

Broadening innovation policy: New insights for cities and regions

Fostering innovation in less-developed regions (with low institutional capacity)

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Background information

This paper was prepared as a background document for an OECD/EC high-level expert workshop on “Developing strategies for industrial transition” held on 15 October 2018 at the OECD Headquarters in Paris, France. It sets a basis for reflection and discussion. The background paper should not be reported as representing the official views of the European Commission, the OECD or one of its member countries. The opinions expressed and arguments employed are those of the author(s).

Broadening innovation policy: New insights for regions and cities

The workshop is part of a five-part workshop series in the context of an OECD/EC project on “Broadening innovation policy: New insights for regions and cities”. The remaining workshops cover “Fostering innovation in less-developed/low-institutional capacity regions”, “Building, embedding and reshaping global value chains”, “Managing disruptive technologies”, and “Experimental governance”. The outcome of the workshops supports the work of the OECD Regional Development Policy Committee and its mandate to promote the design and implementation of policies that are adapted to the relevant territorial scales or geographies, and that focus on the main factors that sustain the competitive advantages of regions and cities. The seminars also support the Directorate-General for Regional and Urban Policy (DG REGIO) of the European Commission in their work in extending the tool of Research and Innovation Strategies for Smart Specialisation and innovation policy work for the post-2020 period, as well as to support broader discussion with stakeholders on the future direction of innovation policy in regions and cities.

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Executive summary

1. The target of this report is to discuss practical experiences regarding the way to foster innovation in less-developed (with low institutional capacity) EU regions. I argue that the time is right now to pursue long-term growth and overcome path dependencies and the middle-income trap. However, as regional development policies did not live up to the expectations of persistent convergence, policy makers will need both to learn from good practices and to experiment more in the next programming period. Policies, which failed to transform regions during the past decades may be equally, if not more, unsuitable for the future. The methodology followed is composed of a mix of academic literature, findings of policy documents and the discussion of only a few good practices that may inspire future regional development policies in the lagging regions.
2. Our current knowledge for effective innovation policy is that the transfer of resources alone is, insufficient to create resilient, competitive national or regional economies. Innovation results from the combination of investments (in physical and human capital), technology (knowledge of production and management) and institutions (effective governance) combined. Money is wasted unless it is managed well, and this applies equally to public organisations and the business sector.
3. The 21st century experience of the EU is that there has been intra-European convergence before the crisis, often accompanied by national divergence. The crisis reversed the trend, which took off again after the end of the great recession. Conditional convergence is the rule, while absolute convergence is the exception. Growth was above average in EU-12 with spectacular success of capital cities, some of which have surpassed the EU average. The Southern less-developed regions underperformed, trapped in a declining middle income during the crisis. Growth patterns are strongly correlated with the Quality of Governance but much less so with the Summary Innovation Index.
4. Academic papers and policy papers tend to agree on a number of points: The policy mix adopted was more homogenous than their idiosyncratic problems and challenges would justify. Institutions matter: they matter more after an initial level of investments is attained; informal institutions matter more for diversification, making them a crucial element of innovation policy to overcome the middle-income trap. The routines and informal rules in less-developed regions have diluted the effectiveness of the SSS during implementation. All these findings lead to a need for radical change and more EU intervention in the 2020-2027.
5. In the next programming period, which will unfold in an era of disruptive changes, less-developed economies will only converge if they succeed in somehow participating in the emerging sectors. For this they will need to strengthen their productivity through R&I. They are better placed to be part to the increasing and diversifying food demand, while for health, ICT and nano, they will need to considerably develop/strengthen R&I capabilities through education (in particular digital skills), research and innovative investments. Improving their governance structure will enable it.
6. Effective innovation policies need to be coordinated and systemic. Unless they are, their impact will be at best unexceptional and convergence will be brief and small. However, ambitions and effectiveness cannot be the same for all regions. Some general guidelines suggest that:

7. Labour markets call for broad educational reforms, but this goes beyond the reach of ESIF and has only a long-term impact. What regional intervention can do very effectively for all regions and already with medium-term impact is shift from supporting conventional training courses organised by public organisations to encouraging organisations that have (or target) alliances with the business sector and have (or target building) a reputation that will ensure employment for their graduates.

8. Small-scale, conventional schemes which serve incumbents are necessary but insufficient for research and innovation policies. There is a need to raise ambitions and take the risk of concentrating resources following the SSS philosophy, ensure synergies, use extensively financial instruments, reinforce Pockets of Excellence and offer additional incentives to schemes not tested before in a region.

9. All regions will need to engage in ensuring the basic infrastructure, invest in digital education and create synergies by exploiting the benefits offered by the incentives for creating Digital and Smart Strategies. A combination of strategic documents or successful pilots with ESIF can speed up the digital transformation and increase the pace of fund absorption through an equivalent to the Seal of Excellence (e.g. a Seal of Maturity). Top performers can learn from the Estonian example and go all the way towards a fully digitised economy and society.

10. Institutions will only slowly improve. Insisting on SSS will be necessary. It is suggested for the next programming period to ask regions to select 1-2 Smart Specialisation Flagships, which will be more closely monitored and can create forces for internal change, in particular in the weakest regions.

11. The report suggests specific topics for different regions, differentiating between more and less ambitious policies and between top performing regions, low-income high-growth regions, regions stuck in the middle-income trap and low-income and low-growth regions.

Abstract

This report discusses empirical evidence and practical experiences regarding the way to foster innovation in less-developed (with low institutional capacity) EU regions. Our current knowledge for effective innovation policy is that the transfer of resources alone is insufficient to create resilient, competitive national or regional economies. Innovation results from the combination of investments (in physical and human capital), technology (knowledge of production and management) and institutions (effective governance) combined.

Past problems in EU regional development policy include too homogenous a policy mix as well as weak institutions in formal and in informal rules, limiting experimentation and adaptation of intervention tools. A need for radical change within regions and more EU intervention in the 2020-2027 period arises. To exploit windows of opportunity and join the emerging sectors and technologies, less-developed regions are expected to: better orient their educational systems to market needs through new public-private cooperating organisations, develop their own entrepreneurial ecosystems and link them with foreign direct investment and global value chains, exploit all grants and strategic opportunities leading them to digital transformation and last but not least improve their institutional capabilities in terms of both better coordination and user-friendly micromanagement. The mix, however, will need to adapt to a typology of regions based on income level and GDP growth. Experimentation will help each type of region adopt what is best for its economy.

Smart Specialisation Strategies constitute a good instrument that needs to continue but for effective operation its design has to adapt and become more responsive to the consistency (or not) of regions to implement. Concrete ways to do that, depending on the type of region, include expanding the strategy to investment instruments (TO3) and promote one or two Smart Specialisation Flagships, as a special case within the overall strategy. It can help convince regions to become more ambitious, diminish their resistance to change and lead them to more effective innovation policies.

1. Introduction

12. The objective of this paper is to present the experiences of innovation policy in the European Union's less-developed regions, exploring the extent to which (and the reasons why) EU innovation policy has (or has not) contributed to regional convergence and suggest new ways forward for the 2020-2027 programming period. For such an exercise, one needs to focus both on innovation policy design and on its implementation.

13. Economic disparities between European regions are significant and after four decades of active interventions in favour of regional convergence in the EU-12 (mainly Southern Europe) and almost two decades in EU 15, the lessons drawn suggest that:

- *Converting from less-developed to developed regions is the exception, not the rule:* Convergence regularly took place, but it was often temporary and precarious. Using Euro GDP per inhabitant - % of the EU average as the criterion, only a few regions have succeeded in overcoming their structural disadvantages and were able to overcome the middle-income trap transforming into “developed” regions, endowed with resilient production capabilities, able to compete internationally in high value-added activities and to cope with crises. Ireland is the most prominent example in this category. Among the EU-15, Prague and Bratislava are the most noticeable cases of a cities climbing up the ladder rapidly and persistently (despite a slight temporary decline at the beginning of the crisis).
- Many other regions have also seen their relative position improving either spectacularly (conditional convergence) or persistently but not spectacularly. Several of the regions with GDP per head close to the EU average appear stuck in a 'middle-income trap' (EC, 2017a). Many of the less-developed regions in the Southern Member States have remained in the convergence status, despite decades of European intervention. This is in line with empirical findings elsewhere, for example in the US, where disparities continue (despite comparatively higher transfer of resources).
- *Convergence is closely related to the business cycle:* Convergence was the rule until 2008, although often the intra-European convergence was achieved at the cost of intra-country cohesion, with the capital cities and larger agglomerations growing faster than the least prosperous regions. This indicates that conditional convergence was not attained *within* the cohesion countries and was only partially realised between EU regions with the middle level (capitals and large cities) converging with the developed ones, leaving the others behind. Conversely, conditional convergence was manifested within countries during recession but not among Member States. The crisis reversed the long-term trend towards narrowing regional disparities in GDP per head and employment. First signs of convergence taking off became evident recently, as European growth resumed; however, in many regions GDP per head and employment remain below their pre-crisis levels (EC, 2017a).

14. After the initial interventions prioritising physical infrastructure and research, innovation policy has gained momentum as the best way to create wealth and help regions converge. Now, after two programming periods with increasing support for research and innovation, we see that success or failure of regional performance in Europe (or elsewhere) cannot be explained with mathematical models and growth accounting. This is in line with

the progress of academic knowledge: the first models linked growth to capital accumulation, then to knowledge creation and accumulation, emphasising research and development (Romer, 1986, 1990) and human capital (Lucas, 1988). More recently, the explanation as to why some countries grow and others fail (Acemoglu and Robinson 2012) put emphasis on the role of institutions. This means that innovation is crucial, but the transfer of resources alone is, and has empirically proven to be, both in the US and the EU, insufficient to create resilient, competitive national or regional economies. Innovation results from the combination of investments (in physical and human capital), technology (knowledge of production and management) and institutions (effective governance) combined. Money is wasted unless it is managed well, and this applies equally to public organisations and the business sector.

15. I argue that the time is right now to pursue long-term growth and overcome the middle-income trap, not only because we enter a new Programming Period 2020-2027, but most importantly because we live in a period of Schumpeterian growth bringing pervasive changes. Artificial intelligence and big data will disrupt technologies. Empirical evidence shows that it is during growth periods that convergence can be achieved. However, it should not be taken for granted. Disruptive changes create both opportunities and threats: It is a period when less-developed regions have a chance to transform, taking advantage of increasing European and global demand but they are also threatened by business and technological hubs likely to attract talents and investments, leaving peripheral regions further behind. Policies which failed to transform regions during the past decades may be equally, if not more, unsuitable for the future.

16. The methodology followed is composed of a mix of a literature review, the findings of policy documents and the discussion of few good practices that may inspire future regional development policies in the lagging regions. Identifying and recommending good practices is a challenging, almost risky, task. Good practices can be small individual schemes, larger ambitious programmes and entire strategic approaches. Good practices are extensively used in policy learning; however, experience shows that the good practice label may sometimes be too easily awarded using self-declaration or criteria such as design, good-will and inputs to a policy rather than its long-term impact. Therefore, I used very few small and large-scale good practices very selectively, relying on their long-term impact or on their experimenting and testing nature. The selected good practices do not come exclusively from current less-developed regions. I refer to cases that made a difference in Ireland and helped it transform from less to highly developed and a French case, where experimentation helps the digital transformation, an area where France is lagging behind innovation leaders.

17. The rest of this paper is structured as follows: A first part deals with the past, the empirical evidence demonstrating convergence and divergence trends before and after the crisis (Section 2.1), an overview of innovation policies in earlier programming periods (Section 2.2) and the emergence of the relevance institutions for innovation policy (Section 2.3). The first part is completed with a short section on experiences from the first years of applying Smart Specialisation Strategies. Based on the past experiences, the second part discusses future innovation policy: the new challenges that will shape the environment for future global competition and wealth creation (Section 3.1) followed by the enabling environment shaped by education (Section 3.2), and research policies (Section 3.3), enterprise and investments (Section 3.4) and the opportunities arising from digital strategies (Section 3.5). Section 3.6 discusses the potential of institutional change. A concluding part will try to answer specific questions on how to shape European innovation policies in convergence regions.

2. Evidence from the past

18. Cohesion Policy aims to reduce disparities between EU regions in order to achieve balanced economic, social and territorial development. With increasing funding since the adoption of the Single Market in the mid-1980s, cohesion policy now accounts for the second largest share of the EU budget. Through this intervention the less-developed regions were able to keep pace with the growth of the more developed ones and there have been some real success stories. However, so far regional development funding is not living up to the expectations to deliver continuous convergence run. There are still many low-income regions (starting low and not growing rapidly enough to catch up) and low-growth regions, which struggle with stagnating productivity and rising labour costs. In the low-income regions, however, lower public and private debt levels meant that higher investment rates could be maintained: the combination of productivity growth and more moderate increases in labour costs boosted their exports and smoothed their economic adjustment (European Commission, 2017e). In the wake of the new programming period there is an ambition for greater economic and social cohesion. Accumulated experience from the past is valuable for new policy guidelines in the Programming Period 2020-2027.

