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COMPETITIVENESS OF RURAL AREAS: METHODS AND APPROACHES

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Abstract
The study of rural areas' development is a subject of extensive research and analyses. Globalization and the process of digitalization have significantly increased the intensity and changed the characteristics of competition at any level, starting from firms and moving to the level of regions and countries. Research interest and efforts towards understanding, conceptualizing and evaluating competitiveness at regional level are growing, but yet the number of studies on the topic of rural regions' competitiveness are quite limited.
The paper aims at specifying methods and approaches used so far by studies devoted to regional competitiveness and how they could be applied on the level of rural regions. Three are the main sections of the paper. The first one briefly discusses definitions of regional competitiveness, peculiarities of rural regions, and changes of policies for territorial development. A transformation of rural regions is also underlined. They shift from traditional industrial structure (agriculture and labor extensive manufacturing) towards diversification of economic activities, also through being an option for the location of companies that are digital manufacturers. The second section introduces a classification of methods applied to assess the regional competitiveness. They are divided into two groups regarding the approach on which are based. With the first approach the focus is on the output of the system through different indicators. To this group belong indexes developed by worldwide acknowledged organizations as World Economic Forum, International institute for management development, Food and Agriculture Organization, Organization for Economic Co-operation and Development, European Commission, and the World Bank, the Index for measuring regional variation and competitiveness (Huovari et al., 2001), Regional competitiveness index (Dijkstra et al, 2023), and DEA method. The second group of methods are more descriptive and they aim at comprehensive analysis to identify the key drivers of regional development, productivity and economic growth. Among them is the Diamond model of Michael Porter (Porter, 1990). The final section discusses the issue of the applicability of methods used on regional level to assess the competitiveness of the rural regions. Conclusions are derived about the appropriateness of the methods for the assessment of rural areas' competitiveness and a recommendation is given for the benefits of their co-use. One of significant limitations to assess the competitiveness of rural regions is the provision of data. Also, we assume and give some arguments that using a combination of methods, belonging to both groups, would be more effective way to assess the competitiveness of rural regions. The main methods used for the purposes of the research presented in the paper are a desktop research to produce a comprehensive review of the literature, and the methods of analysis and synthesis.
Key words: rural regions, methods to assess regional competitiveness
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Introduction

Competitiveness is priority objective of the development policies set about systems on different economic levels – supranational, national, regional, firm, and people themselves. Nevertheless, the significant number of studies about each of the levels, yet that notion has not found the "right" definition. The firm level is considered easier to understand and define competitiveness. On the other hand, national and regional levels are still in search for clearer understanding of what these systems to be competitive. Therefore, the difficulty of finding a single definition about these two levels is the reason why so many definitions or better to say variety in understanding and assessment methods exist.

Michael Porter (1990) is the founder of the theory of microeconomic foundations of competitiveness. By that theory, he reveals the interrelations among different economic levels regarding competitiveness, highlighting the crucial role of firms in driving competitiveness at both regional and national levels.

The paper aims to focus on the adopted approaches and particular methods applied by researchers to assess competitiveness on a regional level and how they could be applied on the level of rural regions. In order to achieve that, the paper is structured as follows: briefly are introduced some of definitions about the regional competitiveness, and in particular, some important peculiarities of rural regions are clarified. These peculiarities need to be considered when choosing a method to assess their level of competitiveness. Then, based on a comprehensive review of the existing literature, are presented and discussed approaches and methods to measure regional competitiveness. The end of the paper discusses and conclude on the appropriateness of the approaches and methods to assess the rural regions' competitiveness. The research utilizes analysis and synthesis as scientific methods to examine and integrate prior findings and information.

Regions, rural regions and their competitiveness

Sustainable growth and competitiveness become the focal point of territorial policies applied in different countries (OECD, 2005; Kitson et al., 2004, Kovshov et al., 2024). That signifies that the efforts and instruments used by territorial policy were designed in a way not just to prevent the decline in the development of the territory, but to make it develops in a more prosperous or in other words more competitive way. Keeping in mind the understanding of leading researchers, and particularly the expert in the field of competitiveness Michael Porter, over the years a significant transition was observed regarding the policies for territorial development. The transition involves a shift from directly distributing resources, mainly financial, through programs or direct subsidies to regions in need with less favorable indicators compared to other regions, to implementing region-specific measures aimed at supporting and increasing the productivity of local businesses.

