insights from the above-mentioned taxonomies, an expert group set-up in the PACINNO project has agreed to develop a novel taxonomy characterised by two main features:

- A comprehensive and simple grouping of policies;
- The applicability of the taxonomy to all eight countries.

Indeed, existing taxonomies present some limitations precisely because they do not define properly the 'borders' of policies; they are also sometimes ambiguous with regards to the categories to be included in it. Therefore, the PACINNO strategy has been to identify few macro-areas that can be identified in all countries. Some macro-areas have been immediately identified: this is the case of R&D and of linkages policies. For the other ones, instead of using the EC's categories of skills or competencies of firms, a slightly different categorisation has been opted for.

Another crucial point has been the distinction of direct vs. indirect support policies. The former being represented by all policies directly helping (mainly via monetary support) the innovation actors in the territory; the latter being characterised by the improvement in the infrastructures, but also of the competitiveness conditions for these actors. With this distinction, governmental grants are considered direct

support, while both tax credit and infrastructure setting-up is indirect support. The rationale is that direct support takes place whenever an actor is already involved in innovation (e.g., because it has applied for a project funding); indirect support takes place to favour the innovation conditions in the area. The PACINNO expert group has started from the observation that one of the most relevant policies, that is R&D tax credit, which is also relevant in the top EU countries, was usually kept separate from other policies. However, it is not the content of the R&D tax credit that makes it different from other policies, e.g., from an R&D grant. In fact, in both cases, the expected effect is an increase in the amount of R&D efforts of actors. The difference resides in the way this R&D increase is pushed: precisely, a direct vs. indirect support, as put forward in our taxonomy.

In addition, it clearly emerged that the tax credit policy could be not present in all countries, but that some kind of R&D policy was implemented everywhere. Therefore, it has been decided to split the policy description into two blocks:

- On the one hand, the content of the policies has been identified:
  - R&D;
  - Human resources;
  - Collaboration;
  - Innovation capabilities
- On the other hand, the types of support have been singled out:
  - Direct;
  - indirect.

In order to better clarify the content of these categories, we give some examples.

R&D: The direct support category includes R&D grants, subsidies and all monetary support going from central/local governments to R&D performers. Indirect support of R&D concerns tax credit and all other fiscal incentives to R&D performers.

Human resources: The direct support category includes grants and other policies to directly support the development of Human Resources; while indirect support for human resources regards bank loans to students, tax incentives to lifelong learning (also for researchers) and similar tools.

In the Collaboration category we have included all policies favouring collaboration in research and innovation, including technology transfer ones, again, distinguishing whether this support was direct or indirect.

Finally, the Innovation capabilities categories, both direct and indirect, concern all policies regarding embodied technological change, purchase of machinery and standard regulations or intellectual property rights. Direct support is considered key in this category and it is coincident with the definition provided in the European

Commission (2013): "a direct support to enterprises encouraging them to conduct innovation projects supporting product development, commercialisation, marketing, services innovation, innovation management, industrial design, support to investment readiness; to acquire modern machinery, equipment, know-how, promotion of internationalisation".

In the next section, we will start with the description of all policies identified in our analysis on the Adriatic Region. As a methodological remark, we recall that two main tools have been used to perform this activity:

- Desk research, mostly reviewing the existing scientific and policy documents from each of the eight PACINNO countries;
- Interviews with experts, conducted in all eight PACINNO countries[3].

