

*Cristina Serbanica and
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**EU Cohesion Policy and
Innovation Support in
Central and Eastern Europe:
A Critical Review**



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INTRODUCTION

During the post-socialist transition, supporting innovation became an important policy objective for Central and Eastern European (CEE) countries that joined the European Union in 2004 (Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovakia and Slovenia), 2007 (Bulgaria and Romania) and 2013 (Croatia). During their transition phase, CEE countries face a number of common challenges, even if they are no longer a single and homogenous area. There is no doubt that CEE countries have embarked on strong and sustainable growth paths in recent decades (Aghion *et al.* 2011). They have also achieved indisputable successes in terms of social advancement, improvements in living standards, and political and institutional reforms. After 1990, these countries underwent substantial socio-economic restructuring and opened their markets to global capital and external sources of knowledge (Capello and Giovanni 2013), while integrating into European and global production networks. Low (unit) labour force, coupled with a well-trained, educated workforce and expanding markets attracted large FDI inflows and important investors in the region (Gauselmann *et al.* 2011). However, there is a clear disjunction between the fast growth in productivity in the CEE region and the performance in developing innovative capacities (Gorzela 2017). Some authors suggest that the CEE countries are suffering from a serious innovation ‘deficit’ (Havas and Keenan 2008), and despite massive FDI and the introduction of modern production and management methods, there have not been sufficient spill-overs of technology and know-how into the domestic economy (Economist Intelligence Unit 2008). As a result, these countries are still far removed from approaching the technology frontier (Aghion *et al.* 2011; Estrin *et al.* 2014), have a low propensity for innovation (Becker *et al.* 2010) and less efficient national and regional innovation systems (Kravtsova and Radošević 2012).

Some explanations for this phenomenon relate to the communist legacy and lock-in effects: for example, innovation processes were organised according to a linear science-push innovation model during socialist times and interactive learning processes were underdeveloped or non-existent

(Koschatzky *et al.* 2001). During their transition to market economies, CEE economies did not grow based on research-driven innovation (Radošević 2017). Instead, growth at the firm-level was closely related to export, vertical specialisation, non R&D innovation (Radošević and Stancova 2015) and the majority of companies engaged in process innovation in the form of the acquisition of new machinery and mastery of production capabilities (Tiits *et al.* 2008). Despite a strong potential advantage in many pure and applied science fields (Camagni and Capello 2014), there is a substantial gap in demand for research and technological development (Radošević 2011) and firm innovations are mostly of an in-house nature (Zenka *et al.* 2014). Even if the results show positive trends in terms of the CEE region catching up in science knowledge generation, its absorptive capacity is still limited (Radošević and Yoruk 2014).

Many deficiencies in policy frameworks and institutional capacities emerge at the CEE level (Bachtler *et al.* 2014). Regional innovation systems are highly fragmented, lack regional autonomy, strong science bases and local capabilities (Krammer 2017). In addition, the benefits of transformation in these countries have been unequally distributed and major disparities in economic and innovation performance exist between capital regions and the less developed peripheral regions. CEE countries, or at least most of the regions in this part of Europe, are classified as ‘peripheral’ or ‘lagging-behind’ areas, which exhibit fundamental differences in innovation, be it sectoral, structural, behavioural, related to resources and capabilities, related to externalities or issues of market failures, etc. (McCann and Ortega-Argiles 2015). The ‘common denominators’ in these peripheral areas are the deficits in the supply of skilled human capital, the differences in the structural and sectoral composition of the ‘economic fabric’ that makes them less prone to innovation, the brain drain phenomenon and the deficient institutional settings (Rodríguez-Pose 2015).

The rationale behind EU policy intervention in the region was to alleviate these regional disparities and help CEE countries to catch-up with Western Europe. It is estimated that between 2007 and 2015, EU Structural and Cohesion funds contributed 11–24 percent of the GDP of CEE member states, making considerable contributions to these countries’ infrastructure, transportation systems and modernization, among others (KMPG 2016). The largest share of structural funds went into infrastructure and environmental investments, followed by productive investments (Brown *et al.* 2017).