2.1. Some empirical evidence

19. Taking a longer period into consideration, empirical evidence identified convergence during the 1990s (Leonardi 2006; Stephan et al. 2005; Faiña & López-Rodríguez, 2004), in particular for the most developed among less-developed regions, identifying in certain cases that inter-country convergence was achieved at the cost of intra-country cohesion (Cappelen, Castellacci, Fagerberg, & Verspagen, 2002; Marzinotto 2012; Rodríguez-Pose & Fratesi 2002). Other studies claim that real convergence occurred only initially (Cuadrado-Roura & al., 2005), while structural interventions were ineffective later (Ederveen et al. 2006). This indicates that conditional convergence was not attained within the cohesion countries and was only partially realised between EU regions with the middle level (capitals and large cities) converging with the developed ones and leaving the others behind (corroborating Krugman's thesis on the role of liberalisation of trade). Similarly, conditional convergence materialises within countries during recession, but not among Member States. Absolute convergence is rare. Rodríguez-Pose and Fratesi (2002) and Sterlacchini (2008) explain the precarious convergence through the distribution of resources, which favoured infrastructure rather than human resources development. Still others emphasize that it is the regulatory framework that needs to be further improved to make intervention more effective (Bachtler & Gorzelak, 2007), and only a radical restructuring of cohesion policies can address the EU's challenges (Barca 2009; Farole, Rodríguez-Pose & Storper, 2011). This request for radical change was to some extent adopted in the 2014-2020 period through the introduction of the ex-ante conditionality of the Smart Specialisation Strategies.

Table 1. Best performing regions in convergence countries

Compound annual growth Euro/head (1)			Compound annual growth PPS/head (2)			Euro/inhabitant (% EU) (3)			QoG (4)	Innovation performance (5)*
2000-9	2009-16	2000-16	2000-9	2009-16	2000-16	2000-9	2009-16	2000-16	2017/2010	2017/2009
RO- Bucuresti- Ifov	LT - Lietuva	RO - Bucuresti-Ifov	RO - Vest	LT - Lietuva	RO - Bucuresti-Ifov	SK - Bratislavský kraj	MT- Malta	SK - Bratislavský kraj	RO - Bucuresti- Ifov (-1.576)	LT - Lithuania
BG - Yugozapaden	MT- Malta	RO - Nord- Vest	RO - Sud- Muntenia	LV - Latvija	RO - Vest	CZ - Praha	RO - Bucure?ti-Ifov	CZ - Praha	BG – Severen tcentralen (-0.997)	EL - Western Macedonia
RO - Sud- Muntenia	RO - Sud- Est	RO - Vest	RO - Bucuresti- Ifov	HU - Nyugat- Dunántúl	RO - Nord- Vest	RO - Bucure?ti- Ifov	EE - Eesti	RO - Bucure?ti-Ifov	CZ – Praha (-0.161)	IT - Calabria
RO - Vest	EE - Eesti	RO - Sud-Est	RO - Nord-Vest	RO - Sud-Est	RO - Sud- Muntenia	EL - Attiki	LT - Lietuva	EE - Eesti	RO – Vest (-1.337)	IT - Provincia Autonoma di Bolzano/Bozen
RO - Nord- Vest	LV - Latvija	BG - Yugozapaden	BG - Yugozapaden	HU - Közép- Dunántúl	RO - Sud-Est	SK - Západne Slovensko	PL - Mazowieckie	SK - Západne Slovensko	PL – Pomorskie (-0.131)	IT - Molise
SK - Bratislavský kraj	RO- Bucuresti- Ifov	RO - Sud- Muntenia	RO - Centru	BG - Yugoiztochen	BG - Yugozapaden	HU - Közép- Magyarország	HU - Nyugat- Dunántúl	LT – Lietuva	LT – Lithuania (-0.264)	IT - Umbria
RO - Centru	HU - Nyugat- Dunántúl	RO - Centru	RO - Sud-Vest Oltenia	MT- Malta	RO – Centru	ES - País Vasco	LV - Latvija	LV - Latvija	RO – Sud- Muntenia (-1.104)	LV - Latvia

RO - Sud-Vest Oltenia	HU - Közép-Dunántúl	RO - Sud-Vest Oltenia	RO - Sud-Est	EE - Eesti	LT- Lietuva	CZ - Jihovýchod	HU - Közép-Dunántúl	BG - Yugozapaden	CZ - Strední Morava (-0.017)	CZ - Jihovýchod
RO - Sud-Est	BG - Yugoiztochen	RO - Nord-Est	RO - Nord-Est	PL - Malopolskie	RO - Sud-Vest Oltenia	BG - Yugozapaden	SK - Bratislavský kraj	SK - Stredné Slovensko	PL – Slaskie (-0.481)	EL - North Aegean
RO - Nord-Est	RO - Nord-Est	SK - Bratislavský kraj	SK - Bratislavský kraj	PL - Dolnoslaskie	RO - Nord-Est	SK - Stredné Slovensko	RO - Sud-Est	CZ - Moravskoslezsko	PL - Kujawsko-pomorskie (-0.335)	IT - Toscana
SK - Západné Slovensko	BG - Severen tsentralen	LT - Lietuva	EE - Eesti	PL - Mazowieckie	LV - Latvija	SI - Zahodna Slovenija	PL - Dolnoslaskie	CZ - Jihovýchod	PL – Dolnoslaskie (-0.482)	CZ - Severovýchod
SK - Stredné Slovensko	RO - Nord-Vest	EE - Eesti	LT- Lietuva	RO- Bucuresti-Ilfov	EE - Eesti	ES - Galicia	PL - Wielkopolskie	PL - Mazowieckie	CZ – Jihovýchod (0.018)	IT - Veneto
BG - Yuzhen tsentralen	RO - Sud-Vest Oltenia	BG - Yuzhen tsentralen	LV - Latvija	PL - Łódzkie	SK - Bratislavský kraj	CZ - Moravskoslezsko	PL - Malopolskie	RO - Vest	PL – Wielkopolskie (-0.466)	IT - Friuli-Venezia Giulia
SK - Východné Slovensko	PL- Malopolskie	SK - Západné Slovensko	BG - Yuzhen tsentralen	PL - Wielkopolskie	BG - Yuzhen tsentralen	EE - Eesti	RO - Vest	MT - Malta	PL – Lubuskie (-0.409)	IT - Sardegna
BG - Severen tsentralen	RO - Centru	LV - Latvija	SK - Západné Slovensko	PL - Podkarpackie	PL - Dolnoslaskie	ES - Comunidad de Madrid	RO - Centru	HU - Közép-Magyarország	PL – Zachodniopomorskie (-0.370)	SK - Západné Slovensko

Note: * Nuts 2 substituted with Nuts 1 when indicators were not available at the lowest level

Source: Own calculations based on:

(1), (2), (3), <https://ec.europa.eu/eurostat/data/database>

(4) <https://nicholascharron.wordpress.com/european-quality-of-government-index-eqi/>

(5) https://ec.europa.eu/growth/industry/innovation/facts-figures/scoreboards_en and <http://ec.europa.eu/DocsRoom/documents/31644>

Table 2. Worst performing regions in convergence countries

Compound annual growth Euro/head (1)			Compound annual growth PPS/head (2)			Euro/inhabitant (% EU) (3)			QoG (4)	Relative innovation performance (5)*
2000-9;	2009-16	2000-16	2000-9	2009-16	2000-16	2000-9;	2009-16	2000-16	2017/2010	2017/2009
IT - Umbria	EL – North Aegean	EL - Continental Greece	IT - Umbria	EL – North Aegean	EL - Continental Greece	IT - Piemonte	EL - Attiki	IT - Umbria	IT – Umbria (-1,510)	RO - Sud-Est
IT - Piemonte	EL - Eastern Macedonia and Thrace	EL - Eastern Macedonia and Thrace	IT - Piemonte	EL - Eastern Macedonia and Thrace	EL - Eastern Macedonia and Thrace	IT - Provincia Autonoma di Trento	EL - South Aegean	IT - Lazio	IT - Valle d'Aosta/Vallée d'Aoste (-0.671)	RO - Nord-Est
IT - Emilia-Romagna	EL - Ionian Islands	EL - South Aegean	IT - Emilia-Romagna	EL - Ionian Islands	IT - Umbria	IT - Emilia-Romagna	EL - Ionian Islands	IT - Provincia Autonoma di Trento	IT – Abruzzo (-1.966)	RO - Bucuresti-Ilfov
IT - Veneto	EL- Crete	IT - Umbria	IT - Veneto	EL- Crete	EL - South Aegean	IT - Umbria	EL- Crete	EL - Continental Greece	IT - Provincia Autonoma di Bolzano/Bozen (-0.362)	RO - Nord-Vest
IT - Friuli-Venezia Giulia	EL - Central Macedonia	EL - Ionian Islands	IT - Friuli-Venezia Giulia	EL - Western Greece	EL - Ionian Islands	IT - Veneto	EL – North Aegean	EL - South Aegean	ES – Canarias (-0.709)	PT - Algarve
IT - Provincia Autonoma di Trento	EL - Western Greece	EL - Epirus	IT - Provincia Autonoma di Trento	EL - Central Macedonia	EL - Epirus	IT - Friuli-Venezia Giulia	IT - Lazio	IT - Piemonte	IT – Piemonte (-1.193)	RO - Sud-Vest Oltenia

IT - Basilicata	EL - Attiki	EL - Crete	IT - Basilicata	EL - Attiki	EL - Crete	IT - Basilicata	EL - Continental Greece	IT - Valle d'Aosta/Vallée d'Aoste	EL - Attiki (-1.212)	CY - Cyprus
IT - Puglia	EL - South Aegean	EL - Central Macedonia	IT - Puglia	EL - South Aegean	EL - Central Macedonia	IT - Lombardia	EL - Central Macedonia	IT - Lombardia	ES - Galicia (-0.431)	PT - Área Metropolitana de Lisboa
IT - Abruzzo	EL - Continental Greece	EL - Western Greece	IT - Abruzzo	EL - Continental Greece	IT - Lazio	IT - Abruzzo	EL - Eastern Macedonia and Thrace	IT - Veneto	IT - Marche (-1.379)	RO - Sud-Muntenia
IT - Lombardia	EL - Peloponese	IT - Lazio	IT - Lombardia	EL - Thessaly	EL - Western Greece	IT - Puglia	EL - Western Macedonia	IT - Emilia-Romagna	HU - Észak-Alföld (-1.270)	ES - Comunidad Foral de Navarra
ES - Illes Balears	EL - Thessaly	EL - Peloponese	ES - Illes Balears	EL - Peloponese	IT - Molise	ES - Illes Balears	EL - Western Greece	EL - Ionian Islands	Ro - Nord-Vest (-1.851)	ES- Canarias
IT - Toscana	EL - Epirus	IT - Molise	EL - Continental Greece	EL - Epirus	EL - Peloponese	IT - Toscana	EL - Peloponese	IT - Friuli-Venezia Giulia	IT - Provincia Autonoma di Trento (-0.362)	PL - Swietokrzyskie
IT - Valle d'Aosta/Vallée d'Aoste	EL - Western Macedonia	EL - Thessaly	IT - Toscana	EL - Western Macedonia	IT - Sicilia	IT - Valle d'Aosta/Vallée d'Aoste	EL - Thessaly	ES - Illes Balears	HU - Nyugat-Dunántúl (-1.016)	PL - Opolskie
IT - Campania	CY - Cyprus	EL - North Aegean	IT - Valle d'Aosta/Vallée d'Aoste	CY - Cyprus	EL - Thessaly	IT - Marche	CY - Cyprus	IT - Marche	IT - Liguria (-1.253)	CZ - Strední Čechy
IT - Provincia Autonoma di Bolzano/Bozen	ES - Ciudad Autónoma de Melilla	EL - Western Macedonia	IT - Marche	ES - Ciudad Autónoma de Melilla	IT - Provincia Autonoma di Trento	IT - Campania	EL - Epirus	IT - Molise	HU - Észak-Magyarország (-1.088)	RO - Centru

Note: *Nuts 2 substituted with Nuts 1 when indicators were not available at the lowest level

Source: Own calculations based on:

(1), (2), (3), <https://ec.europa.eu/eurostat/data/database>

(4) <https://nicholascharron.wordpress.com/european-quality-of-government-index-eqi/>

(5) https://ec.europa.eu/growth/industry/innovation/facts-figures/scoreboards_en and <http://ec.europa.eu/DocsRoom/documents/31644>

20. Table 1 and Table 2 present:

- The best and worst performance, measured as compound annual growth and relative position, distinguishing between the pre and post crisis performance of the less-developed regions as well as two indicators available as explanatory variables:
- Changes in Quality of Government and changes in the relative position of the regions in the European Innovation Scoreboard. The tables are not meant to lead to econometric evidence but to point out the winners and losers, thus helping policy makers identify what to imitate and what to avoid. The differentiated performance confirms to a large extent the findings of earlier empirical research: CEEC low income regions grow fast, some of them so spectacularly that they outperformed many of the middle-income regions. Spanish, Italian and Greek regions have been the worst performers. The growth dynamics correlate almost perfectly with the change in Quality of Governance between 2010 and 2017, as it is mostly CEEC regions that outperform the others and notably those that start at lowest income. In both cases β -convergence is obvious, yet some of the best performers continued their improvement both in terms of GDP and quality of governance after reaching a middle level.