10.3 AN OVERVIEW OF RESEARCH AND INNOVATION POLICIES IN THE ADRIATIC REGION

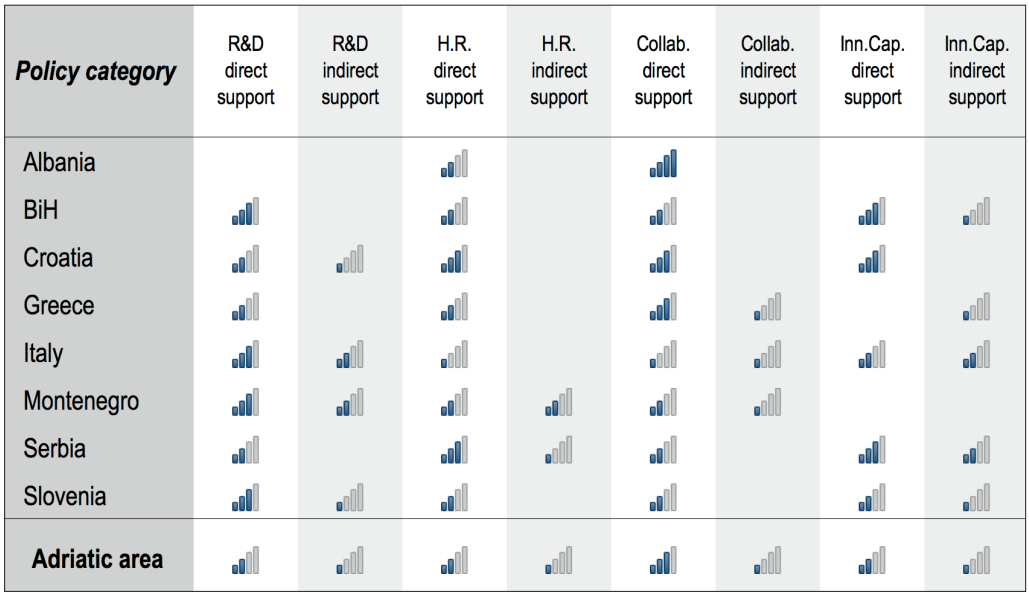
The main advantage of having developed a simple and comprehensive taxonomy of research and innovation policies is that a direct comparison of the eight Adriatic countries is now possible. As mentioned before, the relevant heterogeneity within the area made the comparison quite complex: how can policy tools considered for advanced countries be used within a set of both advanced and latecomer countries? Nevertheless, the descriptive analysis on the innovation systems shown in the previous chapters, together with expert interviews, has confirmed that the four pillars of our novel taxonomy are relevant in all Adriatic countries. R&D is relevant, although is often too limited (especially in some non-Member States); Human resources and Innovation capabilities indicators are improving in the whole area; policies for Collaboration have largely been used in the area, often favoured by international programs set in place by the EU (e.g., Interreg, FP7).

Keeping this in mind, in Figure 10.1 we present an overview of the distribution of policies across the categories identified, based on the number of policies that have been implemented in recent years and/or are active at the moment, in each country[4].

3 For further details on these interviews, see the PACINNO project report 6.1.

4 We avoid using the absolute values or budget shares for each policy category for two main reasons. On one hand, the 'size' of each policy can strongly vary across countries; consequently, the use of absolute value is not directly informative. On the other hand, the use of budget shares has been precluded, it being impossible to gather complete information on the budget for all countries, Moreover we should observe that the use of budget share could be partially misleading. Think for instance of two very different countries such as Italy and Montenegro having approximately the same share (25%) of direct support R&D policies. In both cases, a quarter of their policies are focused on supporting R&D performers; howev-

Figure 10.1 – Distribution of innovation policies in the Adriatic region(*)



(*) Bars reflect the intensity of the intervention in terms of the number of policy actions: recurrences accounting for more than 50% of the total are represented by four bars; recurrences accounting for up to 50% by three bars; those up to 33% by three bars; and those up to 16% by one bar.

Figure 10.1 gives a comprehensive insight on the quality structure of innovation policies for the whole Adriatic region.

We can read the figure starting from the overall distribution of innovation policies in the Adriatic Region (last row). The most recurrent policy category is that of direct support to collaboration in innovation. This is not surprising if we think that the general idea is that of supporting the linkages of less developed areas with more advanced innovation performers. The Adriatic Region is the target of many EU policies aimed at developing cross-border and transnational cooperation (and

er, the same share reflects two completely different situations. The amount of money needed to support top R&D performers in Italy is necessarily higher than that needed to help small firms trying to improve their innovative performances in Montenegro.

Moreover, for technical and administrative reasons, some countries replicate the same policy with two or more distinct tools. Although this is not always the case, some level of duplication might happen. Vice versa, in other countries (such as Italy), the complexity of the legislative system implies that the same law might include distinct articles about policy tools that we classified in two or more different categories. In this way, some countries might have a relative underestimation for some policies. In the light of these difficulties, we decided to simply represent which policies are more recurrent in each country in Figure 10.1.

the PACINNO project is itself an example of this). Therefore, national policies also reflect this type of policy tool. Furthermore, as private innovation investments are very limited in many countries (see country chapters in this book), direct collaboration policies aim at enhancing private-public partnerships in almost the whole area. Finally, it must be noted that the accession of Slovenia and Croatia to the EU, as well as the inclusion of the other Western Balkan countries in EU innovation programmes, have been coincident with the increasing focus on cross-border collaboration tools. This might be another explanation for their strong interest in this type of policies.

