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Regional Competitiveness in Central European Countries: In Search of a Useful Conceptual Framework

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Abstract *The goal of this discussion paper is to examine the relevance of selected influential theoretical and conceptual approaches to regional competitiveness for specific geographical and institutional contexts of Central European (CE) regions. We argue that strategic documents and policies (both nation- and region-wide) in CE countries are based on un-critical applications of a few popular concepts of competitiveness that were originally proposed and mainly applied in Western European and US regions. Existing empirical evidence documents a strong role of exogenous factors of competitiveness in CE regions, the in-house character of firm innovations and weak demand for innovations, and other impediments of R&D collaboration. We suggest that these (and other factors) limit the applicability of concepts such as regional innovation systems and Porterian clusters in the context of many CE regions. On the other hand, we argue that some other concepts such as the global production networks perspective or related variety and economic complexity can provide some relevant and inspiring frameworks for analysing regional competitiveness in CE countries.*

Introduction

Lagging somewhat behind the international debate, the pervasive language of competitiveness has flooded national and regional policy circles and documents in the Central European (CE) region. This discussion paper has grown out of our dissatisfaction with the uncritical understanding, conceptualization and measurement of regional competitiveness in CE countries, as well as with the related policy implications. We aim to examine the applicability of various concepts of regional competitiveness when confronted with the specific characteristics of CE countries and regions. Although the main arguments in

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this paper primarily arise from our field research[1] and practical policy experience from Czechia, attempts are made to provide a more general discussion valid for other CE countries, including Slovakia, Hungary, Poland and Slovenia.

The majority of concepts of regional competitiveness and its underlying factors regard innovation and creativity as key sources of a competitive regional economy. However, most of these have been based, tested or fine-tuned on the most developed regions of Western European (WE) and North America, with world-class universities and research centres. While these cases definitely provide us with interesting lessons, we note that disproportionately less attention has been given to the examination of competitiveness in "ordinary", peripheral or structurally affected regions (Tödling & Trippl, 2005). This is especially true for the research oriented on indigenous factors of regional development—localized knowledge spillovers, elaborated in concepts such as clusters (Porter, 1998); industrial districts (Markusen, 1996); regional innovation systems (RIS) (Cooke, 1992) or related variety (Frenken *et al.*, 2007). On the other hand, concepts focused on extra-regional forces of regional development were tested rather at a global level or through comparison of economically mutually inter-connected regions in developed and developing countries—global commodity chains, global value chains (GVCs), and global production networks (GPNs). Surprisingly, despite their relevance for small, export-oriented and foreign direct investment (FDI) driven CE countries and regions, these concepts have not attracted much attention among CE policy-makers.

We argue that the conceptualization of regional competitiveness in the majority of CE strategic documents and policies bears several shortcomings. The policies fail to reflect the networked nature of the world economy, do not address the dependence of regional competitiveness on extra-regional linkages and prevailing position of firms and regions within the GPN (BSA, 2010; MIT, 2011). Strategic documents at both national and regional levels largely disregard the prevailing position of companies and regions within the GPN in terms of their autonomy and competences. The CE strategic documents are excessively focused on establishment and support of clusters and RIS, regardless of whether the necessary conditions for successful development of clusters or RIS are met or not.

In addition, competitiveness measures are to a large extent focused on the ability to generate science-based innovations (GH, 2007; MEYS, 2009; MES, 2010). Therefore, national and regional strategic documents focus excessively on supporting or setting up new public research institutions and on stressing the need for collaboration between the academic and business sectors.[2] There is usually no reflection of the lack of innovation demand and weak capacity across the business sector that could utilize the innovation potential of cutting-edge research (Berman Group, 2010; Radosevic, 2011).

Keeping these shortcomings in mind, we aim to discuss the relevance of selected conceptual frameworks for analysing regional competitiveness in CE. The following section starts with very brief remarks on the notion of regional competitiveness. In the third section, some integral characteristics of CE regions are outlined in order to provide the necessary context. The main part of the paper is the fourth section, in which we critically evaluate the applicability of concepts such as clusters, RIS, GPN and concepts of related variety and, relatedly, of economic complexity. The final section provides conclusions.

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The Notion of Regional Competitiveness

The term "competitiveness" has a prevalent and sometimes hegemonic (Bristow, 2005) or obsessive (Krugman, 1996) usage in policy discourse. A single coherent definition or conceptualization is, however, lacking (Aiginger, 2006). It also applies for more recent but no less pervasive focus on regional and urban competitiveness that has raised some additional questions about how to conceptualize competitiveness of places and territories. For our purposes, we follow a widely used general definition that views regional competitiveness as "the ability of regional economies to improve standards of living for their citizens through generating high levels of income and employment, while remaining continually exposed to external competition" (European Commission, 1999, p. 4). More specifically, regional competitiveness may also be understood as the rate of success with which regional economies are able to compete for their share in regional, national and international markets, governmental incentives and other resources as well as the extent to which they are able to mobilize internal, and attract external, productive investments and/or prevent locally based firms from plant closures and relocations (Camagni, 2002; Gardiner *et al*., 2004).

