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Harnessing Talent Platform

Successful recent practices in university-industry collaboration at a glance

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Abstract

Innovation is at the heart of European Policy but regional convergence in innovation and economic performance remains an ambitious goal. Regional innovation systems evolve, and this is reflected in the varying institutional arrangements of university-industry-government relations, and in the dynamism that regional government bodies put in designing policy initiatives that can support global challenges such as digitalisation, education and workforce transformation while embracing what is known as the knowledge economy. Effective regional innovation policy design is a complex task, as it needs to consider the peculiarities of specific existing innovation ecosystems, or their creation. Some examples are described in this brief. The three cases presented highlight the relevance of innovation policy in shaping regional economies and the pervasiveness of the interactions between government, universities, and businesses in generating growth.

Introduction and aim of the article, with theoretical framing

Innovation is a socially and territorially embedded process and the regional dimension has been finally recognised as being the most effective context for the development of innovation-based learning economies (Asheim & Isaksen, 1997; Cooke & Morgan, 1998; Isaksen, 2001). An impressive number of authors in the last thirty years have explored and redefined the concept of Regional Innovation Systems (RISs), and while it is not the only existing theoretical framework highlighting the complex dynamics between innovation, economic and institutional actors and the geographical dimension (Muscio, 2006), it has had a significant impact on the design and implementation of regional innovation policies, especially in Europe. Following Asheim et al., "The RIS approach will remain an important framework for the design of innovation-based policies to promote competitiveness, inclusiveness and sustainability, for the implementation of such policies and for the evaluation of the success of these policies. […] We see the RIS approach as the single most used analytical framework in designing smart specialisation policies and implementing smart specialisation strategies." (Asheim et al., 2019:vii).

The RIS approach is a "widely used framework for examining the dynamics of innovation across space and for crafting policies to promote the innovation capacity of regions" Tödtling et al., 2021). It has inspired or, at the very least can be considered, compatible with many policy initiatives aimed at reinforcing university-industry collaborations, in very different contexts. The RIS approach highlights the regional dimension in supporting the deployment of the *triple-helix model* (Etzkowitz & Leydesdorff, 2000) (which has now evolved in the *quadruple-* and *quintuple-helix* models, with the former including the public and the latter including the natural environment (Carayannis et al., 2012)), which captures the multiple reciprocal relationships at different points in the process of knowledge capitalisation between the university system, industries, and governmental institutions. The RIS is also at the heart of the concept of innovation ecosystems. The RIS and ecosystems are interconnected concepts as they share the focus on innovation performance of specific geographical areas

and the ‘system’ approach (Grandstrand & Holgersson, 2020). Innovation ecosystems are seen as a regional development strategy that aims at creating a supportive environment to foster innovative start-ups (Spigel & Harrison, 2018). Their evolution is driven by the generation of critical resources, such as investment capital, services, entrepreneurial knowledge, highlighting the regional policy approach and environment to support high-growth entrepreneurship.

The European Union puts research and innovation at the heart of its policy and has invested significantly both in the private and public sector in European regions whose economies, despite all the best efforts, have developed with extremely different levels of performance. The EU was founded on the values of solidarity, equal opportunities, and cohesion, but reaching more harmonious levels of wealth, growth and wellbeing remains a daunting task, as also highlighted in the most recent European Commission’s cohesion report (European Commission, 2024). EU progressive enlargements represent clear examples of the positive impact of Cohesion Policy, but regional convergence remains uneven, highlighting the different challenges that regions are facing even in the area of research and innovation.

The following sections present the virtuous dynamics promoted by the RIS approach in different regional contexts. We present here three case studies on three regions at very different stages of economic development, whose governments implemented a long-term strategy in fostering university-industry collaboration. The three case studies analyse the regional strategies implemented in one less-developed region, Puglia (IT), one transition region, Wallonia (BE), and one transition Baltic country, Estonia. Policy implications follow. This brief presents a comparative analysis of the case studies, highlighting the role of regional authorities in promoting triple-helix initiatives and university-industry collaborations, which are used to formulate policy recommendations.