The other policy instruments in the area follow a very precise rule: direct support measures are more frequent than indirect ones. This result is not a surprise as the indirect support can be considered as a peculiarity of most advanced regions; the R&D tax credit, for instance, works far better where high R&D expenditures already exist and the extra expenditure is more easily expected. Similarly, in more advanced areas, we can expect that human resources also increase their skills with indirect measures (e.g., loans for studying), while in poorer areas more direct support is needed to bring more students into higher education or to continuous training and lifelong learning. The same concept applies for collaboration; the PACINNO project has shown, for instance, that while Technology Transfer Offices (TTOs) already exist in more advanced countries such as Italy they just need additional support to be connected to each other. In other countries, TTOs have to be established from scratch and this is impossible without direct support from governments.

We can then look at the single country cases. As said before, we are not comparing countries on the single policy tools, but we can see how distributions change throughout the area. Comparing the distributions, we have, in fact, a confirmation of the heterogeneity of the Adriatic region.

In Albania, direct support measures are apparently the only ones that exist and they target human resources and collaboration. Given the limited profile of Albanian R&D investors (as seen previously in the book, in chapter 2) this result is also expected. Furthermore, in Bosnia and Herzegovina direct measures are more recurrent than indirect ones; however, in this case the main target is R&D, which is probably to enable a catching-up process in a country where R&D expenditures are still very low. More generally, Bosnia and Herzegovina, along with Croatia and Greece, shows a balanced situation with policy tools in all categories. The most notable exception occurs in Greece, which only has indirect Innovation capabilities policies.

Looking at the largest country in the area, Italy, we can notice a different situation. R&D measures are the most important ones and they are achieved more through direct than with indirect tools. In the other categories, rather, direct and indirect measures are more balanced. Innovation capabilities policies are the second

most important: this is not surprising, given the advanced industrial and technological structure of Italy.

Montenegro, on the other hand, has the highest use of indirect measures. However, given the latecomer profile of this country, the categorisation of policies has been more difficult than in other cases.

To conclude with Serbia and Slovenia, in both cases, and in the overall area, direct measures are more frequent than indirect ones. Serbian policies are, however, more focused on human resources and Innovation capabilities, while Slovenian ones mostly target R&D.

Both desk research and expert interviews have allowed us to gain useful insights on innovation policies in the Adriatic Region. Beside the identification of existing policies, as shown here above, using these methods the PACINNO team has been able to identify three main topics that can be considered pivotal in the innovation development of the area. In particular, all Adriatic countries share these topics, although the single situations can be slightly different. We mean that these three key points represent areas of potential common intervention in the area (e.g., under a common strategy such as the EUSAIR). Other topics that emerged in the interviews are really country-specific and are not mentioned in this section. To give just a couple of country-specific topics, it could be that policies for the growth of start-ups are particularly intensive in Slovenia, or that support to top global R&D performers is almost exclusively a matter for Italy.

We recall the three main common topics in the rest of this section.

10.3.1 THE CRITICAL MASS OF INNOVATION COMPETENCIES

The first key issue identified when dealing with innovation policies in the Adriatic Region is the persisting lack of adequate competencies. We can, generally, speak of being above or below a certain critical mass of innovation competences. However, it is never easy to identify what that means for each single country. As a general rule, we can say that:

- For non-EU Member States, and also partially for Croatia and Greece, being below a critical mass means having a poor industrial and technological structure. Innovation investments are very limited and this affects both public and private sectors.
- For Italy and Slovenia, and also partially for Serbia, the concept is more complex. Being below a critical mass more often means there is a lack of coordination in innovation activities.

To give an example, in the first case we can find firms that do not invest in R&D or that have a very limited share of turnover devoted to innovation. In the second case, we can find firms that invest in R&D and innovation but which do not have the appropriate advantages from these efforts; for instance, they might cooperate in R&D without being able to exploit partners' knowledge.