In the long term, productivity improvements undoubtedly represent a key driver of a country or region's competitiveness. However, the sole focus on increasing productivity—understood typically as an output macroeconomic variable (Krugman, 1996)—covers only one part of the story. Various other processes and factors (largely microeconomic and including many qualitative ones) may be similarly important in determining the region's ability to capture value through profit reinvestment, prevent selective plant closures or maintenance of low wages because of labour shedding, and, in the long run, flexibly adapt to changes in the external environment (Coe *et al*., 2004; Martin, 2005). We do not see any contradiction between these two views; indeed, they can be regarded as two indispensable sides of the same coin.[3] Similarly, we also acknowledge a distinction, but a close relatedness between different sources of competitiveness (Simmie *et al*., 2006). These are, on the one hand, locally or regionally induced innovations and productivity additions and, on the other, productivity achieved because of functional integration into GPNs and continual upgrading in terms of product/process innovation and development or adoption of strategic functions such as R&D, design or marketing (Humphrey & Schmitz, 2002).

Contextualization: Specifics of the CE Region

The concepts of regional competitiveness often tend to generalize across various types of regions and sectors, while overlooking significant variations in the region's geography, history, institutional context or developmental stage (Martin, 2003). Even many geographical approaches often concentrate either on the most developed regions or regions in which a particular phenomenon is represented in a "crystallic form" (consider, for example, industrial districts and exemplar cases of regions such as the Silicon Valley or Emilia Romagna). Any attempt to assess the practical relevance of particular concepts, thus, requires at least some brief contextualization. Although the CE region is far from being homogenous in terms of factor endowments and competitiveness drivers, there are some shared characteristics that make it distinct from more economically developed WE countries.

First, the CE regions are generally less densely populated and their economic base, domestic market size and spatial intensity of economic activity is significantly smaller. The largest NUTS2 (Nomenclature of territorial units for statistics) WE regions generate comparable or even higher GDP than whole of Czechia or Hungary. These differences limit the potential of CE regions for capitalizing on the agglomeration economies on which key arguments of sound concepts of regional competitiveness are based. Moreover, while a central role in the competitiveness of territories is often attributed to the performance of their major cities (Simmie *et al.*, 2006), this reasoning is less valid for CE. A significant portion of manufacturing activities are located outside of the metropolitan areas of individual regions (Ženka & Čadil, 2009).

Second, the NUTS2 administrative division is an inappropriate regional breakdown in CE countries, including artificial units amalgamated from two or more NUTS3 regions, or capital cities less their commuting hinterlands. On the other hand, the CE NUTS3 level represents functional mezoregions (Hampl, 2002, p. 341). Given that the WE NUTS2 regions are generally more organic, historically grounded and institutionalized, it seems reasonable to compare WE NUTS2 regions and CE NUTS3 regions to avoid distortions resulting from the fragmented and non-organic regional structure at the NUTS3 level in WE states.[4]

Third, there is a clear, historically grounded west–east gradient in economic performance and transformation success within most CE countries, resulting from the proximity to WE borders (Petrakos, 2001; Baláž, 2007). Nevertheless, patterns of regional disparities in CE are much more influenced by position in settlement hierarchy; there is often a sharp polarity between metropolitan and non-metropolitan regions, while socio-economic differences among the non-metropolitan regions are relatively low. Economic super-dominance of capital cities suggests the key importance of urbanization economies, a gateway function for FDI, the concentration of corporate headquarters (HQs) and generally strategic, non-production functions (Radosevic, 2002).

Fourth, it is acknowledged that a form of capitalism represented in the CE region is rather a unique one. The major distinctive characteristic of external dependency has led some scholars to label these countries as "dependent market economies" (Nölke & Vliegenthart, 2009, p. 672). The spatially uneven development during post-communist transition has been accompanied by intense FDI inflows (Table 1) and dynamic integration into the system of international division of labour. The specific position that CE countries adopted in this system has been determined, among other factors, by the combination of comparatively low-production costs, technically skilled labour, geographical position (proximity to WE) and relative political stability (Pavlínek *et al.*, 2009).

Fifth, and relatedly, the majority of economically important but non-metropolitan CE regions are export-oriented and FDI-driven branch plant economies, characterized by an under-developed sector of knowledge-intensive business services. Manufacturing, thus, represents the major driver of competitiveness. In general, CE countries have a wide industrial base, also reflected in the high rankings with respect to the index of economic complexity shown in Table 1. Following the underlying logic of this index (Hausmann *et al.*, 2011), the high economic complexity rankings indicate that CE countries hold a diverse stock of productive capabilities and knowledge, suggesting promising potential for future economic development. However, the high rankings in economic complexity can be compared to lower positions of CE countries regarding the global competitiveness index and GDP per capita, which implies that the existing innovation potential has not been fully realized.

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Table 1. Basic economic indicators for CE countries, Germany, and the EU-27

	Per capita GDP PPP (2010, EU-27 = 100)	FDI inflows as percentage share of GDP; average 2005–2010	Real labour productivity per hour worked (2005–2010; 2005 = 100)	Global competitiveness index, 2011–2012 (rank in parentheses)	Economic complexity index, 2008 (rank in parentheses)
Czechia	80	4.4	113	4.5 (38)	1.6 (8)
Slovakia	74	4.0	118	4.2 (69)	1.4 (15)
Poland	63	3.8	113	4.5 (41)	1.0 (25)
Hungary	65	3.9	104	4.4 (48)	1.4 (14)
Slovenia	85	1.8	107	4.3 (57)	1.5 (10)
Germany	118	1.4	104	5.4 (6)	2.0 (2)
EU-27	100	1.8	103	–	–

Source: Eurostat 2012; Hausmann *et al*. 2011; WEF 2012.
Notes: Economic complexity index is taken from Hausmann *et al*. (2011, pp. 64–66) and reflects the diversity of a given country export base when controlling for the global-level ubiquity of individual products. It is assumed that the index mirrors the extent of productive capabilities and knowledge a given country holds with respect to its productive output.

