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Abstract

The 'top 100' global university ranking systems are dominated by American and Western European universities. While there are many ranking systems currently in use, and while there is considerable variance within the top 100 – one pattern remains evident – the United States dominates global university rankings with Western Europe close behind.

Although there is considerable debate within the university ranking community about the 'best' way to rank global universities, there is little research done on ranking systems as a form of global epistemic violence. Epistemic violence refers to any system that uses the legitimization of knowledge as a form of domination. Where epistemic violence is studied is almost exclusively in the domain of post-colonial higher education systems or as a way to frame scholarship about the global south.

However, it appears that Eastern European universities are equally subject to a form of epistemic violence in the biases of current university ranking algorithms. This study attempts to uncover biases in ranking systems within the context of what Bourdieu would define as a global center/periphery system of knowledge production. The primary hypothesis of this study is that global ranking systems use algorithms that reinforce the current center-periphery model of Western universities and systems of knowledge production and transmission being 'better'.

Keywords

Eastern Europe, HE, University Rankings, Power, Violence, Discrimination, Capitalism.

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Introduction

General research into global systems of hegemony and Western dominance tends to focus on the political and economic, or on the broader systems that have sustained Western dominance for several centuries, such as mercantilism, imperialism, capitalism, etc... The role of universities as agents that reinforce that dominance has not been nearly as well researched. However, the emergence of the export of Western university brands to developing markets, the growth of the American MBA degree and the generation of increasing global ranking systems has put a larger spotlight on a specific dynamic within the broader global system: the university as an active agent within the current Western dominated world system.

Within that system, ranking has become an increasingly powerful tool for reinforcement of position. Ranking is not new. "Following the publication of college and university rankings by US News and World Report (USNWR) in 1983, often identified as the first of the national rankings of universities (van Dyke, 2005), league tables have become a minor international industry." (Dill, 2009) But it has exploded in popularity. "There are a number of ranking systems exists, which includes, The Shanghai Jiao Tong University 'Academic Ranking of World Universities (ARWU)', the Times Higher Education Supplement 'World University Rankings (THE Rankings)', Quacquarelli Symonds (QS) 'World University Rankings', Webometrics Ranking of World Universities 'Webometrics Ranking' published by Spanish National Research Council (CSIC), The Guardian Higher Education Network, UNESCO Rankings and Accountability in Higher Education, US News Education, UNIVERSITAS 21, and NTU Ranking." (Anowar, et al., 2015) It should be noted that the growth of ranking companies has also changed the nature of ranking itself. Not only are the companies employing widely different techniques in ranking, but they also have vastly different business models. For example, QS primarily employs a peer-review based model of ranking. "Initially OS used to just ask people about their preferences about universities in different fields. These fields included technology, biomedicine, science, arts, humanities and social sciences." (Anowar, et al., 2015) This model, which suffers from user bias is not new. "The initial USNWR rankings were [also] based entirely on reputational surveys of college presidents and deans. Reputational surveys continue to play an important role in most of the available league tables, but they have now been supplemented with data on various measures of university input, process, or output." (Dill, 2009) While surveys can represent a component of ranking, relying on 'perception' alone can easily lead to perception bias and to reinforcement of existing models of dominance.

Interestingly, no matter which ranking system is used, there is one clear loser in each system, despite the fact that, on paper, it shares (as a region) many characteristics with its Western European counterparts: Eastern Europe, specifically Eastern European universities. The primary question that I am exploring in this research study is whether or not these rankings reflect a bias in the ranking models or whether they reflect a true difference in some generalizable model of university excellence? My primary hypothesis is that the bias against Eastern European universities is not specific to a particular ranking criteria, but reflects a consensual perpetuation of a Western dominated center-periphery dynamic. The word consensual is significant here, because it presents the possibility that the maintenance and reproduction of center-periphery dynamics is not only externally imposed but also internally generated through a type of acknowledged self-ranking as peripheral.

1. Issues with the Current Global Ranking System

Global university ranking systems represent themselves as objective assessors of quality or excellence. The truth is quite different. The reason is simple: the output of a university is not consistent and quantitative. A university is not a factory that produces sneakers or televisions, where a defect can be counted and where quality can be numerically determined. The output of a university is complex: it consists of degree-earning students, research and knowledge influence in the world. The problem is that each of these three components is not quantitative and is, furthermore, fairly difficult to assess. In addition, the fact that every country has slightly different criteria for licensing degree programs and the work of universities means that it will always be difficult to provide true cross-border comparisons. "With international systems the difficulties of finding satisfactory criteria for assessing university excellence are increased greatly by the absence of data sources that provide for objective transnational comparisons, at this time, are metrics that are themselves, transnational, such as patent filings or median scores on tests such as the GMAT, that are required for admission to numerous global MBA programs.