Given such a distinction, it is evident that innovation policies have to target different objectives. We focus on the first case, the 'absolute low level' of innovation competences, by mentioning some of the concepts that have been recurrent in the expert interviews.

An expert from Albania has stated that the Albanian "scientific community needs to be re-designed and the government needs to shift its orientation and program it in terms of a knowledge-based society that relies on science and education and employs these as powerful instruments. It follows from this that more resources need to be allocated to science and research and the whole infrastructure needs to be reconsidered. The specific policies will be inefficient unless radical improvement of the above is designed and enabled". The expert has highlighted that the Albanian scientific community is in great need of restructuring and support.

Experts from Montenegro have underlined the strong lack of knowledge and experience in innovation in their country. This goes together with a general difficulty of the overall industrial structure, characterised by low levels of productivity and competitiveness.

The situation in Bosnia and Herzegovina is relatively more complex. Relying on both desk research and expert interviews, the PACINNO analysis has shown that the Federal Ministry for Education and Science allocates the largest portion of public funding on research activities in Bosnia and Herzegovina, with no reference to any policy document. More than four fifths of this amount is distributed directly to public universities and public research organisations in the form of support to R&D activities. Experts have also noted that the Ministry is both understaffed and is lacking competences to distribute these funds appropriately, which seem a reasonable argument in favour of increasing support to R&D. In other words, limited innovation competences also reflect the limits of policymakers and their approach in sustaining the national innovation system.

Although innovation competencies have improved in Croatia in recent years, a Croatian expert has highlighted some key problems in the country. These are: the lack of innovation capacity due to the structure of the economy, lack of political will, lack of strategic planning and coordination between relevant actors, and the mismatch between the educational system and the requirements of the labour market. In addition, he mentioned that, "The state administration is dealing with a lot of paperwork and bureaucracy instead of proactively doing politics. There are too many

procedures for simple things" and that "there is significant resistance to change in the academic and scientific community and we did not manage to break that".

More generally, and this also concerns Italy, Serbia and Slovenia, there is a perception among the interviewed experts that the budget set for innovation in the Adriatic Region is still too limited. Although budget constraints are obvious in times of crisis, there is almost unanimous consensus on the fact that Adriatic countries should put more money into innovation, whatever the specific policy measure chosen.

Of course, as already stated, when dealing with very heterogeneous countries, not only in terms of innovation efforts but also simply for population or GDP, the reference to a unique critical mass threshold could be misleading. Therefore, we suggest that a continuous and comprehensive mapping of research and innovation competencies in the area should be developed. In PACINNO, we have implemented mapping in WP5 (see again footnote 1) that could be extended over the years, as well as in terms of available indicators. Until now, in fact, a lack of statistics on research and innovation in the whole Adriatic Region has been evident. A limited knowledge of innovation in the area might lead to wrong policy decisions.

Furthermore, we suggest breaking this critical mass into two dimensions: a quantitative and a qualitative one. In other words, it has to be clear that while most advanced countries in the area (e.g., Italy or Slovenia) have to launch policies to increase the quality of innovation competencies (while also keeping their quantity high), other countries (e.g., Albania or Montenegro) primarily need to put all their efforts into the quantitative increase of these competencies. Quantity and quality are not alternative per se but, in times of limited resources, smart policies should be able to target the right dimension in the right place. Moreover, in this policy area, it becomes of critical importance to connect innovation policies to the wider set of industrial (sectoral and regional) policies aimed at exploiting the specific comparative advantage of each country or region (Pianta & Zanfei, 2016; Cimoli et al., 2015; Bianchi & Labory, 2011), favouring innovation diffusion and catching up.

In order to do so, and as a last suggestion on this 'critical mass' point, it is relevant to identify the actors for each policy, giving specific roles. A governmental body at a higher level should coordinate who is doing what, for instance, giving the responsibilities for education policy to the Ministry of Education and those on R&D policy to the Ministry of Research. Although this might appear obvious and common sense, after interviewing experts, we can underline that, for cultural reasons, in the Adriatic Region there are often cases of overlapping responsibilities and conflicting or duplicating activities.

10.3.2 THE COLLABORATION IN RESEARCH AND INNOVATION

A second key topic is that of collaboration. It is a crucial point, especially because the majority of Adriatic countries are latecomers in research and innovation. Moreover, the largest country, Italy, shows lower innovation performances in comparison to its potential, considering its industrial structure (see European Commission, 2015a.). As also confirmed in the overview given in Figure 10.1, policies for collaboration are active in all Adriatic countries and account for the largest share overall intervention.

