11. Territorial cohesion, polycentrism and regional disparities: revisiting an unsolved debate

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INTRODUCTION

Like many development concepts, not least those discussed at the European scale, territorial cohesion is a remarkably ill-defined concept, certainly in comparison with economic cohesion and social cohesion, the other two cornerstones of European Regional and Cohesion policy. Perhaps this relates to the fact that territorial cohesion was institutionalised as late as 2008 (Treaty of Lisbon), whereas economic and social cohesion became a competence of the European Community in 1986 through the adoption of the Single European Act. However, it seems also due to territorial cohesion being a 'bridging concept' – its ambiguity becomes an advantage as it offers something to a wide variety of (political) actors, without making them commit to any particular interpretation or application (Davoudi, 2005), leaving sufficient flexibility to be adopted to the diverging and changing interests of many actors that need to find common ground (Waterhout, 2007).

While the concept of 'territorial cohesion' is perhaps inherently fuzzy, its objective is quite precise. The Treaty on the Functioning of the European Union (EU) states clearly the ambitions of the Cohesion Policy: 'the Union shall aim at reducing disparities between the levels of development of the various regions and the backwardness of the least favoured regions' (article 174). Also, the European Regional Development Fund is intended to redress the main regional imbalances in the Union (article 176). Hence, territorial cohesion aims to diminish regional imbalances.

Over the years, attempts have been made to turn territorial cohesion into a better defined and even measurable construct (Zaucha and Böhme, 2019). From the start, a spatial justice dimension has been associated with territorial cohesion; it is, for instance, associated with equal access to services of general economic interest and mitigating territorial imbalances (Faludi, 2007).

Davoudi (2005) considers territorial cohesion to be an extension of underlying principles of the European social model, broadening these from individuals to places and territories and calling for solidarity not only amongst European citizens but also amongst European territories. Over the years, a variety of other key points have also been associated with territorial cohesion (Zaucha and Böhme, 2019, p. 4), including, for instance, 'harmonious development', 'allowing citizens to make the most of their territories', 'inherent features' (Green Book on Territorial Cohesion; CEC, 2008) and 'equal opportunities for citizens and enterprises, regardless of their location, to make the most of their territorial potentials' and 'promoting convergence between better-off and lagging behind economies' (Territorial Agenda, 2011), as well as sustainability (Medeiros, 2016).

Having defined a variety of more practical interpretations associated with diminishing regional imbalances and territorial cohesion is a first step. The next question becomes how such a more balanced development can be achieved. Out of a larger spectrum of mechanisms that have been identified, 'polycentric development' surfaces as one of the first and more prominent mechanisms (Malý, 2019), even to an extent that some have started to consider it an end in itself, rather than a mechanism to obtain the larger ambition of Cohesion Policy, namely reducing regional imbalances in levels of development. Polycentric development has been defined both analytically and in a normative fashion. In the latter interpretation it concerns policies that address the distribution of economic and/or economically relevant functions over the urban system in such a way that the urban hierarchy is flattened in a territorially balanced way (Meijers et al., 2007, p. 1).

Still, the relation between polycentric development and the persistence or mitigation of regional imbalances is not that evident. Equating the persistence of regional imbalances with the concept of 'regional disparities', on which a vast scholarship exists, we previously explored whether a polycentric national urban system coincides with and causes only limited regional disparities in a country, or the other way around – whether a monocentric urban system correlates with and leads to large regional disparities (Meijers and Sandberg, 2008). The outcomes of these empirical analyses forced us to temper the policy enthusiasm over the promise of polycentrism in bringing about cohesion. The shape of the urban system did not play a role in explaining the persistence of regional disparities.