Presentation of case study 1: Puglia

Puglia is a region located in southern Italy, lagging behind the EU and the Italian average in terms of economic performance, despite its vibrant tourism, aerospace and agrifood industries. The region is also severely affected by the “talent development trap” (European Commission, 2024) suffering from skilled workforce migration and low tertiary education. Although, after the pandemic, the number of active companies in Puglia has returned to grow, the average size is still very low, with a predominance of micro and small enterprises. The regional production system, as in most of Italy, is a heterogeneous mosaic in which areas with a high concentration of companies (especially in the vicinity of the metropolitan area of Bari) alternate with areas with a lower industrial vocation, more oriented towards agricultural and/or tourist activities. According to the Regional Innovation Scoreboard,[1] Puglia is a region with moderate innovative performance. It has good levels of performance of the university system (it has five universities), with performance levels above the Italian and EU average in terms of most cited scientific publications and public-private co-publications, and a relatively dynamic

[1] https://ec.europa.eu/assets/rtd/ris/2023/ec_rtd_ris-regional-profiles-italy.pdf

industrial system, with a good level of expenditure on innovation not related to R&D, but it suffers from structural problems mainly related to human capital and training (low levels of: tertiary education; Employment of ICT specialists; Employment in knowledge-intensive sectors and activities). In addition, according to the regional Smart Specialisation Strategy (Smart Puglia 2030), there remains a lack of integration and unclear definition of the role of intermediaries (e.g. technology transfer, development agencies, etc.); lower digitisation than the national (and EU) average and low digital skills among the employed. Smart Puglia 2030, also highlights the need to increase the overall level of education and improve the quality of human capital available to businesses, but the region still lags behind the national and EU average levels in this area, highlighting the pressing need to adopt more efficient policy measures to generate the talents the regional industry lacks.

In 2007 the regional government promoted a measure (Regional Law No. 23/2007) fostering the "clustering" of regional enterprises to strengthen their competitiveness, innovation and internationalisation.[2] The initiative addressed an atavistic problem of the economic system in Southern Italy, which is the low level of businesses networking to meet common goals as it happens in many successful industrial districts in the rest of the country, that have often established collaborations with local universities (Muscio et al., 2012). In order to address this issue, the regional government promoted the creation of what they call ***production districts***, fostering the creation of associations involving the regional university system, the business sector and other relevant stakeholders that specialise in different sectors, ranging from IT, to agrifood and creative industries. Production districts can be defined as business aggregations intended as formal cluster organisations.

The implementation of the district measure was simple and, while supporting the regional industrial vocation, it laid the foundations in the design of the Smart Specialisation Strategy in 2013, supporting the birth of regional ecosystems. The regional authorities played an important role in setting some minimum requirements in order to achieve the regional recognition of production districts. While this may look like a top-down effort, "it comes from a bottom-up approach. This modality allows stakeholders to self-design governance, development strategies, composition and managing aspects of the production district" (Fiore et al, 2023:58). The regional government published a call defining the characteristics that districts should have had, such as being based on a significant concentration of SMEs, being specialised in a sector that is important for the region, and involve other institutional and social actors operating in support of the local economy. Furthermore, and this is perhaps the most distinctive element, the regional district must be an expression of the ability that these actors have to express shared strategic planning. The production districts therefore represent useful tools to support and encourage the implementation of homogeneous and integrated development initiatives and programmes on a territorial basis, in order to strengthen competitiveness, innovation, growth, internationalisation and the creation of new and better employment for companies operating in different sectors, from agriculture to business

[2] https://www.arti.puglia.it/sezione/knowledge-hub/iniziative/distretti-produttivi

services. According to the regional smart specialisation, they represent an initiative to implement the quadruple helix paradigm, as they connect administration, businesses, universities and civil society, with a view to smart specialisation. Actions undertaken by these organisations often contribute to improving links and exchanges between companies but also between companies and the research community. ARTI, the regional agency for technology and innovation, carried out a comparative study to collect evidence and indications at the European level on how to improve the law in the near future (Fiore et al, 2023). Along with fostering a stronger evaluation culture regarding the strengths and weaknesses of regional districts, it is essential to strengthen the role of cluster organisations to enhance the region's resilience, particularly in addressing the lack of skills and training.

