European Commission

JRC SCIENCE FOR POLICY REPORT

Promoting innovation in transition countries

A trajectory for smart specialisation

Alexander Kleibrink
Philippe Larédo
Stefan Philipp

2017

Joint Research Centre

EUR 28638 EN

Contact information
Name: Dr Alexander Kleibrink
Address: Joint Research Centre, C/ Inca Garcilaso 3, 41092 Seville, Spain
Email: Alexander.KLEIBRINK@ec.europa.eu
Tel. +34 954488484

JRC Science Hub
https://ec.europa.eu/jrc

JRC106260

EUR 28638 EN

PDF	ISBN 978-92-79-69344-1	ISSN 1831-9424	doi:10.2760/988830
Print	ISBN 978-92-79-69343-4	ISSN 1018-5593	doi:10.2760/611468

Luxembourg: Publications Office of the European Union, 2017

How to cite this report: Kleibrink, A., Larédo, P. and Philipp, S., *Promoting innovation in transition countries: A trajectory for smart specialisation*, EUR 28638 EN, European Union, 2017, doi:10.2760/988830

Title Promoting innovation in transition countries: A trajectory for smart specialisation

Abstract
Innovation policies seek to prepare an economy for the future by steering it on a transformation path to make it more competitive in increasingly global and interconnected markets. While most advanced economies have a tradition of strategymaking for territorially based innovation and economic development, transition countries moving from centralised unaccountable planning to decentralised democratic policymaking have no working, market-based practices to build on. Governments in such contexts often resort to mimicking the economic priorities and instruments of advanced countries. We suggest a trajectory for transition countries to avoid the widespread pitfall of poorly defined innovation policies by upgrading and changing their industrial polices in line with the ideas embedded in the concept of innovation strategies for smart specialisation (RIS3): (1) Build a trusted 'competence centre' to provide a comprehensive analysis of your economic fabric and coordinate the process; (2) Begin with one strong economic domain in which engaged stakeholders work together with government bodies to define joint priorities and actions (domain experimentation); (3) Start with one region to experiment with different approaches at subnational level (territorial experimentation); (4) Sequence your process in a way you can harvest the low-hanging fruits in the short-term (non-R & D measures), focus on the core of your activities with high potential in the medium term, and leave R & D-heavy breakthrough programmes for the longer term.

Contents

Acknowledgements

This policy brief is a deliverable for the FP7 project Danube-INCO.NET, a strategic high-level coordination and support action for the EU Strategy for the Danube Region and its Priority Areas for Knowledge Society and Competitiveness. The authors gratefully acknowledge the comments received from JRC staff members from Unit B3 working on Territorial Development and the quality reviewer Christian Hartmann from JOANNEUM RESEARCH. We also thank the experts and participants contributing to the policy roundtable 'Which role for science in smart specialisation?' that took place at the Open Evaluation Conference in Vienna on 25 November 2016.

Authors

Alexander Kleibrink, Joint Research Centre, European Commission

Philippe Larédo, Université Paris Est Marne la Vallée (IFRIS) and University of Manchester (MIOIR)

Stefan Philipp, Centre for Social Innovation

Executive summary

Innovation policies seek to prepare an economy for the future by steering it on a transformation path to make it more competitive in increasingly global and interconnected markets. While most advanced economies have a tradition of strategymaking for territorially based innovation and economic development, transition countries moving from centralised unaccountable planning to decentralised democratic policymaking have no working, market-based practices to build on. Governments in such contexts often resort to mimicking the economic priorities and instruments of advanced countries. We suggest a trajectory for transition countries to avoid the widespread pitfall of poorly defined innovation policies by upgrading and changing their industrial polices in line with the ideas embedded in the concept of innovation strategies for smart specialisation (RIS3): (1) Build a trusted 'competence centre' to provide a comprehensive analysis of your economic fabric and coordinate the process; (2) Begin with one strong economic domain in which engaged stakeholders work together with government bodies to define joint priorities and actions (domain experimentation); (3) Start with a capable region to experiment different approaches at subnational level (territorial experimentation); (4) Sequence your process in a way you can harvest the low-hanging fruit in the short-term (non-R & D measures), focus on the core of your activities with high potential in the medium term, and leave R & D-heavy breakthrough programmes for the longer term.

Policy context

Smart specialisation is a European approach to foster knowledge-intensive development, a central element of the Europe 2020 strategy for smart, sustainable and inclusive growth. It requires national and regional administrations to identify, through a transparent 'entrepreneurial process of discovery', the innovative domains that have most potential for growth and to establish these as clear priorities for public investment. Since 2013, over 200 smart specialisation strategies have been developed, mostly at regional level, across the EU. The Smart Specialisation Platform was established at the Joint Research Centre, the European Commission's in-house science and knowledge service, with the main objective of advising and supporting regional and national authorities tasked with coordinating the process.

At the same time, the European Commission has identified regional development, competitiveness and smart specialisation as key areas for joint support activities in enlargement and neighbourhood countries. The regulation outlining pre-accession funding clearly mentions smart specialisation as a thematic priority for assistance to

enlargement countries ([1]). In a recent Joint Staff Working Document for the Eastern Partnership, the European Commission, together with the European External Action Service and the representatives of the six partner countries, agreed on having at least one partner government commit to starting a full-fledged RIS3 process in 2017 and formally adopting a new innovation strategy by 2020 ([2]).

