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Measuring territorial cohesion trends in Europe: a correlation with EU Cohesion Policy

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ABSTRACT

Territorial cohesion is a formal EU policy goal since 2010, when it was placed in the Lisbon Treaty, alongside the long-term EU goals of economic and social cohesion. Understandably, by itself, a policy goal is irrelevant if it cannot be assessed. In this light, this article discusses potential methodological approaches to measure territorial cohesion trends in a given territory, their advantages and limitations, based on existing literature. It uses European NUTS 2 and the Portuguese and Polish NUTS 3 as concrete case studies to assess territorial cohesion trends from 2005 to 2020 via a Territorial Cohesion Index. As such, it presents an updated and unique picture on the territorial cohesion trends in Europe and in two specific EU member states, based on available data. It concludes that measuring territorial cohesion trends is challenging mainly due to lack of available data in certain key dimensions of territorial cohesion, but it is possible and needed.

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Territorial cohesion; EU Cohesion Policy; development trends; European Union

1. Introduction

There are not many scientific consensuses on the concept of territorial cohesion (TC), except that it is vague, elusive, European, multi-dimensional and difficult to implement and measure (Dao, Cantoreggi, and Rousseaux 2017; Davoudi 2005; Faludi 2007; Medeiros 2016; Van Well 2012). In this context, this article discusses prevailing TC conceptual lenses and potential methodologies to assess TC trends in all territorial levels. To get beneath the skin of this European Union (EU) long-standing goal of a more harmonious and balanced territory, the role of EU Cohesion Policy to implement TC policies post-2020 is debated.

With the institutional legitimization of TC via its formal inclusion in EU treaties (firstly mentioned in the Amsterdam Treaty and more recently included as EU policy goal in the Lisbon Treaty), EU policy orientations towards the 'cohesiveness' of the EU territory have begun to receive increased attention (Servillo 2010). In normative terms, TC builds upon the notions of economic and social cohesion (Janin Rivolin

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2005) as a more holistic policy goal, ensuring positive and balanced development for all regions (Van Well 2012). According to Faludi (2013), a less visible EU policy intension to include TC in the EU Treaties was acutely provoked by an EU intension to assume a 'spatial planning controlling role'. But more than anything else, the legitimation of TC provided a new legal basis for implementing EU territorial development policies (Schön 2005). Much contemporary research acknowledges that the main EU policy instrument to deliver this EU TC goal is EU Cohesion Policy. This policy has acted as a solidary and redistributive form of regional policy, absorbing, by now, around a third of the EU budget (Colomb and Santinha 2014).

In this context, this paper discusses TC as a policy goal and scientific concept, and how it has been viewed over past years. In particular, it presents recent methodologies to measure its trends in a given territory. Furthermore, this article assesses the role of EU Cohesion Policy in fomenting TC policies. Crucially, this research arena has not been researched sufficiently yet in current literature. Drawing mostly on political science and geography literature, the analysis of TC and EU Cohesion Policy is complemented by the use of quantitative methods in elaborating a TC index, supported by a multi-dimensional set of statistical indicators from three case studies (the EU, Portugal and Poland) at two territorial levels: Nomenclature of Territorial Units for Statistics (NUTS) 2 and 3, for the last decade (2010–2020). These two countries have been chosen as being net beneficiaries of the EU Cohesion Policy. Here, Poland has been performing much better in terms of GDP growth in comparison to Portugal. In line with the recent academic fascination with spatial injustice approaches to policymaking, the analytical framework accommodates the analysis of several TC analytical models, mostly from the research produced under European Spatial Planning Observatory Network (ESPON) projects, coupled with other TC models resulting from alternative research.

Ultimately, the article contributes to the current literature on TC and EU Cohesion Policy by providing an updated TC index which measures TC trends both in Europe (NUTS 2) and two EU Member States (Portugal and Poland – NUTS 3), and by relating those TC trends with EU Cohesion Policy investments at the regional level in the past decade (2010–2020). This is one of the first attempts to use the TC concept for assessing the performance of the EU Cohesion Policy in the EU regions, as well as in Poland and Portugal. It is in line with the recent paradigm change questioning neoliberal approaches to growth and development (Raworth 2017). Thus, the paper fills in an important research gap, since it highlights the importance of the need to measure TC trends as an alternative for evaluating the effects of EU Cohesion Policy. In almost every way, the assessment of EU Cohesion Policy has been centred around neo-classical approaches, e.g. Hermin or Rhomolo models (Bradley, Untiedt, and Zaleski 2009; Brandsma and Kancs 2015). In the end, the research intends to answer the following main research questions: (i) based on the used indicators of TC, has the EU territory achieved intended TC trends in the past decade (2010–2020)?; (ii) is there any clear positive correlation between EU Cohesion Policy investments and TC trends in the EU regions? The remainder of the paper is structured as follows. It begins by setting out a conceptual discussion on the TC concept, including its potential analytical dimensions and respective components. The role of EU Cohesion Policy post-2020 to revive the EU TC policy goal. Theoretical and policy implications are discussed in the conclusions.