There are currently 18 recognised districts[3]. From their creation to today, their operation and development have been heterogeneous, and their future evolution will also be linked to the importance that the European Commission will give to certain sectors and strategic technologies (e.g. green technologies or sustainable building sector). An evaluation of the district initiative is also long overdue. The recognition of districts as a legal entity, has provided in some cases the opportunity to design regional calls that can be targeted to members of these aggregations (regional calls like the "Bando Reti"[4] targeting collaborative research between universities and business networks; national calls like those sponsored by the RFF[5]). Moreover, district stakeholders are consulted for the design of policy schemes targeting specific industries, in the design of the regional innovation strategy (e.g. the Digital Agenda 2030) and in the creation of vocational training and university courses. Education and training are the most critical areas of intervention for cluster organisations. Clustering helps businesses (and cluster organisations) in identifying common challenges. Human capital remains one of the most pressing issues in Puglia.

At present, the initiative counts many success stories. One of the most successful district initiatives is the **Apulian IT Production District**, founded in 2010, with an initiative of the regional industry association Confindustria Puglia. The IT district counts some 70 members, including IT companies as well as universities and associations such as unions, and is constantly expanding. The IT district has developed several virtuous practices that drove companies' growth and full employment in sectors such as cybersecurity, promoting training and reskilling, in an area where the average unemployment rate is 12%, well above the EU average. The district association has a committee including business as well as universities and unions representatives, and a scientific committee. In the case of the IT district, the regional initiative had an impact on fostering the creation of a network of relationships between members increasing mutual trust. Over the years, they have been able to plan and implement complex projects efficiently and effectively with frequent meetings and social events (self-funded by members). Over time, the district has played an increasingly active role in

[3] https://www.sistema.puglia.it/portal/page/portal/SistemaPuglia/distretti
[4] https://www.regione.puglia.it/web/ricerca-e-relazioni-internazionali/-/reti
[5] https://distrettoinformatica.it/pubblicato-bando-servizi-ict-alla-pubblica-amministrazione-il-dialogo-tra-distretto-produttivo-dellinformatica-pugliese-e-le-istituzioni-che-funziona/

representing the development needs of IT companies located in Puglia, translating them into many initiatives, promoting training innovation and internationalisation policies, and supporting the Apulia Region in policy design in the area of high tech. For example, the district was among the promoters of the digital innovation hub PICS2 focusing on cybersecurity. Members have also developed competencies and experience in the design and implementation of collaborative R&D projects with universities. Many member companies now prefer to carry out project activities with the district rather than independently. Among the many initiatives promoted by the district, it is worth mentioning the participation in public and research tenders, the recruitment and training of human resources, industry-level studies and evaluations of local demand for IT skills. In fact, the district has been active in training, one of the most urgent problems in Puglia. Activities in this area include, for example, the creation of coding academies (short-term courses) by groups of local IT companies in selected residential locations; encouraging and guiding regional universities to establish undergraduate and postgraduate courses in cybersecurity and AI well ahead of the rapid expansion of these deep tech fields. As part of its Development Plan 2024-2027,[6] in collaboration with high schools, ITS (Higher Technical Institutes), universities, and advanced training institutions, the IT cluster organisation aims to create customised training programmes for businesses. These programmes will be tailored to their specific business objectives, with the goal of training new talent or reskilling existing employees. A key objective is to develop training projects for undergraduate and graduate students in the humanities (therefore, with low or no IT competencies). This initiative seeks to enhance the value of young talents. Additionally, the organisation plans to start managing career orientation programmes in the IT sector, in partnership with local education institutions. They will also establish a District Summer School.

Presentation of case study 2: Wallonia

Wallonia is a Belgian region and amongst those classified as being in a middle-income trap. It was once the powerhouse of the Belgian economy thanks to the extraction and transformation of raw materials (mining, steel, heavy industry). Before the beginning of the century, Wallonia faced serious issues in terms of regeneration of business activity, high unemployment, and difficulties in terms of structural adjustments of the regional economy. The highly complex governance system in Belgium rendered the definition and application of a coherent regional industrial policy difficult (Reid & Musick, 2000). After years of decline, the region now consists of territories ranging from Europe's top performers in income and innovation to major cities struggling with industrial transition and stagnating rural areas. Since 2000, regional policy has shifted from saving declining industries to a modern industrial policy focused on competitiveness clusters, creativity, and digitalisation. Initially, Walloon policymakers resisted smart specialisation, using existing clusters as S3 priorities. However, for 2021-2027, a significant shift occurred with the adoption of a challenge-driven approach,