At the time, we were certainly not claiming that this was the definite answer in a then emerging debate. A decade later, the debate is ongoing. Malý (2019, p. 84) asserted that '[r]egarding the EU cohesion-policy agenda, the 'polycentric obsession' continues despite the lack of empirical evidence about the positive impacts of polycentricity on harmonized balanced development'. In part this is because the debate on territorial cohesion is still largely conceptual

and planning oriented, in contrast to the empirical quantitative perspective used, for instance, in our previous paper to sustain development strategies. Since the question has not lost any importance over the years, it in fact 'should be a fundamental part of the EU Territorial Cohesion Policy research agenda' (Malý, 2019, p. 79).

The objective of this chapter, therefore, is to revisit the debate on the relationship between the fundamental and original aim of territorial cohesion, namely reducing regional disparities on the one hand and polycentric urban development on the other. While building on the general empirical approach of Meijers and Sandberg (2008), we substantially extend our initial analyses, making use of:

- Updated measures of the level of mono/polycentricity of national urban systems;
- Recent measures of regional disparities and in their wake, a new and longer time period;
- Several new control variables.

The question we try to answer remains the same, namely to question whether polycentric urban systems are associated with fewer regional disparities. In Section 2 we discuss the data and methodological approach to studying this relation, and the results of our empirical explorations are presented in Section 3. We reflect on our findings and their implications for policy in Section 4.

2. DATA

2.1 Measuring Levels of Mono/polycentricity

Although the concept of polycentrism is fairly easy to grasp, there is still a debate on how it should be measured. Rauhut (2017) discusses a variety of approaches to measuring the level of polycentricity of (European) countries. Calculations by the ESPON 1.1.1 (2004) project, Meijers and Sandberg (2008) and Brezzi and Veneri (2015) all consider the rank-size distribution of cities in a country – the more flat the regression line that best fits this rank-size distribution, the more polycentric. In addition, ESPON 1.1.1 and Meijers and Sandberg (2008) also consider the spacing of cities over the territory, arguing that when all major cities are concentrated in one specific part of the country, this should be considered as a monocentric spatial distribution. However, the latter is arguably of less interest when discussing polycentric development as a policy strategy, since the location of cities is fixed. The fact that we included the spacing of cities dimension in our definition of polycentricity largely explains our 2008 findings on the relation between polycentricity and regional

disparities. The ESPON 1.4.3 (2007) project also proxies polycentricity at the national level; however, primarily considering the relative importance of the largest city versus several sets of other cities, which seems to be somewhat arbitrary and more oriented at measuring primacy.

With priority given to policy relevance, we will follow the tradition of measuring polycentricity based on the rank-size distribution. Some methodological choices are then relevant to consider. First, the number of cities taken into account to measure the slope of the rank-size distribution is highly influential – some countries that would score as very polycentric if one includes all cities (see Table 11.1) would be amongst the more monocentric ones if only a handful of the largest cities were selected (Meijers, 2008; Zhang and Derudder, 2019). We argue that measurements of polycentricity should be based on a limited number of cities. However, in order to reduce the arbitrariness in the choice for an exact number of cities to include, we will base our overall averaged polycentricity score on calculations for N=3, N=5 and N=10.

Second, how do we define the size of 'cities'? There are several options here, ranging from legal definitions (jurisdictions/municipalities), to contiguous built-up areas or agglomerations, to functional urban areas, and so on. The sensitivity of statistical outcomes to such choices is known as the modifiable areal unit problem (MAUP; see Burger et al., 2008). Here, we believe that it is important to base ourselves on a functional rather than administrative definition, and we will consider the updated Functional Urban Area data provided through the ESPON 2013 database (Peeters, 2011), hence considering both cities and their commuting zone. Unfortunately, the most recent population data available for functional urban areas concerns the year 2006 (note that in Meijers and Sandberg, 2008, we used data for 2000).

In addition, there are other methodological choices to make. We could actually question whether 'size' in the rank-size distribution should be proxied with population size – outcomes could be quite different if one would define 'size' as the number of jobs, for instance. Likewise, there are also functional approaches considering the balance in relationships possible, instead of the morphological approach used here (Green, 2007; Burger and Meijers, 2012). What we want to stress is that the diverging and sometimes conflicting findings of studies into the relation between polycentricity and performance (Meijers, 2008; Brezzi and Veneri, 2015; Rauhut, 2017) can often be directly related to diverging methodological choices.