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Sixth, the CE countries are regarded as being in a transition between the factor-driven and innovation-driven stage of competitiveness (WEF, 2012). The ability to create and commercialize own technological innovations is crucial for sustaining the competitiveness of CE in the long term. So far, however, it seems that existing capacity utilization and innovation transfers are a more important source of productivity growth than internal creation of knowledge (Radosevic, 2011). This may be one explanation for the underperformance of CE countries regarding some of the indicators of cutting-edge innovations. FDI-driven medium-tech industries may be considered as major sources of backward spillovers in the form of supplier linkages, the introduction of technical and qualitative standards, organizational models and superior technologies. High-tech CE firms, on the other side, significantly lag behind their WE counterparts regarding productivity and technology-intensity as they are represented mostly by foreign-owned assembly plants (Srholec, 2007).

Finally, the weak innovation performance in internal innovation ability[5] might be also attributed to the institutional context. Radosevic (2011, p. 365) documents limited potential for creation of science-industry links in CE because of low demand for R&D, while arguing that CE countries have failed to realize their R&D potential. Other authors document immature, erratic and often formal character of innovation and industrial policies (Blažek, 2010; Pavlínek & Ženka, 2011), the existing barrier between public and business sector R&D or the predominantly in-house character of business innovation as major constraints, resulting from the linear model of R&D inherited from the socialist era (Žížalová, 2010).

Selected Concepts of Regional Competitiveness and their Relevance for CE

We have selected four concepts of regional competitiveness in order to critically assess and compare their explanatory power and relevance for the CE regions (Table 2).

Table 2. Concepts of regional competitiveness and their relevance for CE

Mechanisms spurring regional competitiveness	Concepts	Policy implications	Relevance	CE Regions' context/specifics limiting applicability of particular concepts
Spatial proximity of businesses within the same or related industries initiates and encourages mutual cooperation in strategic fields	Clusters, RIS	Establishment and development of formalized clusters	Low	• Very low level of mutual trust both within business sector, and between businesses and academia • Subordinate position within production networks strengthened by the dominance of passive marketing approaches across business sector
		Establishment and development of Centres of Industrial Competence	High	• "Institutional gap" between academia and businesses • Break-up of applied research as a consequence of privatization of large public companies
Cognitive proximity initiates and facilitates knowledge creation and diffusion	Related variety and economic complexity	Smart specialization strategies (S3)—not implemented yet across CE region	High	• Key industries are not driven by strong innovation-oriented companies, but by Trans-national corporations' (TNCs') subsidiaries • Low innovation demand across both business and public sector
Easier monitoring of co-localized competitors enable innovations	Clusters	Initiation and support of strategic alliances; sharing specialized knowledge infrastructure	Irrelevant	• Propulsive industries in CE regions are dominated by (i) TNCs' manufacturing facilities with limited decision-making autonomy and, thus, limited innovation functions, and (ii) endogenous tier 2+ suppliers fulfilling "blueprint" tasks prepared by their customers

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Intense cooperation between businesses and academia facilitated by government encourages knowledge transfer and radical innovations	RIS	Grants for business-academia cooperation	Low	• Innovation demand across business sector is focused on the types of innovation for which research cooperation is not needed
	RIS	Establishing/developing technology transfer and intellectual property commercialization services	High	• Very low level of experience with the commercialization of research outputs • Universities have inefficient formal procedures that impede researchers in utilizing the potential of their results • Very few endogenous industrial partners capable of using results of world class research
Innovative SMEs create most of the new jobs	Clusters, industrial districts, RIS	Incubation of new technology-oriented ventures	High	• Infant local markets with specialized services such as mentoring or venture capital • The entrepreneurial tradition disappeared during the era of central planning
Process, product and functional upgrading in production networks generates higher value-added and increases productivity	GVCs GPNs	Improvements of local educational system, institutions, direct customized support for the TNCs and suppliers	High	• Limited possibilities of upgrading for CE firms in quasi-hierarchical value chains of medium-high-tech industries • Lack of highly skilled engineers and blue-collar workers • Low quality of regional universities and R&D institutions

Source: Blažek and Uhlíř 2011; Berman Group 2008, 2009, 2010, 2012; Radosevic 2011.

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Undoubtedly, there are also many other theoretical approaches that can be useful when analysing regional competitiveness. However, the concepts discussed here were selected primarily by considering either their existing factual importance or promising but unrealized potential regarding both their analytical strengths and applicability in practical policy in the CE context. More concretely, Porter's conceptualization of clusters has been chosen as a very influential concept in policy circles, and one which has been extensively implemented. The RIS idea has attracted a lot of attention both by academics and policy-makers. Successful implementation of regional innovation policies is, however, almost absent in the CE, but for some rare exceptions.

After considering the convergence of the literature concerning endogenous and exogenous factors of regional development (Bathelt *et al.*, 2004), we decided to also include the GPNs concepts in this discussion. This perspective seems to be especially relevant for relatively small, export-oriented, regional branch plant economies in CE, though the attention within policy circles has been minimal so far. Finally, we also consider the relevance of recent concepts of related variety and economic complexity, which can be instrumental in explaining regional differences between monocultural and diversified CE non-metropolitan regions. Individual concepts are then discussed in more detail below.