[6] https://distrettoinformatica.it/wp-content/uploads/2024/07/Piano_di_sviluppo_del_Distretto_2024-2027.pdf

involving stakeholders to identify five strategic innovation areas (SIA).[7] A new delivery model was introduced, promoting the creation of strategic roadmaps in quadruple helix partnerships, without direct public funding. The current S3 strategy directs public investment, concentrating 75% of the Walloon annual R&I budget in the five SIA (€2.7 billion in 2021-2027).

The Regional Innovation Scoreboard 2023 classifies Wallonia as a strong innovator and the regional innovation performance has increased by 13.9% since 2016, with a particularly strong performance relative to the EU average on collaboration by innovative SMEs, innovation expenditure per person employed and business expenditure on R&D. A significant number of plans and strategies related to R&I has been introduced in Wallonia. An important role in the process of economic transformation was the implementation of the **competitiveness clusters policy initiative**. The relevance of this initiative is highlighted by the fact that the key R&I performing sectors in Wallonia are very much in line with the Competitiveness Clusters (BELSPO, 2021). Therefore, the measure matches the regional specialisation well. However, the analysis of the Regional Innovation Scoreboard highlights that there is room for improvement in education and learning.[8] While the region generally performs above the EU average in this broad area, it falls below the national average in indicators related to human capital.

In 2007, a decree on cluster policy was adopted by the Walloon Government. It introduced funding for cluster organisations (at a decreasing rate). This funding scheme was conditional on positive evaluation of cluster initiatives every three-years. Two types of clusters were conceived.

Business clusters focus on SMEs, fostering cooperation between cluster firms in R&I, joint business development and exports. The measure aims at developing SME ecosystems promoting innovation and creativity responding to environmental and societal challenges. These clusters specialise on sectors or technologies ranging from imaging technologies to eco-construction and plastics.[9] Competitiveness clusters (‘pôle de compétitivité’), were launched at a second stage, in 2006, in the framework of the first Belgian ‘Marshall plan’ (the Marshall Plan 4.0 has now been reached), to co-manage a major regional investment into collaborative industrial R&D projects (involving large firms, SMEs, universities and research centres) and help to structure and prioritise the business R&D and innovation activity in given priority fields (BELSPO, 2021). In financial terms, the competitiveness clusters have represented a key R&I initiative, absorbing an important share of the regional R&I funding since 2006.

Competitiveness clusters group companies, training centres and public or private research units in a leading sector of the Walloon economy, that are committed to a partnership-based

[7] Strategic innovation areas: Circular materials; Innovations for enhanced health; Innovations for agile and safe design and production methods; Sustainable energy systems and housing; Agri-food chains of the future and innovative management of the environment. Each SIA is expected to take account of cross-cutting dimensions, notably digitalisation and a transition to a low-carbon economy.
[8] https://ec.europa.eu/assets/rtd/ris/2023/ec_rtd_ris-regional-profiles-belgium.pdf
[9] https://clusters.wallonie.be/federateur/fr/ligne-du-temps-chaine-de-valeurs/liste-des-clusters

approach in relation to common innovative projects. The partnership aims at developing the critical mass needed for competitiveness and international visibility in a chosen market and the related technological and scientific fields, therefore supporting the S3. Initially five competitiveness clusters were launched in five key sectors, with a sixth focusing on environmental technologies (GreenWin), which was launched in 2011. In the most recent regional strategy (Walloon Government's regional policy declaration 2019-2024), the Government maintained the Competitiveness Clusters and aligned them better with the broader triple transition objective (OECD, 2023), reinforcing the cross-cutting support to enterprises. It gave a priority to increasing the involvement of SMEs and pushed for cross-cluster cooperation, always with an evaluation approach, confirming the use of revamped KPIs. Three evaluations of the cluster initiatives were carried out over time. The latest evaluation is quantitative and refers to the Marshall 4.0. It was carried out by IWEPS (2019) and aimed at measuring its impact on the performance of the participating Walloon companies. The results suggest that the measure was successful in promoting employment, added value and exports, especially when benchmarked against non-cluster companies. The results confirm that the intervention did not just mobilise R&I top performers, but has also started to mobilise a broader range of smaller innovative firms. The evaluation underlined the need to reinforce the commercial application of R&D results to increase the impact on the business sector performance. In 2014 another evaluation report, focusing on cluster actions evidenced how (IWEPS, 2014) the cluster initiative generated a significant number of trained individuals, with more than 35,000 beneficiaries of the training programmes. Training needs vary across each strategic sector defined in the cluster strategy, and the training projects reflect this diversity. Clusters such as Logistics in Wallonia and Wagralim (Agri-food) have significant potential in terms of basic training needs and the creation of low-skilled jobs, as they operate in less technology-intensive sectors. In contrast, training projects in other clusters are more specialised, focusing on advanced training and the development of a highly skilled workforce.

