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Review of the doctoral thesis
of **Flavio Besana**
entitled **The future of shrinking areas in the EU:
potential policy impacts in light of pressing pandemic,
environmental and institutional challenges**

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under the supervision of:
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The problems of shrinking regions and cities are among the issues frequently addressed in contemporary studies in socio-economic geography as well as economics. They constitute an important scientific problem, but at the same time they are also important for the conduct of territorial policies, including urban policy and European Union cohesion policy. The great majority of the research undertaken, however, is based on case studies. They concern one centre or cities in one region or country. Cross-country studies, especially pan-European, are rare. They are most often carried out on the occasion of large research projects (such as ESPON), which means that their embedding in the scientific literature is weaker.

The different viewpoints and possible applications of this type of research mean that it is not always easy to maintain methodological or even terminological compatibility. There is a need to undertake independent, primary research of a prospective nature, combining quantitative and

qualitative methods in the analysis of shrinking areas. It is also true that urban and local shrinkage is not treated in the literature as a problem 'in itself' for European space. It is most often described as the result of other, implicitly unfavourable, processes such as loss of economic functions, high unemployment, low income levels. This is reflected in the recommendations formulated. According to them, a specific economic or even just infrastructural investment is enough to remove these negative factors and consequently stop the depopulation process. Concentration on shrinking areas as the main research topic, without excessive reliance on explanatory factors, is of great value. It is also innovative (at least for research on a European scale).

Flavio Besana doctoral thesis must be evaluated in the light of the problems mentioned and, at the same time, with an awareness of the difficult challenges the Author faced. These included: a) delimiting the subject of the research; b) correct selection of quantitative methods; c) combining different spatial scales; d) specific features of urban and regional shrinkage processes in individual EU Member States; e) integrating conclusions from the application of very different methods. The author has met these challenges to varying degrees (see the following review for comments in this regard). Nevertheless, the asset of Flavio Besana dissertation is the efficient application of a set of complementary research methods (even if some of them could be omitted without affecting the final conclusions). The author's experience gained during the implementation of pan-European projects involving spatial analysis was helpful in correctly interpreting such rich material. Wishing to make use of his experience and the output of numerous projects, the Author decided on a thematic and methodological scope of the work that considerably exceeded the requirements of a standard doctoral thesis. This was associated with a serious risk of losing narrative clarity and deviating from the originally outlined objectives. However, this did not happen. Despite a certain overload of material, the work is readable and constitutes a unified compact study.

The following sections of this review first present problems of a general nature. Then an outline of the content of the dissertation is provided, including more detailed comments. In conclusion, the main assets and shortcomings of the dissertation are pointed out, the whole is related to the standard requirements for doctoral theses, and a final conclusion is presented.

General comments

Flavio Besana doctoral thesis consists of 280 pages. It includes eight chapters as well as a bibliography and annexes. The author formulated a rather general aim of the thesis, defining it as answering the question: what are the potential territorial impacts of selected European policies on the future of shrinking areas? He has also formulated three specific research questions, corresponding to large and clearly distinct parts of the thesis (for comments on the structure see below). We can divide the objectives of the dissertation into those related, on the one hand, to the assessment of the current and future phenomenon of shrinking areas itself and, on the other hand, to the impact of specific actions (policies) on this process. The author rightly notes that the intersection between policies and shrinking areas in Europe has not been explored thoroughly. He attempts to fill this gap. The selection of policies analysed may appear to be accidental (it would have been possible to examine a range of other measures, especially sectoral ones). However, the analyses themselves are done in a very solid, detailed manner. Maintaining this level of detail would have been impossible if the sectoral scope of the dissertation had been larger.

At the beginning, the author himself indicates the areas in which the results of his work can contribute to the literature on shrinking areas. Of these, the following should be mentioned as particularly relevant: a) providing insights on future trajectories of population loss if no specific action is taken; b) testing a methodology to produce an ex-ante assessment that could be replicated and adapted into more policy fields; c) providing evidence that ‘place matters’ even more for shrinking areas, calling for place-based policies and structured approaches to shrinkage.