The complete ranking is provided in Table 11.1. In the subsequent analyses we use the polycentricity index presented in the first column, the values of which are the average of the next three columns. The last column provides the rank-size distribution score reported in Meijers and Sandberg (2008) – these scores correlate highly with our current measure (0.803), despite the fact that the previously reported data is for the year 2000 instead of 2006 and that we

now use a slightly different Functional Urban Area delimitation (due to a difference between ESPON 1.1.1 project used back then and the ESPON 1.4.3 project delimitation used now).

Table 11.1 Levels of polycentricity (2006) according to various measures and levels of regional disparities (1995–2005–2016). Polycentricity rank within brackets

Country	Polycentricity Index (N=3, 5, 10)	Polycentricity N=3	Polycentricity N=5	Polycentricity N=10	Polycentricity N=all	Meijers and Sandberg (2008) Rank-size distribution N=10	Regional disparities – CVw		
							1995	2005	2016
Germany	−0.41 (1)	−0.35 (1)	−0.30 (1)	−0.56 (1)	−0.98 (8)	−0.57 (1)	0.25	0.28	0.24
Netherlands	−0.61 (2)	−0.52 (2)	−0.63 (2)	−0.68 (2)	−1.09 (13)	−0.76 (5)	0.14	0.21	0.22
Poland	−0.79 (3)	−0.77 (5)	−0.78 (3)	−0.81 (5)	−1.12 (15)	−0.77 (6)	0.19	0.29	0.33
Italy	−0.82 (4)	−0.52 (3)	−0.95 (6)	−1.00 (7)	−0.99 (9)	−0.82 (7)	0.28	0.27	0.28
Slovakia	−0.91 (5)	−1.15 (9)	−0.85 (4)	−0.72 (4)	−0.70 (1)	−0.59 (2)	0.45	0.53	0.53
Switzerland	−0.94 (6)	−0.77 (4)	−0.88 (5)	−1.18 (17)	−1.35 (22)	−1.00 (10)	n/a	n/a	n/a
Romania	−1.00 (7)	−1.18 (12)	−1.10 (8)	−0.72 (3)	−0.94 (4)	−0.76 (4)	0.24	0.48	0.54
Cyprus	−1.07 (8)	−0.95 (7)	−1.13 (9)	−1.13 (12)	−1.13 (17)	−1.21 (19)	n/a	n/a	n/a
Belgium	−1.11 (9)	−1.16 (10)	−1.03 (7)	−1.13 (14)	−1.23 (20)	−0.59 (3)	0.40	0.40	0.34
Czech Rep.	−1.11 (10)	−0.91 (6)	−1.28 (14)	−1.14 (15)	−0.89 (2)	−1.05 (12)	0.28	0.43	0.43
Spain	−1.15 (11)	−1.10 (8)	−1.19 (11)	−1.16 (16)	−1.11 (14)	−1.12 (14)	0.23	0.22	0.25
United Kingdom	−1.21 (12)	−1.55 (18)	−1.15 (10)	−0.95 (6)	−1.37 (23)	−1.20 (18)	0.32	0.55	0.67
Bulgaria	−1.22 (13)	−1.27 (13)	−1.30 (15)	−1.09 (9)	−1.00 (11)	−1.04 (11)	0.25	0.37	0.52
Norway	−1.26 (14)	−1.42 (14)	−1.24 (12)	−1.11 (10)	−1.00 (10)	−0.99 (9)	n/a	0.26	0.24
Finland	−1.28 (15)	−1.44 (15)	−1.27 (13)	−1.12 (11)	−0.97 (7)	−1.09 (13)	0.17	0.23	0.23

