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EDITORIAL



Polycentric urban regions: conceptualization, identification and implications

Ben Derudder^a , Evert Meijers^b , John Harrison^c , Michael Hoyler^d  and Xingjian Liu^e 

ABSTRACT

This special issue offers a cross-section of state-of-the-art research into ‘polycentric urban regions’: regions characterized by the presence of multiple, more-or-less proximate, centres where there is balanced development among these centres. With the literature increasingly transcending the focus on paradigmatic examples, the papers in this special issue concentrate on three fundamental and complementary questions: How can polycentric urban regions be conceptualized? How can we identify them formally? What is the impact of this regional form on people and places? We discuss how the contributions collectively push the boundaries of the regional studies literature and identify promising avenues for further research.

KEYWORDS

polycentric urban regions; centres; balanced distribution; paradigm

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‘Polycentric urban regions’ (PURs) have become a key concept in regional studies both as an analytical framework to capture empirical realities as well as part of normative visions and goals in regional development policies. Internationally, this was reinforced in the New Urban Agenda by a commitment to ‘support the implementation of integrated, polycentric and balanced territorial development policies and plans, encouraging cooperation and mutual support among different scales of cities and human settlements’ (UN-Habitat, 2016, p. 24). Similar narratives have emerged across very different national and regional contexts. As one of the most recent rallying calls in British political vocabulary, the ‘Northern Powerhouse’ proposes a polycentric perspective on the longstanding challenge of addressing England’s North–South inequalities. In the words of its political champion:

if we can bring our northern cities closer together – not physically, or in some artificial political construct – but by providing modern transport connections ... then we can create a northern powerhouse with the size, the population, the political and economic clout, to be as strong as any global city.


(George Osborne, 2014,
quoted in Mackinnon, 2020, p. 1)

Putting an explicit emphasis on the complementarities and linkages between the region’s individual urban centres is significant because it represents a deliberate choice rooted in the assumption that ‘[i]mproving the nature of interactions between centres in a polycentric region is ... likely to have positive economic outcomes’ (Seymour, 2017, p. 25). These positive outcomes, it is assumed, will emanate from additional agglomeration economies operating


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at the regional scale and that will complement those at the level of individual urban centres. Likewise, in China's National Plan on New Urbanisation (2014–20), 'urban agglomerations' (*chengshiqun*) were put forward as a central policy concept. These urban agglomerations closely resemble the Northern Powerhouse's PUR framing because they are defined as regions with densely interconnected cities with complementary economic profiles. This represents a major paradigm shift in China's regional policy, where provinces used to dominate, as urban agglomerations are explicitly designed as a new state space for the central state to reassert and enhance its governance capacity in economic, social, economic and environmental terms (Wu, 2016).

This special issue of *Regional Studies* offers a cross-section of state-of-the-art research on the conceptualization, identification and implications of such PURs. A straightforward definition of PURs would point to regions characterized by the presence of multiple, more-or-less proximate centres where there is balanced development among these centres. Of course, being polycentric is not a regional condition that is present or absent because 'any group of reasonably closely spaced settlements is likely to be polycentric to some extent' (Green, 2007, p. 2082). Therefore, it is always necessary to speak of polycentricity as a property that exists on a sliding scale. Further complications exist because PURs can be difficult to differentiate from regional patterns associated with concepts such as edge cities (Garreau, 1991) or extensive suburbanization (Bartosiewicz & Marcińczak, 2020), and they are often discussed using slightly different terminologies such as polycentric metropolises (Hall & Pain, 2006) and urban agglomerations as per the Chinese regional policy framework (Wu, 2016).

Paralleling the regional policy interest, PURs have become an established and widespread framework in urban and regional studies. In geographical terms, the literature has transcended – albeit unevenly so – research into what now appear to be paradigmatic examples such as the Dutch Randstad, the Flemish Diamond or the German Rhein-Ruhr Area (Meijers, 2007). More broadly, PURs are now acknowledged as an important empirical reality throughout Europe (Champion, 2001) and estimates suggest that today 25% of the European population and 34% of the European urban population lives in a PUR (Meijers et al., 2018). Research on North American mega-regions often invokes the spatial vocabulary of PURs (Nelson & Rae, 2016; Sweet et al., 2017). However, echoing the regional policy shift in China, it is above all research on regional development in China that increasingly adopts the PUR framework (Li & Phelps, 2017; Liu & Wang, 2016). However, recent regional studies also research polycentric patterns in Latin American (Fernández-Maldonado et al., 2014), Asian (Sadewo et al., 2021) and African urban regions (Agyemang et al., 2019).