21. Conversely, correlation with regional innovation performance is not high. Italian and Greek regions, which were lagging behind, improved their innovation performance quite substantially between 2009 and 2017. At the same time, some of the rapidly growing regions are performing poorly in terms of progress in their innovation performance compared to the European average¹. This lack of correlation may be interpreted in many ways: (a) innovation is not directly correlated with growth, in which case innovation expenditure as a means for regional development should diminish; this is, however difficult to accept given the abundant econometric evidence from other countries; (b) it may be the case that innovation makes only sense after a critical mass is attained; this means that innovation expenditure should increase and concentrate (c) innovation has significant time lags to produce wealth, in which case no major policy changes should be recommended, just patience; (d) some innovation ingredients improve and carry with them the Summary Innovation Index, whereas others, continue to lag suggesting that absorptive capacity is not captured by the metrics; if this is the case then innovation metrics need to become more sophisticated to capture these differences.

22. The most recent Report on Economic, Social and Territorial Cohesion (EC, 2017a) points out that regional disparities are narrowing again after the crisis. During the high growth period of 2000-2008, the big winners, based on the GDP per capita index, were exclusively the formerly planned economies, almost all of them starting low in terms of GDP per head, but many regions have performed spectacularly and have overtaken Southern European regions. The difference becomes more striking and revealing after the crisis, when some of these regions continued to grow, overcame the EU average and avoided the middle-income trap. Prague, Bratislava and Mazovia are the regions with the highest growth, despite starting higher than others after the crisis, reaching an income well above the EU average, as indicated on Table 3:

¹ In some cases, where NUTS2 Summary Innovation Index was not available, we used the NUTS 1 to reflect the performance of the corresponding NUTS2 regions. This did not affect the top and bottom ranking.

Table 3. Changes in GDP per head index 2000-2008 and 2008-2015

(EU average 2000=19800; 2008=26100, 2015=29000)

Changes in GDP 2000-2008: 15-20%			20-25%			>25%		
Central Slovakia (Stredné Slovensko) SK (3400; 9900)			Latvia (Latvija) LV (3600; 11200)			Lithuania LT (3600;10200)		
South East (Sud-Est) RO (1600; 5600)			North West (Nord Vest) RO (1600; 6400)			Estonia EE (4400; 12300)		
South - Muntenia (Sud - Muntenia) RO (1500; 5900)			Western Slovakia (Západné Slovensko) SK (3900; 11600)			Bucharest-Ilfov (Bucuresti - Ilfov) RO (4000;17800)		
South-West Oltenia (Sud-Vest Oltenia) RO (1500; 5200)			Central Hungary (Közép- Magyarország) HU (7800; 17900)			West (Vest) RO (1900; 7800)		
Centre (Centru) RO (1900; 6800)						Southwestern (Yugozapaden) BG (2400; 8300)		
Moravian-Silesian (Moravskoslezsko) CZ (5000; 12900)						Bratislava Region (Bratislavský kraj) SK (9000; 28300)		
						Prague (Praha) CZ (12800; 33700)		
Changes in GDP 2008-2015: 10-15%			15-20%			20-25%		
Pomerania (Pomorskie) PL (9200; 10700)			Greater Poland (Wielkopolskie) PL (10200;12100)			Mazovia (Mazowieckie) PL (14700; 17800)		
Lodz (Łódzkie) PL (8900; 10500)			Lower Silesia (Dolnoslaskie) PL (10400;12500)			Bratislava Region (Bratislavský) SK (28300; 35400)		
Lesser Poland (Malopolskie) PL (8600;10100)								
Silesia (Slaskie) PL (10300; 11600)								
Lithuania LT (10200; 12900)								
South East (Sud-Est) RO (5600; 6900)								
Bucharest-Ilfov (Bucuresti - Ilfov) RO (17800; 19500)								
Western Transdanubia (Nyugat-Dunántúl) HU (10400;12100)								

Source: European Commission, 2017a, based on Table p.13

2.2. The need to go beyond homogeneity of Innovation Policy Mix

23. Historically effective innovation policy proved a crucial factor in turning less-developed and middle-income countries into competitive, resilient economies paving the way for innovation to become a ubiquitous policy agenda. From the strictly Schumpeterian growth theory perspective, it would be expected that countries at different innovation levels would have different policy mixes (Aghion and al, 2013). The available evidence on innovation policy impacts at the national level seems to suggest that a holistic—or systemic—perspective in policy is important (Fagerberg 2016), that sensitivity to context is essential (Flanagan and Uyarra, 2016), and that mechanical transfer of policy practice from one national system to another (without concern for contextual factors) is highly problematic (Edler and Fagerberg, 2017).

24. In a nutshell, innovation policy in less-developed countries/regions constitutes a real challenge, demanding that (often inexperienced) policy makers have to balance potential blunders and design policies on a razor's edge:

- Policy makers do not need to re-invent the wheel and can learn from others, but this learning is only a first step before adapting; mechanistic transfer can prove highly

inappropriate if the environmental conditions and local institutions differ from the model.

- At the same time, while the theory prescribes adaptation it is at least equally important to take distances from path dependencies, as they often lead to lock-ins and prove counter-productive, constituting a transformation hurdle. Instrument-specific evaluations confirm that innovation policy measures that work in some frameworks are inappropriate in others. For instance, evaluations of the effectiveness of tax incentives (Larédo et al., 2016; Mohnen et al., 2017), financial instruments, innovation vouchers and the role of intermediaries are indicative of how differentiated impacts of very similar measures can be.
25. Rather than adopting tailor-made policies, less-developed regions in the EU tend to follow very similar recipes:
- A systematic analysis of the Erawatch and INNO Policy TrendChart initiatives of the European Commission, dating back to 2000, was used to identify the composition of the innovation policy mix per country and across countries and changes in the policy mixes over time. The analysis discovered five approaches followed by the EU Member States, pointing at an unexpected convergence and very slow evolution among the national innovation policy mixes, despite different technological challenges. Although policy learning is helpful, too much convergence of support instruments might undermine the effectiveness of policies. Policy mixes are an outcome of a variety of factors and only one of these is technological distance. Other factors are path dependencies, policy fashions and perceptions of the best practice in innovation policy. Before opting for one or another policy instrument, one has to be sure that the specific country challenge and situation was understood. (Izsak et al. 2014).
 - Another indication of a tendency to concentrate on a few types of policy instruments only, with no or limited adaptation (which in this case probably includes developed countries), arises from the study of the General Block Exemption Regulation (GBER) of the European Commission, which explicitly describes R&I policy measures that are compatible with State Aid rules. In order to avoid delays and complexity, policy makers in the Member States tend to virtually copy the examples given in the GBER, even if they are not the most appropriate components of their own policy mix, instead of experimenting, because this would entail going through a screening and notification process. The rationale behind this de facto “precautionary principle” avoiding any “innovative use” is partly due to the conservative attitude of weak administrations (experimentation is not promoted by policy makers) and partly due to the justified perception that in the real world even the clearest rules are subject to interpretation. Regulatory uncertainties emerge from the treatment of different categories of research aid, depending on how remote the research is from the market. As there are many levels of interaction before an incentive is decided, there are also many layers of interpretation; hence the precautions. While there is neither a survey of policy makers nor systematic analysis by country, indications towards this “precautionary principle” are shown by aggregate statistics: “Total new GBER cases as % of total new cases with reported expenditure amount to 90%” and the corresponding “total GBER cases as % of total cases with reported expenditure rose from 50% in 2010 to 80% in 2016”, indicating that policy makers are reluctant to take initiatives beyond the GBER. One may of course argue that the GBER has developed to encompass almost all

needs of the Member States, but it is also highly unlikely that its unintended impact was to limit new ideas and experimentation.

- As shown in Section 2.4 below even Smart Specialisation Strategies have shown very similar patterns.

2.3. Institutions matter: The role of Effective Government and Social Capital

26. Taking over from sociologists, development economists in the 21st century tend to agree on the role of institutions and the quality of government for economic and sustainable growth (Rodrik et al., 2004, Acemoglu et al. 2012). In the EU, institutional maturity (Hooghe 1996; Smyrl 1997; Bache & Jones 2000; Ederveen et al. 2002) and the potential for local networking (Ansell et al. 1997) were introduced after the first evaluations as key variables determining the potential for convergence.

27. Recent attempts have been made to measure the quality of governance and the role of social capital. Empirical research has investigated their links to regional growth:

- The European Quality of Governance Index (EQI) measures the ‘quality of government’ – understood as low corruption, impartial public services and rule of law – for national and sub-national levels in twenty-seven European Union countries. The index is highly correlated with sub-national levels of socio-economic development and levels of social trust, yet political decentralization is uncorrelated with greater within-country, or higher levels of overall, Quality of Governance. For some countries the index shows notable within-country variations: high-performing regions in Italy and Spain (for example, Bolzano, País Vasco) rank amongst the best European Union regions; others perform well below the European Union average (Charron et al., 2014).
- Rodríguez-Pose, A. and Garcilazo (2015), after examining a total of 169 European regions during the period 1996–2007, underline the importance of government quality, both as a direct determinant of economic growth as well as a moderator of the efficiency of Structural and Cohesion Funds expenditure. When a region receives a level of investment in cohesion and regional development which can be considered more than testimonial, the quality of the local government becomes a vital factor in determining the extent to which a region grows. The analysis finds that both European Union investments targeting regions and quality of government simultaneously make a difference for regional economic growth, but that above a threshold of cohesion expenditure – calculated at more than €120 of cohesion expenditure per capita per year – government quality improvements are a far more important and realistic option for regional development than additional public investment. While greater aggregate growth can be achieved by significantly increasing the cohesion budget, improving government quality is a far more realistic alternative.
- Looking at institutions in a broader sense to include informal rules (North, 1990) Cortinovis et al. (2017) studying 118 European regions in the period 2004–2012, find evidence that institutions, and especially bridging social capital (using proxies from the end of the 20th century and considering them time invariant), matter for regions to diversify into new industries. The results, which are particularly relevant for the success of Smart Specialisation Strategies, suggest that regional institutions relevant for diversification in regions are predominantly informal in character rather than formal, and bridging rather than bonding.

28. In a nutshell, institutions matter: they matter more after an initial level of investments is attained; informal institutions matter more for diversification, making them a crucial element of innovation policy to overcome the middle-income trap.

2.4. First experiences with Smart Specialisation Strategies (SSS or RIS3)

29. The main novelty in the 2014-2020 programming period was the introduction of SSS, in particular the ex-ante conditionality that was imposed on the Member States. The idea of strategic planning was not new at all. The European Commission introduced incentives for longer-term innovation and technology strategies in the less-developed regions as pilots² already in the 1980s followed by successive Regional Innovation Strategies (RIS1 and RIS2). These pioneer strategies shared with SSS the idea of identifying promising, innovation-oriented activities linked to the regional capabilities, leading to higher value-added and increased competitiveness. In terms of governance they shared the leading role entrusted to the business sector. The earlier attempts distinguished themselves from SSS in one major formal requirement: there were to be no strings attached. Based on the subsidiarity principle, the regional authorities, supported through the RTP/RIS initiatives, could use the EU funding for planning, but they were not in any way obliged to respect their own strategic planning. This voluntary approach undermined the credibility of the earlier attempts and therefore representatives of the business sector were less willing to invest the time and put their weight behind the voluntary exercise. In several cases the result was a strategy in favour of public research and intermediaries, which was never fully implemented.

30. The two important legal features of SSS, which make it radically different from the past and make them unique:

- For the first time the agreed Strategy is an ex-ante conditionality (i.e. a formal requirement for agreement between the national/regional authorities with the Commission on the strategy content before releasing EU funds); this puts significant time and quality pressure at the beginning of a programming period. The predecessors could drag on forever with no consequences; delays in SSS adoption have severe consequences.
- The role of the business sector is not simply desirable or recommended, it is mandatory: the entrepreneurial discovery can only come from the market. On top the governance structure ensuring the ex-ante conditionality foresees a formal role for continuous monitoring and evolution.

31. While we have not yet seen detailed evaluations of the SSS strategies, a first impression is that it worked well in regions that already had the right governance and policy in place (and hence needed it least), but less so in the less-developed countries and regions who needed it most. A quick view of the strategies posted by the Southern European Member States at the central repository³ of the JRC indicate 318 priorities reported; 177 of these priorities were described at a very generic level as priorities in advanced manufacturing (3), aerospace (5), 21 agriculture etc. In very few cases there were real examples of smart specialisation: aquaculture was among the priority areas for a few

² Regional Technology Plans (RTP)

³ The central repository of all RIS3 strategies is organized by the Joint Research Centre of the European Commission.

regions, sea-linked cosmetic products, the shoe industry, innovative solutions in logistics, deep sea mining. But these are exceptions not the rule (Tsipouri, 2017).

32. Papers assessing specific SSSs tend to confirm this generic perspective: results are uneven, there is still a tendency to mechanistically imitate advanced countries/regions and remain in traditional interventions. *Less-developed regions face a challenge*: Implementation of RIS3 is proving to be a huge challenge for all concerned, especially for public and private stakeholders. Although there are many examples of good practice examples reported in the RIS3 implementation process, the results to date have been decidedly uneven. In a public consultation exercise designed to gauge the impact of the RIS3 process, respondents were asked about the specific impact on their R&I support systems. Not surprisingly perhaps, respondents from North Western EU countries perceived a bigger impact than those from Mediterranean and Eastern European countries. The institutional context and capacities are major challenges in that respect and so is the need for experimentation, while the actual implementation shows that the experimental nature of RIS3 is stymied by political and administrative requirements of public administration and funding rules (Foray et al., 2017).