This transition also aims to promote private investments and innovations in the designated regions.

Porter (2004) and other researchers see productivity and innovations as the heart of the path of regions toward raising their competitiveness. Based on that understanding, the definition of regional competitiveness by the EU Commission is "the ability of a region to offer an attractive and sustainable environment for firms and residents to live and work." (Dijkstra et al., 2023). Michael Porter explains it in a way that "Competitiveness depends on the productivity[1] with which a location uses its human, capital, and natural resources." (Porter, 2008). The economic and social effects stalked by raising the productivity lead towards a raise in the standard of living.

The difficulty to design regional policies for development and to find means to raise regions' competitiveness comes from their complexity. The complexity results from the variety of elements-drivers of local development (people, enterprises, natural resources, infrastructure, etc.) and complex interrelations among them, as well as the industrial specialization of the region. The challenge to research the competitiveness of rural regions comes from the "belief that rural regions are home to an inherently less favorable composition of economic activity than metropolitan regions." (Porter et al, 2004, p. 19). The common belief is that the main two sectors in rural regions are agriculture and traditional labor extensive manufacturing that in the age of digitalization hardly could be a driver of prosperity. Current empirical research deals with the process of digitalization. Toma based on empirical research concludes "digital manufacturers are relatively often found in rural areas" (2023, p. 219) and also that "Germany's rural regions are home to a relatively large share of small "Mittelstand" firms for which the use of complex digital manufacturing technologies (Industry 4.0) is an important factor influencing innovation and competitiveness." (Toma, 2023, p. 220). Other researchers raise the issue about knowledge-intensive business services (KIBS) and their role in rural areas (Hlaváček et al, 2023; Doloreux et al, 2023). Therefore, the traditional perception for rural regions' industrial structure is changing.

Already in 2005, OECD researchers emphasize that regional competitiveness policies represent a challenge for the local and national governments and their success depends on "effective integration of sectoral policies such as R&D and education" (OECD, 2005, p. 8). What comes as a result is the heterogeneity of economic performance among rural regions (Porter et al. 2004). Thompson & Ward

[1] Productivity is measured by the value of goods and services produced per unit of labor, capital, and the natural resources employed and productivity, contrary to popular usage, is more than just efficiency. It depends on the value of the products or services that a region's firms can produce, as measured by the prices they can command, not just their efficiency of producing standard items. (Porter et al., 2004, p. 6)

(2005) argue that the prevailing perception among national and regional policy makers is that rural areas are merely passive recipients of urban-oriented development.

In 2004, Porter et al. talked about "no truly comprehensive assessment of the performance of rural regions in the literature" (Porter et al., 2004, p. 7). OECD researchers claim that the "concept of competitiveness applied to rural regions is still relatively new, but is having an important influence on policymaking" (OECD, 2005, p. 11). Further, the strong attention and the extension of the concept about competitive development on regional level resulted in a change in the regional policy (OECD, 2005, p. 20). The regional policy evolved replacing predominating top-down approach, direct financial interventions into a "broader family of policies designed to improve regional competitiveness" (OECD, 2005, p. 22; Porter, 2008). The regional policy transition involves a development strategy that influences both direct and indirect factors impacting the performance of local firms. It primarily focuses on endogenous factors, with less emphasis on endogenous investments and transfers, while prioritizing opportunities over disadvantages and granting greater power to local stakeholders.

What was said about the existing ambiguity for competitiveness as a notion is valid also for the notion rurality. The fact is that a variety of classification criteria and typologies exist due to the lack of a clear concept (Center for Regional Development, 2007; Isserman, 2005; Waldorf, 2006). Porter et al. concluded that lower density of population is a real problem for rural regions and that distinguishes them most from the metropolitan regions, but "it does not suggest the need for a fundamentally different economic development approach" (Porter et al, 2004, p. 5) towards rural regions. The last idea supports the thinking that the approaches and methods to measure regional competitiveness are appropriate and applicable also for the rural level. And, further, they say "Examining economic development in rural regions using the same analytical lens as applied to economic development generally, will hopefully shed new light on their prospects and appropriate policy." (Porter et al, 2004, p. 5).

Approaches and models to assess regional competitiveness

The assessment of competitiveness is an important issue on a country, EU level, and worldwide level. Within government circles, there is growing interest in the regional foundations of national competitiveness and the development of new forms of regional policy interventions to help improve the competitiveness of each region and major city, and hence the national economy as a whole.