Country	Poly-centricity Index (N=3, 5, 10)	Poly-centricity N=3	Poly-centricity N=5	Poly-centricity N=10	Poly-centricity N=all	Meijers and Sandberg (2008) Rank-size distribution N=10	Regional disparities – CVw		
							1995	2005	2016
Sweden	−1.31 (16)	−1.16 (11)	−1.55 (19)	−1.21 (18)	−0.93 (3)	−1.12 (16)	0.16	0.24	0.27
Austria	−1.35 (17)	−1.46 (16)	−1.31 (16)	−1.27 (19)	−1.27 (21)	−1.44 (23)	0.27	0.21	0.17
Slovenia	−1.39 (18)	−1.65 (19)	−1.38 (17)	−1.13 (13)	−1.13 (18)	−1.35 (22)	n/a	0.28	0.26
France	−1.43 (19)	−1.87 (22)	−1.39 (18)	−1.02 (8)	−0.96 (5)	−1.12 (17)	0.32	0.32	0.42
Portugal	−1.58 (20)	−1.67 (20)	−1.75 (25)	−1.34 (21)	−1.23 (19)	−1.60 (25)	0.29	0.29	0.22
Denmark	−1.60 (21)	−1.81 (21)	−1.62 (21)	−1.39 (22)	−1.13 (16)	−1.12 (15)	n/a	0.25	0.29
Lithuania	−1.71 (22)	−1.52 (17)	−1.81 (26)	−1.81 (26)	−1.81 (26)	−1.32 (21)	n/a	n/a	n/a
Estonia	−1.77 (23)	−1.87 (23)	−1.73 (23)	−1.73 (25)	−1.72 (25)	−1.31 (20)	n/a	n/a	n/a
Hungary	−1.83 (24)	−2.49 (27)	−1.71 (22)	−1.28 (20)	−0.97 (6)	−0.89 (8)	0.35	0.51	0.47
Latvia	−1.84 (25)	−2.14 (25)	−1.74 (24)	−1.64 (24)	−1.64 (24)	−1.57 (24)	n/a	n/a	n/a
Ireland	−1.88 (26)	−1.97 (24)	−1.60 (20)	−2.07 (27)	−2.07 (27)	−1.89 (26)	0.30	0.33	0.61
Greece	−2.03 (27)	−2.48 (26)	−2.03 (27)	−1.59 (23)	−1.07 (12)	−1.89 (27)	0.18	0.32	0.38

2.2 Measuring Regional Disparities

Table 11.1 also presents measures of regional disparities. As discussed in Meijers and Sandberg (2008), the measurement of regional disparities is not as straightforward as it may seem. First, regional disparities are very sensitive to the level of territorial disaggregation at which data is gathered (Arbia, 1989; Spiezia, 2003). For instance, within larger regions potentially large disparities tend to be averaged out. Second, regions tend to be delimited according to administrative boundaries, which do not necessarily correspond to functionally coherent regions. This may cause problems, particularly when measuring disparities in terms of gross domestic product (GDP) per capita, which is measured at workplaces, while population is measured at residences. Thus, the levels of GDP per capita may be misleading in some regions owing to the presence of commuting patterns across regional boundaries (OECD, 2003;

Magrini, 2004). Third, regional disparities can be observed using a number of variables, such as GDP, unemployment rates, education levels and so forth (see, for instance, Portnov and Felsenstein, 2005). The one to prefer will therefore depend on the purpose of the analysis, with possibly varying outcomes.

Here, we decided to analyse regional disparities at the NUTS 2 (Nomenclature of Territorial Units for Statistics 2) level. This facilitates comparisons with other empirical work, as the literature generally also focuses on this level. Second, the use of NUTS 2 regions can be justified as EU Cohesion Policy is also oriented at this scale. Using NUTS 2 regions unfortunately implies that several smaller countries that are made up of only one region had to be removed from the analysis. Third, using GDP facilitates comparison with our previous study for the time period 1995–2004. Data on GDP per capita at market prices (PPP) was collected from Eurostat, at the NUTS 2 level for 23 countries, and covers the period 2005–2016. As in Meijers and Sandberg (2008), a population weighted version (CVw) of the coefficient of variation is used. High values indicate large disparities between the regions in a country. The development paths vary from country to country. Some countries, such as Austria and Portugal, saw a decrease in regional disparities over time. The opposite is true for the Czech Republic and Romania, for instance. But we also have countries that have been quite stable over time, such as Finland and Italy.