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Clusters

Although the concept of clusters (Porter, 1998) has been criticized[6] for its vagueness (Martin & Sunley, 2003) and Porter's hypotheses about spatial proximity fostering interactive learning and the innovation process have not been empirically confirmed (Simmie, 2004), clusters and the Porterian diamond of competitive advantage have remained very influential concepts in CE regional policy and academic research (Davendra & Pavelková, 2011). Only recently has there been growing academic interest in the implications of newer and more differentiated views on the role of clusters, such as the focus on the "local buzz-global pipelines" concept (Blažek *et al.*, 2011). Thus, the key role of translocal (mostly inter-firm) linkages for innovation performance of CE-based firms and clusters both in high-tech and more traditional industries have been stressed. Based on these findings, together with comprehensive policy-related documents focused on delimitation of clusters in CE and evaluation of their impacts on economic growth (OECD, 2005; Ketels & Sölvell, 2006 are examples of empirically valuable, but rather uncritical documents), we argue that the main criticisms of Martin and Sunley (2003), Simmie (2004) or Boschma (2005) are perfectly applicable to the situation of CE countries as well.

First, the main concern with the exchange of knowledge is often ignored and clusters in CE are often confused with other types of spatial industrial concentrations such as pure agglomerations of unconnected firms. Simmie (2004) identified three inherent features of Porterian clusters including the vigorous inter-firm competition driving innovation performance; existing links between participating firms in terms of vertical buying/selling chains and horizontal linkages with suppliers of complementary products and services; and stressed the fact that these linkages are among geographically proximate firms, while spatial proximity is seen as stimulating value-creating networks. By contrast, while many industrial concentrations can be found in CE, majority of them exhibit either weak or absent inter-firm linkages, limited innovation collaboration with public institutions, and the predominantly in-house character of the innovation process (OECD, 2005; Žížalová, 2010). In addition, the latter is strengthened by a lack of trust

and social capital as well as an immature institutional framework that would not facilitate innovation collaboration (Ionescu, 2005).

Second, the role of spatial proximity for encouraging innovation collaboration is generally overestimated. With the exception of large metropolitan regions, CE-based "clusters" and firms are characterized by weak innovation collaboration at the local level and intensive external linkages at national and international level (Dermastia, 2005; Wojnicka *et al.*, 2005; Žížalová, 2010). Knowledge sourcing patterns often strongly correspond to the urban hierarchy (Blažek *et al.*, 2011) as long as there is a lack of high-quality R&D institutions and universities, as well as other specific barriers to knowledge transfers in CE regional centres (Gál & Ptáček, 2011). Therefore, "national pipelines" connect medium-sized regional centres to the metropolitan regions of capital cities, for which rather international linkages are of key importance. These findings support an argument against an over-territorialized conception of embeddedness that implicitly focuses on the local dimension, while neglecting the multi-scalar character and international dimension of economic organization (Bair, 2008).

Moreover, while turning to the influential typology of industrial districts by Markusen (1996), we argue that the competitiveness of CE regions is based rather on export-oriented hub-and-spoke clusters than on Marshallian clusters of small proximate firms, and that vertical linkages are much stronger than horizontal (Wojnicka *et al.*, 2005). Hub-and-spoke clusters integrated by vertical linkages between the lead firms and the suppliers can be found mostly at the national level (Širák & Řehák, 2005) and are close to Porter's original concept of drivers of national competitiveness. On the other hand, whether such interconnected groupings of relatively distant firms can still be regarded as clusters is debatable, implying the question of whether they should rather not be analysed using GPN or related perspectives.

Regional Innovation Systems

Policies inspired by RIS aim to capitalize on existing spatial concentrations of economic activities and on their agglomeration economies, which can be stimulated by purposive governmental support of knowledge creation and transfer. Quality of both public and business sector R&D, intensity and quality of social networks facilitating technology transfer and firms' innovation capabilities are considered to be vital factors stimulating regional competitiveness (Cooke *et al.*, 1997).

There is a widespread conviction both in policy and academic discourse that during the post-communist transition, CE countries have failed to utilize their inherited science bases (Radosevic, 2011, p. 365). This argument is relevant mostly for Slovenia and Czechia, which have recently joined the elite group of innovation-driven economies (WEF, 2012) and score relatively high in comprehensive evaluation of innovation performance by the European Innovation Scoreboard. Therefore, their competitiveness should be based more on their own R&D and innovation rather than solely on the absorption of external knowledge. The existing findings, however, suggest some systemic failures in knowledge transfer between the public and business sector and in the commercialization of technological innovations. While this was evident some time ago (Radosevic, 2002), more recent empirical work still documents erratic policies and an immature institutional framework for knowledge transfer and innovation collaboration in CE. National innovation systems (NISs) are fragmented into several loosely inter-connected regional subsystems (Blažek & Uhlíř, 2007), of which many are integrated more tightly into WE

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than into NISs (Lengyel & Leydersdorff, 2011). In addition to weak coordination at the national level, RIS and the intensity of innovation collaboration in the majority of CE non-metropolitan regions is even weaker (Žížalová, 2010), mainly for the following reasons.