This paper aims to offer an in-depth review of EU policy interventions to support innovation in the CEE countries. As illustrated in the literature on this topic, there are two main rationales underpinning the logic of such interventions: either addressing market or system failures that hinder the capacity of companies to compete and grow or to support their

start-up in the most promising and relevant sectors (European Commission 2016a). The second part of the paper therefore looks at the logic of intervention and the strategic orientation of policy frameworks for innovation and enterprise in the region in three distinct financial frameworks: 2000–2006, 2007–2013 and 2014–2020, while distinguishing between funding allocations for research, technological development and innovation (RTDI) and enterprise support. The third part of the paper presents the outputs of the interventions – as revealed by the strategic evaluations carried out at the EU level, but also by dedicated literature in this field. The paper concludes by highlighting different policy recommendation strands that deal with necessary changes and adaptations, especially in the context of the smart specialization paradigm.

COHESION POLICY INVESTMENTS IN INNOVATION AND ENTERPRISE IN CEE COUNTRIES

2000–2006: The Initiation Phase

Except for the capital regions of the Czech Republic (Prague) and Slovakia (Bratislava), all the regions in the CEE countries that joined the EU in 2004 (Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovakia, Slovenia) were classified as ‘objective 1 / convergence’ regions in the 2000–2006 EU financial framework and exercised considerable discretion in allocating EU funds. Unlike the more developed ‘objective 2 / competitiveness’ regions – whose focus was on encouraging advanced research and development processes and innovation links, the main policy objective for CEE regions was to support and/or diversify the economy, thus inter-twining the themes of innovation and enterprise. On average, cohesion regions spent 4.9 percent of their total available structural funds on research, technological development and innovation, while the more competitive objective 2 areas spent on average 9.8 percent of total funds on the same purposes (Technopolis 2006). When compared to the most advanced countries, CEE countries were considerably more active on attracting foreign direct investment and in the creation of industrial parks and enterprise incubators, while on the innovation side they mainly supported investments in basic infrastructure, clusters and applied research. This was coherent with the low R&D capacities in these countries and the lack of expertise in managing innovation support measures, which also explains the

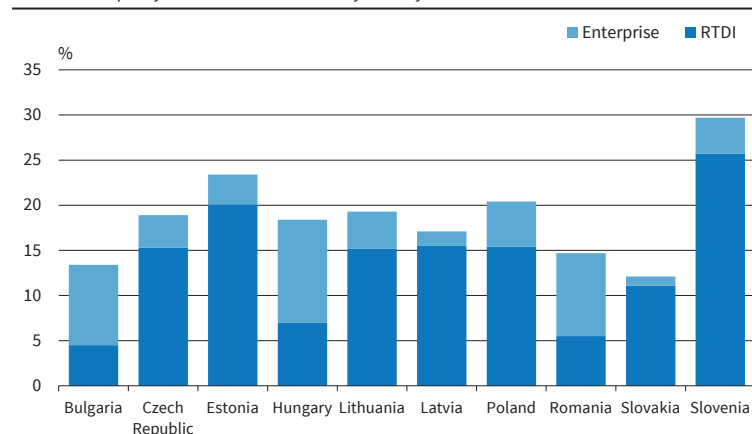
preference for more ‘supply side’ interventions and the extensive use of direct instruments (Holm-Pedersen *et al.* 2009; Technopolis 2006).

2007–2013: The Experimentation Phase

A key difference in the strategic orientation of enterprise and innovation support in the 2007–2013 framework – compared to the 2000–2006 period was its greater thematic differentiation. Under the convergence objective, financial support was aimed at the modernisation and diversification of economic structures and the creation of sustainable jobs. In this respect, member states were encouraged to target their resources on key-priorities, including the improvement of knowledge and innovation for growth, which comprises different sub-priorities, such as: (1) strengthen research and development capacities and their integration into the European Research Areas (RTDI) and (2) facilitate innovation and promote entrepreneurship through aid to SMEs and to technology transfer, development of business networks, innovation funding through financial engineering instruments, etc. (Enterprise). Figure 1 presents the allocations for these priorities (expressed as a percentage of total cohesion policy investments) in CEE countries, by the end of 2014.