2.3 Control Variables

Obviously, we need to control for several issues in our analysis. First, this includes EU membership, as this implies access to cohesion funding aimed at diminishing regional imbalances. This is captured by a dummy representing whether the country concerned was part of the EU15 or not. Second, it is hypothesised that the level of development of a country differs, and that periods of divergence may transition into periods of convergence after a certain level of development has been obtained (see, for instance, Ezcurra and Rapún, 2006). This is captured by the average GDP per capita (PPS) in 2006 per country. Third, it may be assumed that regional disparities are more substantial in larger countries, which increases the variability in the performance of regions. This is captured by each country's population size in 2016. Fourth, we may assume that the political philosophy regarding spatial justice that a country adheres to is of relevance. This can be captured by welfare regimes; for instance, a 'liberal' model, a 'social-democratic'/Nordic model, or a 'conservative-corporatist' welfare model. However, no uniform classification of all European countries according to welfare systems exists, and very often the Eastern European countries are still changing from one model to another. A proxy is therefore used. Since neighbouring countries often have similar welfare models, we make a distinction between countries according to

their geographical location in Europe, more precisely distinguishing between Eastern and Southern Europe, and taking Northern and Western Europe together as one category (the grouping is in conformity with the approach of the United Nations Statistics Division). Obviously, such a classification is quite correlated to EU15 membership and to levels of development, so it is not that useful to include all these control variables at the same time since the number of observations is limited.[1]

3. ANALYSIS AND RESULTS

As a start, we calculated correlations between our measures of regional disparities on the one hand and our variety of polycentricity scores on the other. No significant correlations between our preferred (index) measure of polycentricity and any of the regional disparities variables were found. The same holds for the other measures of polycentricity, except for the polycentricity score (N=10), which shows a negative correlation with the development of regional disparities as measured by the change in GDP/capita 2005–2016. This suggests that more monocentric countries saw a greater change in regional disparities than polycentric countries over time. This is an exception, however, as the overall picture that emerges is that there is no association between polycentricity and regional disparities.

Figure 11.1a presents a scatter of regional disparities as measured by the weighted coefficient of variation for GDP per capita 2016 and our index of polycentricity, while Figure 11.1b associates levels of polycentricity with trends in regional disparities over time. Figure 11.1a suggests a slight tendency for polycentric countries to have somewhat less strong regional disparities. Similar plots can be obtained for the years 2005 and 1995, although the relationship with polycentricity seems less strong. Figure 11.1b seems to suggest that more polycentric countries saw a weaker increase in regional disparities than more monocentric countries over the 2005–2016 period.