Main findings

To be able to meaningfully start a comprehensive innovation strategy and stakeholder process, governments need to first understand where their economies stand and how they arrived at their current economic fabric. Every time this diagnosis is done, new discoveries can emerge about the evolution of economic sectors, their linkages, and subnational or regional variety. This exercise has also shown that economic potential does not only lie in high-tech manufacturing or established research and development (R & D); rather a broader definition is more appropriate, given the overall importance of services, and of combining new activities with existing traditional sectors to upgrade to higher value added. Smart specialisation is a strategy process to identify and prioritise new domains based on the current economic fabric with a strong involvement of stakeholder groups.

Transition countries are driven to remodel and drastically reform their socioeconomic and political systems at the same time. Governments in such contexts often resort to mimicking the economic priorities and instruments of advanced countries. In turn, this alienates the policies from the economic reality on the ground, resulting in an increasing gap between wrongly defined policy agendas and their implementation.

We see four major aspects to address: a better knowledge of the socioeconomic fabric is an important precondition for identifying key domains on which to focus effort ([3]). Identifying key domains and defining the policy instruments that can support them are the objectives of this strategic endeavour. This requires the design of an adequate governance structure, build-up of administrative capacities and the coordination with stakeholders. Progressive and iterative efforts are needed to accumulate experience and trigger policy learning. This is why we suggest four complementary options, which taken

([1]) European Parliament and Council of the EU, Regulation 231/2014 establishing an Instrument for Pre-accession Assistance (IPA II) (2014).

([2]) European Commission and European External Action Service, Joint Staff Working Document, Eastern Partnership: Focusing on Key Priorities and Deliverables, SWD(2016) 467 final (2016).

([3]) Rodrik, D. and Hausmann, R., 'Self-Discovery in a Development Strategy for El Salvador', *Economia* 6, No 1 (2005): 86.

together build a trajectory for smart specialisation and economic transformation ([4]). Getting the process itself right is at least as important as the final outcome of the strategy process:

Option 1: Build a 'competence centre' to manage the process of learning and strategymaking. This team, freed from political considerations to the extent possible, prepares the full evidence needed for an innovation strategy and its implementation. Professionals from diaspora networks can contribute to this centre. Political support, important to start and manage the process, is obtained through inter-ministerial working groups and high-level R & I councils.

Option 2: Begin with a pilot on a well-developed economic domain with willing and capable stakeholders to experiment with different approaches for defining the fine-grained sub-areas of prioritised domains and designing ways to mobilise the right stakeholders (domain experimentation). Showing the effects smart specialisation had in the EU can trigger greater interest among stakeholders, who are often eager to engage provided governments provide credible incentives.

Option 3: Take the 'experimental approach' from smart specialisation and apply it in one capable and interested region that would help set the approach for other ones, enabling a cumulative process over time to overcome the lack of data about the situation on the ground (territorial experimentation). Regional administrations enjoy sometimes greater trust from stakeholders than national ones.

Option 4: Take existing activities as a starting point and develop a 3-phase process that sequences and prioritises measures. Start with small-scale activities and projects, while following the broader principles of smart specialisation. Experimental approaches, by definition, can fail. Given the limited public resources in most transition countries, 'low-hanging fruit' are a viable way to start. Sunset clauses are useful mechanisms to assess progress of experimental new measures and projects, while limiting costs of failure.

Related and future JRC work

Since 1999, JRC has been providing scientific and technical support to countries on the road towards EU membership, new Member States and countries associated to the EU Framework Programme for Research and Innovation. Smart specialisation has become a key element of these activities, supporting bottom-up processes focused on regional development and economic transformation. Until 2018, JRC is conducting a pilot project to build capacities for participatory and evidence-based processes in Serbia, Moldova and

([4]) Foray, D., *Smart Specialisation: Opportunities and Challenges for Regional Innovation Policy* (Abingdon; New York: Routledge, 2015), 86.

Ukraine. Insights from this pilot can provide critical input for designing and implementing innovation policies for smart specialisation in emerging economies and less developed countries more generally.

Quick guide

The report begins by outlining the relationship between industrial and innovation policy: both share the goal of transforming the economic structure but differ regarding the means to achieve this. In a second step, the lessons learnt from two decades of regional innovation initiatives in Europe underscore the importance of initial phases. Success is highly contingent on a precise idea of a region's endowments and on appropriate solutions to tackle properly identified issues. Thirdly, we present the main novelties smart specialisation entails. Finding new opportunities and prioritising new domains constitutes a discovery process that requires a strong involvement of multiple stakeholders. It is an interactive process as opposed to traditional planning processes. Fourthly, we discuss the implications for transition economies. Structural change in these countries has meant drastic changes of the economic fabric's composition through harsh de-industrialisation, the emergence of a large services sector and associated shifts in employment. All this had repercussions on sectoral productivity, trade and specialisation patterns and the attempts to link to global value chains. The report concludes with four options for a trajectory for smart specialisation. A competence centre to manage the process and ensure a methodologically sound process is a key component of this trajectory.