Presentation of case study 3: Estonia

Estonia's recent economic performance has been affected by international events and has still not fully recovered from the aftershocks of the pandemic. Estonia remains below the EU average in terms of GDP per capita. Yet, the country has been investing in creating a business-friendly environment, also thanks to a simple and favourable tax system,[10] nurturing a dynamic research and development foundation and good framework conditions for hi-tech start-ups. This allowed Estonia to have the EU's highest number of start-ups per capita. Synergies have been established in cities such as Tallinn or Tartu, with incredible results in terms of innovation generation and talent development.

According to the European Innovation Scoreboard, Estonia is a Strong Innovator with performance at 104.8% of the EU average in 2024. The weight of the manufacturing sector and lower-medium tech sectors in the economy is higher than the EU average, but the ICT

[10] Estonia has been ranked first in the Tax Competitiveness Index for the last 11 years. See: https://taxfoundation.org/research/all/global/2024-international-tax-competitiveness-index/

sector is a key component of the service sector, representing a higher share of employment and value added when compared to the EU average (ETAG, 2023). The country has been investing in computer and network infrastructure and education, laying the foundations for business creation. Estonia enjoys a business-friendly environment and has a highly developed start-up ecosystem, hosting the most unicorns per capita in Europe (10) and a high number of incubators and accelerators (22) (OECD, 2024). The Estonian incubation and acceleration ecosystem is complemented by several business angels, venture capital firms and equity investors. Private initiatives also enrich the local ecosystem (e.g. coworking spaces).

Behind Estonia's strong performance in innovation lies significant investment in education and digital skills. Since the 1990s, Estonia has prioritised education, particularly in technology, emphasising digital literacy and coding in schools. This focus has created a highly skilled workforce and fuelled the growth of its tech sector. Estonia's efforts in education began with the ambitious **Tiigrihüpe** (Tiger Leap) program, which aimed to build schools' technological infrastructure and provide internet access to all schools as early as 2001.[11]

Estonia is an extraordinary example of successful triple-helix model implementation in creating business ecosystems. Some initiatives in support of entrepreneurship pre-existed Estonia's entry in the EU but a national strategy was missing (Rouwmaat et al., 2003). Entrepreneurial activity is supported by a range of government policy measures that have been developed over the past two decades. Estonia has adopted a broad strategy focused on creating an enabling environment for tech-driven entrepreneurship, rather than prioritising the funding of incubators or accelerators. The primary policy goal in this area is to attract and support start-up entrepreneurs, as well as international incubators and accelerators, encouraging them to collaborate with local stakeholders. This approach aims to enhance Estonia's appeal to both domestic and international investors. While several initiatives contributed to Estonia's success in creating an ideal environment for tech entrepreneurship, few stand out.

Estonian Business and Innovation Agency (EIS) was established in 2022 following the merger of KredEx and Enterprise Estonia (EAS). EIS controls **SmartCap** and **Startup Estonia**, its two main operational subsidiaries supporting the start-up ecosystem. Since 2011, SmartCap supports Estonian venture capital funds and greentech startups. In 2016, after a two-year pilot period, Startup Estonia was launched and has been an important step forward in consolidating past policy efforts and investments. Startup Estonia oversees and supports the growth of the country's start-up ecosystem, serving as a key facilitator of collaboration among stakeholders such as start-ups, investors, and partners, to drive innovation and entrepreneurship nationwide. Startup Estonia has been funded by the ERDF (2014-2020 and 2021-2027). Since its inception, the organisation has played a significant role in fostering a start-up community, supporting incubation and acceleration programmes, establishing connections with investors, and streamlining administrative processes for start-ups and support organisations through standardised templates. It is widely regarded as a reliable authority with a comprehensive

[11] https://www.educationestonia.org/tiger-leap/

market perspective and a valuable ecosystem database. Local stakeholders also view its role in strategic development and priority setting as highly impactful.