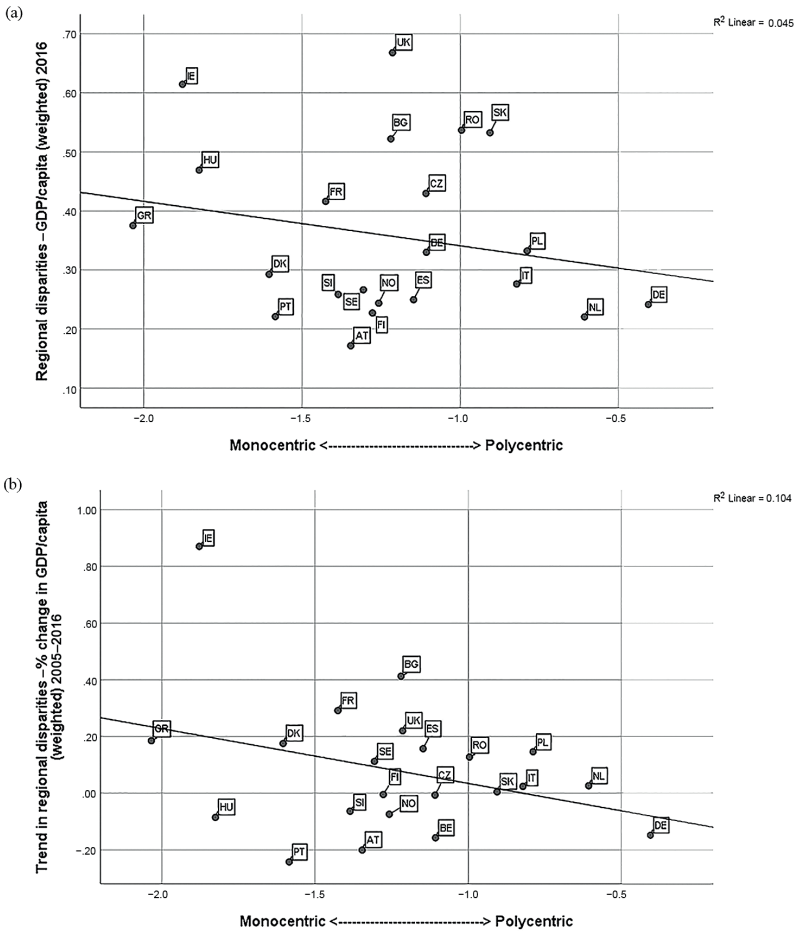

Figure 11.1 Polycentricity (Index) versus a. regional disparities in terms of GDP/capita (1a, top) and b. trends in regional disparities 2005–2016 (1b, bottom)

We now turn to the relation between polycentricity and regional disparities, using OLS (ordinary least squares) regression models, which allow us to control for several factors. Table 11.2 presents seven models explaining the presence of regional disparities in 2016.

Table 11.2 Relation between polycentricity and regional disparities (GDP per capita CVw) (dependent) 2016

	(1) Base model	(2) EU member-ship	(3) Develop-ment stage	(4) Size of country	(5) Location	(6) All	(7) Best
Constant	0.265	0.312	0.405	0.195	0.335	0.179	0.182
	(0.101)	(0.102)**	(0.122)**	(0.137)	(0.093)**	(0.153)	(0.107)
Polycentricity Index	−0.075	−0.087	−0.086	−0.111	−0.119	−0.215	−0.214
	(0.078)	(0.076)	(0.074)	(0.091)	(0.068)	(0.081)*	(0.074)**
EU15		−0.096				−0.004	
		(0.062)				(0.104)	
National GDP/ capita 2006			−0.002			0.000	
			(0.001)			(0.002)	
Size of country				0.001		0.003	0.003
				(0.002)		(0.001)*	(0.001)*
Southern Europe					−0.224	−0.278	−0.279
					(0.076)**	(0.144)	(0.073)**
Northern and Western Europe					−0.144	−0.178	−0.178
					(0.062)*	(0.192)	(0.058)**
Adj. R2	−0.003	0.064	0.104	−0.024	0.267	0.327	0.406
F	0.938	1.721	2.225	0.757	3.550*	2.703	4.593*
N	22	22	22	22	22	22	22

Note: Standard errors in parentheses. * $p < 0.05$, ** $p < 0.01$.

The most basic models (1–4) do not suggest a significant relationship between polycentricity and the persistence of regional disparities in 2016. Controlling for EU membership, level of development of a country or the size of a country does not seem to matter. However, we find that the location in Europe is very important (model 5). With Eastern Europe being the reference case, we can see that both in Southern Europe and in North and West Europe regional disparities are significantly lower. Model 6, in which all controls are entered simultaneously, shows that the level of polycentricity has become a significant explanatory factor for the persistence of regional disparities in 2016: the more polycentric a country is, the lower regional disparities. Note, however, that given the limited number of countries in the analysis and the substantial number of variables entered, the model itself is not significant. When only keeping the significant variables from model 6, together with our variable of interest (polycentricity), we obtain the best model fit (model 7). Location in

Europe remains important, and we also see that larger countries have more regional disparities than smaller ones. And, most interestingly, polycentricity is a significant explanatory factor ($p<0.01$): the more polycentric, the fewer regional disparities.