On the surface, we can replace all of the complex qualitative factors with a broad concept of quality or excellence. "Because university ranking systems use a range of criteria for measuring excellence, a critical assessment of any particular system requires, at the very least, a broad conception of what we mean by excellence in the university context." (Taylor & Braddock, 2007) The problem is self-evident. If the output of universities is qualitative and incredibly difficult to compare, the same holds true for measuring excellence. Ranking systems try to get around this problem by attempting to quantify two dimensions. "There are other standards that are commonly used to assess the excellence of universities, but the quality of teaching and research are fundamental, capturing what we generally mean when we talk about excellence in a university." (Taylor & Braddock, 2007) How exactly does one measure teaching and research? What specific numerical factors - that can then be 'translated' into a ranking - can be used to measure these two aspects? Is teaching measured based on national exams? Is it based on a student/teacher ratio? Is it based on the ratio of full-time to adjunct faculty at a university? Is it based on student engagement? Is it based on GPA? Which measure would be a true or better measure of teaching? What about research? Is it based on number of patents issued? Is it based on Nobel prize winners? On number of journal articles published?

There just doesn't seem to be a truly good and simple indicator for any of these categories. "An inevitable source of 'subjectivity' in ranking systems is that a choice must be made about how much weight to give the various criteria of assessment the system uses. Is research more important than teaching? Should some measures of research output be given more weight than others?" (Taylor & Braddock, 2007) Since the decision to preference one dimension of these two variables over another is, ultimately, subjective and arbitrary, the result is a set of ranking systems that, as an aggregate, undermine the very thing they purport to measure.

Ranking systems are weak, and there weakness is best demonstrated by the tremendous diversity of outcomes once we reach past the "top 20" global university brands of the world's 'Ivy League'. These weaknesses can be defined according to nine distinct categories: "the

vicious circle of increasing distortion; endemic weaknesses of data and indicators; the lack of agreement on quality; 'imperialism' through rankings; the systemic biases of rankings; preoccupation with aggregates; praise and push towards concentration of resources and quality; reinforcement or push towards steeply stratified systems; and (i) rankings undermining meritocracy." (Teichler, 2011a: 62-66). These weaknesses mean that bias is hard to measure, since the purported goals of the rankings are also hard to measure. That bias is evident is certain. But it is also possible that it affects universities across the board, not just those specific to certain regions. What is certain is that the bias that is present favors, "Research-intensive institutions with strengths in hard sciences, universities that use English, older institutions in countries with long-ranking traditions, HEIs (Higher Education Institutions) in countries with steep hierarchies and with little intra-institutional diversity (Altbach, 2011: 3; Kehm, 2014; Teichler, 2011a: 67)." (Boyadjieva, 2017) This focus on research-intensive universities is problematic for a number of reasons. The most important of which is the simple fact that 'measuring research' is itself problematic and relies primarily on proxy indicators. As but one example, "The emphasis on publication-based bibliometric indicators in global rankings has been subjected to criticism since such indicators tend to favour large research universities without emphasizing other important missions of an university, such as education and service to public (Federkeil et al., 2012)." (Cakir, et al., 2015) A university doing 'good' in its community is therefore lower-ranked than one that 'produces more research', even if the research it produces leads to advances that harm people.

Finally, there is a financial reality that is closely linked to many of the metrics that global ranking agencies prefer: richer schools do better. Part of this is the development, at least in the United States, of an endowment-based system of top-tier higher education funding. Harvard University, for example, has an endowment of over \$50 Billion dollars and has been called, tongue-in-cheek, a hedge fund attached to a University. That model, given Harvard's success, is become increasingly tantalizing and popular to other universities. But it is producing a type of new 'academic capitalism'. That model, " focus[es] on the growing market for knowledge products and the escalation of market-like processes and activities. As such, academic capitalism describes one of the key sectors in the development of a contemporary, global, knowledge-based form of capitalism (Robinson, 2004; Sklair, 2002), where education policy is increasingly produced in a transnational space, controlled jointly by the market and various state and international bureaucratic mechanisms that set the objectives and measure performance (Moutsios, 2010, pp. 122, 125)." (Collyer, 2013) Academic capitalism further skews rankings because it increasingly rewards top-earners and top-aggregators of capital as opposed to top knowledge producers or top producers of global public good. While financing of higher education is important and is linked to the quality of research, money alone is no guarantee of significance. Ranking experts argue that, "Developing countries have inadequate budget, insufficient resources and they lack of expert people for research. Hence they are lagging behind significantly in scientific research and resources." (Anowar, et al. 2015) But these same researchers must also acknowledge a simple fact: some of the greatest discoveries in the 20th and 21st century have come from the most unlikely of places and have not required great financial backing or great financial resources. In fact, one of the greatest discoveries of the 20th century- relativity – was the product of a thought experiment by a patent clerk – Albert Einstein. This is the ultimate conundrum of research – because the outcome of research is indeterminate, no amount of money can guarantee a certainty or quality of output. At the same time, there can be structural and historical factors that greatly affect the way in which

rankings assess specific components of a University's work. This is quite significant in the case of Eastern Europe.