2. Territorial cohesion a forgotten policy concept?

With its entry into force in the EU treaties in 2009, TC became a formal EU political objective, as a recognition of the potential development advantages of favouring a harmonious and balanced development of the EU territory (Dao, Cantoreggi, and Rousseaux 2017). But what is exactly TC? Since the early 2000s, there have been several attempts to define this vague and holistic concept. For Davoudi (2005) TC spatializes the European Social Model. Instead, Camagni (2020) adopts a more environmental rather than a social perspective in that the notion that TC translates the goal of sustainable and balanced development assigned to the EU into territorial terms. In a complementary manner, Faludi (2006) relates the TC concept with the concept of polycentric development. Likewise, some authors link the TC notion with spatial planning goals and policies, as well as with potential functional territories (Faludi 2013; Luukkonen and Moilanen 2012).

In a more comprehensive and modular framework, Medeiros (2016) views TC as the process of promoting a more cohesive and balanced territory, by: (i) supporting the reduction of socioeconomic territorial imbalances; (ii) promoting environmental sustainability; (iii) reinforcing and improving the territorial cooperation/governance processes; and (iv) reinforcing and establishing a more polycentric urban system. These four elements are key to analyse TC since territorial development is a multi-dimensional concept which entails the need for positive development trends in more than one of its critical analytical dimensions (Medeiros 2019). A different perspective is presented by Camagni (2020) which links TC with three main analytic dimensions: (i) territorial efficiency; (ii) territorial quality; and (iii) territorial identity. Conversely, Zaucha and Komornicki (2019) present an alternative TC model, also supported by three main and interlinked analytical dimensions: (i) policy territorialization; (ii) territorial utility; and (iii) territorial capital.

In his seminal analysis of several ESPON projects focused on analysing TC policies, indicators and trends (ESPON, 3.2 – TEQUILA – TIA 2000–2006/Project 4.1.3 – 2000–2006/TIP TAP TIA 2007–2013/ARTS TIA 2007–2013/EATIA TIA 2007–2013/KITCASP 2007–2013/INTERCO 2007–2013/BSR-TeMo 2007–2013), Abrahams (2014) highlights, for instance, a consolidated definition of TC provided by the ESPON INTERCO project, based on six main policy goals: (i) strong local economies ensuring global competitiveness; (ii) innovative territories; (iii) fair access to services, (iv) market and jobs; inclusion and quality of life; (v) attractive regions of high ecological values and strong territorial capital; and (vi) integrated polycentric territorial development. Ultimately, Abrahams (2014) concludes that despite attempts to accommodate different contextual understandings of TC, these ESPON 'projects have maintained the essentialist belief that a concept can be defined according to a set of coherent, essential traits and these traits can be used as the basis for measurement and assessment tools'. Indeed, most Territorial Impact Assessment (TIA) tools in existence (see Medeiros 2020) are supported by a TC conceptual framework.

For Servillo (2010), the concept of TC goes hand in hand with the concepts of spatial justice (Dabbinet 2017; Weck, Madanipour, and Schmitt 2021) and spatial identity (Camagni 2008), whilst including procedural orientations and governance processes. Petridou and Ioannides (2012) also interconnect TC with the concept of sustainability. In turn, Colomb and Santinha (2014) claim the importance of EU TC policies to

urban development and regeneration policies. Most instructive in this regard is Schön (2005, 393) when claiming that TC 'aims to strengthen endogenous potential in territories so as to overcome imbalances between territories'. Indeed, a relative complete and updated rich vein of theoretical thinking on the concept of TC is elaborated by Zaucha and Böhme (2020), following a scientific literature and EU reports analysis. Here, a varied set of different, yet many times confluent TC definitions are presented, associated with the notions of harmonious, efficient, balanced, cooperative, integrated, inclusive and sustainable development.

While sometimes analytical perplexing, TC has been on the EU agenda since the 1990s in which the support to public infrastructure services has been understood as essential for TC trends (Clifton, Díaz-Fuentes, and Fernández-Gutiérrez 2016). With its French roots (Faludi 2004), TC policy acceptance varies from country to country, since territorial imbalances vary greatly between them. In Portugal, for instance, there is a dedicated Ministry for TC since 2019, as this country presents an eloquent example of territorial development imbalances with a vast concentration of economic activities and population living close to the sea, and the majority of the inland territory suffering from depopulation and lagging socioeconomic development trends. Despite having evolved gradually (Zaucha and Böhme 2020), TC policy goals have survived in both EU and some national development strategies, despite the rise of neoliberal and EU smart growth policy rationales, in past decades (Medeiros 2017). Here, for instance, the most recent EU Territorial Agenda recognizes that TC 'should play an important role in the recovery process' (TA 2020) faced by the EU under the current pandemic (COVID-19) scenario.

3. EU Cohesion Policy post-2020 towards territorial cohesion?

EU Cohesion Policy is, by now (2021), the costliest EU policy. That was not the case when it began in 1988. Since then, EU Cohesion Policy has acted as the main EU policy tool to correct territorial development imbalances at the EU level. With this in mind, however, it suffered radical shifts in the proposed investment priorities over its several programming periods, mostly aligned with EU mainstream development agendas (e.g., Lisbon, Europa 2020) (Medeiros 2017). Acting as a redistributive mechanism for the European economy (Crescenzi, Fratesi, and Monastiriotis 2020), EU Cohesion Policy operates in a variety of policy arenas (Capello and Perucca 2019), with a crucial role in developing lagging regions (Percoco 2017). Based on territorial impact assessment studies in certain EU Member States, it can be concluded that EU Cohesion Policy has provided a crucial boost to territorial development processes mainly in less developed Member States. However, it has not achieved its ultimate policy goal of TC trends at the national level in Member States such as Portugal, Spain, Sweden and Finland (Medeiros and Rauhut 2020).