Regarding collaboration, it is important to distinguish between intra-country and inter-countries (or international collaboration).

As regards intra-country collaboration, all countries have specific tools. To give just some examples:

- All countries, including Albania and Montenegro, have put policies in place for developing clusters and incubators aimed at connecting small firms and start-ups in the country;
- Since 2007, Bosnia and Herzegovina has launched competitive grants to support scientific cooperation;
- Croatia has developed several programmes for the collaboration of national scientists (and also of Croatian scientists abroad), such as the Research Cooperability Program and the Connectivity programme, as well as several ones for public-private collaboration in science and innovation (e.g., the RAZUM or IRCRO programmes).

Among the different policy tools to foster collaboration, a primary role is played by TTOs. This policy area has been extensively addressed within the PACINNO project, especially via the establishment of new TTOs and the signature of an international agreement, as an instrument to facilitate the networking activity among them[5].

Technology transfer polices have been frequently used in all the analysed countries. In particular:

- In the 2009-2015 period, a section of Albania's National Strategy on Science, Technology and Innovation has strongly focused on TTOs as a means of enabling Albanian universities to successfully participate in EU research projects;
- In 2015, the Croatian Business Innovation Agency (BICRO) launched a EUR 1.5 million programme to support national TTOs;
- Since 2014, Montenegro has a programme for knowledge transfer between higher education, research and industry (mostly SMEs) sectors;

5 More information on this at www.pacinno.eu

- Since 2010, Serbia has a programme on Integral and Interdisciplinary Research, whose aim is to enhance knowledge and technology transfer, as well as the application of R&D results in industry;
- Finally, in Slovenia, there are several programmes regarding technology transfer; the oldest is a programme on subsidies for technology centres/parks, which has been running between 2007 and 2014 (Programme of Measures to Promote Entrepreneurship and Competitiveness, 2007).

When dealing with international collaboration it is worth mentioning the crucial distinction between intra-Adriatic collaboration (where the PACINNO project is an example) and extra-Adriatic collaboration. These two levels meet when dealing with EU macro-regional strategies (that is the EUSAIR in the case of Adriatic and Ionian areas). In fact, the strength of intra-Adriatic collaboration is directly proportional to the ability of the Adriatic countries to set-up R&D and innovation collaboration with third areas.

10.3.3 THE CONTINUITY OF RESEARCH AND INNOVATION POLICIES

In both desk research and interviews with experts, a third critical issue has emerged. In many cases, good innovation policies have been undertaken for limited periods of time or with intermittence. This lack of continuity in innovation policies is a problem for almost all countries, although it may take different forms. In some cases, a policy has been completely abandoned; in other ones, the policy focus was changing, leading potential beneficiaries to lose all the expertise developed on that policy tool. This is especially true for SMEs, which form the bulk of companies in the Adriatic Region. Since the cost for understanding and applying for a policy instrument is very high in their case, a perceived lack of continuity in terms of policies implies that SMEs do not even try to learn how to apply them. The consequence is a dramatically limited use of policies by those needing them most.

As said previously, in the PACINNO expert interviews this concept has emerged several times, although with different emphasis. Here, below, we report the most relevant statements regarding this issue in the single countries.

An expert from Albania stated, "unfortunately, each time there has been a political rotation, the prioritisations of the relevant and responsible institutions for innovation and R&D have been changed. Thus, policies have been successful enough in identifying the obstacles, but this has not been the same as successfully overcoming them". In other words, continuously changing the priority for policies is seen

as an obstacle to innovation and, at the same time, the main reason for which other obstacles are also not removed.

Experts from Bosnia and Herzegovina agreed that innovation-funding schemes are usually designed to support beneficiaries for one year, that is, short term and small-scale projects with limited impact on research and innovation systems. This is mostly due to the limited funding capabilities of institutions. However, notable differences exist in terms of efficient policy design between the different entities. It is worthwhile noticing that in Bosnia and Herzegovina policy is designed to follow a horizontal approach, that is all sectors and thematic fields are treated equally.