When running models similar to model 7 but trying to explain the level of disparities in 2005 or 1995, polycentricity turns out to be insignificant, although the direction of the association is similar.

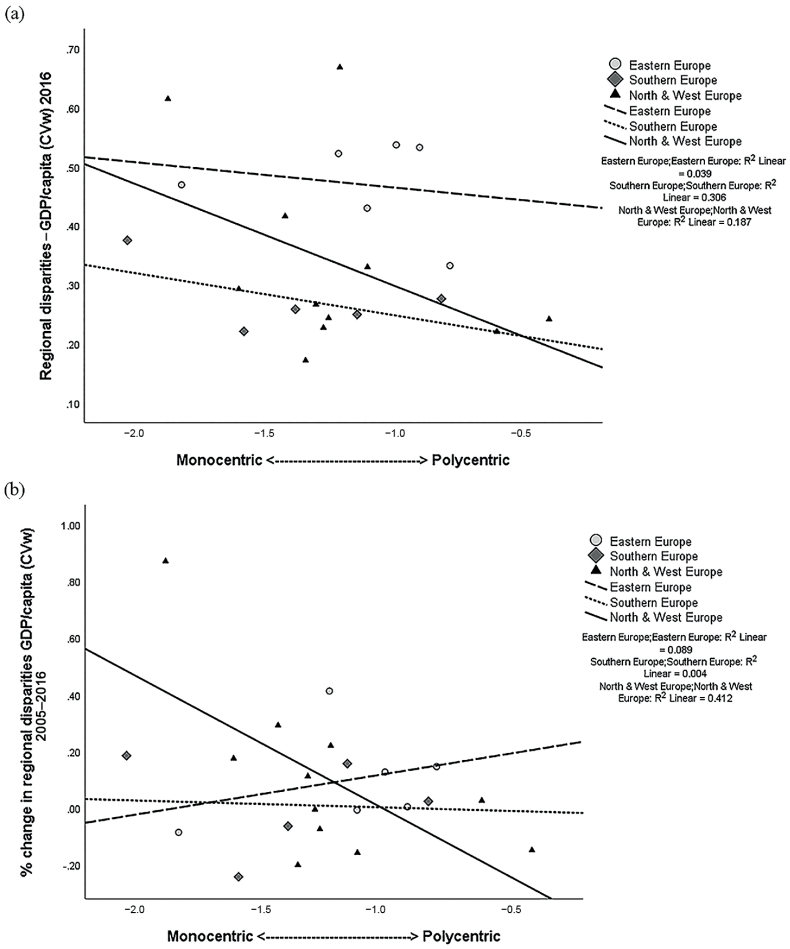

Figure 11.2 Part of Europe and polycentricity versus regional disparities and part of Europe, 2016 (2a, top) and versus trend in regional disparities, 2005–2016 (2b, bottom)

Given the relevance of controlling for the location in Europe of a country (as a proxy for associated welfare systems, levels of development, and so on), we now delve deeper into this effect by presenting a series of simple scatters in which we distinguish the effect of polycentricity according to the three main groups of countries in Europe (East, South, North and West) (Figure 11.2).

Several observations can be made when considering Figure 11.2a. First, the levels of regional disparities differ between the different parts of Europe, as was also indicated by our regression models. Southern Europe has the lowest levels, while Eastern Europe has the highest levels of regional disparities. Second, the impact of a polycentric urban system differs. It seems to be much stronger in North and West Europe. Nevertheless, the statistical significance is highest in Southern Europe.