1 Industrial and innovation policies: Same goals, different means

Innovation policies, similar to industrial plans in the past, seek to prepare an economy for the future by steering it on a transformation path to make it more competitive in increasingly global and interconnected markets. To be able to meaningfully start a comprehensive strategy and stakeholder process for this, governments need to first understand where their economies stand and how they arrived at their current economic fabric. Every time this diagnosis is done, new discoveries can emerge about the evolution of economic sectors, their linkages, and subnational or regional variety. This exercise has also shown that economic potential does not only lie in high-tech manufacturing or established research and development (R & D); rather a broader definition is more appropriate, given the overall importance of services, and of combining new activities with existing traditional sectors to upgrade to higher value added. Smart specialisation is a strategy process to identify and prioritise new domains based on the current economic fabric with a strong involvement of stakeholder groups.

Academic authors as well as policymakers have used different terminologies to speak of the same objective: making national industries more competitive so that they create employment, wealth and well-being. This was already the objective of post-WWII classical industrial policies that addressed economic sectors. One approach was to build 'technical centres' for the manufacturing firms to enhance their capability to project themselves into the future — what we now label foresight and roadmapping — and to improve the ability of firms to absorb new technologies. This holds true especially for new production technologies, e.g. new materials or electronic components. Progressively preparing new products and processes became an activity in itself, encapsulated in the terms of R & D and later innovation. OECD was instrumental in this move both in pushing for specific policies but also for measuring investments made by countries — with the famous Frascati and later Oslo manuals. OECD documents are also a good mirror of three evolutions: we moved from '*politique scientifique et technique*' to 'science and technology policy', then to 'science, technology and innovation policy', which was synthesised in the 2000s in the idea of 'innovation policy' or in recent policy documents phrased as 'research and innovation policy' (R & I).

Similarly, the portfolio of instruments that could be mobilised enlarged. The Compendium for Innovation Policy mirrors this expansion ([5]). Direct support to individual firm projects has always been an important component of public policies. Today this is often delegated to a professional agency or development bank. Many governments complement direct

([5]) http://www.innovation-policy.org.uk/compendium (accessed 2 April 2017).

support with fiscal policies such as research tax credits so that firms take their own risks. As evidence showed that technology absorption by firms was difficult without those firms participating in its creation, collaborative programmes became another important tool, especially for large firms. *Centres de ressources technologiques* were created to intermediate between knowledge producers and small and medium-sized enterprises (SMEs). The former were more mobilised by national governments and the EU, whereas the latter were mostly developed at regional level. Since the beginning of R & I policies, an important aspect has been the promise of new industries borne by breakthrough and frontier science. The large programmes in the 1960s and 1970s organised public efforts to create new industries in nuclear energy, civil aeronautics and space. Many scholars analysing these programmes in OECD countries considered that this was no longer an adequate policy and that policies should support the creation of 'new technology-based' or 'start-up' firms, also called spin-out firms when coming from university. This became widely adopted and supported by a rich portfolio of instruments, ranging from incubators, science parks and *technopoles* to supporting the risk capital industry. The shift started at the beginning of the 1980s and became prevalent in the 1990s. Academic work has shown that only in exceptional cases do such firms become new large enterprises like Apple or Microsoft. They mostly remain small to medium sized or provide new market opportunities for large existing firms that buy them.

The 2000s have witnessed three major evolutions in our understanding of innovation and in corresponding policies that today build the core of R & I policies:

1. The rediscovery of the importance of framework conditions that help in building a friendly environment for innovation. This covers four main dimensions. The oldest of policy interventions is intellectual property rights originating in the 18th century. Standards build a second critical dimension not only for safety issues but also as a major tool to shape and harmonise markets. Third, recent work has highlighted the increasing importance of procurement policies: in 2007, public procurement was estimated at 16 % of the combined EU GDP, a figure that demonstrates the catalytic role it can play in the development of new products ([6]). As procurement is widely distributed, R & I policy becomes thus de facto a multi-level policy whose principles are decided at the national level, while its implementation depends mostly on regional and local authorities. Some analysts consider human capital a fourth critical framework condition, highlighting the contribution of education and training policies to innovation.

([6]) Edler J. and Georghiou, L., 'Public Procurement and Innovation: Resurrecting the Demand Side', *Research Policy*, No 36 (2007), 949-963.

2. In the 1990s and early 2000s, governments rather retracted from sectoral policies. In the predominant view of that time, focusing on sectors or 'sectoral innovation systems' was considered very difficult to implement given that most economic sectors reach beyond administrative borders, value chains are becoming increasingly international if not global, and innovation is becoming increasingly 'open', mobilising actors from multiple countries, domains and organisations. Recent debates on the 'entrepreneurial state' indicate a return to sector-based policy development — albeit in different shape. Sectoral policies now are linked to collective initiatives of various actors — such as those associated at European level to technology platforms; and they tend to be more narrowly targeted toward transforming sectors. Modern sectoral policies no longer focus mainly on manufacturing industries. They also include knowledge-intensive business services as well as culture — from museums to games, tourism or services more broadly speaking.
3. The third major evolution is largely associated with decentralisation and the recognition of the central role of small and mid-sized firms in job creation in OECD countries. Multiple academic analyses have highlighted the critical importance of proximity and clusters as central levers for competitiveness. This has progressively transformed regions and metropolitan areas into central actors for supporting innovation capabilities.

While framework conditions provide the necessary basis for economic growth and are by and large determined at the national or even global level, we focus on the sectoral and territorial dimensions. They underscore the need for strategic capabilities to define and coordinate transformational activities by governments, firms, organised interest and research organisations. In the next section we discuss the lessons learnt from more than two decades of policy evolution in regional development and territorial innovation policies.