Although the genealogy of PURs is still being (re)written (Van Meeteren, 2020, in this issue), it is clear that today the concept is broadly adopted as both an analytical frame for research (Taubenböck et al., 2017) and a

normative territorial development goal (Rauhut, 2017). In addition, there are related PUR research agendas on politics and governance (Harrison et al., 2021; Schafran, 2014), identity-building (Van Houtum & Lagendijk, 2001) and planning (Boussauw et al., 2018). However, the increasing breadth and popularity of PURs comes at a cost: surveying the literature using scientometric methods and content analysis, Van Meeteren et al. (2016) observe that the notion of 'polycentricity' has evolved into a stretched concept causing Babel-like confusion in urban and regional studies. According to Davoudi (2007), this scientific ambiguity was at some point even instrumental for its adoption in policy circles: as every actor involved in a regional planning process could attribute its own interpretation to it, it seemingly became easier to establish consensus (Granqvist et al., 2019). However, it must be said that the sometimes ambiguous nature of the PUR concept does not imply it is no longer useful: it simply raises the stakes of (1) being clear about what a PUR does or does not entail (Kloosterman & Musterd, 2001), (2) operationalizing it using appropriate analytical frameworks (Derudder et al., 2021) and (3) carefully specifying and examining the alleged consequences – including heightened economic productivity (Li & Liu, 2018), lower environmental emissions (Burgalassi & Luzzati, 2015) and the geographical distribution of metropolitan functions (Meijers et al., 2018) – sometimes associated with it.

This special issue builds on *Regional Studies'* long-standing interest in PURs (Burger et al., 2014; Hoyler et al., 2008; Liu et al., 2016; Parr, 2004) and emerged out of a Regional Studies Association research network on this topic. The purpose of the research network was to critically evaluate the state of the field, and to articulate an agenda for the next wave of PUR studies. Several thematic foci were identified, including the governance, alleged worldwide manifestation and infrastructure challenges of PURs. However, the preliminary thematic focus was to clarify the nature and scope of PURs by pursuing the tripartite research agenda of conceptualizing, identifying and implicating PURs.

Conceptualizing goes to the very core of PURs by asking: What does the concept entail? In many writings, Hall's (1966) analysis of the Dutch Randstad as a putative 'world city' is credited as the genesis for the PUR literature. Hall argued that polynucleated urban regions such as the Dutch Randstad (as well as the German Rhein-Ruhr Area) could be functionally equivalent to the likes of New York and London. Although it took some time for the PUR concept to catch on and mature into a more-or-less coherent research literature, it seems fair to state that the status of Sir Peter Hall in urban and regional studies has been instrumental in the popularization of the concept as well as turning the Randstad into an alleged PUR archetype, prototype and stereotype (Brenner, 2003). The appeal of the Dutch Randstad continues (Zonneveld & Nadin, 2021) even though its polycentric nature remains questioned (Burger et al., 2014), showing that even PUR stereotypes can make for unstable conceptual

referents; an even more pressing observation when considering that Hall's (1966) writings drew heavily upon Dutch planning discourse of the 1950s (Van Meeteren, 2020, in this issue).

Despite ongoing typological work examining how PURs are related to polycentric patterns at other scales of analysis (e.g., intra- versus inter-urban polycentricity; Liu et al., 2018) or come in different shapes and forms (e.g., morphological versus functional polycentricity; Liu et al., 2016), understanding of how PURs fit into the broader conceptual toolkit of urban and regional studies is surprisingly limited. Part of the reason is that traditional models of urban–regional expansion start from monocentric ideals (Humer et al., 2021, in this issue). This highlights a need for theorizing the nature of PURs, for example, by extending classical models such as the spatial-cycle model in ways that allow testing the formation of urban regions under mono-, multi- and polycentric trajectories. Irrespective, conceptual frameworks will always be constrained by the spatiotemporal context in which they are devised and applied (Bartosiewicz & Marcinczak, 2021, in this issue).

Identifying asks the question: How can we formally recognize PUR formation? Although the generic description of PURs is intuitive enough, it is also fairly vague: there are many ways in which 'region', 'multiple', 'centres', 'proximate', 'balanced' and 'development' can be understood and operationalized. Different analytical frameworks have been put forward, drawing on distinctive data, methods and interpretations. While some of the underlying analytical choices are rarely scrutinized in much detail and/or are guided by pragmatism (e.g., the territorial extent of the region), the selection of specific data and methods are subject to recurring debates (for an overview, see Derudder et al., 2021).

The most commonly used data to determine the degree of polycentricity in urban regions remain population statistics (Humer et al., 2021, in this issue; Ouwehand et al., 2021, in this issue; Wang et al., 2020b, in this issue; Hoogerbrugge et al., 2021, in this issue; Zhang et al., 2021, in this issue), probably because of their intuitive appeal and the myriad ways to source these. Nonetheless, commuting and employment data (Bartosiewicz & Marcinczak, 2021, in this issue; Volkmann & Münter, 2020, in this issue) are also often used, as are night-time light data (Zhang et al., 2021, in this issue; Li & Du, 2021, in this issue). Less frequently, data on advanced producer service firms and their office linkages have also been employed (Hall & Pain, 2006; Hoyler et al., 2008). Cross-cutting the different types of data is how and where they are sourced. For example, population data can be obtained from either official statistics (Ouwehand et al., 2021, in this issue) or from satellite data (Wang et al., 2020b, in this issue). This is in turn associated with differences in the way in which centres are identified, ranging from administrative definitions (Volkmann & Münter, 2020, in this issue) to clusters of population density (Li & Du, 2021). Identifying the balance across centres, in turn,