The trends in the development of regional disparities also vary according to levels of polycentricity (Figure 11.2b). More polycentric countries in North and Western Europe saw a weaker increase or even a decline in regional disparities, whereas more monocentric countries in this part of Europe are associated with a stronger growth of regional disparities over the 2005–2016 period. When splitting our sample according to the three groups, and then running the most basic model (1; see Table 11.2) again for the 11 countries in North and Western Europe, we can confirm a statistically significant effect of polycentricity on the development of regional disparities indeed: more polycentric countries saw weaker increases in regional disparities, or put differently, more monocentric countries saw sharper increases in regional disparities between their regions.[2] The opposite seems true for Eastern Europe. Here, it appears that the more polycentric Eastern European countries saw a more rapid increase in regional disparities, in contrast to those countries that are rather monocentric. This, however, could not be statistically confirmed in a regression model.

4. DISCUSSION AND CONCLUSION

This chapter has explored the question of whether countries with a more polycentric urban system are characterised by fewer regional disparities. This assumption is at the heart of European debates on territorial cohesion, and policies advocate a further polycentric urban development to diminish regional imbalances.

Addressing this relationship required us to make several methodological choices that may impact the findings. Such choices often tend to blur the current debate on polycentricity, as certain choices may lead to diverging findings, as shown in previous studies linking polycentricity to some performance measure, on a wide variety of spatial scales (Meijers, 2008; Rauhut, 2017). In this study we therefore tried to be as transparent as possible about our approach

and indicate the impact of these methodological choices in order to shed some light on these pressing issues.

In contrast to our previous study into this problem, results with newer data indicate that more polycentric countries tend to be associated with fewer regional disparities. Or, vice versa, more monocentric countries tend to be associated with greater regional disparities. While mono/polycentricity is a significant explanation for regional disparities in 2016, it was not for regional disparities in 2005 or 1995.

Another conclusion is that more polycentric urban systems seem to be more stable when it comes to the evolution of regional disparities over time, although this effect was only significant for countries in Northern and Western Europe. As many of these countries have been long-term EU members, share a high level of development and generally belong to similar welfare systems, it is rather striking that neighbouring countries that differ in terms of the shape of their urban system experience different trends with respect to regional disparities.

What our analyses also indicate is that we need to be rather specific when discussing the influence of mono/polycentricity on regional disparities – we established a relation at one point in time (2016), and for trends (2005–2016) in regional disparities, but only in parts of Europe. This points us to a future research agenda into cohesion, polycentricity and regional disparities that deals with this heterogeneity. The debate on their interrelation would benefit from future research taking into account a wider range of regional disparities than only GDP per capita. Also, alternative measures of polycentricity need to be tested. Here, we have only tested polycentricity based on the distribution of population, but this does perhaps not necessarily reflect the distribution of jobs or urban functions. Also, while our analyses were quite static (as we could calculate our measure of polycentricity for one year only given lack of complete data on the Functional Urban Area level for more recent years), a dynamic perspective is welcomed. Can we then explain developments in regional disparities with development in levels of polycentricity?

Finally, as the debate on polycentric urban regions teaches us, it seems to be not just a matter of a balanced distribution of people over cities, but more a matter of their integration into coherent urban systems that is of most importance for the performance of a polycentric urban system as a whole (Meijers et al., 2018). Perhaps the reason that rather polycentric urban systems in North and West Europe performed better than their counterparts in the South or the East of Europe regarding the trend over time of regional disparities has to do partly with the fact that their national urban systems are better integrated in spatial-functional and economic terms. The finding that smaller countries are somewhat associated with fewer regional disparities, and the fact that smaller countries may be more integrated, points in this direction.

While there remain issues for further investigation, the policy implications of our findings so far are clear and significant. As 'territorial cohesion' is operationalised into the objective of having fewer regional imbalances, and as polycentricity can be associated with fewer such regional disparities, it follows that polycentric urban development is an important means to obtain more territorial cohesion. Polycentric urban development needs to be high on territorial policy agendas aiming for a more just and equal spread of opportunities and development.

NOTES

1. Descriptions of all variables and a correlation table are available upon request.
2. The results are available upon request.

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