Between 2000 and 2010, the development of a start-up ecosystem culminated with the launch of the **Estonian Development Fund[12] (EDF),** implemented under the Estonian Development Fund Act. The EDF did risk capital investments with private investors into start-ups with high growth potential. It offered foresight and supported co-funding and training for business angels and for the emerging investor system (Kirihata, 2016).

Important reforms have also improved the regulatory landscape for entrepreneurship in the country. Recognising the limitations of the domestic market, incubation and acceleration policies have prioritised internationalisation from the outset, frequently emphasising connections with foreign markets, including neighbouring Baltic and Nordic regions. In 2014, the ground-breaking **e-residency** scheme opened up the small Estonian ecosystem to attract international start-ups. Estonia's **digital authentication and signature system** played a crucial role in promoting Estonia's e-Residency scheme by providing secure, efficient, and legally recognised digital identity solutions. The e-residency scheme represents a significant technological advancement[13] that placed the country years ahead of other nations still grappling with the concept of authentication without physical presence. It served to open up the entrepreneurial ecosystem to citizens of other countries and build the critical mass of its business community. Thanks to it, entrepreneurs from other countries can obtain EU residency in Estonia and contribute to turning the country into an international business centre, broadening the range of services available to foreign entrepreneurs and investors, including finance, consulting, accounting, and legal support. It also enhanced, with the support of ERDF, investments in private R&D competence centres and other innovation support measures. According to Invest Estonia,[14] so far, e-Residents[15] have founded or co-founded more than 31,800 Estonian companies. In 2023, the direct economic revenue from the e-Residency scheme to the state was €67.4M, with a yearly ROI (return on investment) of nearly 10 for the Estonian Government. However, the overall impact of the scheme on the country's GDP has not yet been fully quantified.

As said, the Estonian ecosystem is rich in intermediaries. **Accelerate Estonia[16]** is worth a mention because it is a Government Innovation Lab, funded by the Estonian Ministry of Economic Affairs and Communication. It runs a public-private programme to remove regulatory barriers to create new markets and address systemic legal challenges. Thanks to

[12] http://www.arengufond.ee
[13] The technological advancements behind this scheme include: 1. Secure Digital Authentication - E-Residents have a digital ID card which enables highly secure remote verification; 2. Blockchain and Cryptographic Security, promoting data integrity; 3. End-to-End Digital Governance via the country's X-Road system, which enables secure data exchange between different government databases (e.g. company registry, banking services, tax services); 4. Remote Business Operations management, thanks to the availability of online services. that do not require physical presence.
[14] https://investinestonia.com/estonian-e-residency-attracts-record-interest-and-revenue-in-2024/
[15] https://www.e-resident.gov.ee/et/
[16] https://accelerate.ee/

its services, the scheme attracts global tech entrepreneurs and professionals to move to Estonia.[17] The programme also aims at understanding market needs to resolve regulation bottlenecks. In addition, Accelerate Estonia also provides support to start-ups that respond to specific challenges defined in Estonian Government priorities. In line with the e-residency scheme, eligibility includes both national and foreign ventures, yet they must be located or registered in Estonia. Since its inception in 2014, Estonian e-resident status has been granted to 117,000 people from 185 nationalities.[18]

Estonia has its own range of business clusters, that mostly specialise in high-tech sectors.[19] Clusters are relatively small (10-20 members), including both businesses and research organisations. In Estonia, clusters and joint activities are supported at the national level within the framework of three EAS programmes: the first for the development of technological development centres, the second for cluster development and the third for competence centres.[20]

Conclusions and take-aways

Thirty years from the definition of the concept of regional innovation systems, the concept is still more alive than ever. The system approach, the geographical dimension of the innovation process and the key role of the public actor in strategic design, in defining innovation trajectories and in leveraging local resources in the era of the knowledge economy has hardly been challenged and has been enriched by the complementary theoretical contributions of other schools of thought. The three regions (or, in the case of Estonia, the country) differ considerably in their stages of economic development, industrial structure, socio-economic conditions and even geopolitical contexts. However, it is clear that in all cases, regional bodies, encouraged by the European policy priorities, are pushing for the implementation of endogenous development processes to better exploit local competencies and resources, to strengthen their regional innovation systems (Garofoli, 2020).