First, despite an excessive focus on equalization of regional disparities during the socialist era, CE countries inherited highly uneven spatial distribution of basic R&D and universities, concentrated in the metropolitan regions and the largest industrial centres. Geographically more dispersed institutes of applied R&D almost collapsed during the privatization era, or were transformed into specialized engineering or consultancy centres, oriented on rather short-term and simple tasks (Blažek & Uhlíř, 2007). Regional mid-range universities, often established after 1989, are predominantly oriented on education. Their capacity to perform high-quality R&D is very limited; the tradition in spin-off firms is relatively short, while the potential to induce localized knowledge spillovers has often been overestimated. Moreover, even in traditional regional industrial centres, the regional knowledge base is often incompatible with actual industry needs (Gál & Ptáček, 2011). Therefore, innovative firms in non-metropolitan regions very often cannot find local collaboration partners, and so they cooperate mostly at the national (SMEs) or at the international (large firms) level—see Žížalová (2010).

Second, there is a significant gap in demand for science-industry links in CE when compared to the US or WE. R&D supply by the public sector is larger than the absorption capacity of the business sector and its willingness and capacity to cooperate with domestic universities and R&D institutions (Radosevic, 2011). Blažek (2010) identified fractures common in many CE regions, where R&D institutes are frequently unable to find local partners to commercialize their results, or where the innovation needs of local firms are too simple and unattractive for public R&D. The lack of local cooperation between relatively strong, basic government R&D and the business sector, as well as almost non-existent applied R&D that would bridge this gap, typically restrict the effective creation of RIS (Blažek & Uhlíř, 2007).

Third, innovation performance of the CE regions is FDI-driven and dominated by large subsidiaries of foreign TNCs and their major suppliers in medium-tech manufacturing industries (Radosevic, 2011). Although manufacturing facilities require some R&D and sales capacities, the key strategic functions are located abroad and the CE position has continually remained peripheral (Pavlínek, 2012). Moreover, the majority of firms in CE are engaged in little or no external innovation collaboration. Intra-firm knowledge creation is stronger than inter-firm collaboration or linkages with local R&D institutes and universities (Žížalová, 2010). Technology transfer takes place primarily between CE-based subsidiaries or suppliers and their foreign-based customers, HQs and R&D centres. Not only product and technological innovations, but also incremental process innovations are primarily FDI-led and governed by the lead firms of trans-local production networks (Pavlínek & Ženka, 2011). While the majority of foreign-owned subsidiaries prefer intra-firm knowledge creation and international innovation collaboration, a few locally developed innovative high-tech companies include primarily small enterprises or even start-ups. Their financial and R&D capacities are, therefore, very limited.

Fourth, local enterprises typically compete in market segments of standardized goods and services with high-price elasticity and increasing competition from countries with even lower costs of factors of production (e.g. Romania, Turkey or China). Despite this trend, most entrepreneurs do not have the ambition to re-orient towards markets where

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higher rank innovations are the key to long-term success (Berman Group, 2008, 2009, 2012 for details). Moreover, the four decades of experience of communism broke-up the tradition of entrepreneurship. Although clusters of high-tech SMEs can be found, especially in metropolitan regions, their share in total R&D innovation performance is rather marginal; these firms have usually lagged technologically behind their WE counterparts, or tend to orient on simpler tasks and domestic markets (Blažek & Žížalová, 2010; Radosevic, 2011).

On the basis of the CE specifics noted above, we regard the concept of RIS (and similarly, learning regions) as relevant to metropolitan regions with the largest concentration of business HQs accompanied by the concentrations of quality public research institutions. Only under these conditions can business ambitions, knowledge potential, economic power and intellectual capital be engaged to an extent sufficient to develop a functional RIS.

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Global Production Networks

The arguments against the relevance of clusters and RIS in CE strongly support the hypothesis about the vital importance of extra-regional factors and trans-local linkages for the prospects of regional economic development in CE. Two main features of regional competitiveness in CE that support this argument are as follows. First, the TNCs' subsidiaries and FDI are major drivers of innovation performance, productivity and employment growth (Nölke & Vliegenthart, 2009; Hagemeyer & Tyrowicz, 2012). Second, innovation collaboration in CE has predominantly international and intra-firm character (Žížalová, 2010). Intense productivity and technology spillovers are expected among the value chain participants and the TNCs' subsidiaries rather than among loosely connected, but geographically proximate firms and institutions (Damijan *et al.*, 2003; Szent-Iványi & Vigvári, 2012).

In our opinion, the GVC/GPN perspective puts an emphasis on the key factors of regional competiveness in CE in terms of the position in the GPN and intensity of functional upgrading, which is understood as a shift towards strategic higher value-added functions such as design, R&D or marketing (Humphrey & Schmitz, 2002). Asymmetric distribution of corporate power and competences between the lead firms and their suppliers, which is considered as an important factor of uneven distribution of profits (Gereffi & Korzeniewicz, 1994; Kaplinsky & Morris, 2002; Coe *et al.*, 2004), has far-reaching consequences for the prospects of regional development. As long as the lead firms, corporate HQs and strategic functions are scarcely represented in CE (Dischinger & Riedel, 2010), their high level of spatial concentration (Pavlínek & Janák, 2007) and highly selective nature of functional upgrading in upper parts of the GPN (Pavlínek *et al.*, 2009; Pavlínek & Ženka, 2011) are expected to contribute to spatially uneven development. Limited upgrading possibilities of lower tiered suppliers and prevalence of foreign-owned branch plants with no strategic functions among the first-tier suppliers (Blažek, 2012) hamper the prospects of economic growth in branch plant economies.