In the 2007–2013 financial framework there was no legal obligation for CEE countries to earmark expenditure falling under the heading of ‘improving knowledge and innovation’ and this explains the large intra-country variations in allocations. On average, CEE countries spent around 22 percent of their total cohesion policy allocations on RTDI, Enterprise and ICTs, with Slovenia and Estonia taking the regional lead in these chapters of expenses. At the other end of the spectrum, Bulgaria and Romania had very low allocations for RTDI, while Slovakia and the Baltic countries devoted only limited funds to enterprise support. By contrast, the most developed countries in the EU (EU15 countries) allocated large

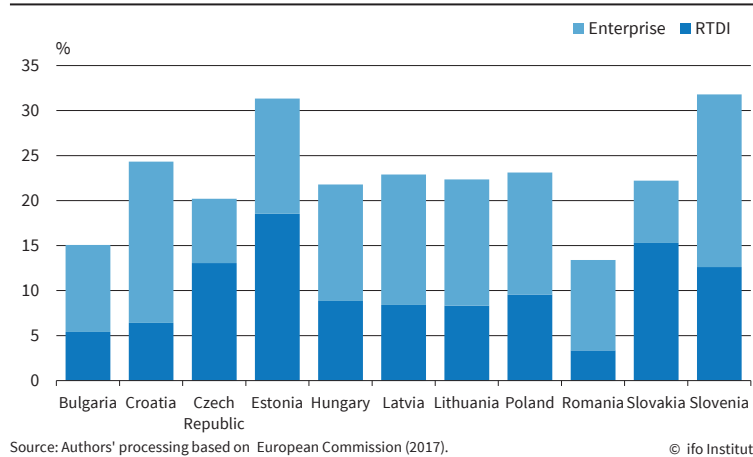
Figure 1
Financial Resources for Enterprise and Innovation
Total cohesion policy investments 2007–2013 by country



Source: Authors' processing based on European Commission (2016b).

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Figure 2
Financial Resources for Enterprise and Innovation
 Total cohesion policy investments 2014–2020 by country



shares of support to enterprises and focused more on the thematic priority of innovation and the knowledge economy. It is also worth noting that in the EU15 countries, national state aid for SMEs was far higher than that of the cohesion policy, while in the CEE countries structural funds represented the only (or most significant) source of funds for industrial policy (European Commission 2016a).

The financial crisis drove the absorption of funds in the 2007–2013 period and some categories of investments – including those in RTDI – struggled in terms of performance; while programme authorities preferred actions where they had experience and where results were quickly tangible (e.g. investments in ‘hard infrastructure’), instead of more sophisticated interventions in the RTDI field (Ferry 2014). This is why over the course of the programming period, some of the CEE countries shifted funds from RTDI to other operational programmes (like other investments in enterprises, energy, social infrastructure, etc.) – see European Commission (2016b).