The structure of the thesis is clear. What is questionable is the choice of issues in the light of which, in the second part of the dissertation, the process of shrinking of European cities and regions is assessed. These are the constraints of COVID-19, the potential impact of the Just Transition Fund (JTF) and the public proposals made at the Conference of the Future of Europe. Each of these issues is slightly different in nature. The constraints of COVID-19 have already taken place (between 2020 and 2021), while the impact of the JTF is yet to possibly take place. Quantitative methods are used in both cases. The final benchmark is the current perception of the problem in European societies. It is strictly qualitative and based on a small research sample. In order to understand the role of chapters 4, 5 and 6 in the dissertation as a whole, it is necessary to read it carefully. This does not change the fact that the thesis would have been of great substantive value even if the three chapters mentioned above had not been included. Moreover,

chapters 4 (on COVID-19 restrictive measures) and 5 (Just Transition Fund) could have formed the basis of separate reports or perhaps even separate dissertations. The three most important parts of the thesis (the description of the shrinkage phenomenon, the analysis of the impact of COVID-19 and the analysis of the potential effects of the JTF), are separate valuable studies, with original, authors' methodology and valuable conclusions.

An unquestionable strength of the work is to undertake the analysis at the level of local LAU2 units. Only at this scale is it possible to capture the shrinkage process. Studies at NUTS2 or even NUTS3 level do not have sufficient precision. Many other analyses at European and Member State level have shown that in recent decades there has been an increasing diversification of the social and economic situation of local units (e.g. as a result of different degrees of endogenous resource use). Shrinking municipalities may sometimes be neighbouring units in which negative processes are not taking place. The above mentioned strength of the work, however, mainly concerns its first part. In the later chapters (reference to COVID-19 and to the JTF), the author, by necessity, has to use larger units. The interrelation of LAU2 and NUTS2/3 level information is one of the weaker elements of the thesis. It creates a risk of false interpretations.

Furthermore, in addition to the threat of over-generalisation (NUTS3 level and above), there is also the threat of over-detailing. The loss of population by units within a functional area (FUA) does not have to be considered as shrinkage. It can mean displacement within the FUA, with a constant demographic potential (or even under conditions of growth). It is also difficult to compare the figures for the unit as a whole with those relating to shrinking municipalities in the unit. E.g. in Chapter 4, the author comes to the optimistic conclusion that regrowing and stabilised municipalities are more systematically located in areas with high sensitivity to Covid-19. At the same time, the examined dynamics of shrinking municipalities are local in nature. There may be municipalities next to them with a completely different development trajectory (within the same FUA). In that case, the interpretation would have to be quite different... The limitations described are not easy to overcome, especially with an EU-wide study. However, this problem should be better addressed by the Author when interpreting the results.

A more serious problem is the assumption made at the beginning that only units with a population of more than 5 000 in 2001 will be analysed. The author is aware of its subjective character. In the conclusion part of the thesis, he refers to this problem several times. He highlights that the result obtained may be a consequence of this assumption. The omission of smaller units is understandable from the point of view of the research tools used. On the other

hand, however, it is not clearly described and the threshold of 5000 inhabitants may be questionable. It would be more appropriate alternatively: a) to include all, also smaller units (and at the same time both urban and typically rural units) or; b) to set the threshold at a higher level (e.g. 10 or 20 thousand, which would mean examining centres that are usually cities and form a functional area around them). A boundary of 5,000 clearly cuts across the entities of the local settlement structure, considering only part of the rural areas. The way in which it divides the hierarchical pattern of the settlement network also varies greatly between European countries. Sparsely populated areas in Scandinavia and Central and Eastern Europe are underrepresented in the study.

The dissertation contains a number of mutually complementary research methods of a very different nature (both quantitative and qualitative theses). This provides an opportunity to deepen the analysis, but also creates some risks. The chapters become incomparable with each other. It is only the synthesising seventh chapter that makes a rather efficient connection, these seemingly incompatible fragments. The author accurately notes that his study is dominated by quantitative methods, but fails to mention at the beginning that in many cases these required subjective assumptions. On the other hand, the use of the TIA method in assessing the impact on shrinking areas should be seen as valuable and innovative.

The dissertation is written in good language, allowing the reader to follow the Author's narrative. With such a large and multi-faceted dissertation, the Author's numerous references to previously described chapters and methods, as well as to the role a particular procedure plays in a study, are very valuable. These are elements that other doctoral theses often lack.

The work is also very well done editorially. The illustrations provided adequately fulfil their role. There is some dissatisfaction with the number of cartographic illustrations. It could have been richer. This would facilitate the perception of some of the issues described.

Of the more minor problems, the following is worth noting:

- The author consistently uses the term Czech Republic in the work, while, according to the objections raised by Czech geographers, the correct English name for their country is Czechia. Even more illegitimate is the use of the term Slovak Republic. Adopting such a convention should mean using their full official names for all EU countries (e.g. Federal Republic of Germany, not Germany).