The CE non-metropolitan regions may be generally conceptualized as export platforms (Martin, 2003), orchestrated by foreign-based TNCs[7] and broad network of their suppliers in technology-intensive industries, especially in quasi-hierarchical value chains of the automotive industry (Bohle & Greskovits, 2007). In Czechia and Slovakia, roughly two-thirds of manufacturing value-added and R&D expenditure are directly controlled through foreign ownership (ZEW, 2010; Eurostat, 2012) suggesting that a large share of

economy is integrated into hierarchical value chains in these countries. These figures do not include thousands of lower tiered domestic-owned suppliers, for which data are not available (except for widely studied industries such as the automotive). The extent of supply networks can be estimated only indirectly through indicators of vertical intra-industry trade and domestic sourcing. For example, in 2007, the share of the vertical intra-industry trade in total exports varied between 30% and 40% among the CE countries (Černoša, 2007). In 2002–2003, the TNCs in Poland, Hungary, Slovakia and Slovenia sourced on average 41.1% and sold 44.4% of their sales to domestic-owned firms (Jindra *et al*., 2009). Based on this fragmentary evidence, we can propose a very rough estimate that 75–80% of the CE manufacturing value-added is generated in firms tightly integrated into the GPN, for which the foreign-based TNCs or their CE-based subsidiaries are principal customers or suppliers.

There is rich empirical evidence of significant (both positive and negative) impacts of FDI, foreign-ownership, and external demand on productivity growth and innovation performance in CE (Srholec, 2007; Allard, 2009; Damijan *et al*., 2010; Hagemeyer & Tyrowicz, 2012). Three types of mechanisms may be distinguished in this respect, including the effects of direct ownership control on productivity and innovation, effects of vertical productivity and knowledge spillovers among the GPN participants (TNCs, HQs, subsidiaries and suppliers) and, finally, horizontal spillovers as unintended benefits of FDI on competitors and other non-participating actors. While the former two reflect the importance of GPN, the presence of the latter mechanism would support the view of regional competitiveness driven by external economies, as suggested by concepts of clusters and RIS.

Direct and significantly positive effects of foreign ownership on economic and innovation performance at both national and firm level have generally been reported (Damijan *et al*., 2010). At the same time, these effects have been proved to be larger for totally foreign-owned firms than for joint-ventures or firms with partial foreign ownership (Hagemeyer & Tyrowicz, 2012). Some of the authors (Damijan *et al*., 2003) argue that the most important channels for technology transfer are vertical linkages between the TNCs and their CE-based subsidiaries. There is a consensus that vertical backward spillovers are the most significant type of spillovers spurring the productivity growth and innovation activity in CE. By contrast, the effects of forward vertical and horizontal spillovers have been found less significant or negative (Hanousek *et al*., 2011; Szent-Iványi & Vigvári, 2012). Although there is a lack of empirical evidence about how the position of firms and regions in GPN affects their prospects of economic growth and innovation performance in CE, a few recent studies have found this relation significant (Kokko & Kravtsova 2008; Jindra *et al*., 2009). On the other hand, Damijan *et al*. (2010) did not find any significant effect attributable to the position of subsidiaries within the TNCs network. Foreign subsidiaries in CE were found to be relatively independent ventures when innovation activity is considered.

Although we have found several arguments strongly supporting the relevance of GPN for regional competitiveness in CE, there are also certain limitations. Empirical research drawing on the concept of GPN is oriented mostly on transactions between the lead firms and their suppliers (Coe *et al*., 2008), while at the same time intra-firm relations between corporate HQs and their foreign-based subsidiaries are neglected. Nevertheless, it is probably the autonomy, competences, and overall position of subsidiaries in hierarchical networks of parental TNCs what affects the prospects of regional economic growth in CE more significantly than their position in supplier tiers. This hypothesis is supported by

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empirical evidence provided in Ženka and Pavlínek (forthcoming) who examined the effects of the position of Czech-based firms in tiered automotive supply chains on regional development variables such as employment, wages and corporate tax revenues. The authors found a strong polarity between the tier-two lead firm Škoda Auto and the group of supplier firms in Czechia. At the same time, differences among the first, second and the third-tier suppliers were much smaller, suggesting that autonomy in the TNCs is more important than the position in supply chains and complexity of manufactured products. Moreover, Ženka and Pavlínek (forthcoming) also argue that strategic higher value-added functions and corporate HQs are scarcely represented in CE and that it holds even among the firms on the top of supply chains. The GPN perspective, thus, may be more informative in explaining international differences in economic development of regions plugged into a particular GPN than in explaining a general pattern of regional disparities within individual CE countries.

Despite these potential limitations, we regard the GPN perspective as highly relevant to explanation of economic disparities and differences in regional competitiveness among the CE non-metropolitan regions (especially among these which do not possess any specific or unique assets). While the concept of "spatial marginality" may provide the best explanation for the situation in remote and sparsely populated subarctic Scandinavian regions, "lock-in" for structurally affected old industrial regions, "industrial districts" for regions with dense local networks of SMEs such as Emilia Romagna, "urbanization economies" for metropolitan areas, and various institutional approaches for "culturally distinguished" peripheries such as the Italian Mezzogiorno, focus on the integration, position and upgrading in GPNs may have a strong explanative power for economic differences among the ordinary, "geographically non-specific" regions.