Most often, aggregate macroeconomic indicators are used to assess competetiveness. The same approach is applied also at regional level. The focus of the measurement of competitiveness with that approach is on the output (results) of the system. That logic is followed by competitive indexes produced by worldwide

acknowledged organizations as World Economic Forum (WEF), International institute for management development (IMD), Food and Agriculture Organization (FAO), Organization for Economic Co-operation and Development (OECD), European Commission (EC), and the World Bank. Papers of Rizzi et al. (2015), Dijkstra et al. (2011), Huovari et al. (2001), Mikuš et al. (2012), CORE (Competitiveness Analysis of Regional Entities) for the analysis and evaluation of competitiveness of municipalities in Mexico developed by Fernandez et al (2013), Bukhtiyarova et al. (2020), Doitchinova & Stanimirova (2022), Peneva & Bankova (2024) apply that approach to measure regional competitiveness as well. Bowen (2012) describes a methodology for estimating suppressed values in a series of regional-level business models from the US Census using the resulting enhanced dataset in shift-share analyses (SSA) and then providing these analyses and some potential explanatory variables for web mapping. The end result is an online tool that can be useful in analyzing regional competitiveness, especially in rural areas.

Another approach to investigate competitiveness is via a comprehensive (mostly primarily descriptive) analysis to identify the key drivers of regional development, productivity and economic growth. In another way, that is the approach that focuses on the factors responsible for the rise or the decline of competitiveness. Examples of methods based on that approach are the Diamond model of Michael Porter (Porter, 1990), and the model of drivers of regional productivity (Kitson et al., 2004, p. 995).

To the first type of approach towards measuring and discussing regional competitiveness, based on the outcomes for the system represented, we may outline the following:

(1) Index for Measuring Regional Variation and Competitiveness (Huovari et al., 2001) developed by a group of Finnish researchers, which is based on 4 sub-indices, each of which has an equal weight in the final one.

(2) Regional competitiveness index (RCI) that adapts the framework developed by WEF for the GCI (global competitiveness index) and extends it to the regional context in the EU, with the aim of capturing the underlying factors that support a region's long-term economic development (Dijkstra et al, 2023). The newest version of the index, calculated for the first time for 2010, is RCI 2.0 and suppose some changes in the methodology. The RCI is calculated for the territories of NUTS 2 level. In methodological terms, RCI comprises three sub-indices – basic, efficiency and innovation, and 11 pillars that refer to different aspects of competitiveness on that level. Basic sub-index covers the basic conditions presented by 5 pillars: institutions, macroeconomic stability, infrastructure, health and basic education. The second sub-index Efficiency assess the achievements of the region in three aspect specified as 3 pillars: higher education, training and life-long learning; labor market efficiency; market size. The innovation sub-index also includes three pillars: technological readiness;

business sophistication innovation. What the authors of the index themselves comment is that a "composite indicator of this complexity is always subject to small modifications and adjustments" (Dijkstra et al, 2023, p. 8).

(3) Data envelopment analysis (DEA) method is used to measure regional efficiency and subsequently to measure regional competitive potential. DEA was developed by Charnes, Cooper & Rhodes (1978) as a non-parametric method to identify production frontiers. Regarding the usage on regional level, it allows to measure the relative productivity of a sector of the regional economy compared to the same sector in another region in order to establish its regional competitiveness: 1) defining and selecting indicators (most commonly GDP, employment by sector, investment, economic activity of business units, education spending, IT infrastructure density, etc.) that are consistent with those used in the development of the index; 2) defining the input and output variables to be used to measure relative efficiency by region; 3) applying the analysis models with data coverage and interpreting the results. In that way, the DEA method is accepted as an appropriate method to determine each region's competitive/non-competitive position. The application of the method is based on the hypothesis that the performance of regions can be considered as a source of regional competitiveness/competitive potential. Charles and Zegarra (2014) apply the method to measure regional competitiveness and outline methodlogical and practical advantages attributed to DEA to assess the competitiveness on that level. The authors present a structure of regional competitiveness based on five pillars – economy, firms, government, infrastructure, and human capital. Charles and Zegarra (2014) state that their study overcomes several limitations postulated in the scientific literature in the past. Thus, the development of a robust super-efficient model to overcome the DEA ranking constraint may be useful in terms of refining the assessment of regional competitiveness.