33. Two concrete examples show the reluctance to be idiosyncratic and to experiment:

- *Estonia follows Finland*: A number of interesting and similar issues are being experienced by Finland and Estonia in their application of smart specialisation, and indeed their trajectories are looking increasingly similar as the agenda progresses. A comparative paper (Kolehmainen & al., 2015) finds that the two countries are specialising in remarkably similar areas and pursuing surprisingly similar strategies in direct contrast to the central edict of the smart specialisation approach that it will reduce duplication and competition between European regions. The comparative case study has spurred a realisation that the same issues and barriers may be faced by similar countries of a small, weak, and peripheral nature within the EU, and that their needs and experiences could be quite different from their dominant and economically successful neighbours.
- *Better the devil you know*: The 2014-2020 interventions continued in most regions. Main issues concerning RIS3 strategies in Spain lay in a broad inclusion of many priorities and a certain level of "tradition" choosing the policy instruments. In parallel, monitoring systems are designed vaguely (too broad indicators, as well as a lack of a "logic of intervention") and the governance process reflects more an "intention to be" than a "factual reality". However, we consider it to be a very interesting process, where many regional authorities have included some of the key issues that may lead them to progressively improve their policies during the next seven years (del Castillo et al., 2015).

34. In summary: SSS worked well in the regions that needed them less. Less-developed regions complied with the ex-ante conditionality but diluted the essence of the policy, because their routines prevent them from risk and experimentation. With the experience gained, SSS need to evolve and diversify, taking into consideration the lessons from the past and the new challenges which will frame policies in the years to come.

3. Turning to the future

The past performance and the literature conclusions asking for radical changes in regional development policies led to SSS and their ex-ante conditionality. The preliminary evidence suggests that Smart Specialisation Strategies need to rely on the lessons learned and the challenges ahead. For the next programming period the evolution of Smart Specialisation needs to link to the challenges identified by foresight studies, the well-researched key determinants of growth, namely education, research and innovation and last but not least the institutional set up of each region.

3.1. Expected changes described by foresight studies

35. Foresight, as the disciplined exploration of alternative futures, helps make policy makers aware of different potential scenarios in a structured way in order to confront complex challenges and help create a better future. It enables evaluating current policy priorities and potential new policy directions. Its importance obviously rises in times of disruptive technologies, which create threats and opportunities, as they entail significant changes in production and the labour market.

36. The most recent foresight exercise of the European Commission identifies new directions, disruptive technologies and targeted scenarios in the areas (Weber et al., 2018) of:

- Health (e-health solutions including tele-medicine, measuring and transfer of health data; Research on assistive technologies and the impacts of their application; Defeating Communicable Diseases; Effective public health education on communicable diseases, incl. prevention, treatments, hygienic questions, disinfection, human organ replacement breeding of tissues and organs; Precision Medicine Making use of biotechnologies for personalised medicine)
- The Bio-economy (Developing and testing new circular bio-economic processes); Cheap Renewable Energy Methods, Low Carbon Economy Exploitation of new business models for circular economy and promotion of sustainable lifestyles; Material Resource Efficiency; Environmental impact assessment
- ICT-related changes (Continuous Cyberwar Tools for monitoring, evaluation and responding to threats; Ubiquitous Expert Systems Development of better machine-learning algorithms; Emotional Intelligence Online Developing standards and codes of behaviour concerning the use of individuals' emotions for commercial and public purposes; Research and development in cybersecurity, ICT-Based Security and Defence; Understanding the roots causes of security)
- Nano-to-Macro Integral Manufacturing; Understanding the impact of 3D printing on individual health and safety and on the environment, across various industries; Nature Valued Building models for a sustainable circular economy based on renewable resources and renewable energy; Reframing Work Research on new variants of entrepreneurship through collaborative research; Smart Sustainable Mobility Research
- Towards a More Diverse Food Supply System (Understanding and managing systems of sustainable agriculture and aquaculture; Towards a New Knowledge System)

- Adapting educational techniques to online environments, and piloting various solutions (e.g., distributed online courses with tutoring, navigating through the stock of knowledge)
 - Devising intellectual property models and practices in open knowledge systems and experimenting with new forms of IP sharing.
37. In this changing world regional economies will only converge if they succeed in joining the emerging sectors and in strengthening their productivity through R&I.
38. In sectoral terms the emerging paradigms will favour less-developed regions in the case of the more diverse food supply system. Demographics and the rapid economic growth of developing countries will increase demand for agricultural products and food and this will constitute an opportunity for most less-developed regions, where food production is a priority. Conversely, for health, ICT and nano, capabilities need to be developed/strengthened: education (in particular digital skills), research and investments are necessary for attracting investments and joining global value chains.

3.2. Policies for effective education

39. Regional development policies include education and skill development in their agendas. Less-developed regions will have to comply with the needs of the labour market if they want to attract investments. Employment growth in the EU from 2013 to 2025 will be driven by service sector jobs, especially in higher-skilled areas such as professional services, business services and computing. It is anticipated that 3 million new professional jobs will be created, as well as over 5 million new technician and associate professional jobs (CEDEFOP Panorama⁴): STEM, digital and other skills necessary for the platform economy, such as legal and administrative professionals, will be needed. Work transformations are driven by globalisation and technological revolutions, particularly the digital revolution – that is, the shift from mechanical to digital technology. Globalisation has generated gains for some and losses for others. The digital revolution has created new opportunities, but has also given rise to new challenges, such as irregular contracts and short-term work, which are asymmetrically distributed between highly skilled and unskilled workers. In this context it affects education in a dual way: changing the needs for skills and creating new modes of learning.

40. Criticism of the current system abounds: “Building an entrepreneurial Europe also requires us to rethink our education systems. Every year the learning speed of AI goes up by a hundredfold. Yet, we have schools that are still based on the format founded 250 years ago, which follows a factory-line model. It is designed to train an army of administrators, not a nation of innovators. Higher education that is based on examinations by subjects organised in silos do not necessarily get young people to be more entrepreneurial. What is increasingly needed in a world that is becoming more and more automated are people able to work in a collaborative manner, solve complex problems and manage both people and robots. Cognitive skills such as empathy, communication and the ability to connect people, as well as emotional intelligence, are set to play an ever more critical role. In a business environment in which large corporations are trimming down in size and the so-called “gig economy” is expanding, promoting these skills can encourage the entrepreneurship our societies need (Tse et al., 2018)”.

⁴ https://skillspanorama.cedefop.europa.eu/sites/default/files/EUSP_AH_JobCreators_0.pdf

41. In the next decade, education as an element of regional development policies needs modernisation everywhere. However, as systemic changes take a long time and are subject to national rules, regions can primarily focus on the lack of digital skills, which is one of the major drawbacks for productivity gains in developed and developing regions alike. For low-income regions the shortage is exacerbated by the emigration of the few engineers trained in the traditional formal system, who are in high demand in technology hubs. Therefore, any support measures designed to enhance a local ecosystem are endangered by the lack (and related cost increase) of digital skills.

42. Addressing the shortage and challenge of digital strategies can take many forms: increasing the number of students in formal education and vocational training or increase ambitions to scale up and contribute to making the region an attractive target for start-ups and foreign direct investment (a philosophy currently devised in Granada). There are windows of opportunity for the latter. New pedagogical research indicates that the rapid changes in market needs and the rigidities of the formal educational system call for new models of skill enhancement to fill the constantly changing skill gaps. I consider two good practices in that respect, one from France (composed of developed regions but lagging behind in digital skills) and one from Greece, the country with the highest unemployment in the EU presently, see Box 1 and Box 2 respectively. Both are selected because of their links to the market.

Box 1. School 42 for disruptive software engineering education

In the French labour market there was a conviction that the educational system suffers from inertia and makes it difficult to adapt rapidly to the needs of the digital economy. This is not only an issue of the number of STEM graduates but more importantly the way digital skills are taught. The French experiment of School 42 is an example which can inspire new ways of teaching digital skills both in advanced and less-developed regions.

Convinced that education and society are out of synchronisation and the public education system is unable to fill the gap of digital skills, the French billionaire, Xavier Niels, funded an alternative model of peer learning, which teaches not only IT technical skills (algorithms, and networks) but also critical thinking, adaptation and problem solving. After a selection process to detect talent and willingness to learn, students work on hands-on projects, collaboration and mentoring on a 24/7 basis. The duration of the studies, which are completely free of charge, ranges between 1.5 and 5 years depending on the abilities and commitment of the students. No degree or diploma is awarded; only a certificate of attendance. In its 5 years of existence the school has trained 3200 students and feedback from the companies that have hired its graduates is outstanding. The school has also developed an entrepreneurship programme and pre-incubation support. Its success in the French market has attracted interest and its model has been adopted by similar schools in both developed and less-developed regions. Schools outside France are funded by local sources.

Source: <http://www.42.fr/> and interview

Box 2. Alliance of Digital Employability in Greece

The Alliance of Digital Employability in Greece was started during the turbulent crisis years in Athens as a cooperation of a Professional Association and a University. It was a voluntary initiative and the initiators were convinced that the lack of digital skills on the one hand and the abundance of unemployed STEM graduates on the other (driving labour costs down) were not a threat but an opportunity for the local economy, if someone could intervene to correct the mismatch through education and nurturing of high-quality digital skills. They correctly anticipated that once the Alliance was in place, companies would cooperate, provided the quality of graduates was satisfactory and led to a successful public-private partnership. Indeed, in the first years of its existence the initiative was able to ensure an increasing number of cooperation agreements with 234 companies, which is constantly growing.

The partners' synergies are evident: The university and the association ensure the selection and the fast-track training of candidates in high-level digital skills and certify the skills they have acquired. The companies not only support the training activities, but most importantly they give frequent input on specific market gaps and are an active forum, ensuring graduates their access to employment. The initiative started with an ambitious study justifying the endeavour and claims that it can scale up from covering the current Greek manifest gap of 2000 jobs to half a million trainings within a decade in order to help Athens leapfrog in digital investments. The main merit of the exercise is its flexibility, which means low fixed costs and hence viability: the systematic mapping of specific needs of the cooperating companies means quick turnover in curricula, which are not rigid but constantly adapt to emerging and specific employers' needs. Trainers are paid based on the courses needed/offered. This is a feature which a formal educational system cannot offer, therefore leading to the complementarity of the two institutions.

Sources: <https://www.afdemp.org/#pgc-4978-1-0> and <http://www.afdemp.org/wp-content/uploads/2016/06/RESEARCH-EN-final-for-web.pdf>

43. Using ERDF funding as a leverage for creating organisations outside the formal public institutions such as the ones suggested here, is a novel approach to addressing emerging needs and rapidly filling skill gaps in a way in which a rigid formal system cannot. The common elements of these two good practices (and to a large extent the Granada digital strategy) can be summarised in just a few major lessons:

1. It is not the purpose of regional development intervention to be directed towards permanent operational expenditure on education in publicly funded rigid curricula, instead it can be used as an initial nudge towards public-private partnerships for modern, economically sustainable organisations.
2. The quality of the training is one crucial element in the process. Companies are not interested in a formal degree; once the training organisations gain the trust of the market, a certification of attendance and graduation is enough.
3. Flexibility and constant adaptation are in-built in the success stories.
4. The role of the business sector is to guide and hire, not to get funding. A scheme that would directly fund the business sector would attract rent-seeking rather than growth-oriented companies.

5. Funding is, however, an issue. ESIF can be used to promote a similar training logic, when charities or private initiatives are not in place.

3.3. Policies for effective research

44. The influence of the linear model inspired regional development to support research in the 1980's as a basis for enhancing innovation. The first thematic evaluations of the European Commission found that the linear model does not apply. GERD has increased significantly in less-developed regions in Southern Europe without triggering a corresponding growth in either GDP or competitiveness.

45. R&I capabilities are important. In its study on The Specialisation of EU Regions in Fast Growing and Key Enabling Technologies, the JRC (Evangelista et al., 2016) confirms "the very uneven distribution of technological capabilities, with all indicators of technological concentration being much higher than the ones referring to GDP. The level of technological concentration has a spatial dimension with the first four NUTS1 regions accounting for, in most technological fields, between one third and half of all EU patent activities. However, over the last 15 years some degree of technological convergence of the most peripheral and less innovative regions of Europe with respect to more advanced core EU regions has occurred. The evidence presented has shown that this process of spatial re-distribution of the innovation potential of EU regions has a clear sectoral characterisation, being more substantial in the area of ICT and Electrical Engineering technologies. However, the analysis has also shown that at the end of the period taken into account in this study (2008-11), technological gaps in the EU area have remained substantial, suggesting that the overall process of convergence has been rather slow, and below expectations and the EU cohesion policy targets. Furthermore, the process of economic convergence (GDP per capita) has been much weaker than technological convergence, which raises a series of issues and policy concerns regarding possible causes and remedies for these asymmetric dynamics".