Moreover, in the case of Croatia, experts have stated that many problems are connected to the lack of continuity and patience in the policy cycle. Whenever many changes occur, for example changes of government, and there is no adequate structure in the political and economic relationships among organisations in the country, then the effectiveness of policies is severely damaged.

In the case of Italy, an expert stressed the continuity problem with specific regard to an innovation policy tool, that is R&D tax credit. Over the recent years, in Italy, there have been several different measures, often changing year by year: "in 2007, the government experimented first with a general policy based on tax credits allocated through the 'click day', a selection process that awarded funds to firms in the order that the electronic requests arrived for 2008 and 2009. In 2010, tax credits were not available. They were reintroduced in 2011 by the Monti government, which launched tax credit schemes for businesses financing research projects in partnership with universities or public research. [...] At the end of 2013, the government reintroduced a general tax credit scheme based on incremental expenditures" (Nascia & La Placa, 2016). After other amendments, only in 2015, the current version of this scheme has been defined.

The aim of the Italian Ministry of Economic Development, today, is to set up a policy on R&D tax credit that can act for several years in the same way. In fact, firms need certainty that the tool is working for many years in the same way; otherwise, they do not change their R&D propensity because they fear that the increase in R&D will not be supported in successive years by the same tax scheme.

An expert from Serbia also stated that political changes in Serbia influence the execution of the programmes or change the objectives. For instance, in the past, the Ministry of Science and the Ministry of Education were separated; after the merging of the two in 2011, some of the programmes were changed and the budget was cut.

As a corollary to this lack of continuity, we recall that changes in the political systems, or in governments, should not affect innovation policies. Both private and public actors in research and innovation should know that, despite a change in the government, innovation policies continue with more or less the same frameworks.

Currently, instead, many policies are strongly dependent on the political scenario in all Adriatic countries. Implicitly, then, these changes in policies and policymakers do not allow good evaluation of policies themselves to be developed.

10.3.4 THE GOVERNANCE OF INNOVATION POLICIES

Before concluding this review, a few notes on the problem of governing innovation policies are worth mentioning. In the recent past, the innovation policies at the European level have been greatly focused on regions (Serravalli, 2009; Laranja et al., 2008) as the appropriate level of governance for setting and implementing a wide set of innovation policies[6]. Now, the new tendency is towards an increased role of nation States. The existence of these contradictory forces, acting toward centralisation or decentralisation, emerged clearly during the field research. In fact, in some countries, NUTS2 regions ask for more autonomy in setting the policies. Both in Italy and Greece, there are fears that the regional level, which is gaining more and more importance with the Smart Specialisation Strategy, does not always have enough autonomy in setting objectives and, even more, in developing policy tools. In Italy, for instance, the weight recently given to R&D tax credit, reasonably managed at the central level, tends to counter the power of regions in setting the policy agenda.

Also in the case of Greece, interviewed experts argue that "a tendency towards decentralisation is a positive step, since there would make easier communication and cross-control between actors and policy makers. In this direction, further decentralisation to more local authorities should be encouraged".

In some other countries, it is the structure of the country itself that implies a strong decentralisation force, although this increases the complexity of the innovation system. It is worth mentioning the case of Bosnia and Herzegovina. As reported by one expert, a "strong political commitment is necessary for both the adoption and the implementation of policy measures other than the current narrow support to international innovation cooperation. Moreover, integrated innovation strategy at the state level may be ineffective given the decentralised governance structure, including the highly decentralised regulatory and financing structure between the two entities, and limited funding at the state level. What seems necessary instead, is to harmonise and synchronise the existing strategies between the state and entity levels, the process which seems fully absent". These remarks call for the need to jointly define the set of policy instruments that best fit with the specific econom-

6 This strategy was a straightforward effect of the economic research on the field that highlighted, almost unanimously (although starting from different theoretical and empirical approaches), the importance of the local and regional dimensions to spur innovation growth.

ic conditions of latecomer countries, together with the optimal allocation of each policy instrument to the appropriate level (local, regional, national) of government (OECD, 2011b).

10.4 BEST PRACTICES OF POLICIES IN THE ADRIATIC REGION

As highlighted at the beginning of this chapter, a critical point for the adoption of innovation policies in the Adriatic Region is the identification of the most appropriate benchmark. In this regard, trying to copy policy instruments developed in countries with very different socio-economic conditions can lead to failure. On the contrary, the imitation of best practices already adopted and, in some cases, established in the same environment, is more of a guarantee for the successful improvement of each Adriatic country's innovation.