(4) Comparatively new is the research of Kovshov et al. (2024). It develops a new approach towards interpreting the notion of "international, regional competetiveness of rural territories" and assesses the position of rural territories of the region in the domestic and external (international) markets through a comparative assessment of indicators that measure production and export potential, competitive advantages, and economic, social and environmental factors.

The second approach to regional competitiveness involves examining the factors that support competitiveness.

As said before, the "Diamond model of competitive advantages" developed by Michael Porter represent that approach. According to Porter, regions compete in providing the most productive environment (Porter, 1990). Four are the main aspects according to that model. The first one refers to Firm strategy, structure and rivalry. On a regional level, that factor translates into local policies or specific regulations that could affect in a positive way the investments and innovation activity

of firms located on the territory of the region. The second factor is the Demand condition. Specific characteristics that lay behind that determinant are factors related to local population and business entities in the role of customers. That determinant is beneficial when the customers are knowledgeable, competent and demanding. The third group of factors is named Related and supporting industries. That are local suppliers and the determinant signifies about the level of clusterization. The fourth main determinant in the model is Factor conditions. These are human resources, raw materials, different types of infrastructure, and educational institutions. One of the criticisms of the model is its inflexibility (OECD 2005). Following the interrelations among the four main determinants in the Diamond model, improvement in competitiveness of some firms in some sectors will influence other related firms and business activities. And that will not be just the firms around, in localization mean, but also in other geographical places. In that way we observe effects that are meaningful from point of view of regions and their competitiveness. Talking about competitiveness, location matter a lot is what Porter gives argument. The main proof based on his research is that firms acquire their competitive advantage because of the fact they have chosen the correct location. Right location may mean raw materials, skilled labor, proximity to markets, etc. And, "Skilled labor and investment gravitate away from "uncompetitive" regions towards more competitive ones" (OECD, 2005, p. 20). Two notions are important in that regard: (1) Structural competitiveness specifies the capacity of region to support and attract economic activity; (2) Territorial capital represents the attributes that a region possesses and could support or not its competitiveness. Further, Kitson et al. (2014) present another way to assess the regional competitiveness that implements the logic of that second approach based on drivers for regional development. They present a model of the base of regional competitive advantages represented by different types of capital: productive capital, human capital, social-institutional capital, cultural capital, infrastructural capital and knowledge/creative capital. They say "… the definition and explanation of regional competitive advantage need to reach well beyond concerned with "hard" productivity to consider several other – and softer – dimensions of the regional or urban socio – economy." (Kitson et al, 2014, p. 994).

Conclusion and discussion on the appropriateness of methods used on regional level to measure rural competitiveness

Over the years different researchers questioned to what extent the frameworks describing a firm's ability to compete, grow and be profitable can be applied to countries or regions (Martin et al., 2006). The implicit analogy between firms and nations has been widely criticized (Krugman, 1994). Regarding that, we find in the literature an important clarification by Kitson et al. (2004, p. 997) "the notion of regional competitiveness has meaning and value, it is much more complex and

richer concept…that focuses more on the determinants and dynamics of a region's long-run prosperity than on more restrictive notions of competing over shares of markets and resources."

Regarding the RCI, even the third sub-index' pillars, to some extent, are relevant to rural regions, considering the technological advancements and digitalization in both most widely represented industries – agriculture and basic manufacturing (see also Toma, 2023). The most significant difficulty and limitation would be regarding the data to feed the calculation of RCI for rural regions. That problem is discussed as a first step of the methodology for RCI 2.0 (Dijkstra et al, 2023). Another problem in conducting comparative analysis using RCI could be administrative reforms on local level. Simultaneously, DEA analysis offers opportunities to reflect the complex nature of processes, multiple factors at the input and output of a system and the variety of relationships and dependencies between them also on a rural level.

Therefore, considering the peculiarities of the given rural region all of the methods used to assess the regional competitiveness could be applied with some adjustment. After comparing the methods representing both outcome-based and driver-based approaches, we can conclude that using a combination of methods from both approaches would be a more effective way to assess the competitiveness of rural regions.

The arguments are as follows: first approach integrates competitiveness logic to be evaluated through indicators representing the output of the rural region, providing insight into the current state of the system. Another approach includes the analysis of development drivers, considering qualitative aspects and the potential for future development in the region. The outcomes of the still potential opportunities for development would be visible and could be reported in the future. In other words, the co-use of methods deals simultaneously with the static and dynamic nature of competitiveness that corresponds to the systems' approach logic.