46. Research continues to be a priority in regional funding but, using lessons from the past, a shift has occurred from individual support to networks and clusters and from academic research to business research. This focus can have two different tiers of ambition:

- Supporting local research teams to produce results that can be used by local businesses. This will most likely lead to incremental rather than radical innovations. While such a research policy enhances productivity, it is unlikely to lead to persistently above average performance and leap frogging.
- Governments may wish to upgrade the level of local R&D activity and support higher scientific complexity (Amsden et al. 2003). Over a longer period of time, more ambitious policies can create research capabilities which act as a pole of attraction for new investments, upgrading and upscaling the indigenous system.

47. Policies can, through research capabilities, contribute to an improving sectoral composition of less-developed regions. As described in Box 3 Ireland has been a prominent example of turning the research system into an element of growth at a time in which the country was a low-income region.

Box 3. The Irish model of making R&D a pole of attraction

The way Ireland has become a pole of attraction for high-tech FDI is related to its firm decision to improve R&I governance. Ireland is the most striking example of a country that improved its GDP and research performance, making it to the top tier of the EU. Since the end of the 20th century, it has heavily invested in supporting research capabilities and continues to do so. The interesting story of Ireland is that it all started with an exogenous incentive, the Chuck Feeney – Atlantic Philanthropies, who challenged the Irish Government to get their act together regarding third level research and infrastructure. The condition for matching Ireland’s public funds in the case of the Programme of Research in Third Level Institutions (PRTLTI) was to ensure focus and cooperation. PRTLTI, which started in 1998 through a charity grant, aimed at facilitating Irish institutions to produce world class research in areas such as science, technology, humanities and the social sciences through a combination of capital funding for infrastructure and recurrent funding for the development of human capital, including graduate programmes for the training of increased numbers of PhDs. Selection criteria obliged HEIs to focus on few areas, promote excellence in research carried out by institutions rather than by specific faculties or individuals and ensure multi-actor cooperation. There have been five cycles of awards under PRTLTI with a strong emphasis on knowledge transfer and innovation which support key areas of economic development such as medical technologies, food and drink, pharma/biopharma, ICT, energy and environment, engineering, social sciences and humanities, physics and chemistry.

Source: <https://ec.europa.eu/growth/tools-databases/regional-innovation-monitor/support-measure/programme-research-third-level-institutions-prtli-0>

48. Horizontal backing to R&D has failed to create vibrant economies in many sectors but careful data analysis shows that in many peripheral regions one can identify “Pockets of Scientific Excellence”, which have been created, to a large extent, thanks to EU funding (both regional and R&D support). The term Pockets of Excellence is coined for excellent team creation in business, but can be borrowed for regional development purposes, if a smaller geographical area outperforms the national or regional average. Pockets of Excellence are then local or regional research or innovation eco-systems, in regions/countries with an overall weaker R&D system. However, while regions dispose of Scientific Pockets of Excellence, they may be disconnected from the local business activities. In this case additional support to break through and spill over the benefits of excellence to the entire region makes sense. Smart Specialisation would be expected to build on Pockets of Excellence (RISE 2017d).

49. An opportunity for increasing research in less-developed regions comes with the emphasis on synergies between regional support and the R&I Framework Programmes (now Horizon Europe). This constitutes an opening to combine regional needs with the target of excellence. The adoption of the Spreading Excellence and Widening Participation Part facilitates, through Teaming, Twinning and ERA Chairs, the integration of less-developed systems with developed research systems, laying the foundations for broader cooperation. The need for synergies and complementarities between EU funds for R&I has been increasingly highlighted at a political level and the European Commission is simplifying the regulatory framework to eliminate barriers to synergies. All less-developed regions would benefit from active design of synergies and an appreciation of the “Cost of

no-synergies” (European Commission, 2018). See Box 4 for an example of approach to finding and exploring synergies in Slovenia.

Box 4. Making synergies an integral part of national R&D strategy

In Slovenia, synergies between national, ESIF and FP funds are firmly embedded in the Slovenian research and innovation system. National Research and Innovation Strategy of Slovenia (RISS) 2011-2020, adopted by the Slovenian National Assembly in 2011, states that these funds should be used in synergy and mandated the Government to prepare a document detailing ‘synergic use of diverse sources for strengthening of research and development system’ (RISS, action 25). Following this policy orientation, the Decree on the use of European Cohesion Policy funds in the Republic of Slovenia in the 2014–2020 Programming Period for the "Investment for Growth and Jobs”, article 27, provides the basis for the implementation of a synergy between FP and ESIF. According to this, if a project is selected at the EU level, and it allows the complementation funding at the state level, the managing authority shall treat this operation as a matter of priority and treat the operation as if the decision to support it has already been issued. In addition to the co-funding of the Seal of excellence projects (form ESIF), Slovenia also decided to approach the synergies on a systemic level. To this end, the Government of Slovenia established a working group with the EIT Climate KIC in order to elaborate and implement a systemic synergy between EIT - KIC horizontal mechanisms and the regional national ones. The mandate of the working group is to explore options and possibilities of synergies between Slovenian policy instruments, mostly financed through ESIF and KIC Climate ones, and the ones by EIT KIC and to prepare proposals on how to integrate the activities of both parties to foster a better functioning of the national and transnational research and innovation ecosystem.

Source: MLE 2018a

50. In a nutshell, as with education, research policies can become ambitious, if research is focused and branded to attract attention to the regional capabilities. Conventional policies are necessary but not sufficient conditions. Policies can investigate the possibility of long-term support to Pockets of Excellence with strings attached, plus exploiting synergies with Horizon Europe in combination with the next generation of Smart Specialisation Strategies.

3.4. Policies for entrepreneurship and innovation

51. Economic reforms and austerity have diminished the resources available for public investments. If local companies are to become more productive and globally competitive in the next programming period, the size of private investments will be the key variable. In lagging regions there are few large firms; the overwhelming majority are SMEs and micro-enterprises, often offering non-tradable products and services.

52. Foreign direct investment (FDI) was initially considered to be the silver bullet but it worked only in a minority of less-developed regions, where its availability in quantitative and qualitative terms created a critical mass that helped transform the economy. In most other regions the share and type of FDI has been insufficient to renew the local productive tissue. This does not mean that the FDI target should be abandoned, but policy makers need to know its needs and limitations. Endogenous development may often prove a more

worthwhile policy, increasing local investments, linking them to global value chains and making the region more attractive for FDI. Higher investments of incumbents (large or small firms) envisaging expansion and/or productivity growth and the creation of new companies, in particular technology and export-oriented firms, can contribute to transforming local economies.

53. Investments need capital, human resources and technology. They need them cumulatively. One of the major mistakes in development policy is supporting only part of the equation: grants or tax incentives alone do not lead to competitive companies; investing in human resources with no demand for qualified labour leads to brain drain; supporting research and technology without complementing them with capital and human resources ends up with cathedrals in the desert. The whole system must function in favour of investments in a coordinated way. The conventional tools (grants, tax incentives, cluster development etc.) alone have proven insufficient to make a change. Conversely, a mix composed of the development of regional ecosystems and linking them globally, through exports of GVCs can make a difference.

3.4.1. Attracting foreign investments and access to Global Value Chains

54. The globalization of innovation, production and trade has fuelled the growth of industrial capabilities in a wide range of developing countries. So has the vertical disintegration of transnational corporations, which are redefining their core competencies to focus on innovation and product strategy, marketing, and the highest value-added segments of manufacturing and services. Together, these two shifts have laid the groundwork for a variety of network forms of governance situated between arm's length markets on the one hand, and large vertically integrated corporations on the other (Gereffi et al., 2005). In the “new industrial age” with economic, societal and environmental transformations and technological breakthroughs that occur at fast pace (e.g. robotics, Internet of Things, artificial intelligence) the integration of industry in global value chains opens windows of opportunity for regions endowed with capabilities that attract multinationals. Driven by multinationals in the pursuit of increased efficiency, international production is increasingly organised within global value chains (GVCs) in which the production process spans several countries.

55. Recent desk research and empirical investigations of the EU Joint Research Centre have tried to summarise the factors attracting investments by the top R&D performers (Ciriaci et. al, 2016) and has concluded that both product market regulation (PMR) and employment protection legislation (EPL) significantly affect the location decisions of top R&D investors, as well as red tape and tax on profits. The cost of starting a business and profit tax show lower marginal effects. Moreover, the study found that (i) PMR and EPL are complementary (i.e. reducing one would also reduce the negative impact of the other) and (ii) of the three components of the PMR indicator —barriers to trade and investment, state control and barriers to entrepreneurship—the latter is the one with the lowest marginal effect. The World Economic Forum has stressed the problems of Europe as a pole of attraction of FDI, focusing on the rigidity of labour laws in some of the countries.

56. The emergence of global value chains constitutes an opportunity for lagging regions. Low-labour cost regions are attractive for manufacturing activities while highly-skilled, low-labour cost may also attract investments in R&D and design. The high value intangible capital remains concentrated on advanced regions. Overall, a complex picture emerges whereby technology and globalisation can be positively or negatively related to employment growth and skill formation, depending on the type of GVC participation and

on technology development and adoption. Allowing the benefits from globalisation to materialise to a greater extent and to be distributed more equitably thus requires countries to activate or step up actions in multiple policy-making areas in a coordinated fashion. Education and life-long learning represent fundamental areas of intervention, as they empower pupils and workers with the ability to integrate into the labour market and to transition successfully between jobs (when needed). Well-functioning labour market institutions are important to enhance the reallocation of the labour force. Active labour market policies coupled with workers' training and the design of suitable social protection mechanisms can help improve the match between workers and firms and allow for smoother transitions both between occupations and sectors, and between self-employment and salaried employment. Finally, innovation is important for job creation. Supporting the creation and diffusion of knowledge calls for new approaches to science, technology and innovation policies, as well as for the removal of existing barriers to firm entry and for the need to re-think competition policy (OECD, 2016a). Experience from successful upgrading in East Asia suggests that “establishing a mix of policies conducive for investments in intangible assets – including through balanced IP policies – should be a key priority. In addition, governments can play a constructive role in identifying pre-existing industrial capabilities – often at the level of sub-regions – and leveraging them by removing constraints on entrepreneurial activity. In doing so, it is important to adopt a global value chain perspective as the opportunities and challenges of local entrepreneurs evolve with global market trends” (WIPO, 2017).

57. Access to global value chains has is complementary to agglomeration economies (Rodríguez-Pose & Fratesi, 2002) and more effective than sticking to the benefits of clusters alone. However, the difficulty is that peripheral regions find it extremely difficult to capture a share of regional value from wider production chains whose scope and focus of control is largely beyond their reach (Yeung, 2000; Benneworth and Hospers, 2007; Vang, Chaminade, & Coenen, 2007). Eichengreen et al., (2013 see Spain, Portugal, and Greece as having difficulties in climbing the product quality ladder and in exporting high-tech products, which caused them to fall into the middle-income trap and experience severe growth (Tsipouri, 2017).

58. Ireland is a prominent example of successful policies for attracting FDI and joining GVCs. Since the '60s, Ireland has constantly pursued an attractive FDI policy entrusted to a highly skilled, autonomous agency, adapting and reinvesting strategies as the country crossed the middle-income trap. The first stage of low taxation in the beginning was followed by creating a vibrant academic community and highly-skilled labour force plus incentives to connect to indigenous SMEs and now the policy focuses on attracting high value-added investment and “continue winning investments and see the benefits flow as widely as possible in economic terms throughout Ireland (IDA, 2015.)”. It has taken over 50 years for Ireland to achieve this status but eventually it worked.

59. CEECs are following a different path, which proves faster but needs to be persistently pursued to avoid stagnation, as explained in Box 5.

Box 5. Succeeding in attracting FDI and joining value chains

The Central and Eastern European countries have, in two decades, become deeply integrated into the global economy. Their skilled and relatively cheap labor force, a fairly stable economic and political environment, reinforced by the accession to the EU, have been the most important factors affecting the inflow of foreign direct investment (FDI). Infrastructure and appropriate governmental incentives have reinforced the favourable market situation. In addition, the labor laws in the V4 countries (the Czech Republic, Slovakia, Hungary and Poland) have been more flexible and the power of trade unions is relatively weak.

The Czech Republic belongs among the most globalized countries in the world in terms of trade and FDI flows. Since the transition, it has captured the largest amount of FDI among the transitioning countries in the CEE region. FDI represented an important source of capital, and supplements finance for ownership structure and capital formation. The crisis had a limited impact in time; in 2012, FDI inflows returned to almost as high a level as before the crisis. This was achieved by labour and product market regulation, and since 1998, a program of incentives aiming to target potential investors in the country's preferred industries and geographical locations.

Responding to the finding that most of the R&D located in the CEE countries is routine research, whereas key R&D functions remain in the home countries of foreign TNCs, policies in the Czech Republic are engaged in upgrading the local contribution to GVCs through improving education and research capabilities. For example, strategic R&D can be found in Škoda Auto or Visteon Autopal following one of the conditions of the acquisition of Škoda; namely to keep the R&D in-house.

Education also plays a crucial role in this matter. Trends indicate a constantly increasing share of expenditure on education relative to GDP. The crisis did not negatively impact public expenditure on educational institutions. At the same time the total amount of R&D expenditure in absolute terms has increased three times since 2000. To improve linkages the government approved a new law on income tax for the purposes of technical education and contract research, which facilitates purchasing research activities from public research institutions

Source: Vlckova et al. (2015)

60. In essence, regions can invest to become attractive to FDI or get orders from multinational companies to join their value chains if they are in a position to demonstrate technical and organisational capabilities. Building them up will help both indigenous investments and will upgrade their image in the global economy. While some of the key attractions for FDI are determined at the national level (labour and competition law), regions can differentiate themselves through the quality of research, education, additional financial incentives and good local negotiation skills.