The case studies presented in this brief highlight the role of innovation policy in promoting business ecosystems. Each case demonstrates the heterogeneity in the approaches taken in addressing the objective of increasing innovation performance and the integration of local agents promoting university-industry collaboration. While this exercise does not pretend to make a comprehensive analysis of the regional innovation policy in the three regions considered, some lessons can be learned.

[17] initiatives like **Work in Estonia** simplify the process for local companies to employ overseas experts and introduce Estonia as an ideal destination for fulfilling one's potential.
[18] https://www.e-resident.gov.ee/blog/posts/e-residency-applications-and-company-incorporation-increased-7-in-first-half-of-2024/
[19] https://www.tallinn.ee/en/clustersinestonia/estonian-clusters
[20] https://www.clustercollaboration.eu/content/enterprise-estonia-eas

Table 1 presents a comparison of the relevance in regional policy for a set of criteria.

First, cluster policy is considered in all cases, with due differences. In all cases, the choice of adopting a triple or quadruple helix model, emphasising the interaction between the three (or four) agents is evident in the regional strategies. However, the integration seems simpler or more coherent in Wallonia and Estonia than in Puglia. The support of the Pugliese government could be improved in further narrowing the choices of the areas of investment (stretching from aerospace to tourism), for example, better selecting the clusters, promoting more initiatives in their support, and most importantly, evaluating their performance on a regular basis. The "Achille's heel" of the region is evident and typical of other regions in similar socio-economic conditions: low schooling levels and far-from-ideal levels of tertiary education that hamper regional innovation performance. As described in this paper, the productive district initiative has surely had an impact on academic and ITS teaching programmes and policies, but these actions need to be supported by national policies reducing the risk of a persisting talent development trap, supporting tertiary education and reducing the alarming rate of school abandonment.

From an academic standpoint, in Estonia, a more centralised approach is preferred, focusing on creating the best possible conditions for IT startups. There has been a courageous choice in setting the priorities in national innovation strategy that are paying off handsomely in terms of economic performance and, most importantly, in terms of the establishment of a competitive regional innovation system. For quite some time Estonia has been creating favourable conditions for innovation and entrepreneurship, promoting IT skills and tertiary education, channelling human capital resources in the flourishing of an integrated ecosystem.

Wallonia stands out for its capacity to renew its regional innovation system. It is now a high performer in innovation and its growth is not just associated to its strategic geographical positioning in the heart of Europe. The regional strategy has been based on tactical foresight with long-term objectives and with a range of measures that have supported the complete renewal of its economic system. Even in this case, the focus on ecosystems is strong and accompanied by top rank levels of university performance and tertiary levels of education of the population.

While all cases highlight that public intervention is a key factor in shaping regional economies – not just by providing financial support but also by designing appropriate and coherent strategies – it must be emphasised that universities play a fundamental role in supplying the necessary resources for regional economies to thrive. These resources extend beyond research output to include the provision of graduates who contribute to the renewal of local economic systems and the creation of knowledge-based environments conducive to business startups. This has clear policy implications for innovation policy, highlighting that sometimes, the key to regional development is simpler than we think.

Table 1 Comparative analysis

	Puglia	Wallonia	Estonia
Triple/Quadruple-Helix implementation	Strong	Strong	Strong
Soundness of the regional innovation strategy	Intermediate	Strong	Strong
Regional focus on clustering	Strong	Strong	Intermediate
Government commitment in creating ecosystems	Intermediate	Strong	Strong
Public funding of the ecosystem	Weak	Strong	Strong
Strength of the RIS	Weak	Moderate	Strong
Evaluation culture	Weak	Strong	Strong

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