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AI (Grammarly) was used to correct grammar, spelling, and punctuation issues and shorten sentences.

References

Bowen Jr., T. (2012). US rural economic competitiveness by the numbers: Data mining, analysis, and web-mapping, Applied Geography, Volume 34, May 2012, Pages 403 – 412. Retrieved from: US rural economic competitiveness by the numbers: Data mining, analysis, and web-mapping – ScienceDirect

Bukhtiyarova, T., Semin, A. Demyanov, D., Tenetko, A., & Nemykina, Yu. (2020). Competitiveness of rural areas: formation, assessment, growth reserves aspects. IOP Conference Series: Earth and Environmental Science. 548. 022055. 10.1088/1755-1315/548/2/022055.

Center for Regional Development, Purdue University. (2007). Unlocking Rural Competitiveness. The role of Regional Clusters. Retrieved from: Unlocking Rural Competitiveness: The Role of Regional Clusters | IATP

Charles, V., & Zegarra, L. F. (2014). Measuring regional competitiveness through Data Envelopment Analysis: A Peruvian case. Expert Systems with Applications 41 (2014) 5371 – 5381. Retrieved from: Measuring regional competitiveness through Data Envelopment Analysis: A Peruvian case – ScienceDirect

Charnes, A., Cooper, W., & Rhodes, E. (1978). Measuring the efficiency of decision-making units. European Journal of Operational Research, 2, 429 – 44, Retrieved from: Measuring the efficiency of decision making units – ScienceDirect

Dijkstra, L., Annoni, P., & Kozovska, K. (2011). A new regional competitiveness index: Theory, methods and findings. Retrieved from: https://www.researchgate.net/publication/259357714_A_New_Regional_Competitiveness_Index_Theory_Methods_and_Findings

Dijkstra, L., Papadimitriou, E., Martinez, B. C., de Dominicis, L., & Kovacic, M. (2023). EU Regional Competitiveness Index 2.0 2022 edition. WP 01/2023. EU Commission. Retrieved from: EU Regional Competitiveness Index 2.0 – 2022 edition | Knowledge for policy (europa.eu)

Doitchinova, J. & Stanimirova, M. (2022). Competitiveness assessment of rural areas: The example of Bulgaria. 10.19275/RSEPCONFERENCES153. Retrieved from: Competitiveness Assessment of Rural Areas: The Example of Bulgaria – Eclipse (ue-varna.bg)

Doloreux, D., Shearmur, R., & Kristensen, I. (2023) KIBS as knowledge sources for innovation in rural regions. Journal of Rural Studies 99 (2023) pp. 53 – 61. Retrieved from: – https://www.sciencedirect.com/science/article/abs/pii/S0743016723000402?via%3Dihub

Fernandez, E., Navarro, N., Duarte, A., Ibarra, G. (2013). Core: A decision support system for regional competitiveness analysis based on multi-criteria sorting, Decision Support Systems Vol. 54 Issue 3 2013. pp. 1417-1426. ISSN 0167-9236 – https://doi.org/10.1016/j.dss.2012.12.009

Hlaváček, P., Kopáček, M., Kopáčková, L., & Hruška, V. (2023). Barriers for and standpoints of key actors in the implementation of smart village projects as a tool for the development of rural areas. Journal of Rural Studies Volume 103. 2023. 103098. ISSN 0743-0167. https://doi.org/10.1016/j.jrurstud.2023.103098.

Huovari, J., Kangasharju, A. and Alanen, A. (2001). Constructing an Index for Regional Competitiveness. Pellervo Economic Research Institute, Helsinki, Finland, Working

Paper No. 44. Retrieved from: Constructing an Index for Regional Competitiveness | SpringerLink

Isserman, A. M. (2005). In the national interest: Defining rural and urban correctly in research and public policy. International Regional Science Review 28 (4): 465 – 499. Retrieved from:In the National Interest: Defining Rural and Urban Correctly in Research and Public Policy – Andrew M. Isserman, 2005 (sagepub.com)

Kitson, M., Martin, R., & Tyler, P. (2004). Regional Competitiveness: An Elusive Yet Key Concept? Regional Studies. 38. 991 – 999. 10.1080/0034340042000320816. Retrieved from: kitson-marrtin-tyler-rs-2004.pdf (michaelkitson.org)