3.4.2. Supporting SMEs, tech start-ups and creating ecosystems

61. The world overall is becoming more entrepreneurial. Start-ups are booming everywhere from the US to China inspired by the Silicon Valley model. Hubs for innovative start-ups have emerged in the EU and most Member States, including less-developed regions, have at least a few success stories to tell about successful start-ups.

Making Europe more entrepreneurial has another benefit: it can likely help reduce inequality and improve inclusion. At the moment, many good jobs often go to the more privileged. Given the right conditions, people from all backgrounds – natives and immigrants alike – can start their own businesses, hence enabling themselves to ascend on the economic and social ladders (Tse et al., 2018).

62. A whole range of theories has developed around the enabling environment for successful start-ups: industrial districts, policy-enabled networks, clusters, innovative milieux, innovation systems and related variety to name a few (Porter, 1990; Morgan 2007; Becattini 1991; Asheim et al. 2011) are suggested as the origin or the policy success stories for endogenous development. In all these cases it is the interaction between the actors that matter, not the creation/existence of the actors themselves. Policy makers followed these ideas, giving incentives for the creation of support structures and intermediaries who would support incumbent SMEs, facilitate the creation of start-ups and help the most successful among them to scale-up.

63. Not all interventions in this direction were successful. The lack of absorptive capacity was addressed primarily through the creation of intermediaries expected to generate research results, which would spill over automatically. Policies were conceived to address “organizational thinness” (Tödling et al. 2005) via a variety of innovation agencies. They have emerged (and mushroomed) when R&I became a priority of regional funding. Their role was to address significant systemic failures. They constituted a wide diversity of specific organisations, established or supported by regional authorities, with the purpose to care for companies’ needs for innovation. Their proliferation and occasional deviation from their original mission led to “an urgent need to optimise a system that has, in most cases, grown in a somewhat anarchic way, lacking strategic governance. In many regions, both individual and collective effectiveness was then put into question” (Nauwelaers, 2011). There is still no tendency to optimise. All less-developed regions have used funds to create Science and Technology Parks, Incubators, Accelerators and other type of intermediaries. Meanwhile there are also many NGOs supporting start-ups, some of them created by successful entrepreneurs within or outside the country. There is no evidence of any systematic benchmarking of their operations, while their mushrooming may hide a rent-seeking behaviour.

64. New companies with growth potential do not grow in isolation and publicly-supported intermediaries are not sufficient to create an Entrepreneurial Ecosystem. While there is no agreed common definition of entrepreneurial ecosystems (EE), the term is widely used to denote “a set of interdependent actors and factors coordinated in such a way that they enable productive entrepreneurship”. Framework conditions, physical conditions and systemic conditions characterise each system and its success or failure (Stam 2015). The EE literature is closely connected to the Innovation System literature but puts more (or for that matter all) emphasis on the role of the entrepreneur(s). And it also stresses the geographical dimension because “geography matters to entrepreneurship as most support structures are organized spatially and personal networking is geographically concentrated even though non-local ties are also important” (Johannisson, 2000). But, while the EE literature is gaining momentum and attracting the interest of policy-making, the concept still suffers from shortcomings in terms of analytical framework and its embeddedness in space and time. This is expected to improve with more theoretical and empirical research (Alvedalen and Boshma, 2017).

65. The focus on entrepreneurial ecosystems starts with ground-breaking work in the 1980s (Birch, 1979 and 1987), indicating that regional development may be better served

with new and small firm creation diverting from the traditional approach (Stam, 2015) favouring large (mainly inward) investments. This idea was then further qualified showing that it is not any kind of new firms, but only a rather narrow group of ambitious entrepreneurs which drives local economic growth (Wong et al., 2005; Stam et al., 2009, 2011). These ambitious entrepreneurs are more likely to achieve substantial firm growth, innovation or internationalization than the “average” entrepreneur. As many of them diversify rapidly into export markets, they started being named “born-global” entrepreneurs (European Foundation, 2012). Ambitious, born-global entrepreneurs are a special kind of Schumpeterian entrepreneur (Schumpeter, 1934) and it does not come as a surprise that their emergence has attracted the attention of policy makers, in particular after identifying that this type of entrepreneur arises everywhere but concentrates and (spectacularly) succeeds in a few regions only.

66. This recognition of the importance of ambitious entrepreneurship has triggered a transition in policy attention, from pushing up the quantity of entrepreneurship, i.e. new firms and self-employment to pushing up the quality of entrepreneurship, i.e. growth and innovation-oriented entrepreneurship (Stam, 2015). In such a context, the economic rationale for policy intervention went beyond market failure: externalities and agglomeration economies are the cornerstone of new economic geography, which sees in cooperation and competition a promising way to increase productivity and competitiveness at the local level. In other words, the problem is not the market itself but the inability of the individual actors to interact and create a system. The notion of system failure (Edquist et al. 1999) started to prevail.

67. The entrepreneurial ecosystem literature has been gaining momentum, in particular thanks to the academic insights attributing significantly higher wealth creation in regions with a rich ecosystem. The issue is equally attractive in policy circles and the entrepreneurial ecosystem approach has since developed in the 21st century. In reality, there are no metrics to measure whether a region (or for that matter other levels of geographic agglomeration) earns the name of an EE. The density of relationships, the propensity to innovate, competitiveness and economic performance are indicators of the existence of an EE but there are no thresholds or combinations of indicators to denote whether an ecosystem exists or not, let alone to what extent it is entrepreneurial. In Europe the creation of Pockets of Excellence (Section 3.3) are considered as the foundations of an EE. Box 6 presents the Slovenian case fostering the creation of an EE.

Box 6. From individual support actors to an Ecosystem: The Slovenian Start-Up Initiative

Slovenia had a number of different intermediaries and strategies with ambitious goals. A change in the landscape was made by the formation of a Start-up Initiative, a network of several dedicated partners with a clear objective to implement what was prescribed in a Start-up Manifest, which had set specific, measurable goals. The idea of the Start-up Initiative was that all the relevant stakeholders should cooperate and contribute; from the governmental institutions to knowledge institutions, enterprises and other subjects of the innovative environment. Members of the network include Venture Factory and Technology Park Ljubljana as the lead partners, two more technology parks (Primorska and Pomurje), two incubators and a research centre on ICT. The Ministry of Economic Development and Technology, SPIRIT and Slovene Enterprise Fund are public members of the Initiative, while as many as 15 different types of institutions are ecosystem partners. They include venture capital funds, accelerators, business angles, etc.

The ambition of the partners in Start-up Initiative is to cover the whole spectrum of support activities, from help in developing the initial idea and turning it into a business proposal, to establishing an enterprise and finding appropriate forms of financial support for a particular stage of the enterprise. The cooperation of a wide range of complementary partners has resulted in an effective support system.

Source: https://www.startup.si/doc/Start-up-Manifest_SI.pdf and interviews

68. Access to capital is a special component for business success and an integral part of a flourishing ecosystem. Although it is not a sufficient condition, it is still a necessary condition for regional growth. The shortage of risk capital and diversity of funding sources hampers the creation of innovative young firms. Ireland has been a pioneer in organising a venture capital market from scratch in the '90s. See Box 7 for the Irish example creating a VC market.

69. During the 2007-2013 programming period, the EIB JEREMIE pilot offered EU Member States, through their national or regional Managing Authorities, the opportunity to use part of their EU Structural Funds to finance SMEs in a more efficient and sustainable way. JEREMIE's financial resources have been deployed through selected financial intermediaries across the EU, which have provided loans, equity and guarantees to SMEs⁵. Greece has benefitted substantially from the application of JEREMIE as a co-funding instrument for Venture Capital: it has triggered the nucleus of a start-up ecosystem, since new VC firms were created and the prospect of funding, as well as initial success stories of acquisitions, has mobilised a community of young entrepreneurs.

Regional policy has started intervening for the creation of VC markets in less-developed regions through the introduction of Financial Instruments which have been gaining momentum over the years. EU funding for financial instruments has increased considerably, rising from €1 billion in 2000-2006 to €11.5 billion allocated in 2007-2013 through the European Regional Development Fund (ERDF). Financial instruments played a crucial role in providing funding to SMEs during the credit crunch of the economic crisis – helping many firms to stay in business. Financial instruments appear as a tool more likely to break path dependencies than others: “As emerged from interviews with Managing

⁵<http://eib.org/products/blending/jeremie/index.htm>

Authorities, the list of instruments selected for each programme is the result of the combination of the lessons learned in the past about ‘what worked well’ in the territory and of the need to adapt and improve the implementation of past interventions. In general, notwithstanding a certain path dependency, a willingness to adopt new modus operandi was observable. This was particularly clear in the use of financial instruments and more generally on repayable aid.

Box 7. Creating a VC market in Ireland

In 1991, when Ireland was still a less-favored region and there was no VC market, the government created a public Equity Fund for co-investment. The government would typically invest around 300000 Euros seed capital in a minority position, only rarely going to second round. The government has a seat on the board but in general it does not exercise its rights. Co-funding and export orientation are prerequisites for the fund’s participation. The support includes not only funding, but also support for their internationalization through government overseas offices.

The scheme has been very successful with two criteria: (a) Local economic growth: Over the years approximately 2.500 companies were funded, which have in their majority contributed to increasing production. There are hardly any IPOs but there were many exits through acquisition. Many of the portfolio companies were acquired by MNCs which either already had a presence in Ireland, or used the acquisition as a vehicle for inward investment. Most of the companies acquired continued to operate in Ireland and were in many cases upgraded. (b) The incentive acted as a catalyst, without in the long term absorbing public resources; on the contrary it generated more funds than the initial contribution of the public budget.

The growth of the economy increased both demand and supply for the scheme. Equity shares from the government are diminishing and startups tend to exit fast because of exit pressure by the private VC funds or because the owners are interested in cash generation. A policy refocus of the scheme management now, in addition to the original features, is to support the companies by trying to demonstrate the advantage of staying longer and exiting after five years; efforts to attract global corporate investors interested in supporting and possibly acquiring Irish startups and efforts to attract global VC.

Source: Interview in Enterprise Ireland

70. To continue to support SMEs and Managing Authorities, the EIF has proposed to the Member States to extend existing JEREMIE agreements. Under the new 2014-2020 programming period, the EIF is currently assessing market needs across EU Member States and Regions to plan the deployment of the second generation of the European Structural & Financial Instruments (ESIF) and design investment solutions through standardised funding agreements and partnerships with national agencies⁶. Box 8 presents a Polish initiative for SME funding.

⁶ <http://eib.org/products/blending/jeremie/index.htm>

71.

Box 8. SME funding in Poland

The ‘Technological Credit’ instrument delivered under the Polish OP ‘Innovative Economy’ by providing grants in combination with loans granted by commercial banks, attempted to spread awareness and experience in the delivery of financial instruments, both among beneficiary SMEs and financial intermediaries, with a view to progressively replacing traditional grant support during the 2014-2020 programming period”.

Source: European Commission (2016b)

72. The rapid globalisation has also been seen as an opportunity for capable and ambitious start-ups from less-developed regions. There is an increasing number of SMEs which fill the gaps of their local ecosystem or the limited size of local market with early internationalisation. There are many support schemes helping start-ups and SMEs to export, but no explicit studies or policy reporting on encouraging internationalisation in other ways, such as re-locating activities to mature ecosystems in order to allow them to fill gaps in funding and specialised services.

73. Overall, the lessons drawn for promoting innovation rather than research may be summarised into:

- Ensure cooperation of all actors involved in creating ecosystems envisaging high impact and avoiding support to non-performing intermediaries
- Good policy schemes are incentives and as such, they help when exercising minimum control and maximum support, as in the case of the Irish VC scheme.
- Good policy schemes have to adapt constantly to both success and failure: In Slovenia, the failure led to a new scheme for coordination, in Ireland, the success led to new ideas on how to support companies and how to ensure the economy did not limit their ambitions.
- Experimenting is good, for example, testing new schemes, supporting internationalisation, investigating demand-side schemes, supporting non-technological innovation etc.

3.5. Opportunities from Digital Strategies

74. The digital economy has the potential to enhance productivity, income and social well-being. It is creating job opportunities in new markets and increasing employment in existing ones. It also improves administrative capabilities contributing to investment enabling environments. On the other hand, digital technologies also expose some workers to the risk of unemployment or lower wages. In addition, they enable changes in the organisation of work, with implications for the capability of existing policies and programmes to ensure labour market inclusion, job quality and skills development.

75. To reap the benefits of the adoption of digital technologies, governments, businesses, trade unions and academia will need to address new economic and labour market challenges. The process of structural change fuelled by the digital economy may lead to significant disruption in the labour market and new Internet-enabled business

models affect the organisation of work and the effectiveness of existing labour market programmes and policies (OECD, 2016a).