At the EU level, there is evidence that, according to certain development indicators, EU Cohesion Policy had a decisive role in reducing development gaps (EC 2017). In this regard, Crescenzi and Giua (2020:, 12) conclude that 'Cohesion Policy has exerted a positive and significant EU-wide impact on both regional economic growth and employment', whereas Di Cataldo and Monastiriotis (2020) assert that this policy acted as a significant stimulant to regional and national growth, mostly in backward regions, which, according to Fratesi and Wishlade (2017) was key to reducing disparities among EU regions.

In the meantime, myriad studies have already shed some light on the potential effects of the smart specialization strategies (S3) in certain territories. By taking the Italian case, D'Adda, Iacobucci, and Perugini (2021) conclude that the S3 did not had a relevant contribution to changing how regions have allocated Structural Funds. The analysis which related the contribution of S3 to fostering renewable energy across European regions, concludes that energy-related priority settings vary substantially in the analysed cases, and that unconducive policy frameworks at national levels tend to condition the effectiveness of implementation (Steen, Faller, and Fyhn Ullern 2019). Drawing on a few sparsely populated European regions, Sörvik et al. (2019) conclude that S3 provided some positive effects on how innovation policies were induced. This resulted mainly from more proactive approaches, multi-governance mechanisms and more decentralized support systems for natural resource management. This novel policy approach led to the unlocking of new market opportunities for bio-based innovations.

In a broader assessment, Barzotto et al. (2020) undercut the assumption that so far, the RIS3s' efficacy to revive European lagging regions has been weak. For these authors, it appears that poor governance and weak initial endowments of technology, coupled with social/business networks and institutional failures are at the base of the relative inefficiency of the RIS3. In a similar note, Uyarra, Marzocchi, and Sorvik (2018) identify the lack of political commitment and relational inertia as potential barriers for effective implementation of the S3. Likewise, sustained by the Welsh case study, Pugh (2014) provides intriguing criticisms to policymakers who are not using the S3 to innovate the implementation of regional innovation policies. On a positive note, however, Ghinoi et al. (2021) found out that intra-regional cooperation has intensified as part of S3 implementation. However, for Santoalha (2019), an effective implementation of the S3 requires cooperation within and between regions, since joint implementation is essential. Alongside this, Moodie et al. (2021) claim smart specialization can be crucial in promoting bottom-up policymaking that is driven by local knowledge, and ultimately mitigates regional disparities within Europe. Finally, Sarkar, Bilau, and Basílio (2021) highlight the positive role of large infrastructure to promote, within RIS3, the innovation potential of rural areas. In all aforesaid studies, the concept of TC is missing. This seems surprising having in mind the important policy status of the TC, regarded as one of the three objectives of the EU Cohesion Policy.

4. Measuring territorial cohesion trends

As previously stated, TC is difficult to measure (Dao, Cantoreggi, and Rousseaux 2017), but not impossible (Zaucha and Böhme 2020). This explains why not many scholars have sought to measure its trends and proposed a wealth of methodologies to translate that task into practical policy indicators. In their quest for existing attempts to measure TC, Zaucha and Böhme (2020) not only mention the early creation of the TC star model (early 2005 and later on published in 2011 and 2016 – see Medeiros 2016) but also: (i) a failed attempt from an ESPON (3.1) project to establish a European Territorial Cohesion Index due to lack of regional data and an overly way of operationalization; (ii) a composite TC index with scores for EU NUTS 2 and 3 (Prezioso 2008), using the TIA STeMA methodology (Prezioso 2020); (iii) the ESPON Project 4.1.3 which advanced a set of indicators selected based on key policy objectives and policy development needs

(ESPON 2007); and (iv) the work provided by the European Territorial Monitoring System to compile territorial development indicators at the European level (ESPON 2014). However, in our view, only the STeMA can be directly coined as sound scientific attempt to measure TC in the EU.

This analysis uses the construction of an aggregated Territorial Cohesion Index, based on the United Nations methodology to build the Human Development Index (UN 2021) which supports the elaboration of the first Territorial Cohesion Index, since it is relatively easy to build and is based on the four main dimensions and respective components of the TC star model (Medeiros 2016) (Table 1).

González et al. (2015) propose an alternative set of key spatial indicators for TC. They present a methodological approach developed and applied by the ESPON KITCASP project based on the following main analytical dimensions: (i) economic competitiveness and resilience; (ii) integrated spatial development; (iii) social cohesion and quality of life; and (iv) environmental resource management. These are not that different from the 'star model' of TC, apart from not incorporating territorial governance and cooperation as key aspects of TC. Moreover, the resultant application from the ESPON KITCASP TC methodology did not reveal any concrete TC overall score permitting measuring TC trends in the five analysed territories.

Similarly, the ESPON INTERCO project identified a vast set of policy indicators to assess TC associated with five main dimensions: (i) smart growth in a competitive and polycentric Europe; (ii) inclusive, balanced development and fair access to services; (iii) local development conditions and geographical specificities; (iv) environmental

Table 1. Main dimensions and components of the star model of territorial cohesion.