2014–2020: The Specialisation Phase

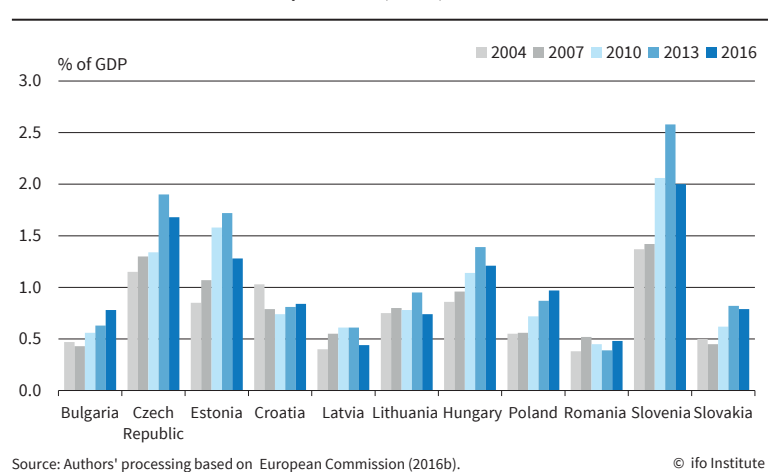
The reformed cohesion policy 2014–2020 was asked to respond to some of the major weaknesses of its predecessors, including the deficit in strategic planning, in adopting territorial perspectives or the lack of focus on priorities (Barca 2009). The ‘smart specialisation’ concept – which is the leitmotif for interventions to support innovation in the new financial framework – emphasises the principle of prioritisation in a vertical logic, as an effort to reduce fragmentation and address the missing or weak relations between R&D and innovation activities

and the sectoral structure of the economy (Foray *et al.* 2011). The new concept emphasises the need to adjust priorities to fit closeness to the technological frontier (Aghion *et al.* 2011), so it is seen as ‘crucial’, particularly for the regions/countries that are not on a major science-technology frontier. For CEE countries, the EU funds continue to represent a key financial lever to public funding for 2014–2020; and some authors position ‘smart specialisation’ as the third external and conditionality-based reform of economic policy rationales – after Washington Consensus and

Europeanization (Karo and Kattel 2015). So far, all CEE countries and most of their regions created ‘Regional Innovation Strategies’ (RIS3) and allocated important shares of their total Cohesion Policy resources to RTDI and Enterprise (Figure 2).

No significant changes can be observed when comparing 2007–2013 and 2014–2020 allocations for innovation and enterprise in the CEE region. The modest innovators – Romania and Bulgaria – devote about 15 percent to these objectives, while the sole strong innovator in the region – Slovenia – and its follower, Estonia – spend over 30 percent of their total allocations for the same purposes. Even if it is still early days to assess the changes that have occurred within the national and regional innovation system, preliminary evidence finds that there are grounds for concern in many Eastern European regions in the take-up of the RIS3 agenda (McCann and Ortega-Argiles 2016; Karo *et al.* 2017), especially due to their different institutional arrangements, the dominant presence of public research in processes of consultation, the underrepresentation of relevant firms in the periphery (Kroll 2017) or the lack of

Figure 3
 Evolution of Intra-Mural R&D Expenditure (GERD) in CEE Countries



attention paid to internationalisation processes (Radosevic and Stancova 2015).

OUTPUTS AND EFFECTS OF COHESION POLICY INVESTMENTS IN INNOVATION AND ENTERPRISE

Substantial Contribution to National R&D Efforts

Despite the various barriers to the implementation of cohesion policy in CEE countries, some important achievements are emphasised in the literature on this topic. Firstly, the relative importance of the EU's cohesion policy is underlined by its substantial contribution to the national R&D efforts: expenditure on R&D increased from 40 euros per inhabitant in 2004 to 91 euros per inhabitant in 2007 and to 144 euros per inhabitant in 2016 at the CEE level, even if the share relative to GDP is still below the EU average (2 percent) for all countries – except for Slovenia (Figure 3).

Since over the programming period, ERDF funding was often the only source of funding for industrial policies in the CEE region, this type of support was meant to counterbalance the decline in governmental expenditure in a period of severe economic crisis (European Commission 2016a).

New Policy Instruments, New Players

In many regions, cohesion policy pushed forward an initial concept of a regional innovation policy and helped to introduce new policy instruments, new monitoring and evaluation systems, while mobilising new players, especially from the private sector (Technopolis 2006). The main results of EU investments in R&D in the CEE region translate into the support offered to RTDI and cooperation projects, the creation of new jobs and support for start-up initiatives. By the end of 2014, CEE countries supported over 12,000 RTDI projects (of which around a quarter were in Hungary) and about 3,000 cooperations between companies and research institutes. This, in turn, led to the creation of around 15,000 new research jobs, of which about a third were in Poland. On the enterprise side, some 70,000 SMEs across the region received direct support and more than 5,500 new businesses were helped to

launch start-ups. In total, around 175,000 new jobs were created as a result of cohesion policy support in the region (Table 1), which helped to offset large declines in employment due to the economic crisis (European Commission 2016a).