2 Lessons learnt from regional development and innovation strategies

Since the 1980s, innovation processes have been increasingly conceived as a complex, collective endeavour where a set of actors such as firms, other organisations and institutions interact in the generation, diffusion and use of new—and economically valuable—knowledge in the production process. This implies a vision of innovation as a multi-faceted behaviour that is not limited to the development or adoption of new technologies. The complexity of these processes has first been captured in the discourse on national innovation systems. This approach revealed huge differences between countries in terms of economic structure, R & D capabilities, institutional set-up and innovation performance. It also generated a growing interest in intra-country diversity, and the regional innovation systems framework puts the territorial dimension into the limelight. Four reasons support this view:

1. Every region is different with respect to industrial specialisation patterns and innovation performance.
2. Knowledge spillovers play a key role in the innovation process and are often concentrated locally.
3. Tacit knowledge contributes to developing new domains ([7]). Yet it is difficult to unveil knowledge that is often fragmented across individuals and organisations. To be useful, it requires intensive personal contacts and trust to enable exchange and mutual learning, which are facilitated by proximity.
4. In many countries, powers to design or implement R & I policies are devolved to regions and cities ([8]). The EU is emblematic of this, given its complex multilevel governance and the way the European Commission shares management responsibilities with national and regional authorities for regional development funds.

Building on insights from clusters and industrial districts, EU regions and Member States have been elaborating territorial innovation strategies, their goals and means in an evolutionary process over the last two decades. In the funding period 1994-1999, the European Commission implemented innovation support as the first large-scale initiative

([7]) Specialised regions with strong interest organisations in a specific industry that are accumulating tacit knowledge may face negative lock-ins and even system failures if the factors of success become constraints.

([8]) Tödtling, F. and Trippl. M., 'One Size Fits All? Towards a Differentiated Regional Innovation Policy Approach', *Research Policy* 34, No 8 (2005): 1203-19.

in this direction within the European Regional Development Fund (ERDF), thus laying the foundation for what we understand today as regional innovation strategies (RIS) ([9]). Regional Programmes of Innovative Actions were developed in the period 2000-2006. In parallel, pre-accession countries in Eastern Europe benefitted from similar support to develop RIS. In total, more than 120 regions participated in these strategy exercises. These projects aimed at fostering an economic and institutional environment that promotes the creation, dissemination and adoption of knowledge, which in turn was meant to increase the competitiveness and the attractiveness of regional economies. RIS focused their attention on a wider set of inter-relationships among innovation actors. They paid particular attention to the way in which universities, educational and R & D institutions, technology centres, the public sector at different administrative levels and firms interact with each other in an interdependent economic ecology. The role of SMEs is particularly important in this process, as they create the vast majority of employment and, at the same time, often do not have access to newly generated knowledge. Therefore, improving the connectivity of SMEs within the RIS should contribute to increased competitiveness.

Since the establishment of the first generation of RIS as a policy field in the 1990s, constant learning and feedback exercises have taken place. Looking back we can find a wealth of different experiences of national and regional innovation strategies in the framework of the EU cohesion policy: strategy development exercises (RIS, RITTS, RISI), inter-regional best practice demonstrations (RTT, RISI2) and pilot actions (RIS+, RISI+) ([10]). These initiatives brought greater levels of cooperation and transparency, strengthened expertise available in regions, provided better communication between technology providers and clients (including policymakers), increased funding of innovation-focused activities and geared public investments towards the long term. These policies thus supported a gradual build-up of innovation capacity. In a knowledge-intensive society, this capacity is primarily evidenced by access to three key components: existence of qualified human capital, access to competence and know-how, and availability of financial resources.

At the same time, these initiatives had several drawbacks. Regional innovation systems were often considered in isolation, lacking a truly international or trans-regional perspective. They were not well aligned with the industrial and economic context of regions. Public involvement in R & D by far exceeded that from the private sector. A narrow and linear vision of innovation prevailed excessively stressing research and its

([9]) Charles, D. R., Nauwelaers, C., Mouton, B. and Bradley, D., *Assessment of the Regional Innovation and Technology Transfer Strategies and Infrastructures (RITTS) Scheme*, Final Evaluation Report (2000).

([10]) European Commission, *Innovative Strategies and Actions: Results from 15 Years of Regional Experimentation* (Brussels: Directorate-General Regional Policy, 2007).

path towards commercialisation. There was a 'picking winners' syndrome. The best performing regions and countries were often copied without consideration of the local context. In many cases, external consultants were driving these processes, leaving little ownership to regional stakeholders. Most of the initiatives had an excessive focus on the technological supply and R & D.

One of the main lessons from these past initiatives lies in the importance of initial phases. Evaluations have shown that the identification of relevant societal needs and capabilities at the outset is of utmost importance. They also underscore the significance of implementation paths defining feasible processes to address societal needs and capabilities, as well as mobilising resources accordingly. In other words, the success of RIS was highly contingent on a precise idea of a region's endowments and on appropriate solutions to tackle identified issues. Evaluations finally showed that this requires continuity and represents an iterative process over a long time period ([11]). This iterative process is all the more important, since significant changes in or outside the region happen rapidly and may require a re-evaluation of the identified preconditions. Periodic revisions highly depend upon keeping stakeholders in productive interactions, allowing each of them to progressively and voluntarily adapt their behaviour in terms of agendas, objectives and actions. Facilitating this process often requires changes in the vertical and horizontal governance systems. The culture of hierarchical policymaking does not only face problems in dealing with the need to accept a division of labour between organisations; it also struggles to ensure a certain level of competition and redundancy to meet the challenges of rapidly changing scenarios.