- The author inconsistently uses terms to describe large parts (macro-regions) of Europe. It is not clear what is Central Europe, what is Central-Eastern Europe, what is Eastern Europe for him.

Content of the thesis

The paper begins with an **Introduction**, including a general description of the background, aims, methods and terminology used (references to these are included within the general comments above). It ends with a description of the research process. It is unfortunate that it was not illustrated with a diagram showing how the chapters contribute to the achievement of the dissertation objectives.

The second chapter is devoted to theoretical background and methodological discussion. It contains a rich review of the literature, indicating that the author is well grounded in the existing scientific material. The chapter includes an extended consideration of the definition and conceptualisation of the term shrinkage. A number of related terms used in individual EU member states to describe areas of depopulation are discussed. The list is extensive, although other terms and delimitations from further countries could certainly be found (e.g. demographic problem areas used in Poland). Nevertheless, the added value of the work is the structuring of many of the terms used. Macro-trends and challenges for the European Union are characterised separately. The author lists here: pandemic challenge, environmental challenge, institutional challenge (quality of governance). It can be debated whether this is a complete list. Geopolitical and external migration challenges are missing. Nevertheless, the final reflections of the theoretical part on spatially blind and place-based approaches in European policies are valuable.

The second part of the chapter is devoted to the theoretical and methodological assumptions of the thesis. The concepts often used in the construction of indicators with a spatial dimension (such as territorial impact or territorial capital) are characterised. Different approaches to demographic modelling are considered. It is noteworthy that the author is aware of the limitations of the various methods, including those he ultimately uses (e.g. limitations arising from the choice of variables used in modelling). This awareness is then reflected in the interpretation of the results obtained. It demonstrates research maturity and is an asset to the work. A critical approach is particularly important when demographic modelling and forecasting is applied to small units (LAU2). A threat is the situation, when migrations take place between neighbouring units, which can lead to over- or underestimation of depopulation

phenomena. Discussions on this topic can be continued. This does not change the fact that the author has clearly described the possible methodological threats and, with an awareness of them, has made a decision regarding his own assumptions.

The third chapter is already empirical in nature. It describes the trajectories of shrinkage from 1991 to 2050 and thus includes both the statistical analysis and the projection model used. This is an essential and extremely valuable part of the thesis. As already mentioned, it could itself be the basis of a doctoral dissertation. A limitation of the results obtained is the aforementioned limit of 5,000 inhabitants, above which the study was conducted. This can be clearly seen in Map 2, where shrinking hotspots are visible mainly in relatively densely populated areas (e.g. Saxony, Polish Upper Silesia). At the same time, we know from studies at higher levels of spatial aggregation that overall depopulation is higher in the same countries in other regions (Mecklenburg and the regions of north-eastern Poland, respectively). However, the phenomenon did not become apparent in the analysis because, due to the generally lower population density, most of the municipalities losing population are units with less than 5,000 inhabitants. Despite these objections, the results are innovative and very valuable. They shed new light on the pattern of shrinking areas in Europe. They show that shrinkage is a problem for many larger units, and is not limited to rural areas and some cities losing functions. It is a problem of entire, relatively densely populated compact areas in many European countries.

The study is also carried out separately for different categories of units. With size categories, some conclusions are obvious. The proportion of shrinking units within a category (Table 2) may correspond to their total number. Cities with more than 250,000 inhabitants will always be in the minority. Thus, the information that only 0.6% of all shrinking units have this number of inhabitants may not be surprising... Map 3 showing the demographic trajectories of shrinking municipalities is very interesting. To some extent, it modifies the core-periphery spatial pattern known from many studies in Europe. Also of interest is the scale of the internal differentiation of the situation in the CEE countries. The author concludes that shrinkage is not a local phenomenon. One should rather say shrinkage is not only the local phenomenon. On the one hand, as the reviewed thesis proves, the phenomenon is widespread (more so than previously thought), on the other hand, this does not mean that significant differences in its intensity do not occur within individual regions. Many works confirm the emergence of intra-regional inequalities (including the inner periphery). These are therefore rather two overlapping processes, depopulation in large areas (also cross-border) and internal polarisation within regions. In the discussion presented in the thesis, the topic of functional areas is too rarely

mentioned. They are of great importance in the context of the process of shrinkage. Suburbanisation is taking place around many cities, including medium-sized and even small ones. Cities lose their population, but it does not move to distant metropolises, but to neighbouring rural municipalities (with a population of less than 5,000, i.e. not included in the study). Are we then dealing with a real shrinkage? In the final assessment of the process, a matrix approach seems necessary to identify the directions of migration. However, this is already a topic for a separate project and/or dissertation.