Technological Upgrading and Job Creation

The evaluations indicate that the Operational Programmes helped to modernise production processes and the purchase of both tangible and intangible assets (new equipment, machinery, the purchase of patents and licenses, etc.). This, in turn, increased the value-added produced by SMEs, increased turnover, profitability and exports and, in a number of cases, it also led to behavioural changes, like SMEs being more willing to take risks, to innovate and to develop new products (European Commission 2016c). Among the CEE countries, the Czech Republic, Hungary and Poland devoted some shares of funding to large enterprises, be this for technological upgrading, investments in large-scale projects or to increase employment in less developed regions. This type of support proved to be one of the most efficient measures in terms of job creation and led to significant increases in productivity – as the support provided to large enterprises went beyond simple replacement investments, and extended to the deployment of cutting-edge technologies. For Hungary, this support helped to lessen the disequilibria between centre and periphery and mitigate significant internal disparities, as support was focused on regions where larger firms were much less present (European Commission 2016b). Last but not least, the support offered through financial instruments (loan guarantees, subsidized interest rates, guarantees, venture capital etc.) also had a positive effect on investments, making it easier for SMEs to access financing and to overcome the constraints they faced in capital markets during the crisis (European Commission 2016c).

No Significant Changes in Innovation Performance

At the aggregate level, analyses need to be conducted with caution, given the 'time-lag' issue between

Table 1
Main Outputs of Cohesion Policy for Enterprise Support & Innovation (2007–2013)

By the end of 2014	RTDI projects	Cooperation projects	New RTDI jobs	Start-ups	Investments in SMEs	New jobs created
Bulgaria	71	37	244	–	–	6,018
Czech Republic	1,423	636	3,900	26	8,047	–
Estonia	2,000	–	–	–	–	10,908
Hungary	3,916	640	3,623	1,991	40,644	41,453
Latvia	153	336	336	1,184	163	3,333
Lithuania	1,526	31	674	1,993	1,509	7,841
Poland	1,382	1,057	5,000	–	14,955	87,427
Romania	569	41	1,160	101	2,898	13,228
Slovakia	504	279	40	291	2,104	3,111
Slovenia	655	–	–	25	–	3,101

Source: Authors' processing based on European Commission (2016b).

investment and effects (Leon *et al.* 2011) and the fact that many impacts (and particularly those resulting from RTDI investments) are expected to be long-termed. However, one can easily observe that CEE countries are still lagging behind in innovation performance. With the exception of Slovenia, which is a strong innovator, all the other parts of the CEE region are moderate or modest innovators, according to the European Innovation Scoreboard 2017. Some say that CEE countries were very successful at meeting output targets, but unable to convert their initial success into longer-term results (Holm-Pedersen *et al.* 2009). Significant improvements in scholarly outputs are observed (Rodriguez-Pose 2015), but this does not translate into higher capacities for innovation (Clar *et al.* 2015), higher participation in the FP / Horizon 2020 programmes (Leon *et al.* 2011) or higher broader socio-economic benefits (Rodriguez-Pose 2015).