([11]) Socintec and Inno, Ex-post Evaluation of the RIS, RTTs and RISI ERDF Innovative Actions for the Period 1994-1999, Final Synthesis Report to the European Commission (2005).

3 Smart specialisation as a new approach

The Knowledge for Growth expert group wove these lessons from regional development with academic insights on innovation economics and synthesised them in the concept of smart specialisation ([12]). It builds a clear transformational approach for policy intervention by emphasising a vertical and non-neutral logic of intervention. Given that governments simply cannot pay attention to all existing economic sectors, it aims at helping regional economies to discover new domains with a strong potential for growth. The word domain here is used on purpose to differentiate it from a whole sector or technology. One example cited by the authors is taken from Finland, where companies explored the potential of nanotechnology to improve the operational efficiency of the pulp and paper industry. New domains often lie at the juncture of different sectors.

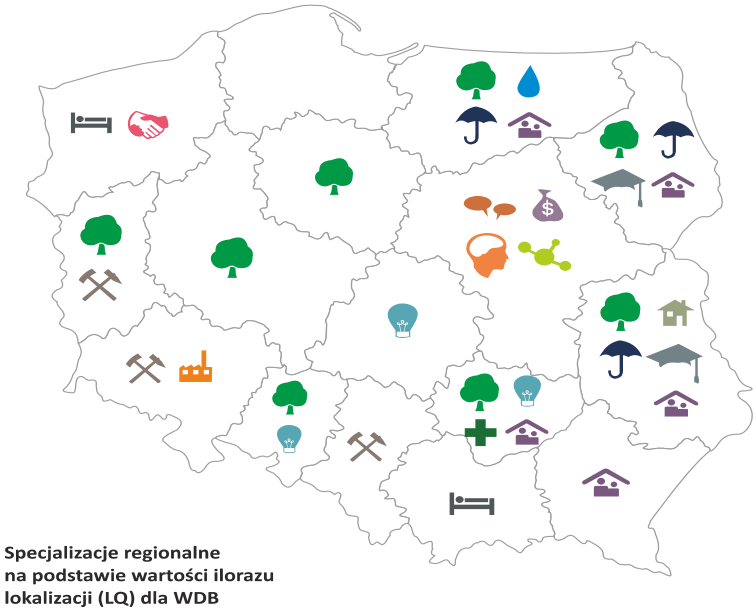
Finding new opportunities and exploring new domains constitutes a discovery process that requires a strong involvement of multiple actors. It is an interactive process as opposed to traditional planning processes. In a nutshell, this is not a one-off solution but an iterative process that should take place periodically, being based on an assessment of the regional situation and on the results of previous processes. It involves experiments aimed at fostering a structural evolution of the whole regional economy. Smart specialisation has become the official approach of the European Commission to support the innovative capabilities of regions within the cohesion policy.

We do not intend here to review the accumulated practice; rather we underline four characteristics that are crucial to the observed dynamics:

1. The starting point is to build a solid understanding of the economic fabric of a country and its regions, in order to identify the nature of the sectors present. This requires a good understanding of inter-sectorial linkages and the entire production cycle to identify opportunities for growth. A territory's capabilities are usually locally concentrated, be it in industrial districts, clusters or innovation networks. An analytical and geographic mapping of the economic, research and innovation potential establishes the informational basis to prioritise domains; see Figure 1 for an illustration.

([12]) Foray, D., Smart Specialisation and the New Industrial Policy Agenda, *Knowledge Economists Policy Brief* No 8 (Brussels, 2008); Foray, D., David, P. A. and Hall, B., Smart Specialisation: The Concept, *Knowledge Economists Policy Brief* No 9 (Brussels, 2009).

Figure 1: Mapping territorial and sectoral diversity in sub-regions



Source: Mapping location quotients of gross value added in the Polish region Wielkopolska. Developed by Monika Matusiak and Wojciech Kisiała Centre for Public Policy, Poznan University of Economics and Business.

2. This informational basis critically supports strategy definition. Experience accumulated in the past underlines the importance of mobilising and coordinating the capabilities of R & I organisations and firms to collectively discuss and choose the domains with the highest transformation potential. This involves both top-down coordination — often within established sectors — and bottom-up initiatives driven by territorial stakeholders articulating their expectations. The more firms and research organisations are engaged in prioritising domains, the more likely the chosen economic transformation path will reflect a solid consensus with widely shared goals. In a highly competitive environment, effective prioritisation bringing together established and new domains can ensure the future of existing industries. Reaching this analytical and societal agreement helps to avoid what has happened in the past, namely the mere imitation of good practices from elsewhere. It is worth repeating that vertical prioritisation focuses on detailed activity areas, not sectors or single projects. Focus groups and project development labs, for instance, are formats to organise such processes ([13]).

([13]) http://s3platform.jrc.ec.europa.eu/entrepreneurial-discovery-process-cycle (accessed 24 April 2017).