draws on methods as diverse as Herfindahl indices (Hoogerbrugge et al., 2021, in this issue; Hummer et al., 2021, in this issue; Volkmann & Münter, 2020, in this issue), standard deviation-based methods (Li & Du, 2021, in this issue), and rank-size regression approaches (Bartosiewicz & Marcinczak, 2021, in this issue; Wang et al., 2020b, in this issue; Ouwehand et al., 2021, in this issue; Zhang et al., 2021, in this issue; see also composite indices that combine different approaches such as Sun & Lv, 2020).

Often, the measurement of the level of polycentricity in urban regions is secondary to the actual objective of the research: examining whether PUR formation is associated with a broad range of other socio-economic patterns. However, that does not imply that debates on the intricacies of PUR identification are settled. For example, measurements of polycentricity are very sensitive to differences in definitions and operationalizations of centres, showing that this is not a trivial operational choice (Zhang et al., 2021, in this issue).

Implicating focuses attention on the 'so what' question: What is the impact of this regional form on people and places? Much of the policy appeal of PURs can be traced back to claims of significant causal powers thought to be associated with them, notably the view in some British, European Union and Chinese planning circles that polycentric development can foster territorial competitiveness (CEC, 2011; Seymour, 2017; Wang et al., 2020a). Ongoing research paints a mixed and nuanced picture, reflected here in the diverse findings across contributions to this special issue.

In five of the papers, the authors marshal a PUR identification procedure as an independent variable in a regression-type model to explore the impact (if any) of polycentricity on regional development (broadly defined). This includes research on territorial competitiveness as visible in regional factor or labour productivity (Wang et al., 2020b, in this issue; Ouwehand et al., 2021, in this issue), but a more diverse evidence base is emerging: research also pays attention to metropolitan functions (Volkmann & Münter, 2020, in this issue), innovation capacity (Li & Du, 2021, in this issue), and well-being and life satisfaction (Hoogerbrugge et al., 2021, in this issue). Analyses of the implications of polycentricity either focus on the urban region as a whole (Li & Du, 2021, in this issue) or on individual centres within the urban region. For example, although the degree of polycentricity in North-west European urban regions is found to be positively associated with life satisfaction, this effect plays out differently across PURs: a significant negative interaction term between polycentricity and urban residence on life satisfaction suggests that urban residents living in polycentric regions are less satisfied compared with their rural counterparts (Hoogerbrugge et al., 2021, in this issue). Irrespective of the focus, PUR research is increasingly paying attention to the analytical complexity of the associations. This shows from the consideration of a broad range of control variables (Hoogerbrugge et al., 2021, in this issue), possible endogeneity issues (Ouwehand et al.,

2021, in this issue) and non-linear associations (Li & Du, 2021, in this issue).

By pursuing these three fundamental and complementary questions, the contributions to this special issue push the boundaries of the scientific literature on PURs, both individually and collectively. But there remains much work to be done. In addition to pursuing related research agendas as set out in the context of the Regional Studies Association's network on PURs (Harrison et al., 2021), future research could focus on some of the blind spots and limitations of the current literature. In our reading, two pertinent areas of further research are (1) improving the presently limited levels of replicability of research and (2) ensuring the rising empirical diversity translates into equally robust conceptual diversity. First, comparing results of PUR analyses is often difficult because of the use of slightly different analytical frameworks across research projects. It is clear that the challenges associated with generalizability, reproducibility and replicability, which are issues in geographical research more generally (Brunsdon, 2016), loom large in the PUR literature. Boeing (2020) recently called for more accessible data-driven software and tools that better embody geographical science and theory, and PUR research would clearly benefit from having access to such open-access software. This would allow spelling out more efficiently, but above all in a more comparable and reproducible way the spatial conditions underlying PUR formation. Second, even though the PUR literature has geographically diversified in empirical terms, this special issue shows that much of the focus remains on North-western Europe and (increasingly) China. However, even more diversity is needed to ensure PUR research is part of the evolution towards a more 'global' urban and regional studies (Harrison & Hoyer, 2018; Roy, 2009). Crucially, however, this goes well beyond calls to further diversify the empirical contexts on/in which we do research: different empirical contexts also shape the scope, starting points and cultures of theorizing in urban research (Craggs & Neate, 2020). New conceptual ideas may not only emerge from detailed historiographies of the PUR concept as we currently know it (Van Meeteren, 2020, in this issue), but also from different and less-studied empirical contexts. The increased use of the concept in very different geographical settings clearly raises the stakes of contextualizing PURs in vastly different socioeconomic, political and geographical settings.

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