Variable Impacts at the Macro Level

Different authors point to the fact that, up until now, no clear and unambiguous results have emerged at the macro level, which is partly due to the multi-dimensional character of the concept of cohesion and to the challenges of isolating cohesion policy from other interventions (Ferry and McMaster 2013). Existing evidence demonstrates a positive correlation between the allocations for productive environments and per capita GDP growth, but no effect on productivity (Pontarollo 2017). On the other hand, the impact of RTDI interventions was highly variable: RTDI initiatives turned out to be extremely useful in those regions where a critical mass of research activities was already present (Camagni and Capello 2013); or in those regions more endowed with human capital, workforce flexibility, entrepreneurship, innovation, information and telecommunication policies etc. (Fratesi and Perucca 2014). By contrast, investments in RTDI funds had limited socio-economic benefits in peripheral areas, as these territories had longstanding difficulties in transforming both basic and applied research into innovation (Rodriguez-Pose 2015). Since there is evidence that structural funds were used as a substitute for national funding in the CEE countries, the incentive provided did not ensure long-term efficiency (Radosevic and Lepori 2009). The conclusion is that, despite some positive impact on territorial convergence, cohesion policy did not succeed in alleviating regional differences (Gorzelać 2017).

CONCLUSIONS AND POLICY IMPLICATIONS

This paper offered a review of the results of cohesion policy investments in RTDI and enterprise in Central and European countries that joined the EU after 2004. The results look very mixed and variable between countries, as well as between the regions within those countries. On the one hand, there are invaluable outputs and

outcomes in the form of new research infrastructures, cooperation networks, new jobs in the RTDI sector, the creation of innovative start-ups, etc. On the other hand, the impacts are mixed and heterogeneously distributed, with important disparities in terms of knowledge production, technology absorption or innovation performance.

The evaluations carried out to date conclude that there is still much room for improvement in the logic of policy interventions in CEE countries, as well as in the management of national and regional innovation systems. Different policy recommendations are formulated in the literature on this topic, which can be grouped into eight categories as follows.

Change the Logic of Intervention

Different authors point to the fact that the mainstream model of R&D-based growth which establishes direct links between R&D, innovation and productivity, is not suitable for CEE countries, as it ignores production capacity and technology capacity as major sources of productivity improvements (Gorzelać and Ferry 2014). Nowadays, the science-push model of innovation is still very influential at the CEE level (Havas *et al.* 2015), while demand-side policies linking the modernisation of the economy and public services with innovation impulses are often neglected (Edler 2009). Thus, shifting funding from direct financial aid to demand-side policies is seen as a solution that may potentially accelerate catch-up processes and address bottlenecks in demand for innovation at the CEE level (Muscio *et al.* 2015).

Consider Specific Innovation Patterns in Policy-Making

Designing place-based policies is one of the main arguments behind the logic of smart specialization, which contrasts the 'one-size-fits-all' approaches. Since the geography of innovation was found to be much more complex than a simplistic core-periphery dichotomy, identifying the 'innovation patterns' followed by each region (Camagni and Capello 2014), overcoming the differentiation between advanced research areas (the core) and co-application areas of general purpose technologies (the periphery) (Camagni and Capello 2013) and designing spatially-targeted interventions (Rodriguez-Pose 2015) emerge as generalised solutions for CEE countries' policy-making.

Adopt New Approaches to Financing Innovation

Securing funding for research and innovation is one of most relevant challenges for the CEE region (Gorzelać and Ferry 2014) and evidence confirms that structural funds were often a substitute, and not a complement to national funding. In this respect, recommendations

aim to diversify the sources of funding for innovation, be it through ensuring a better connection between structural funds, FP and other community innovation programmes (Radosevic and Lepori 2009); or by orienting fiscal policies towards encouraging R&D activities and supporting more private-public partnerships (Gorzela and Ferry 2014). Some authors point to the fact that the focus should not be on increasing investments in R&D (providing the R&D effort is maintained), but on addressing the incapacity of the economic fabric to transform knowledge into innovation (Rodriguez-Pose 2015), while different evaluations confirm that strengthening local conditions are more important than giving subsidies in terms of, for example attracting large enterprises to a region (European Commission 2016c).