3. These dynamics require a clear governance structure to be performative. Knowing who does what is crucial both for an effective internal coordination within and between administrations, but also for ensuring that the outside world is aware of what is happening and whom to contact to get involved. In quite a number of cases, regions have delegated this process to a competence centre — which can even be shared between regions or established at the national level to ensure both critical mass and learning. The strength of such policies relies on their formal adoption at the highest possible political level, in many cases through parliamentary assemblies. Doing so validates the analysis made, the domains selected and their agreed objectives. Thus it provides a strategic agenda that serves as an orientation for where the territory is heading to all domestic R & I actors and the outside world. Given the partly experimental nature of RIS3, these documents must be living documents that have to be revised in regular intervals.

4. Such documents very seldom devise roadmaps for transformation and implementation paths. Choosing appropriate instruments to successfully meet the defined goals for chosen domains is no trivial task. Strong bias exists towards using established default instruments like R & D grants to individual projects or firms. In some cases this may be justified. Yet, priority domains will materialise through broader policy portfolios, often requiring a mix of instruments. Figure 2 provides a taxonomy of innovation policy instruments, knowing that most of the time we face 'policy mixes', that is a set of instruments that are combined in time and space. One important aspect highlighted by this figure is the dual balance between horizontal and vertical instruments and even more so between supply and demand-side instruments. Demand-side instruments are said to have high yet untapped potential and public procurement is an often-cited example. The articulation of the choices made is an important dimension that enables stakeholders to grasp the strategy's logic of intervention. It also enables better monitoring and assessment of dynamics and the potential for materialisation of the proposed transformations.

Figure 2: Taxonomy of innovation policy instruments

Report Title and Instruments	Overall orientation		Goals						
	Supply	Demand	Increase R&D spent	Increase non-financial capabilities		Systemic capabilities, complementarities	Enhance demand for innovation	Framework	Discourse
				Skills	Access expertise				
Fiscal Incentives for R&D	●●●		●●●	●○○					
Direct Support to R&D and Innovation in Firms	●●●		●●●						
Access to Finance, Publicly Supported Venture Capital and Loan Guarantees	●●●		●●●						
Policies for Training and Skills on Improving Innovation Capabilities in Firms	●●●			●●●					
Innovation and Human Resources Migration and Employment Protection	●●●			●●●					
Support Measures for Exploiting Intellectual Property	●●●				●●●			●○○	
Entrepreneurship Policy	●●●				●●●				
Technical services and advice	●●●				●●●				
Cluster Policy on Innovation	●●●					●●●			
Policies to Support Collaboration for R&D and Innovation	●●●		●○○		●○○	●●●			
Innovation Network Policies	●●●					●●●			
Measures to Stimulate Private Demand for Innovation		●●●					●●●		
Public Procurement Policies		●●●	●●○				●●●		
Pre-Commercial Procurement	●○○	●●●	●●○				●●●		
Innovation Inducement Prizes	●●○	●●○	●●○				●●○		
Standardisation and Standards	●●○	●●○					●○○	●●●	
Regulation	●●○	●●○					●○○	●●●	
Technology Foresight	●●○	●●○							●●●

Source: Edler, J., Cunningham, P., Gök, A. and Shapira, P., Impacts of Innovation Policy: Synthesis and Conclusion, Nesta Working Paper 13/21 (2013): 7.

Smart specialisation approaches combine two dimensions: (i) the need for long-term engagement by governments in structural economic transformation through innovation, (ii) taking place through an iterative process that enables periodic adaptation — and even redefinition. When certain activity areas receive privileged and targeted government support, clear success criteria must be defined as to allow policymakers to assess their performance after the support ends. It is not because we speak of innovation that public engagement should focus on frontier science and breakthrough innovations. Most of the time, the starting point is existing activities with the goal to make them more competitive.

The implementation of smart specialisation is challenging because it integrates different policy areas and responsibilities, across ministries, and from local and regional to national and European levels. Moreover, it requires different innovation actors to work closely together, including firms, knowledge centres, government and civil society itself — the end-users of innovation and on occasion co-producers of knowledge. Two key aspects have been identified as important success factors: an institutional eco-system that supports innovation, and the ability and capacities of public sector institutions for effective strategic management and organisational development.

4 Implications for transition economies

R & I policies in transition economies face additional challenges compared to advanced market economies. By definition, governments in transition countries must organise and sequence a vast number of necessary and difficult socioeconomic reforms, leading to a 'dilemma of simultaneity' ([14]). Structural change in these countries has meant drastic changes of the economic fabric's composition through harsh de-industrialisation, the emergence of a large services sector and associated shifts in employment ([15]). All this had repercussions on sectoral productivity, trade and specialisation patterns and the attempts to link to global value chains. Government behaviour also had to change radically, requiring a completely new relationship between the state and the economy. This governance challenge has often materialised in weak coordination capabilities, low stakeholder trust in governments, little experience with instruments to support innovation and limited professionalisation of R & I managers.

What we observe in transition economies resembles the 1960s, when building 'social capabilities' — managerial skills, stable and effective government, mobilisation of capital through financial institutions and the creation of trust in society — was seen as vital to achieve the technological catch-up in the developing world ([16]). This required introducing new institutional arrangements like development banks. Recent evidence suggests that such capabilities are more difficult to build than expected. Similar challenges were highlighted for European regions in what regional development professionals call 'regional innovation paradox' ([17]). Poor regions and countries are those with the strongest need for innovation, yet they have at the same time relatively weak capabilities and institutions to pursue successful innovation policies. In the EU cohesion policy, this paradox is compounded by the preferential allocation of substantial funding to less developed regions, that must plan and co-finance projects notwithstanding their capacity constraints. Having large amounts of funding does not automatically translate into their strategic and effective use.