Dimensions	Components	Potential Indicators
Socioeconomic cohesion	E – Productivity	– Work productivity
	E – Income	– GDP per capita
	E – Employment	– Employment rate
	E – Innovation	– Patents granted
	E – infrastructure	– Industrial parks
	E – Entrepreneurship	– Startups
	S – Education	– Tertiary education (%)
	S – Health	– Physicians per capita
	S – Culture	– Culture expenses (%)
	S – Inclusion/exclusion	– Poverty rate
	S – Basic infrastructure	– Public services access
	S – Security	– Criminality rate
Environmental sustainability	– Climate change	– Co_2 emissions
	– Energy	– Renewable energy production
	– Nature and biodiversity	– Protected areas (%)
	– Environment and economy	– Expenses with environment (%)
	– Environment and health	– Waste collection and treatment
	– Natural resources	– Circular economy implementation
Territorial cooperation and governance	– Horizontal cooperation	– Interreg projects
	– Vertical cooperation	– Multilevel cooperation
	– Participation	– Elections participation rate
	– Involvement	– NGOs rate
	– Information	– e-Government rate
Morphologic polycentricity	– Hierarchy/Ranking	– City ranking in urban network
	– Density	– Population density
	– Connectivity	– Access to internet
	– Distribution/Shape	– City compactness rate

Source: Own elaboration. Based on Medeiros (2016). Note: E – Economy/S – Society.

dimension and sustainable development; and (iv) governance and coordination of policies and territorial impacts (Van Well 2012). Yet again, no aggregated TC score was advanced by this ESPON project to analyse TC trends in Europe. This has been, in our view, one of the main limitations of existing ESPON TC conceptual frameworks. They discuss potential analytical dimensions and respective components, but do not materialize into concrete measurement of TC trends. And even existing attempts using sigma-convergence as a measure of TC (see Dao, Plagnat, and Rousseaux 2013) take an erroneous notion, in our view, in which TC is understood as economy disparities in a given territory.

One can also highlight a more recent attempt to assess the implementation of TC in Poland, supported by an above-mentioned TC model. In essence, it interlinks 'policy territorialisation' (adjusting policies to the territorial context and integrating them in order to make them more efficient and effective), 'territorial capital' (the contribution of territorial assets such as non-movable ones and/or ones that are native to a specific place) and 'territorial utility' (the territorial assets and characteristics that directly impact the well-being of those who have access to them) (Bradley and Zaucha 2017). As such, it provides a more complete picture of TC trends in a given territory. Even so, their authors recognize that the validity of the results is undermined by the neglection of a TC governance element (Zaucha and Böhme 2020), which is used by the TC star model (Medeiros 2016).

The verification of TC trends in Europe is a complex undertaking. This is especially true at the European level due to lack of comparable data at the EU NUTS 2, covering all the main analytical dimensions of TC. Even so, this paper presents a simplified Territorial Cohesion Index to portray the territorial cohesion trends in the EU NUTS 2 for the 2010–2019 period, based on the TC Star Model's main dimensions (Medeiros 2016). It is simplified because it uses two indicators for the Socioeconomic Cohesion dimension (GDP per capita and tertiary education) and one for the remaining three dimensions: Territorial Cooperation and Governance (EU governance index) + Morphologic Polycentrism (potential accessibility) + Environmental Sustainability (CO_2 Atmospheric Emission). It is simplified when compared with the TC index used in for the Portuguese and Polish NUTS 3, which uses more indicators per analytic dimension, since they are available in national statistics.

The TC scores obtained for all EU NUTS 2 are presented in Figure 1. These scores, which are largely dependent on the selected variables, represent TC trends between 2010 and 2019 in these EU regions. As seen, only a few obtained relatively high TC index scores (e.g. Paris region) during this time period. In general, however, the presented picture is not close to a desired one in which lagging regions would obtain higher TC index scores than leading regions, as a result of the EU Cohesion Policy rationale in placing higher financial resources in lagging regions in the same period of time (Figure 2).

Based on the reading of key EU policy documents, Rauhut and Humer (2020, 2120) conclude that EU Cohesion Policy was supported by the Growth Poles theoretical rationale, which holds that economic growth or development 'is not uniform over an entire region but instead takes place around a specific pole (or cluster)'. Curiously, the current EU Cohesion Policy framework (2021–2027) proposes a focus on five investment priorities,[1] which are in our view, more in line with the TC goal:

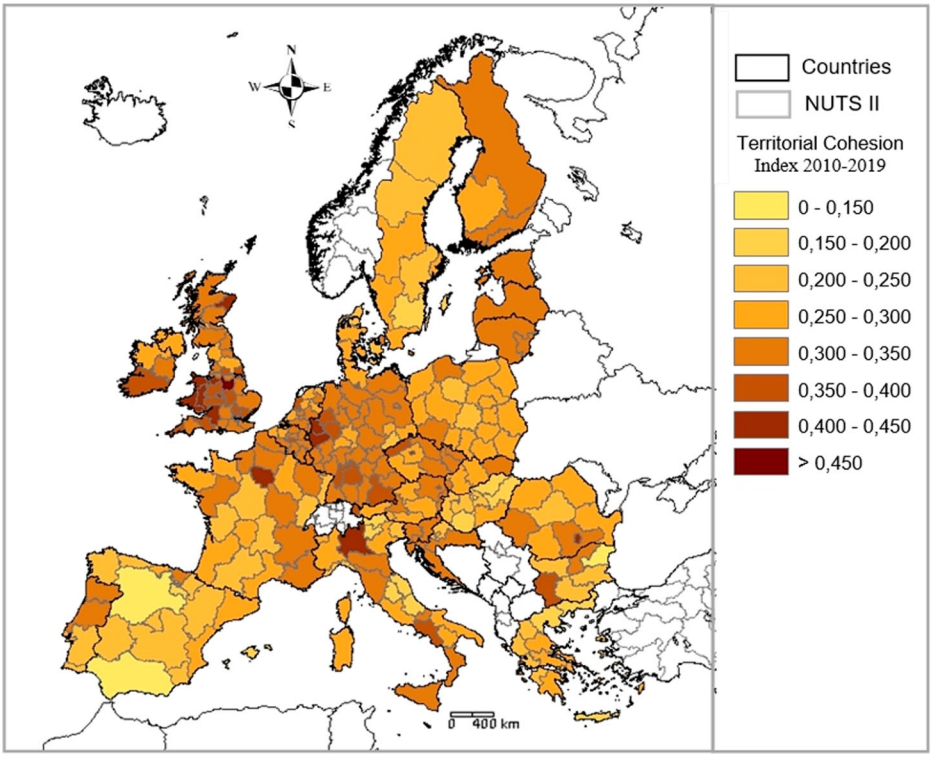

Figure 1. Territorial Cohesion Trends in the EU (2010-2019). Source: own elaboration.

- a Smarter Europe, through innovation, digitization, economic transformation and support to small and medium-sized businesses
- a Greener, carbon-free Europe, implementing the Paris Agreement and investing in energy transition, renewables and the fight against climate change
- a more Connected Europe, with strategic transport and digital networks
- a more Social Europe, delivering on the European Pillar of Social Rights and supporting quality employment, education, skills, social inclusion and equal access to healthcare
- a Europe closer to citizens, by supporting locally led development strategies and sustainable urban development across the EU.

The measuring of TC trends in the Portuguese NUTS 3 (2010–2020) used a more complete set of statistical information associated with each one of the four dimensions of the star model of TC. In detail, socioeconomic cohesion trends used data from GDP per capita, tertiary education, medical staff and productivity (two economic + two social development indicators). The remaining analytical dimensions were measured with two indicators each. Territorial cooperation/governance was measured with the election participation (participation rate in municipal elections) and communitarian participation (proportion of community participation in co-financed projects in total capital revenues (%) of municipal councils by geographic localization) data. The analysis of morphologic polycentrism entailed the use of data measuring the internet access (access to

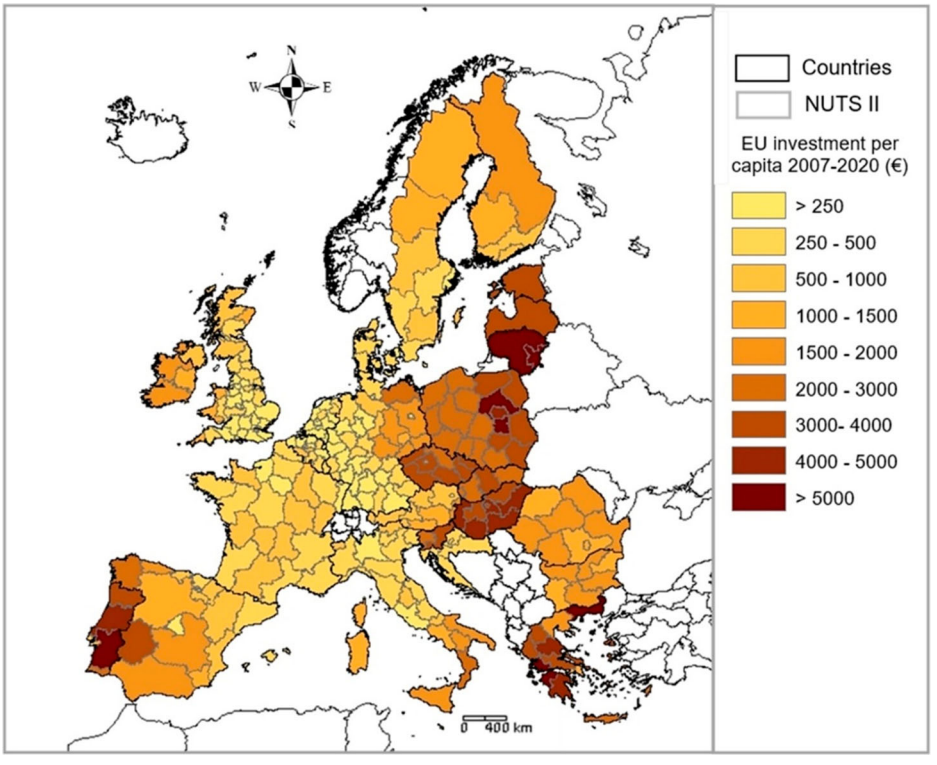

Figure 2. EU investment per capita (2007-2020). Source: own elaboration based on https://cohesiondata.ec.europa.eu.

broadband internet service) and urban density (population density by place of residence – predominantly urban area). Finally, the access to water supply and the selective waste collected was used to measure environmental sustainability trends. Similar computations were done for Poland although with slightly different indicator sets (due to data availability at NUTS 3 level) for environmental sustainability: i.e. industrial pollutants retained or neutralized in pollution reduction equipment in % of pollutants produced and industrial and municipal wastewater treated in % of wastewater requiring treatment. For tertiary education, number of students was used instead of number of people with university diploma (Figure 3).