In the forecasting (modelling) part of the chapter, the author's attempt to eliminate potential modelling errors, including the combination of data for municipalities with variables available only at NUTS3 level, is noteworthy. The methodology as a whole should be considered innovative, although of course it may raise further questions in several places (e.g. how is the result of modelling influenced by the fact that in a given NUTS3 unit small municipalities with less than 5000 inhabitants predominate?). Some weaknesses in the methodological assumptions are evidenced by result map 6 (Presence of shrinking cases in 2050). The picture for Poland results from not taking into account the phenomenon of suburbanisation. All large cities separated as separate NUTS3 were identified as 'blind spots of future shrinking'. However, they are likely to lose population to surrounding NUTS3 regions rather than to remote areas. At the same time, analogous hotspots were not diagnosed for only slightly smaller towns, which, however, do not constitute a separate NUTS3. The conclusions lack reference to the specifics of individual countries (long-term processes taking place in them). It would also be appropriate to interpret the situation (current and projected) of individual municipalities according to the

Starting **with chapter four**, the second part of the thesis begins with references to policies and external factors. Chapter four deals with the Territorial Impact Assessment (TIA) of COVID-19 restructuring measures in shrinking areas. The TIA method was applied. Selected variables illustrating vulnerability to the effects of the pandemic were analysed and related to the results obtained earlier regarding the shrinkage process. However, the selected variables were not a homogeneous set and are sometimes interdependent. This is of particular importance when the author synthesises these indicators (there is no simple correlation matrix to show their interrelationship). Thus, in the conclusion of Table 17, the Author concludes that there is substantial alignment between the distribution of shrinking areas and regions across sensitivities within Member States. He goes on to point out exceptions, which occur, for example, in Greece. The situation described is partly due to the fact that the economic measures used to assess sensitivities are correlated with demographics. The correlation is therefore not surprising. Its

absence becomes apparent when other factors are strong, such as geographical isolation in the case of the Greek islands.

Polemics can be made with some of the conclusions at the end of Chapter 4. It seems that an important factor (underestimated by the Author) is the structure of the economy in the different regions (e.g. the role of sector I, including agriculture, reducing vulnerability to COVID-19). In the Central and Eastern European regions, the vulnerability of some regions to the pandemic was lower due to the strong position of agriculture. At the same time, there is a strong shrinkage of municipalities in the same regions. The author also writes in the conclusion that the location of shrinking areas is disproportionately concentrated in regions highly sensitive to Covid-19 restrictive measures. The direction of the correlation thus captured is not obvious, which affects the entire narrative of the chapter. Perhaps this high sensitivity is a consequence of the shrinking process ?

Of a different nature is **chapter five**, in which the Author relates the obtained results of the territorial distribution of the shrinking process of municipalities to the future use of the Just Transition Fund. This time, therefore, it is an assessment of a specific, already developed, European action (policy) plan. One may wonder to what extent this corresponds with the previous chapters of the work? On the other hand, the TIA-based methodological approach used again raises fewer questions this time than in the COVID-19 vulnerability assessment (chapter 4). The analysis focuses on specific regions, which makes it easier to interpret and evaluate the conclusions drawn. A certain problem is again the comparison of processes in shrinking municipalities with the situation of entire NUTS2/3 units (JTF beneficiaries). It is not clear whether the carbon dependency applies just to shrinking municipalities (also after their aggregation)? The author concludes that the European aggregate picture on potential impacts of the Just Transition Fund on shrinking areas is pessimistic. According to the conclusions reached, the impact of the fund on changing the situation of individuals will be limited due to unfavourable conditions to successfully install the green transition process. There seems to be too little reference to specific shrinking areas in Europe in the conclusion section of the chapter. The author provides such an overview (Table 26), but only at the country level. The carbon economy usually concerns specific cities. The situation of each city is specific and the potential for improvement as a result of the JTF should be assessed individually here. The same problem applies to the interpretation of thematic sensitivity results. The author points out, for example, that there is no process of structural aging in Eastern Europe. This is not true. The problem is very much there, but it is concentrated in certain parts of the NUTS2/3 units, including rural

municipalities with a population of less than 5,000 (and therefore not analysed). Overall, the chapter proposes a large number of new statements, calculations, indicators and typologies. This is not quite adequate to the scale of the problem. The spatial scope and budget available to the JTF do not allow for a permanent solution to the problems of shrinkage. Traditional cohesion policy, the distribution of which was not the subject of the thesis, is far more capable of doing so.