The aforementioned challenges are only partly compensated by two important advantages. Many east European transition economies can resort to a well-educated workforce with strong capabilities in 'science, technology, engineering and mathematics'

([14]) Offe, C., 'Das Dilemma Der Gleichzeitigkeit. Demokratisierung und Marktwirtschaft in Osteuropa', *Merkur* 45. No 4 (1991): 279-92.

([15]) Berglof, E., Foray, D., Landesmann, M., Yifu Lin, J., Nauro Campos, M., Sanfey, P., Radosevic, S. and Volchkova, N., 'Transition Economics Meets New Structural Economics', *Journal of Economic Policy Reform* 18, No 3 (2015): 191-220.

([16]) Fagerberg, J. and Srholec, M., 'National Innovation Systems, Capabilities and Economic Development', *Research Policy* 37, No 9 (2008): 1417-35.

([17]) Oughton, C., Landabaso, M. and Morgan, K., 'The Regional Innovation Paradox: Innovation Policy and Industrial Policy', *The Journal of Technology Transfer* 27, No 1 (2002): 97-110.

like in Serbia and Ukraine, both through classical research organisations and increasingly through universities. Another positive element is the rather rich and diverse firm environment ([18]). Given the lack of appropriate data, we do not know enough about the actual situation of this complex and unbalanced economic composition. To reap the benefits from these advantages, a proper mapping of the economic fabric, which has undergone far-reaching changes over the 25 years, is thus required. The mapping results can be used to highlight the added value of innovation different domains.

([18]) Firm and economic diversity can be measured in different ways. One broad approach is based on traded goods. The MIT Atlas of Economic complexity calculates scores on how diversified and complex a country's export basket is. In its 2014 and 2015 rankings, 17 out of the 50 most complex economies are post-socialist transition economies; see http://atlas.media.mit.edu (accessed 12 May 2017). Another indicator is the share of manufacturing firms doing in-house R & D. In 2014, 19 out of the top 50 countries have been post-socialist transition economies; see http://data.uis.unesco.org (accessed 12 May 2017).

5 Trajectory for smart specialisation in transition economies

From the preceding analysis, we see four major aspects to address: a better knowledge of the socioeconomic fabric is an important precondition for identifying key domains on which to focus effort ([19]). Identifying key domains and defining the policy instruments that can support them are the objectives of this strategic endeavour. This requires the design of an adequate governance structure, build-up of administrative capacities and the coordination with stakeholders. Progressive and iterative efforts are needed to accumulate experience and trigger policy learning. This is why we suggest four complementary options, which taken together build a trajectory for economic transformation ([20]). Getting the process itself right is at least as important as the final outcome of the strategy process.

Option 1: Build a 'competence centre' to manage the process of learning and strategymaking. This team, freed from political considerations to the extent possible, prepares the full evidence needed for an innovation strategy and its implementation ([21]). Professionals from diaspora networks can contribute to this centre. Political support, important to start and manage the process, is obtained through inter-ministerial working groups and high-level R & I councils.

Option 2: Begin with a pilot on a well-developed economic domain with willing and capable stakeholders to experiment with different approaches for defining the fine-grained sub-areas of prioritised domains and designing ways to mobilise the right stakeholders (domain experimentation). Showing the effects smart specialisation had in the EU can trigger greater interest among stakeholders who are often eager to engage, provided governments provide credible incentives.

Option 3: Take the 'experimental approach' from smart specialisation and apply it in one capable and willing region. This would help apply the approach to other regions, enabling a cumulative process over time to overcome the lack of data about the situation on the

([19]) Rodrik, D. and Hausmann, R., 'Self-Discovery in a Development Strategy for El Salvador', *Economia* 6, No 1 (2005): 86.

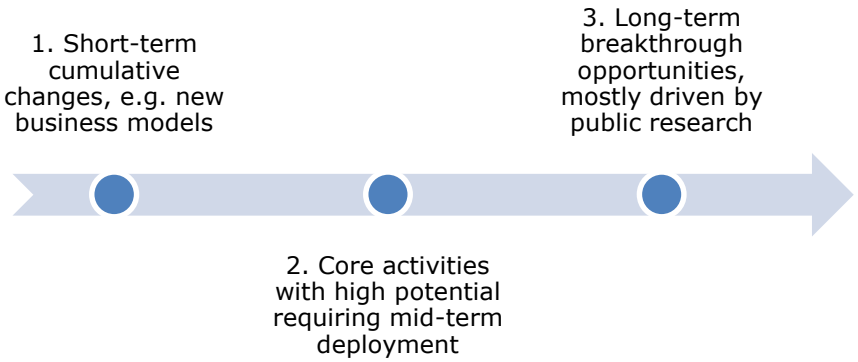
([20]) Foray, D., *Smart Specialisation: Opportunities and Challenges for Regional Innovation Policy* (Abingdon; New York: Routledge, 2015), 86.

([21]) Approaches for mature industries and those addressing radically new domains may require different types of competence centre. On this issue and possible trade-offs between experimentation and implementation see Breznitz, D. and Ornston, D., 'The Revolutionary Power of Peripheral Agencies: Explaining Radical Policy Innovation in Finland and Israel', *Comparative Political Studies* 46, No 10 (2013): 1219.

ground (territorial experimentation). Regional administrations enjoy sometimes greater trust from stakeholders than national ones.