Despite not always being ideal indicators, they offered, in our view, a sound and comprehensive analysis of the TC trends in the Portuguese and Polish NUTS 3 in the last decade (Figures 3 and 5). Alike what was presented in Figure 1 for the EU NUTS 2, these scores represent TC trends between 2010 and 2020 in these regions. In an ideal scenario, the construction of the TC index would be supported by already existing four aggregated indexes related to each analytical dimension, for two periods of time: a socioeconomic cohesion index + a territorial governance/cooperation index + an environmental sustainability index + urban polycentrism index. The reason the research used the selected indicators is obvious: the tremendous limitations in getting comparable indicators in two different periods of time associated with environmental, governance and polycentrism analytical dimensions, at the regional level.

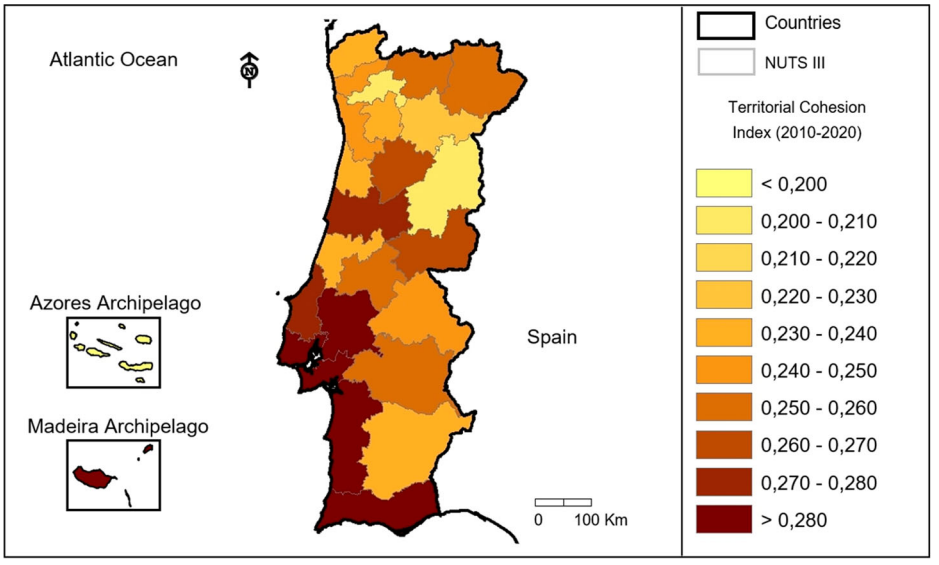

Figure 3. Territorial Cohesion Trends in the Portugal (2010-2020). Source: own elaboration.

The obtained TC trends are, however, far from the ideal and expected ones since, with minor exceptions, the most developed NUTS 3 in a baseline scenario (2014) saw, for the most part, higher TC scores. This means that, in view of the selected indicators, the Portuguese and Polish territory experience 'territorial exclusion' trends, rather than intended TC trends, during the 2010–2020 period. The Polish Picture seems a mosaic one. We can observe increases of TC index among key metropolitan areas as well as in some lagging behind NUTS 3 regions (e.g. puławski or sandomiersko-jędrzejowski) whereas TC of

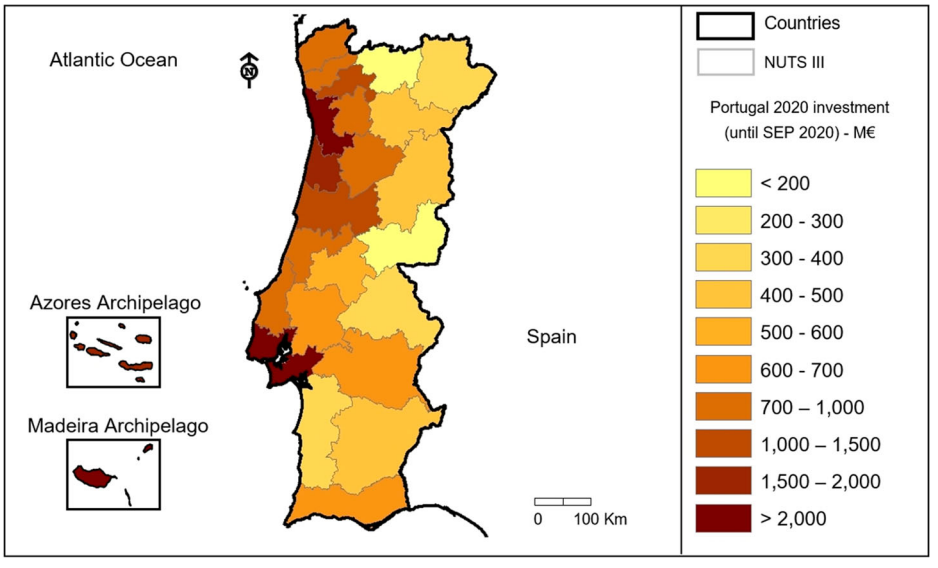

Figure 4. EU investment per capita (2014-2020). Source: own elaboration based on Agência de Desenvolvimento e Coesão (ADC) data.