76. In the context of the Digital Single Market and the Growth aspects of the Single Market Strategy, the European Commission has introduced incentives and tools to support Member States and regions to accelerate their pace towards digital transformation. This includes tearing down regulatory walls, broadband infrastructure, strategic development for Smart⁷ and Digital⁸ Cities, individual projects as well as a Digital Education Action Plan (see Box 9 for the Estonian example implementing a digital strategy). Countries and regions are in the process of preparing for the transformation of their economies to adapt to digital challenges and opportunities, albeit at different paces. The most costly and ambitious steps towards digital transformation; namely infrastructure and regulation constitute in most Member States, national responsibility, but there are sufficient degrees of freedom for regions and cities to exploit opportunities and enter early on in the digital transformation process, taking initiatives to positively distinguish themselves. They can use both own resources and, in the spirit of synergies, exploit the opportunities offered by EU support to prepare and implement their digital strategies.

⁷ In Smart Cities, digital technologies translate into better public services for citizens, better use of resources and less impact on the environment.

⁸ The Digital Cities Challenge focuses more on growth, namely businesses, workers, and entrepreneurs.

Box 9. The Estonian example of a national digital strategy

Estonia is the model country-region, which has progressed systematically throughout the 21st century reaching 65% of the EU average GDP per capita in PPS, partly thanks to its early adoption of a long-term ambitious, innovative digital strategy. Estonia's post-communist transformation has been marked by several parallel processes, such as democratization, economic liberalization and the rise of consumerism. The rapid transition to the information society began with governmental initiatives to develop various areas of societal life through the introduction of new technologies, but soon made its presence felt in people's everyday lives (P Runnel and Pruulmann-Vengerfeldt 2009). eGovernment in Estonia started as a long-term, large effort developing a functional architecture that formed the basis of hundreds of services that have been created over the years. A wide range of service portals, environments and frameworks have been developed including a special citizens web portal with db-services (award Finalist 2003), the Estonian ID-card (over 50% of Estonian population already has an electronic ID-card) with PKI technology for identification, authorization and digital signature; web portals offer almost 500 different eServices from different Estonian central and local governments are available to the general public, civil servants and entrepreneurs alike. Citizen and entrepreneurs benefit immensely from this fully integrated system, as they do not need to fill out long applications (all their data is included in the system), civil servants are freed up from inputting the data from paper documents or checking data on different databases, while the system is also a good example how the state has simplified the payment system.

Since the 1990s, Estonia has made remarkable successes in information society development. The main factors that have made such developments possible include the economic factors, active role of the public sector, technological competency, and socio-cultural factors. Telecommunications and banking sectors were the cornerstones of Estonian information society developments; they were also behind major initiatives dedicated to computer training and awareness raising. Activities of the public sector have been also crucial in providing favourable legislative environment, but also in launching infrastructural projects and in implementing innovative e-services. Public sector developments have been strongly influenced by some non-governmental organisations. ICT skills and R&D competencies, a lot of which was from Soviet inheritance, have been also crucial (Kalvet 2007). A special case is the digital technologies used for e-residency. E-residency or 'virtual residency' is an initiative of the Estonian government which gives foreigners global access to Estonian e-services via state-issued digital identity. We explore the ways in which the ideas of the 'virtual state' and 'virtual residency' have been employed for purposes of nation branding and national reputation management (Tamppuu & al., 2018), which may help attracting investments and incorporating start-ups.

Estonia's e-school system is preparing a future generation that will be more capable and techsavvy than ever. The use of digital technology has enabled Estonia to come top in the EU member states ranking in the OECD's programme for international student assessment (PISA). According to the PISA (2015), a premier global metric for education compiled by the OECD, the results of 15-year-old Estonians are the best in Europe and among the strongest in the entire world.

Source: https://ec.europa.eu/commission/sites/beta-political/files/reflection-paper-globalisation_en.pdf

77. Cities are considered the best unit to adopt digital strategies and spread their benefits. Smart cities are, as expected, concentrated in advanced countries⁹ but in CEECs and Southern Europe middle-sized cities have started adopting and embracing digital agendas. Ljubljana, Maribor, Zagreb, Tartu, Pamplona, Plzen, Valladolid, Usti Nad Labem, Coimbra, Nitra, Rzeszow and Ovieda rank among the top 50 medium-sized European metropolitan cities¹⁰ demonstrating that early transformation is both feasible and rewarding.

78. There is a whole range of opportunities for both regions and cities by the EU supporting the development of infrastructure (Connecting Europe Broadband Fund) exchanging good practices, funding, strategy development and individual projects. Interreg, Horizon 2020, initiatives for improving digital competences (European Commission, 2018b), strategy supporting initiatives by DG CONNECT and DG GROW are offered going beyond the regional funding quotas. They are organised through calls for proposals and administrative units (regions or municipalities), research teams and businesses apply individually or in networks. The result is that in most regions projects exploiting digital opportunities have been undertaken, most of them as pilots. There are also Smart City and Digital City strategies supported by the European Commission. Most of these pilots and strategies are uncoordinated, limiting synergies and long-term benefits.

79. Better governance for the design and implementation of digital strategies at the regional level is an issue for regions and cities to investigate for the next programming period. Borrowing the idea of the *Seal of Excellence* created for synergies between R&D and regional funding, one may create a *Seal of Maturity* for digital strategies. Under such an instrument, regional strategies which have been peer reviewed at EU level can be adopted by regional and local authorities and help speed up ESIF absorption and coordinate the digital transformation. There is a double benefit to such an approach:

- exploiting the high-quality preparatory phase at the EU level leading to maturity and thus speeding up implementation, which in many regions is a drawback
- addressing the problem of often insufficient coordination between national and regional administrations, if the strategic plans are in a position to clarify what the degrees of freedom of the regions are already at their conception phase.

3.6. Improving institutions to strengthen innovation policy

80. Transformative innovation policy requires effective institutions. When a region receives a level of investment in cohesion and regional development which can be considered more than testimonial, the quality of the local government becomes a vital factor in determining the extent to which a region grows (Rodriguez-Pose et al., 2015). As pointed out in Section 2.2, the regions with the most significant improvements in quality of government, in the period under study, are CEEC regions, with some of them having surpassed many western regions, measured by their average GDP per head. Countries facing convergence challenges need to enhance the resilience of their economic structures by improving the relevant institutions and governance.

81. Innovation policy, like any policy, would ideally need appropriate changes in both formal rules and routines, but encompassing change is cumbersome, takes time and is not

⁹ <http://europedirect-cityofathens.gr/?p=657>

¹⁰ http://www.smart-cities.eu/download/smart_cities_final_report.pdf

free of set-backs and failures. As the concept of “institutions” is extremely wide, it is helpful to clarify its content and metrics before discussing the expected direction of change:

- The broad concept: as suggested by Nobel Laureate, Douglass North, Institutions are composed of formal rules, informal constraints and characteristics of enforcing those constraints. While formal rules can be changed overnight informal constraints change very slowly (North, 1992). Nobel Laureate, Oliver Williamson tried to conceptualise the levels of institutions demonstrating that ensuring the appropriate incentives alignment is a continuous process, but for it to be effective, higher levels of institutions, i.e. governance structures, and formal rules such as judiciary and bureaucracy and informal rules, are to be aligned with lower levels, i.e. governance structures and incentives (Williamson, 2000). So, in theoretical terms, the problem of innovation policy for less-developed regions is that while all efforts for incentives (the lower level) are in place, the formal and informal rules are still not aligned.
- In the past the European Commission has devised a common scheme (the Managing Authorities) and earmarked funds for *Technical Assistance* to help regions systematise and improve the timely and efficient absorption of ESIF. These efforts addressed micro-management¹¹, which, as suggested in the business literature, may have a negative connotation, mainly due to the fact that it shows a lack of freedom in the workplace. It corresponds to the lower levels of Williamson’s typology. While public funds need to be controlled for transparency and accountability, micromanagement creates additional layers of bureaucracy that risk annulling its benefits. Better institutions need improvements in formal and informal rules fighting resistance to change. This takes time and is not always at the discretion of the region.
- Formal rules are adopted at the national level by an overwhelming majority. However, as demonstrated by the regional variation in several less-developed countries, there are significant degrees of freedom and the distance between the top and the lowest region within the same country can be very great (Charron et al., 2018). Member States can improve formal rules, but regions can complement and improve them. In the best available current measurement effort of the Quality of Government institutional quality is defined as a multi-dimensional concept consisting of high impartiality and quality of public service delivery, along with low corruption. Since the theory suggests that there are difficulties in addressing the higher layers of institutions, the issue raised for effective innovation policy is how regions can improve institutions in the short and medium term. While impartiality and corruption are beyond any doubt crucial for long-term wellbeing, they need to be addressed at the national level; the quality of delivery is the sub-set which is easier addressed by regional authorities.

82. Despite the above constraints in institutions and their metrics, innovation policy at Member State and regional level can improve their policies within the margins allowed by path dependence of informal rules in a number of ways.

83. *In-depth coordination of ESIF absorption with national and regional policies:* While a formal level of coordination exists, a major focus of the strategies in the current

¹¹ Management especially with excessive control or attention on details Merriam-Webster's Online Dictionary

programming period was to break down silos between various administrative bodies and improve multi-level governance (European Commission, 2017c). Policy realms are difficult to tear down, and regional autonomy is often not endowed with the necessary means to exercise effective policies. Coordination is complex and multilayered. Strong political commitment at the highest level is the best way to ensure coordination. This helps only if the commitment is real, otherwise it may end up doing more harm than good. Not surprisingly, Poland, the best performer in growth, is also a model for policy coordination. See Box 10 for examples of institutional reforms in Poland enhancing policy coordination. The challenge for the next period is to further improve this coordination with formal rules, which will be meticulously enforced so that they lead to new routines.

Box 10. Polish institutional reforms

Decentralization reform in 1999 gave regional self-governments full responsibility for economic development of the regions. Stability of staff involved in managing EU funds is one of the fundamental factors for a better absorption process. One of the factors that contributed to a better absorption of EU funds in Poland was that the Ministry of Regional Development coordinated all Community money. All OP runs through this ministry. The use of public-private partnerships (PPPs) in building an effective public employment system, removing the risks of politicization of the civil service and clarifying the distribution of competencies between regions, districts and municipalities were measures which were taken in order to improve the effectiveness of the multi-level governance framework and regional development policy¹².

In Poland, the main area of ESI Funds support to the institutional capacity is e-administration and e-public services. The issues are addressed by the sectoral programme Digital Poland (at a national level), as well as by regional programmes. The share of CSRs/structural challenges which mobilised ESI Funds is zero in the Netherlands and Germany, while it is 100% in Denmark, Latvia and Poland. In Poland the OP Technical Assistance is used to address the issue of institutional capacity (European Commission, 2018c).

Regional policy in Poland targets the right challenges and has made substantial progress in terms of institutional co-ordination..... supporting accountability, at all levels of government and monitoring the performance of regional as well as sectoral policies (OECD, 2008). In February 2016 the Council of Ministers adopted the Plan for Responsible Development with the aim of enhancing the efficiency of the state. It calls for a cross-ministry co-ordination of economic activity, unification of each of the government's IT, procurement and human resources management strategies, inter-ministerial mobility and goals-based management (OECD, 2016b).

84. *Ensure the inclusive design of innovation policy:* In all innovation policy design, be it preparatory work for the Partnership Agreement and Operational Programmes, or Smart Specialisation Strategies, less-developed regions have adopted the stakeholder participation process. These are, however, often unbalanced. Two areas need improvement: (a) Organised interests and incumbents have better access to policy making than start-ups, young researchers or traditional SMEs. This may be a barrier to innovation favouring the status quo. (b) Stakeholders are not always sufficiently prepared for addressing the essence

¹² https://www.academia.edu/6304215/Poland_Best_practices_case_in_EU_funds_absorption

of the instruments discussed; when this is the case, they tend to repeat stereotypes rather than contribute to challenging debates.

85. *Make sure the targets pursued are clear: Targets (Goals) Must Be Less Than or Equal to Instruments.* Following Jan Tinbergen, the number of goals a policymaker can pursue can be no greater than the number of instruments the policymaker can control. The case of the Greek seed capital grants asking i.a. for a certification of unemployment in the application demonstrates that it is not innovation but social policy they have been pursuing. Start-ups are likely to succeed when founded by people coming up with an idea in the context of their professional experience not by the unemployed. Both start-up support and unemployment allowances are important, but they need different instruments to be effectively addressed.

86. *Make sure the targets pursued are monitored and evaluated:* Significant progress has been made over the years in organising systematic monitoring and evaluations, as well as setting result and impact indicators. This process is not welcome at the level of Operational Programme design. Policy makers shy away from setting quantitative targets and tend to select the simplest indicators possible. Addressing institutional progress is a way to simplify bureaucracy and create trust, diminishing the drive for excellent researchers and dynamic entrepreneurs to migrate. Comparing simple indicators on applications and auditing procedures, such as the size of applications (including required certificates), time to contract and time to first/last payment, can help Member State and regions to benchmark themselves and understand their strengths and weaknesses. Besides, regions may set targets for improving their overall institutional readiness, measuring their own improvements in terms of setting targets of improvement in the QoG survey's questions pertinent for their work, namely "asked to pay a bribe for public service", "Paid a bribe for public service" or measure their own performance on "speed of decision making" and "unnecessary bureaucratic requests" with dedicated surveys.