Option 4: Take existing activities as a starting point and develop a 3-phase process that sequences and prioritises measures (see Figure 3). Start with small-scale activities and projects, while following the broader principles of smart specialisation. Experimental approaches, by definition, can fail. Given the limited public resources in most transition countries, 'low-hanging fruit' are a viable way to start. Sunset clauses are useful mechanisms to assess progress of experimental new measures and projects, while limiting costs of failure.

Figure 3: A step-wise approach



Source: Own elaboration.

References

Berglof, E., Foray, D., Landesmann, M., Yifu Lin, J., Nauro Campos, M., Sanfey, P., Radosevic, S. and Volchkova, N., 'Transition Economics Meets New Structural Economics', *Journal of Economic Policy Reform* 18, No 3 (2015): 191-220.

Breznitz, D. and Ornston, D., 'The Revolutionary Power of Peripheral Agencies: Explaining Radical Policy Innovation in Finland and Israel', *Comparative Political Studies* 46, No 10 (2013): 1219.

Charles, D. R., Nauwelaers, C., Mouton, B. and Bradley, D., Assessment of the Regional Innovation and Technology Transfer Strategies and Infrastructures (RITTS) Scheme, Final Evaluation Report (2000).

Edler, J. and Georghiou, L., 'Public Procurement and Innovation: Resurrecting the Demand Side', *Research Policy*, No 36 (2007), 949-963.

European Commission and European External Action Service, Joint Staff Working Document, Eastern Partnership: Focusing on Key Priorities and Deliverables, SWD(2016) 467 final (2016).

European Commission, Innovative Strategies and Actions: Results from 15 Years of Regional Experimentation (Brussels: Directorate-General Regional Policy, 2007).

European Parliament and Council of the EU, Regulation 231/2014 establishing an Instrument for Pre-accession Assistance (IPA II) (2014).

Fagerberg, J. and Srholec, M., 'National Innovation Systems, Capabilities and Economic Development', *Research Policy* 37, No 9 (2008): 1417-35.

Foray, D., *Smart Specialisation: Opportunities and Challenges for Regional Innovation Policy* (Abingdon; New York: Routledge, 2015), 86.

Foray, D., Smart Specialisation and the New Industrial Policy Agenda, *Knowledge Economists Policy Brief* No 8 (Brussels, 2008).

Foray, D., David, P. A. and Hall, B., Smart Specialisation: The Concept, *Knowledge Economists Policy Brief* No 9 (Brussels, 2009).

Offe, C., 'Das Dilemma Der Gleichzeitigkeit. Demokratisierung und Marktwirtschaft in Osteuropa', *Merkur* 45, No 8 (1991): 279-92.

Oughton, C., Landabaso, M. and Morgan, K., 'The Regional Innovation Paradox: Innovation Policy and Industrial Policy', *The Journal of Technology Transfer* 27, No 1 (2002): 97-110.

Rodrik, D. and Hausmann, R., 'Self-Discovery in a Development Strategy for El Salvador', *Economia* 6, No 1 (2005): 86.

Socintec and Inno., Ex-post Evaluation of the RIS, RTTs and RISI ERDF Innovative Actions for the Period 1994-1999, Final Synthesis Report to the European Commission (2005).

Tödtling, F. and Trippl, M., 'One Size Fits All? Towards a Differentiated Regional Innovation Policy Approach', *Research Policy* 34, No 8 (2005): 1203-19.

List of abbreviations and definitions

ERDF	European Regional Development Fund
EU	European Union
GDP	Gross domestic product
OECD	Organisation for Economic Cooperation and Development
RIS/RIS+	Regional Innovation Strategies
RIS3	Innovation Strategy for Smart Specialisation
RISI/RISI2/RISI+	Regional Information Society Initiatives
RITTS	Regional Innovation and Technology Transfer Strategy
RTT	Regional Technology Transfer
R & D	Research and development
R & I	Research and innovation
SME	Small- and medium-sized enterprise

List of figures

Europe Direct is a service to help you find answers to your questions about the European Union.

Freephone number (*)**:**

00 800 6 7 8 9 10 11

(*) The information given is free, as are most calls (though some operators, phone boxes or hotels may charge you).

More information on the European Union is available on the internet (http://europa.eu).

HOW TO OBTAIN EU PUBLICATIONS

Free publications:

- one copy:
  via EU Bookshop (http://bookshop.europa.eu);
- more than one copy or posters/maps:
  from the European Union's representations (http://ec.europa.eu/represent_en.htm);
  from the delegations in non-EU countries (http://eeas.europa.eu/delegations/index_en.htm);
  by contacting the Europe Direct service (http://europa.eu/europedirect/index_en.htm) or
  calling 00 800 6 7 8 9 10 11 (freephone number from anywhere in the EU) (*).

  (*) The information given is free, as are most calls (though some operators, phone boxes or hotels may charge you).

Priced publications:

- via EU Bookshop (http://bookshop.europa.eu).

KJ-NA-28638-EN-N

JRC Mission

As the science and knowledge service of the European Commission, the Joint Research Centre's mission is to support EU policies with independent evidence throughout the whole policy cycle.

EU Science Hub
ec.europa.eu/jrc

@EU_ScienceHub

EU Science Hub - Joint Research Centre

Joint Research Centre

EU Science Hub

Publications Office

doi:10.2760/988830

ISBN 978-92-79-69344-1