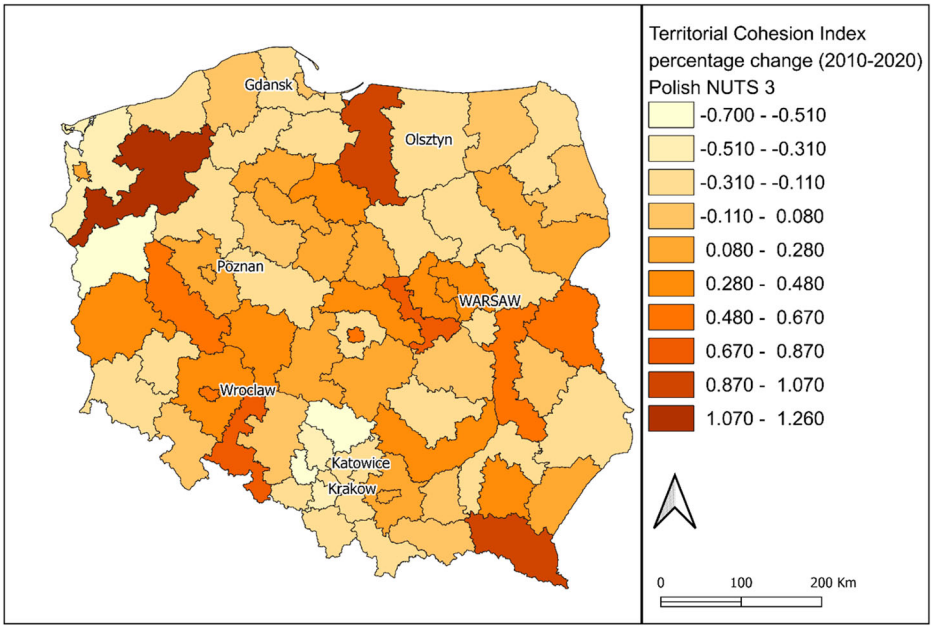

Figure 5. Territorial Cohesion Trends in Poland (2010–2020) – change of the TC index. Source: own elaboration.

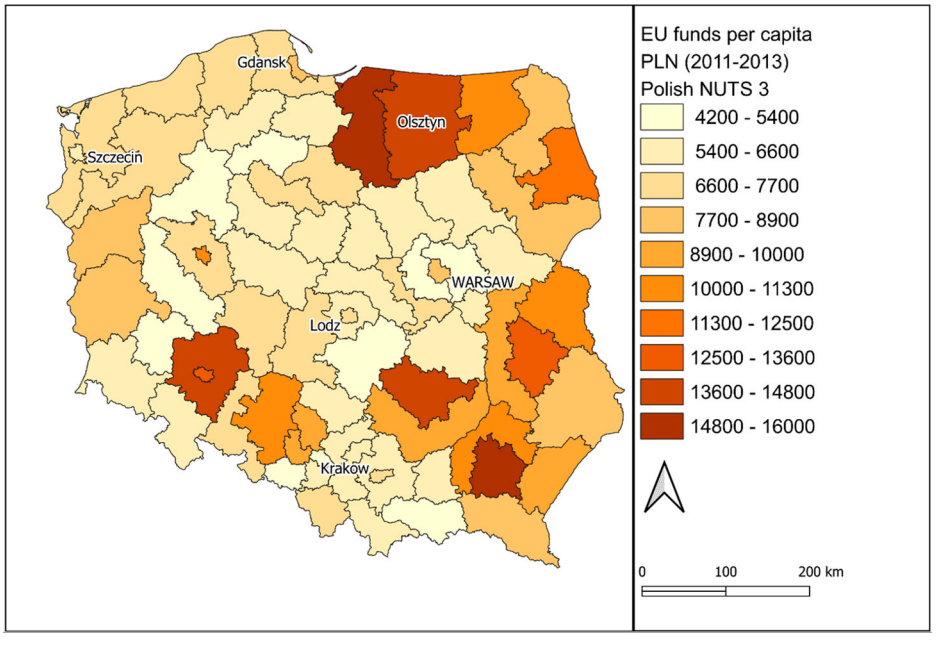

Figure 6. EU investment per capita (2011-2015). Source: own elaboration based on Polish Central Statistical Office data.

their neighbours being in the comparable situation has even been decreased (e.g. chelmsko-zamojski or kielecki). What is more worrisome is the concentration of EU

Table 2. Correlation between initial level or TC change and EU investments per capita in the years 2010–2020 for Portuguese NUTS 3 areas.

Group of regions	TC change versus Total EU funds	Initial TC versus Total EU funds	TC change versus EU funds per capita	Initial TC versus EU funds per capita
25 NUTS 3	-0.020	0.113	0.028	0.046

Source: Own elaboration.

Table 3. Correlation between initial level or TC change and EU investments per capita in the years 2010–2015 for Polish NUTS 3 areas.

Group of regions	TC change versus Total EU funds	Initial TC versus Total EU funds	TC change versus EU funds per capita	Initial TC versus EU funds per capita
73 NUTS 3	0.292	0.357	0.227	−0.011
64 NUTS 3 without agglomerations (100% of the population lives in cities)	0.118	0.091	0.179	−0.100

Source: Own elaboration.

investment during this period in these already more developed Portuguese NUTS 3 (Figure 4). In Poland, the situation is similar. EU investment benefit metropolitan regions, but in per capita the main beneficiaries are selected metropolizes and also some weaker NUTS 2 areas but without any relation to their initial level of development (Figure 6). In Portugal (Table 2) and in Poland (Table 3) just like in the EU case, the correlation between the obtained TC indexes and EU Cohesion Policy funding per analysed region is negative or weak. There are some exceptions to this rule, e.g. bialski NUTS 3 region (Poland) with high increase of TC and large EU investments per capita, but this is not a dominating pattern (Figure 5).