Economic Complexity and Related Variety

As noted above, existing CE innovation and regional policies are excessively focused on the support of highly specialized industrial clusters and RIS. Therefore, localization economies understood as knowledge spillovers, labour market pooling and specialized suppliers available for the local firms in the same sector are considered to be a vital source of regional competitiveness in these strategies. Although CE policy-makers are aware of de-industrialization and unemployment growth resulting from excessive specialization of many CE regions and especially from the dependence on FDI-driven automotive production (Pavlínek & Ženka, 2010), until now they have almost ignored the concepts linking regional economic growth with the industrial variety and technological relatedness between different industries in terms of the concepts of economic complexity and related variety.

These interrelated concepts regard economic development and regional or national industrial diversification as an evolutionary and path-dependent process. Countries and regions often tend to diversify their production and exports towards new products that are closely related to those they already specialize in because of existing productive knowledge and capabilities available in these economies. It is argued that the development prospects of a country/region are strongly related to its economic complexity, which reflects the diversity of its export base when controlling for the global-level ubiquity of individual products (Hidalgo *et al.*, 2007; Hausmann & Hidalgo, 2009). The concept of related variety takes on similar arguments, holding that neither economic diversity nor

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economic specialization *per se* increase the chance of knowledge spillovers, innovation and regional learning, but rather diversity in terms of the presence of a variety of technologically related sectors (Frenken *et al.*, 2007). Thus, the main idea is that firms learn more from other firms operating in different but related industries rather than from firms in the same industries—either from the firms in the same region or external firms—through exports, imports, licensing, FDI, insertion into GPN and other mechanisms (Boschma & Iammarino, 2009). For regions, it is difficult to attract new economic activities when they are technologically distant from the existing regional portfolio. It has also been argued that industrially diversified regions serve as incubators for new economic activities, while specialized ones are more typical for localization of mass-production and low-cost environments. Although we are not aware of any study that would make use of these arguments for a rigorous empirical analysis in the CE context, we consider them highly relevant to the CE context.

A surprisingly strong path-dependence in regional economic diversification and innovation performance in CE has been documented by several empirical studies, though it has not been put into the conceptual framework mentioned above (Pavlínek, 2002, 2012). While the process of regional branching (Boschma & Frenken, 2011) and technological relatedness between contemporary and new industries is more expected in cases of WE regions with long-term continuity in economic development (e.g. Swedish manufacturing—see Neffke *et al.*, 2012), the situation in CE regions might be more complicated because of the discontinuity associated with the complex socio-economic transformation since the beginning of 1990s. However, more radical FDI-driven sectoral changes rather occurred only in a smaller number of old industrial regions facing deindustrialization, or in some smaller peripheral regions that attracted greenfield investments in a variety of manufacturing industries, including high-tech ones. More often, the structural shifts were rather incremental and it was actually determined considerably by the technological relatedness between industries. These processes were stimulated by acquisitions or joint-ventures with TNCs, which capitalized on a skilled labour force, specific know-how and traditional markets of local firms (Pavlínek, 2002). Again, it illustrates the vital importance of extra-regional linkages for economic diversification and growth, as suggested by Boschma and Iammarino (2009). Moreover, Ženka and Čadil (2009) and Pavlínek (2012) documented that history matters considerably in the location of corporate R&D activities and FDI in CE industrial R&D, which tend, with rare but notable exceptions of metropolitan areas, to follow regional patterns inherited from socialism based on the R&D capabilities of former socialist state-owned industrial corporations.

As mentioned, CE countries, and especially Czechia and Slovenia, score very high in the economic complexity index, even outpacing some economically more advanced countries such as the US, UK, Italy or Denmark (Hausmann *et al.*, 2011). We also noted above that the development implications of high economic complexity have been limited because of factors such as those related to the institutional context of erratic or even missing innovation and industrial policies, fragmented RIS, weak innovation collaboration and formal clusters of loosely interconnected firms. However, we still stress the high relevance of the concepts discussed here, especially when economic complexity and related variety arguments are combined with the GPN perspective. There is great potential for the more productive utilization of a wide stock of existing capabilities available in CE economies, for example, in the form of an inter-sectoral upgrading

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accompanied by the transmission of knowledge spillovers through the value chain in driving industries such as the automotive (Domanski & Gwósdz, 2009).

The general implication of these concepts for practical policy would be to support urban and regional economic diversity (and "smart specialization"), inter-industry linkages and similar, at the expense of over-specialization. These arguments are relevant to various types of regions with at least somewhat diversified economies, not only for metropolitan regions with major industrial clusters and high-tech industries, but also to rejuvenate old industrial regions (Rumpel *et al.*, 2010) or smaller cities and regions with an existing industrial tradition, where a stock of unutilized productive capabilities can be expected. They are less relevant to over-specialized regions with little industrial tradition outside a dominant industry, and for places overly oriented towards a low-cost mass-production environment.

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Conclusion

Considering various specifics of many CE regions, the aim of this paper was to critically evaluate and compare the relevance of selected concepts of regional competitiveness. The main argument raised here is in line with the conclusions of Nölke and Vliegenthart (2009), who argue that innovation systems and institutional frameworks in the CE countries are so different from the WE countries that they represent a distinct variety of capitalism—dependent market economies. As the propulsive industries of individual regions are to a large extent driven by manufacturing-oriented subsidiaries, the common denominator is the fundamental dependence on the activities and decisions of TNCs. Hierarchical control of local subsidiaries by foreign-based HQs is found to be the central coordination mechanism and principal source of finance, governance, technologies and innovation demand.