Chapter six is based on a previously published article. It looks for references to the problem of shrinking in the statements of EU citizens attending the Conference on the Future of Europe in April 2021. One may wonder about the advisability of including this otherwise interesting section in a doctoral thesis, when only 119 statements referred to the topic. Drawing conclusions on such a research sample is highly problematic. The author draws the final comment that the impact of direct citizen engagement on the European policy debate around shrinkage is low. This is somewhat of an over-interpretation, as it may be due to the initial configuration of the themes of the Conference.

In chapter seven, the author undertakes the difficult task of bringing together all the results from the different analyses, discusses them, and puts them in relation with the most relevant debates. Given the number of themes in the thesis, he succeeds exceptionally well. He demonstrates an ability to critically synthesise the many, sometimes chaotic, results of the various analyses. Some of the conclusions identified are important milestones in the discussion on the future of territorial policies in the European Union. It is important to note that the main recent policy instruments (CAP, EARDF, ERDF) and strategic documents (Territorial Agenda 2030, the New Leipzig Charter, Long-term vision for rural areas) have not fully recognised shrinkage being a challenge for territorial development. However, one can argue with the author's statement that shrinking will spread in countries where now it is only marginal. Rather, spreading will take place within countries. And only secondarily between them.

There is some dissatisfaction with the lack of reference to cohesion policy and its tasks in the next programming periods. The conclusions refer critically to the JTF. However, there is no clear recommendation that perhaps shrinking areas require a separate targeted policy, or operational programs within cohesion policy? Perhaps, in this case, we need both mitigating (stopping the outflow of population from certain areas) and adaptive (adjusting territorial policies to changes in population numbers and structure) measures. The thesis argues (although the author does not write this explicitly) that a complete stop of the shrinkage process is not

possible in the coming decades. Therefore, adaptation policies (e.g. in terms of public services dedicated to specific population groups) seem to be key for most municipalities studied.

The work concludes with a short **eighth chapter** repeating the main conclusions. It also contains a valuable critical reflection on the methodology adopted (including the threshold of 5000 inhabitants) and very good and concrete recommendations for policies.

Conclusion

In conclusion, it should be considered that the author has fulfilled the research objectives set at the beginning and has also formulated answers to the questions posed. The doubts described above are of a debatable nature. They relate to certain methodological assumptions, which, however, result directly from the availability of source data. Thus, they cannot affect the overall positive assessment of the thesis. As the main scientific strengths of the reviewed doctoral dissertation one should mention:

- the actuality, both scientific and practical, of the subject addressed;
- very good grounding in the scientific literature as well as in current European Union level documents;
- addressing the topic of shrinking areas at local level;
- the development of an innovative method of population forecasting at municipal level (LAU2) and the implementation of such a forecast;
- propose a new spatial picture of territorial disparities within Europe (different from the stereotypical ones);
- innovative application of the TIA method to shrinking areas;
- ability to self-critically evaluate, also in terms of the methods used;
- clearly formulated, concrete recommendations for future research and for territorial policies at different levels;
- good language and fluent narrative.

Possible shortcomings of the work include:

- the use of an excessive number of research approaches and methods, which can cause confusion;
- the not fully justified adoption of a threshold of 5000 inhabitants for the municipalities considered;

- Problems in interpreting the results due to simultaneous work on local units (LAU2) and regions (NUTS2/3);
- Insufficient consideration of Functional Urban Area as shrinking areas.

Relating the study as a whole to the requirements traditionally imposed on doctoral theses, it must therefore be considered that the reviewed dissertation:

- certainly concerns a contemporary topic;
- the research questions have been accurately formulated and answered;
- the temporal and spatial scope was adopted correctly, although the simultaneous work on municipalities and NUTS2/3 units raises some doubts;
- the layout of the work is logical and the narrative is very clear;
- the grounding in the literature is very good;
- the research methods have been applied correctly, some of which are innovative, but some could be omitted without affecting the dissertation as a whole;
- the illustrative material is well prepared, although perhaps more of the issues could have been presented on maps;
- the language is correct;
- the conclusions drawn and recommendations proposed are fully correct.

In summary, the presented dissertation is an original solution to a scientific problem. It demonstrates the Author's knowledge and his capacity for independent research work. Thus, it can be considered that, in accordance with the Law, it can be the basis for the conferment of the doctoral degree to Flavio Besana. Therefore, I make a request that Flavio Besana be admitted to the public defence.

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