5. Conclusion

The article debates the relevance of TC as an EU policy goal in a neoliberal policy context dominated by the 'smart growth' policy rationale. The central finding in this regard is that TC is still alive and kicking in the implementation of EU development and cohesion policies (i.e. EU Cohesion Policy) and EU Territorial Agendas, as well as in some national development strategies. One key example is the creation of a Ministry for Territorial Cohesion by the current Portuguese government (2019–2022). Available literature points to only a few known attempts to measure TC trends in a given territory. The argument here is the need to validate TC policies by checking their effective contribution to achieve TC trends rather than TC exclusion trends. Otherwise, in our view, the arguments to finance such TC policy goals become fragile. This task is important in the wake of aforesaid controversies related to narrowing growth and development only to the economic dimension. There is a prevailing plea in the literature that growth must be better rooted in resilience paradigm, broader aspects of production of public goods, strengthening mutual trust and avoiding creation of the places that don't matter (Rodríguez-Pose 2017) (Figure 6).

One major problem for assessing TC trends is the lack of consensus on the definition of TC. For many, TC is simply economic cohesion on territories. Hence, the erroneous

use, in our view, of sigma-convergence as a measure of TC. On a positive note, there are a few TC multi-dimensional models which incorporate not only economic components of TC, but also social, governance, environmental and spatial planning related ones. The problem is that, mainly due to lack of appropriate data, some multi-dimensional TC models have not been used to measure TC trends via an aggregated statistical indicator. One of the exceptions is the star model of TC, already applied several times to measure TC trends in the EU and several countries, at various territorial levels. This has been done once again for this paper via the creation of a TC index build with the same methodology based on the UN Human Development Index. In the case of the presented TC indexes (EU NUTS 2 2010–2019 + Portugal NUTS 3 2010–2020 + Poland NUTS 3 2010–2020), they incorporated statistical indicators associated with a balanced set of components linked with the four main dimensions of the star model of TC: (i) socioeconomic cohesion; (ii) environmental sustainability; (iii) territorial cooperation and governance; and (iv) morphologic polycentricity.

Despite the challenges in obtaining the desired indicator for each analytical dimension, the obtained cartography of the TC trends on both the EU, Portugal and Poland did not reveal desired TC trends in any of these case studies. Based on the selected indicators, between 2010 and 2019 some of the less development EU regions had some above-average TC scores, but there is not a clear picture showing above-average TC scores for less developed regions, in contrast with below-average TC scores for more development EU regions in a baseline scenario (2010). The same goes for the Portuguese and Polish NUTS 3. In these cases, an undesired picture of increasing territorial inequalities emerges, in which the more developed regions obtained, for the most part, higher TC scores. In all, and based on the selected indicators, it is possible to conclude that from 2010 to 2020, both in the EU, Portugal and Poland, there were no intended TC trends. One should probably not expect that these territorial exclusion trends would be corrected in the current EU financial framework. For that, the implementation of EU policies should be better addressed and operationalized.

Taking this further, the analysis showed that there is not a positive correlation between the TC scores obtained for both the EU and two countries examined (i.e. Poland and Portugal) and the respective EU Cohesion Policy funding for each analysed region. It is true that EU Cohesion Policy does not act in isolation, and that its development relevance differs in all Member States. However, in both Poland and Portugal, this Policy is crucial to finance regional development projects and one should expect that less development regions would receive the bulk of its financing. That has not been the case base on available data for the 2014–2020 (Portugal 2020) programming period neither for Poland in the years 2011–2015.

Looking to the future, from a theoretical standpoint, challenges have to be posed to both Eurostat and national statistics to produce comparable and updated regional statistics which can be regularly used to produce TC indicators able to measure TC trends more regularly, at least in the EU NUTS 2 and national NUTS 3. Here, the authors suggest the creation of four different aggregated indicators: (i) a governance index; (ii) a socioeconomic development index; (iii) an environmental sustainability index; and (iv) a urban polycentrism index. The first was already produced the QoG Institute, for purposes of comparison of the country estimates over time 'based on a large citizen survey where respondents are asked about perceptions and experiences with public

sector corruption, along with the extent to which citizens believe various public sector services are impartially allocated and of good quality'.[2] The second was already presented in the six Cohesion Report and can be easily produced based on existing Eurostat indicators. The same goes for the environmental-related index. Finally, there was a first attempt to produce a polycentrism index for Europe (NUST 1) in a ESPON project (1.1.1), in 2004. The challenge now is to develop it with updated data and for the EU NUTS 2.

The policy implications of a regular and sound production of TC indexes via EU and national official statistics could be profound. Firstly, these indicators would present a more accurate picture of the TC trends in the EU and could contribute to revive the political interest to foster TC policies. Secondly, the individual (governance, socioeconomic, polycentrism and environmental) indexes would help to identify which policy domains should receive more EU Cohesion Policy funding, in each Member State for them to achieve TC trends in a more effective manner. Thirdly, a new momentum could be built around the analysis of TC in the academic world, which has been more focused producing urban and regional development strategies adapted to new globalized times.

Notes

1. https://ec.europa.eu/regional_policy/en/2021_2027/.
2. https://www.gu.se/en/quality-government/qog-data/data-downloads/european-quality-of-government-index.

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