The majority of CE regions represent primarily assembly platforms of the TNCs, which capitalize on the semi-skilled and cheap labour force. Key technological and organizational innovations and unique know-how are being imported from abroad. The TNCs are not motivated to develop intense R&D cooperation with local suppliers and universities, which generally lack capabilities to collaborate on cutting-edge research and are not viewed as a source of strategic knowledge. Collaboration among clustered firms integrated into various RIS is, thus, by far a less important stimulus of innovation and economic performance than the position and strategic role of the CE-based subsidiaries in the TNCs' hierarchies and generally in the GPN.

Therefore, it seems that CE regional policies aimed at building regional competitive advantage through support for R&D collaboration and linkages between academia and the business sector are generally missing the point, at least in many non-metropolitan regions. Weak R&D collaboration and limited localized knowledge spillovers among isolated regional actors are, however, not the main issue. It is the innovation demand among the business sector and in many cases also knowledge creation—not the knowledge transfer—that is particularly weak in CE compared to WE. We suggest that two potentially valuable explanative frameworks that have been underutilized so far in the context of CE regions are the GPN perspective and the interrelated concepts of the related variety and economic complexity. On the other hand, some reservations have been expressed with respect to over-utilization of RIS or cluster concepts and especially with respect to frequent naïve understandings of these approaches.

We argue that recent CE innovation and regional policies are over-territorialized, excessively focused on support of industrial clustering and agglomeration economies, including the oft-advertized support to deemed technology transfer between local private and public actors. Considering small area and short distances within CE countries (except for Poland), the CE-based firms most commonly develop links and networks rather with the top universities in metropolitan regions and with the best suppliers across the country than necessarily only with local actors. There are a number of disputable policy measures that have to be reconsidered and rigorously analysed such as relatively significant support to a large number of small and loosely connected industrial clusters, to the technological parks localized in districts without tradition and sufficient knowledge base, or to the R&D centres and various facilities for technology transfers in regions without critical innovation demand and absorption capacity of the business sector.

Bearing in mind a path-dependent and evolutionary nature of economic development, policy-makers in CE should more seriously search the way how to capitalize on a high-industrial diversity, technological relatedness and economic complexity of many regional economies. From this perspective and in the present CE context, it is inter-sectoral technology transfers rather than localized knowledge spillovers that should be prioritized. It also means support to trans-local vertical backward spillovers among technologically related industries that serve as an important source of technologies and productivity growth of CE firms. This calls for coordinated sectoral policies that would support the clusters of technologically related industries either at the national level or without any explicit spatial dimension rather than explicitly localized clusters of (very often) unrelated firms.

Despite continuing expansion of TNCs into CE countries, from a longer term perspective, there is an obvious need for systematic efforts aimed at reducing the vulnerability of local economies determined by their over-dependence on foreign capital. Various regulation and competition policies are often suggested in this respect. The field research in local CE companies has also indicated generally low ambitions of owners and managers with respect to the expansion of their firms in global markets and/or improvements of their positions in GPN. Specific support addressing this problem, for example, by programmes targeted at improvements of couching and management skills can be instrumental here. This may be especially important for an important segment of relatively mature, but stagnating SMEs which account for a large share of employment in many CE regions.

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Notes

1. In addition to other experience, it includes an extensive survey amog 680 Czech companies (all industries including services, various vertical positions in supply/production networks) in terms of in-depth interviews (mostly with the CEOs) conducted in 2008–2012, which addressed numerous issues directly related to the topics discussed in this paper (e.g. the corporate governance and ownership structures, supply chain, future strategy and key challanges, products and the trends on a given product market, management of innovations and R&D activities).

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2. For example, in the personal experience of one of the authors, when the Karlovarsky and Vysocina regions (as two NUTS3 Czech regions) began with their attempts to conceptualize their strategic development policy, local opinion leaders and politicians were persuaded that it is impossible to restore the competitiveness of their regions without establishing a technical college or even a university.
3. Not incidentally, the Global Competitiveness Index, perhaps the most popular measure of competitiveness at national level, considers a very broad range of proxy variables, of which many are microeconomic determinants, though the interpretation of the index is mostly macroeconomic when mapping the positions of countries regarding their prospects in the scramble for productivity (WEF 2012).
4. WE NUTS3 regions are extremely diverse in terms of population size. Moreover, especially in Germany and Austria NUTS3 regions are split into the regional centres and their commuting hinterlands, which are, therefore, hardly mutually comparable regions.
5. The median value for the number of patent applications recorded by Eurostat over 2005–2007 in Western European NUTS2 regions is almost 20 times higher than the median for CE regions, and other available regional level indicators of internal creation of knowledge differ similarly.
6. For epistemological discussion, see Kofroň (2012).
7. In 2009, the share of foreign firms in manufacturing value added for Czechia, Slovakia, Hungary, Poland and Slovenia was, respectively, 57%, 63.8%, N.A., 45% and 25.4% (Eurostat 2012). Their average shares in the manufacturing R&D expenditures in 2003–2007 were 65.9%, 57.2%, 58.7%, 26.4% and N.A (ZEW 2010).

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