87. *Train policy makers to face new and increasing challenges:* Developing effective innovation policies is a demanding task, which requires a deep understanding of the context, e.g. the national innovation system, into which the policies are introduced. This entails capabilities among policy-makers that cannot be taken for granted but need to be nurtured. Therefore, a major challenge for innovation policy in the years to come will be to increase the capabilities of policy-makers and other stakeholders involved in innovation policy-making. Rather than imitating successful set ups, they will need to learn to adopt three concrete new rules of the game and be rewarded for this :

1. Experimenting with instruments appropriate for their specific needs. Roosevelt's quote, "The country needs, and unless I mistake its temper, the country demands bold persistent experimentation. It is common sense to take a method and try it. If it fails, admit it frankly and try another. But above all try something" is appropriate.
2. Make innovation policy selective: SSS emphasised and tried to impose selection but less-developed regions were reluctant to focus. In the next programming period the narrow focus can be further narrowed and made more ambitious for a negotiated share of ESIF. By allowing regions to keep a share for spreading thin and leaving some room for path dependencies, it may be easier to convince policy makers to adopt change in SS-Flagship projects.
3. Good innovation policy has to respect the needs of companies primarily: This means in particular, reliability, speed and bureaucracy limited to the necessary minimum. National or regional accounting rules may need revision, and time to

contract, as well as time for the final payment have to be strictly respected. The subsidiarity principle makes it difficult for the European Commission to intervene in this respect, but benchmarking of such rules, (in the sense of an open method of coordination) with clear targets and monitoring mechanisms, can offer some pressure for progress.

88. There is nothing fundamentally new in these suggestions for institutional improvements. Already, during the previous programming periods and through the introduction of the SSS, the Commission has tried to address some of the institutional weaknesses indicated above and has made gradual improvements. The challenge is to make sure that national and regional bureaucracies do not circumvent the formal rules due to time pressure or lobbying for continuity.

89. On a positive note, the timing seems to be good for institutional change. The technological challenges identified by foresights, combined with the austerity policies dominating in Europe, are now probably framing a “sensemaking” process, as described by Borrás and Seabrooke (2015). They argue that success comes from how people *make sense of their institutions when they are placed under stress*. When institutional frameworks are challenged, a range of agents engaged in sensemaking processes that invoke certain identities on 'who we are', contain normative claims about 'how things should be', and involve strategies on 'how to get there'. Sensemaking about the future and the past is crucial to institutional competitiveness and includes prospective and retrospective points of departure, as well as focusing on developing abstract causes of change or replicating success from previous experience. If this is the case, the moment for institutional changes is now appropriate to escape from the four dangerous tendencies seen in many innovation policy studies, as described by Flanagan & Uyarra (2016): “idealising policy rationales and policy-makers; treating policies as tools from a toolbox; putting too much faith in coordination and intelligent design of ‘policy mixes’; and taking an a-temporal approach to innovation policy”. Fighting against these dangerous tendencies means facing path dependence and beginning to break away from the past.

90. Evidence from the past, amplified by the current challenges, suggests that the time is right for less-developed regions to pursue convergence more actively in the next programming period and to do it with a more diversified set of tools: we have experience, the business cycle favours convergence, there are new technological opportunities and people are exiting the crisis with the will for change. To exploit these opportunities, there is a need for innovation policy to become more ambitious, to take more risks and to experiment, because policies which have failed to transform regions through the past decades may be equally, if not more, unsuitable for the future.

4. Conclusions and Suggestions

91. Evidence from the past, amplified by the current challenges, suggests that the time is right for less-developed regions to pursue convergence more actively in the next programming period and to do it with a more diversified set of tools: we have experience, the business cycle favours convergence, there are new technological opportunities and people are exiting the crisis with the will for change. To exploit these opportunities, there is a need for innovation policy to become more ambitious, to take more risks and to experiment, because policies which have failed to transform regions through the past decades may be equally, if not more, unsuitable for the future.

92. One of the major mistakes in development policy is supporting only part of the innovation equation: grants or tax incentives alone do not lead to competitive companies; investing in human resources with no demand for qualified labour leads to brain drain; supporting research and technology without complementing them with capital and human resources ends up in cathedrals in the desert. In the future, the whole system, or at least part of the system, must be functioning in favour of productive investments in a coordinated way. This is not an easy task. Designing innovation policy in less-developed regions is very challenging in several ways: human capital and institutional abilities are limited; they need to balance learning from advanced countries and at the same time adapt to their idiosyncrasies; they are careful to maintain their limited productive activities, and, at the same time, they should be forward looking and not locked-in. Externally guided strategies can work, if the regions take ownership and the new formal rules lead to transforming routines; otherwise resistance to change will lead them to bend rules and diminish their effectiveness.

93. Summarising the findings and trends of the past: until now, the policy mix adopted was more homogenous than idiosyncratic problems and challenges would justify. Quality of governance matters and, after a critical mass of expenditure, government quality improvements are far more important than additional public investment. Institutions, in particular informal rules and routines also matter for diversifying into new industries. Innovation needs to be coordinated and create entire systems rather than individual success stories. Human capital development needs to, if not modify, at least complement formal education with novel public-private partnerships adapting to the current market needs. All this affects the way SSS are to be addressed in less-developed regions in the future, in a spirit of selectivity, diversity and experimentation.

94. Before turning to concrete suggestions, I use a double typology, one for regions and one for policies, to help position recommendations for the future.

95. While there are some common elements in all convergence regions, the data point towards four categories:

1. Top performers, i.e. capital cities of the EU-12, which grew rapidly and outperformed the EU average, thanks to FDI, joining GVCs, pioneering some institutional change and investing in innovation.
2. Low-income high-growth CEEC regions, as well as few Southern regions, which have increased their GDP per head relative to the EU average but are still well below the EU average; these regions are lacking absorptive capacity, innovation infrastructure and their EQI is lower than their respective national average.

3. Regions stuck in the middle-income trap; this is the case particularly in the Southern regions which grew rapidly during the boom at the beginning of the century but declined significantly during the great recession.
 4. Low-income and low-growth regions benefitting from low labour cost and expected to start catching up, thanks to conditional convergence. The main problem of these regions is a vicious circle of low competitiveness and weak institutions. Their easy way out, when asked to adopt ambitious strategies is more an "intention to be" than a "factual reality".
96. At the same time, policies can be classified into two extremes, with the real world being somewhere between the two:
1. Strategic, dynamic approaches, focusing on coordinated efforts targeting real change; in this case, policies serve their purpose as leverage for development. These are the policy mixes that were followed by Ireland in the case of the PRTL and the Slovenian Start-Up Initiative. This also reflects the concept and intervention logic of the Smart Specialisation Strategies.
 2. Uncoordinated, smaller scale, path-dependent interventions. In this case, interventions may be effective and result-oriented, but they may also be designed by change-averse incumbents and attract rent-seeking applicants, interested in their own internal agendas and operations and not in long-term impacts. The myopic justification for such policies is that such schemes and approaches help absorption.
97. In between the two there is a third type of policy, which I consider rewarding and appropriate for all types of regions:
3. Experimenting with novel, riskier but more rewarding schemes, such as the educational schemes suggested above, the Czech income tax for improving academia-business linkages, the Polish Technological Credit, the idea of a Seal of Maturity for digital strategies, demand-side policies, non-technological innovation, supporting local start-ups to link globally. These are only indicative cases which are not appropriate for all regions. They are simply used as examples of the potential to go beyond repeating the same, or very similar, instruments from one period to the next.
98. The conclusions and recommendations per policy are ideal types summarised as follows:
99. *Education*: Labour markets call for broad educational reforms, but this goes beyond the reach of ESIF and has only a long-term impact. Top performers will need to engage in broader and ambitious reforms to continue their upward trends and so will middle-income-trapped regions. What regional intervention can do very effectively for all regions and already with medium-term impact is ***shift from supporting conventional training courses organised by public organisations to encouraging organisations that have (or target) alliances with the business sector*** and have (or target building) a reputation that will ensure employment for their graduates. Both shorter courses for unemployed graduates and full courses can work, as long as the curricula are adapted to labour market needs. Leveraging charity funds is an avenue to explore. Graduates being hired in the business sector is a condition for continuing to support each scheme. If not, support must be immediately discontinued.
100. *Research and Innovation*: One can assume that small-scale, conventional schemes which serve incumbents are the rule in low-income, low-growth regions. Top performers

need to raise ambitions and take the risk of concentrating resources following the SSS philosophy. All but the low-income low-growth regions can engage in creating eco-systems and supporting start-ups, with the target of creating well-performing companies, a small number of gazelles, or even unicorns, and both incremental and radical innovations. Innovation policies are not a direct scheme to reduce unemployment, but they lead to new employments if appropriately implemented. Top-performers and middle-income countries can focus their innovation policies on their upgrading in global value chains, whereas the low-income low-growth countries will have to address the lack of absorptive capacity. They are also the regions more likely to benefit from synergies with Horizon Europe, which can then be incorporated into their strategic planning; in all cases, reinforcing the (existing or potential) Pockets of Excellence will nurture competitiveness. Financial instruments and other ways of matching public with private funds prove less costly and is more effective for ecosystem creation.

101. It is also high time to turn the rhetoric of “avoid policy homogeneity and encourage/reward experimentation” into practice. Additional *incentives can be given to schemes not tested before in a region*, such as demand side policies, special support to Pockets of Excellence, linking ESIF support to synergies with H2020, energy, climate change and other EU policies. It goes without saying that new interventions need to be well-documented with their underlying intervention logic. The more ambitious they are, the higher the incentives. A by-product of such an approach would be triggering changes in informal rules (risk-averse policies).

102. *Digital Strategies*: All regions will need to engage in ensuring the basic infrastructure, invest in digital education and create synergies by exploiting the benefits offered by the incentives for creating Digital and Smart Strategies. A combination of strategic documents or successful pilots with ESIF can speed up the digital transformation and increase the pace of fund absorption through an equivalent to the Seal of Excellence (e.g. a *Seal of Maturity*). Top performers can learn from the Estonian example and go all the way towards a fully digitised economy and society.

103. *Improving institutions*: The first steps for improving institutions is by addressing formal rules, namely legislation and coordination. Both have already been addressed to a large extent in the past, however, the effectiveness of coordination mechanisms and laws depends on the extent to which informal rules and routines adapt: the regions where resistance to change is highest are those that ultimately do not benefit from strategy design and ambitious interventions. This is also where the SSS stumbled. Politicians preferred to maintain a high level of satisfaction in their constituencies, policy makers favoured the instruments they knew best, and the entrepreneurial discovery process of the business sector occasionally gave rise to path-dependent selections. In most led-developed regions, changing gear to high ambitions can apparently only occur more slowly than the theory would expect. This is why one may try, in the next programming and adaptation of SSS, to recommend 1-2 *Smart Specialisation Flagships*: While maintaining and expanding to TO3 the SS Strategies for the regions willing and able to fully comply, regions unwilling to commit TO1 and 2 resources to SSS, could be offered the chance to select 1-2 flagships and maintain part of their budget for thinly spread support (which they do in any case when selecting overbroad priorities for their SSS). The Flagships, benefitting from more support, would be expected to mobilise the business sector and be more easily adopted by the regional administrations.

104. If we cross the suggested interventions with the types of regions suggested above, one may prioritise certain suggestions by type of region (while all of them are expected to respect the general direction suggested above):

	High Growth	Low Growth
High income	Winning CEEC regions (capital cities in particular) can continue with their SSS, adopt ambitious novel education schemes and experiment with innovation support schemes used by the EU innovation leaders and followers but adapted to their own systems. Upgrading the position of their business sector in GVCs is a priority; Ireland constitutes an excellent example for that. Their institutional capabilities can improve by benchmarking their effectiveness and improving micro-management.	There is an element of fatalism in being stuck in the middle-income trap, which has to be overcome. These regions can raise their ambitions by prioritising their support on Pockets of Excellence, implementing SSS as well as SS-Flagships, Smart City and Digital City Strategies. They can experiment with new types of interventions. Monitoring and evaluation of intermediaries' support needs to become more effective and eliminate rent-seeking agents as well as reinforce stakeholders beyond the incumbents.
Low income	These are regions risk reaching a middle-income trap in the next programming period, unless they change their policy mix. At the same time, they are the regions with the highest likelihood of leap-frogging, if they address all the gaps in their emerging innovation systems simultaneously: creating ecosystems, improving their research capabilities and accessing GVCs.	These are the most problematic, institutionally weakest regions. They can use SS-Flagships rather than SSS across the board to help ownership and institutional change. Non-technological innovation support and access to GVC, even if in low value-added positions can also trigger some initial transformation. Improving micromanagement and absorptive capacity is their priority.

105. Final remarks are addressed to the role of the European Commission and are designed to help all types of regions:

- Measurements for both innovation performance and institutional set-up need further improvements: the current metrics have allowed us to come up with typologies and correlations which have improved our knowledge, but refined indicators on absorptive capacity in EIS, on micromanagement and on benchmarking delivery mechanisms in EQI will help further policy differentiation.
- Reinforce public-private partnerships in more areas: Education, research and innovation policies bear more fruit when they couple public intervention with the private sector via co-funding and streamlining of demand and supply. One approach to investigate is to mobilise private, non-profit foundations, not by funding them through ESIF, but by aligning targets.
- Accounting rules at both national and regional level need to be simplified and streamlined with the EU audits. In cooperation with the CSR the Commission can help significantly reduce the bureaucracy at national/regional level.

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