Contextualise Support Measures and Focus on Incremental Innovation

Support measures aimed at raising awareness of innovation and promoting innovation management (Technopolis 2006) and training and infrastructure-type investments (Muscio *et al.* 2015) are still considered relevant at the CEE level, given the historical deficit in the region's innovation culture. However, a change of approach is needed to adopt a market-driven rationale (Muscio *et al.* 2015) and to orient the logic of intervention towards final aims (like increasing productivity, sales, exports, etc.), not intermediary aims (investments in production factors: capital, labour, R&D capacity) – see European Commission (2016a). Some authors recommend that less innovative regions carry out applications from leading regions, instead of focusing on investing and researching into general purpose technologies (Foray *et al.* 2011), while many others encourage a bundling of external knowledge (in the form of patents, researchers, scientific consultancy, direct investments, etc.) with local competences and productive traditions, with a focus on incremental innovation (Camagni and Capello 2014).

Adopt Gradual Sectoral Changes

Advocates of the smart specialisation concept plead for keeping the focus on existing industrial strengths, instead of building up novel high-tech industry (Foray *et al.* 2011; Tiits *et al.* 2015). Thus, science, technology & innovation policies are expected to promote knowledge-intensive activities in all sectors, including low and medium-technology industry and services (Havas *et al.* 2015), to help them take gradual steps towards change. In view of the specific sectoral distribution of economic activities, the recommendations are to restructure agricultural areas, integrate bio-tech & agro-industries, link tourism industry to other value added activities, exploit the untapped potential of renewable energy or provide advanced logistics and ICT for the

personalisation of services (Technopolis 2006). Along the same lines, the countries and their regions are also advised to avoid picking winners that do not fit into the regional industrial space and to stop support for declining industries (Boschma and Gianelle 2014).

Support International Knowledge Networks and Global Value Chains

In the literature on this topic, interregional knowledge networks are often seen as the substitutes for the critical mass of localised resources for innovation in peripheral or less developed economies (Gorzela and Ferry 2014), meaning that external learning and the creation of cross-border research and innovation networks are largely encouraged. In particular, CEE countries are encouraged to integrate FDI and innovation policy (Radosevic and Stancova 2015) and to exploit the synergies between FDI and local culture. The integration of regional firms into global value chains is also well considered (Technopolis 2006; Rodriguez-Pose 2015), to facilitate the inflow of new knowledge and the internationalisation of the R&D environment. Research has shown that economic players stand to benefit more from interaction with innovators located outside the region (Iammarino and McCann 2013) than from cluster strategies that foster local interactions and increase the risk of lock-in in cases where critical mass does not exist. Greater engagement in international linkages and extra-local connections is seen as a very viable option as a result.

Adopt the Broader View of Innovation

The broader view of innovation goes beyond R&D based innovations to issues that address the role of entrepreneurship, higher education, human resources and other policies in fostering structural change in less developed regions (Clar *et al.* 2015). Prioritising the transformation of the socio-economic fabric and enhancing firms environment (Rodriguez-Pose 2015), improving market entry and exit conditions (Correa and Guceri 2014), creating innovative economic structures and entities (Gorzela and Ferry 2014) and better matching educational supply to local needs to improve the absorptive capacity of firms – are all part of a new development model that is necessary at the CEE level. At the same time, substantial efforts are needed to strengthen higher education, R&D job creation (Tiits *et al.* 2015) and to stop the brain drain and emigration of the scientific milieu (Camagni and Capello 2014).

Change Routines and Address Institutional Bottlenecks

Developing systems for continuous entrepreneurial discovery and functional national/regional innovation

systems requires more flexible approaches to bureaucratic rules and regulations (Karo *et al.* 2017) and changes in routines and governance practices at the CEE level (Kroll 2015). Weak institutional capacity is currently perceived as the key inhibitor in many lagging regions and specific policies must be developed to promote institutional reforms and alleviate institutional bottlenecks (Rodriguez-Pose 2015), to strengthen strategic management capabilities and to foster the emergence of ‘innovation platforms’ (Muscio *et al.* 2015). Creating a culture of openness, mutual trust and cooperation is the key pillar that can make the whole innovation system work in practice.

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