As highlighted in the majority of the interviews conducted with innovation experts within the PACINNO project, the policy model applied in these countries is based on best practices across the EU. While a 'one size fits all' approach does not exist, successful policies within the Adriatic Region can still be adapted in countries with similar conditions. In this regard we can refer to BICRO (innovation agency), which has been a success story in Croatia. The initiative is based on grater recognition for the role of entrepreneur and having an entrepreneurial model: for a long time, in fact, the innovation system in the country had been focused on institutions and public organisations and entrepreneurship was not addressed. BICRO was an agency that implemented three programmes for innovation and the transfer of scientific knowledge to the economy. Key intervention areas of BICRO were related to: IP protection and evaluation, demonstration of technical feasibility and the construction of functional prototypes. In particular, proof of concept (POC) measures from BICRO has emerged as a best practice. The POC measure has worked providing money for testing concepts. Both SMEs and academics were eligible, and it is considered very successful as many projects were funded. In the first steps, there were patent applications followed by the development of new products. It is worth noting that this has also been implemented in other countries, notably in Serbia and Albania.

The Technology Innovation Award is an example of best practice in Serbia that has also gained international recognition, in particular receiving participants from other Balkan countries. After ten years of being in practice, the contest is receiving international participants. It has been so successful that the results are broadcasted on television.

In the case of Italy, the 'innovative start-ups' tool has been highlighted as a best practice, especially because it has launched a novel modality to support firms.

Also in methodological terms, within the Italian Ministry of Economic Development (MISE) and with partners, a method has been developed that can be replicated in the future for further policies. This means, for instance, a method for setting the values/thresholds for funding innovative start-ups, which derived from various feedback from the territory/industry (mainly through consultations between central and regional policymakers). However, one of the most important policy initiatives consists in two different strategies: (a) an the extensive communication in Italy and abroad, in order to attract more innovative companies, in particular SMEs; and, maybe more importantly, (b) the creation a new institutional environment for firms registered as innovative SMEs or innovative start-ups. In practice, the innovative start-ups tool is related to a wide range of support measures such as the extension of online bureaucratic operations, exemption from registered taxes, exemption from bankruptcy law, taxation on stock options assimilated to taxation on capital gain, favourable credit terms for investments by business angels or venture capital and the possibility of crowd funding on a dedicated portal. This is a clear attempt to create a regulatory framework tailored to innovation entrepreneurship, but having in mind possible future extensions.

These three identified tools refer to very specific situations in the area. However, a more general pattern of best practices can be identified with regards to the type of instruments considered best practice in the majority of the countries. While our taxonomy (see previous section) has included various categories, what has emerged in the majority of the countries is the success of both direct and indirect support for R&D, as well as the collaboration category. This is not surprising, for at least two reasons: although we live in times of open innovation, R&D is still the most relevant input for firms' innovativeness, thus attracting the attention and the efforts of policymakers all around the world; it is not by chance that R&D tax credit measures exist in both very advanced and emerging countries for, having a high heterogeneity of actors, the most effective way to push all of them is to favour their collaboration, in a broad sense. What is interesting, however, is the lack of clear best practices in other categories across other countries. Both education and innovation capabilities appear to receive attention in terms of the number of policies (see again Figure 10.1), but it is more difficult to find best practices among these categories. On the one hand, best practices in the case of innovative competences can be difficult to identify, especially in latecomer countries; on the other hand, human resources policies can be considered more 'traditional', thus difficultly being considered as best practice.

However, some exceptions do exist. In particular, support provided for the establishment of science parks is regarded as a best practice in most of the countries. For example, Corallia, a cluster focused on microelectronics in Greece, has been con-

sidered as highly successful in expert interviews carried out in Greece. In a similar direction, the case of Technopolis, the first innovative Entrepreneurship Centre in Montenegro, established with the help of international funds, is regarded as a success story. This has been due to the great interest shown in it, especially from the young and very well educated part of society and because it is seen as a significant opportunity in developing an innovation and entrepreneurial environment in the coming years.