Kovshov, V., Lukyanova, M., Zalilova, Z., Frolova, O., & Galin, Z. (2024). International regional competitiveness of rural territories as a factor of their socio-economic development: Methodological aspects. Heliyon Volume 10, Issue 1e23795January 15, 2024. Retrieved from: https://www.sciencedirect.com/science/article/pii/ S2405844023110036

Krugman, P. (1994). Competitivenes: a dangerous obsession. Foreign affairs March-April 1994. pp. 28 – 44. Retrived from: http://gesd.free.fr/krugman94.pdf

Mikuš, O., Franić, R., & Grgić, I. (2012). The evaluation of rural competitiveness in creating a policy of rural development in Croatia. Journal of Food, Agriculture & Environment, 962 – 969. Retrieved from: (PDF) The evaluation of rural competitiveness in creating a policy of rural development in Croatia (researchgate.net)

OECD (2005) Building Competitive Regions. Strategies and Governance, Paris. France. Retrieved from: Building Competitive Regions: Strategies and Governance | OECD

Peneva,M., & Bankova, Y. (2024) Drivers and Barriers to the Competitiveness of Rural Areas in Bulgaria. 10th International Scientific Conference ERAZ, KNOWLEDGE BASED SUSTAINABLE DEVELOPMENT, June 6, 2024 (forthcoming)

Porter, M. E. (1990). Competitive Advantage of Nations. New York Free Press

Porter, M. E. (2003). The economic performance of regions, Regional Studies 37, 549 – 578. Retrieved from: The Economic Performance of Regions: Regional Studies: Vol 37, No 6 – 7 (tandfonline.com)

Porter, M. E. (2008). Regional Competitiveness in a Global Economy. The Summit for American Prosperity, The Brookings Institution Washington. Retrieved from: https://www.hbs.edu/ris/Publication%20Files/20080611_BrookingsSummitForAmericanProsperity_MichaelPorter_2c6e1787-526b-4b23-82d0-f8c99dbc6591.pdf

Porter, M., Ketels, Ch. H. M., Miller, K., & Bryden, R. T. (2004). Competitiveness in Rural U.S. Regions: Learning and Research Agenda. Institute for Strategy and Competitiveness Harvard Business School. Retrieved from: https://www.semanticscholar.org/paper/Competitiveness-in-Rural-U.S.-Regions%3A-Learning-and-Porter-Ketels/6045de890b82a8ac5d29ecc949a5750b362aa45e

REDI. (2014). The Regional Entrepreneurship and Development Index – Measuring Regional Entrepreneurship Final Report. Luxembourg: Publications Office of the European Union. Retrieved from: https://ec.europa.eu/regional_policy/en/information/publications/studies/2014/redi-the-regional-entrepreneurship-and-development-index-measuring-regional-entrepreneurship

Rizzi, P., Graziano, P., & Dallara, A. (2015). The regional competitiveness: An alternative approach. *Rivista internazionale di scienze sociali: 3, 2015*, 307-336. Retrieved from: https://www.jstor.org/stable/43830411

Thoma, J. (2023). An urban-rural divide (or not?): Small firm location and the use of digital technologies. Journal of Rural Studies. Volume 97. January 2023, pp. 214 – 223. Retrieved from: https://www.sciencedirect.com/science/article/abs/pii/ S0743016722003205? via%3Dihub

Thompson N., & Ward, N. (2005). Rural areas and Regional Competitiveness. Centre for Rural Economy Research report. Retrieved from: – https://www.ncl.ac.uk/media/ wwwnclacuk/centreforruraleconomy/files/regional-competitiveness.pdf

Vincent, Ch., Zegarra, L., Measuring regional competitiveness through Data Envelopment Analysis: A Peruvian case, Expert Systems with Applications, Volume 41, Issue11, 1, 2014, pp. 5371 – 5381. Retrieved from: https://www.sciencedirect.com/ science/ article/abs/pii/S0957417414001286

Vol. 103 202/103098. ISSN 0743-0167. https://doi.org/10.1016/j.jrurstud.2023.103098

Waldorf, B. (2006). A continuous multi-dimensional measure of rurality: Moving beyond threshold measures. Paper presented at Annual Meetings of the Association of Agricultural Economics, July 2006, Long Beach, California. Retrieved from http://agecon.lib.umn.edu/cgibin/pdf_view.pl?paperid=21522&ftype=.pd