10.5 CONCLUDING REMARKS: INNOVATION POLICY RECOMMENDATIONS FOR THE ADRIATIC REGION

We can consider the three main topics of Section 10.3 as the most appropriate, albeit wide, areas of policy interventions for the Adriatic Region. The development of a critical mass of research and innovation competences, the enhancement of intra and extra-regional collaboration, and the continuity of these policies are, however, too generic to be policy recommendations in themselves. In this last section, we propose some examples on how to develop policy tools within this framework.

We start with collaboration. While in each country, excluding Italy, collaboration can be sustained by some similarities across organisations; in extra-regional collaboration a clear decision has to be taken in advance. Policy tools should clearly address which type of organisations are the target. For instance, the Managerial-Business Skills Development Programme (MBSDr), developed within the PACINNO project, clearly aimed at bridging business and academic worlds by providing training in marketing, business environment, finance, intellectual property, negotiation and design thinking to scientists and prospective managers in R&D academic and profit-oriented institutions in the Adriatic Region. Similarly, policies fostering on collaboration among TTOs in the region, or the development and sustaining of incubators and clusters in the region, are clear examples of very targeted policies.

Of course, attracting interested, potential, foreign partners to the investment in research and innovation in the area is a key choice. However, the analysis conducted in the PACINNO project showed that foreign firms are only particularly interested if a critical mass of innovation competences already exists. Therefore, public policies should primarily aim at improving education, academic research or innovative skills in the region. Among policy tools to achieve such an objective, we can mention either the funding of specific actors (e.g., innovative start-ups or SMEs, as recently done in Italy) or even more the funding of specific innovative needs (e.g. in projects). Policymakers should be able to distinguish, not only between types of organisations (small vs. large, young vs. established, high-tech vs. low-tech, and so on), but also

between the type of innovation they are looking for, i.e., technological, process vs. product, organisational or marketing innovations. Each type of innovation should also have been clear from the first stages of an organisation's life: the one-size-fits-all approach could be dangerous, especially if young and small firms aim at being global players from the start of their venture.

Again, on the critical mass issue, it is important to highlight that all Adriatic countries are characterised by strong rates of brain drain. Innovation policies should target this problem but, again, we believe that the only fruitful strategy is to improve the conditions of researchers and innovators in the region. Then we come to the problem as to how to sustain these conditions. We believe that a unique strategy for the whole region could be dangerous. Some countries (e.g., Italy) are at a stage when they mostly need indirect support for their organisations; typically, the R&D tax credit tool has to be given continuity in its current development and eventually be extended. On the contrary, other countries in the region mostly need direct support, in terms of money, to develop infrastructures and education, in order to achieve the minimum critical mass discussed above. In both cases (more and less advanced countries), the improvement in research and innovation competences requires a higher intervention of venture capital (VC) in the region.

This point brings us to our very last conclusion. We began this chapter talking about the heterogeneity of Adriatic countries. The PACINNO project, and this book, has confirmed and measured the diversities to be taken into consideration: size and GDP of single countries, geo-political changes occurring in the last few decades, differences in the economic and industrial structures of these countries, and differences in institutions, governments and public organisations in charge of developing innovation policies. All these diversities can be faced only with an overall coordinated strategy. However, the lack of coordination in research and innovation strategies in the Adriatic Region is evident. For instance, the ambitious goals currently existing in the EUSAIR are not easily linked to the Smart Specialisation Strategy that each country, at the sub-national level, should develop. Such a contradiction has to be faced urgently, in order to make national policies coherent with each other.

A solution, or at least a partial one, can be found in other past experiences of policymaking. In many cases, in fact, innovation policies in the Adriatic Region do not have the right benchmark. The best policies developed in the EU might be, paradoxically, more difficult to achieve than those of very distant (geographically and politically) countries, for instance in Asia or Latin America. Policymakers should look for policy tools from across a wider perspective. For the latecomer countries and regions, in particular, innovation polices need to be placed in the wider context of polices for growth, such as industrial policies and, more generally, in policies favouring the process of catching up and (where possible) leapfrogging.

For the more advanced countries/regions, if moving the knowledge frontier remains one of the central targets of any policy strategy, the process of change involving the whole of society will greatly benefit from policies targeting innovation diffusion and the reduction of system's inertia. Looking into the future, it seems important for all countries to open the basket of policy tools directed towards innovation inclusion (von Hippel, 2005). However, more analysis is needed to link the overview of innovation policies in the area, performed in this book chapter, with possible solutions developed worldwide.

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