2. Eastern European Ranking Issues and Dynamics

Eastern European universities face a number of historical and structural challenges in the context of parity in global rankings. These challenges can best be summed up by a simple statement: "Most of the HEIs (Higher Education Institutions) from CEECs (Central and Eastern European Countries) remain invisible in the international and European academic world." (Boyadjieva, 2017) That invisibility is evident in the way that all of the global ranking systems situate these universities. Specifically, "The analysis of the latest edition of the Shanghai Ranking, from 2015, shows the presence of the following universities in former socialist countries in Central and Eastern Europe. The data show that the Czech Republic has one university among the top 300; Poland has two universities among the top 400; Serbia has one among the foremost 400; Hungary has two universities among the foremost 500; and Slovenia has one university among the top 500. Not a single university from the other CEECs is present in this ranking." (Boyadjieva, 2017) In addition, when the global rankings are broken down, "The ranking by separate fields - science, engineering, life, medicine and social science, which classifies the top 200 - does not include a single university in CEECs." (Boyadjieva, 2017) Why is this the case? Is it a structural bias of the West against the East, or are their other explanatory factors?

Some historical and structural dimensions from the Communist period certainly play a role. "In many CEECs (for example, Bulgaria, Czech Republic, Poland, Romania, Slovakia), there is a continued reproduction of the division, inherited from the time of the communist regimes, between research institutes united in academies of sciences, and the sector of higher education." (Boyadjieva, 2017) In other words, in the traditional communist higher education system, research was not at the university. It was only done at a research institute. That institutional distinction persists in many places and hurts the ranking of universities that simply do not have the financial or structural capacity to support research. This structural problem has consequences beyond ranking, however. If the only professors that students encounter are those that don't do research, then, surely the quality of their interaction is diminished, since engagement in research is one of the primary drivers of professors staying 'up-to-date' and being excellent teachers. This structural bifurcation also results in chronic under-funding of research. This underfunding is, "Evident from statistical data, regardless of whether funding is measured as the percentage of GDP devoted to higher education, as the percentage of GDP devoted to research or as funding per student." (European Commission/ EACEA/Eurydice/Eurostat, 2012; European Commission DG EAC, 2014a, 2014b) Finally, there is a political dimension to the state of Eastern European universities. I am referring to the transition to democracy in a number of post-communist states. Ever since the Prague Spring in 1968, universities in Eastern Europe have served as a "Source of critical sensitivity in democratic society - a role that was especially prominent in the years of transition from totalitarianism to democracy in the CEECs."(Boyadjieva, 2017) This phenomenon was also true in the Arab Spring. The problem is, that there is no way to measure the role of universities in promoting democracy. At the same time, the significance of universities in promoting democracy is of such importance that it must be seen as being on par with the highest quality of teaching and research.

Finally, it should be noted that the current metrics of quality in both research and teaching are imported concepts that reinforce a broader Western center-periphery dynamic. "The idea of excellence came largely from outside the CEE region. Being a champion in science and higher education was imposed on national political agendas through the Lisbon Strategy (Pinheiro, 2015a), while the notion of excellence was simultaneously diffused via the EU research framework programmes (Fps)." (Antonowicz, et al. 2017) This diffusion of 'excellence' metrics from West to East follows a center-periphery trajectory. It partially explains the poor performance of Eastern European Universities, since they are being judged according to foreign constructs and foreign models of quality. However, a fuller explanation of ranking performance requires an in-depth analysis of Eastern European universities in the context of broader center-periphery dynamics.

3. The Center-Periphery Dynamic and Its Impact on Ranking

Universities don't exist as intellectual islands. They are embedded in the broader national project of a country: in its technological progress, systems of knowledge transmission and production and in the cultural development of the society. They both study and reflect the societies they are in. Given their tremendous power in shaping and legitimizing knowledge in the World, their perceived status plays a critical role in their power to shape global conversations, define global standards in academic fields and define 'truth' through the selection of articles for journals and through the funding of research. As such, universities exist in what Wallerstein would call the World System and they reinforce existing center-periphery fields of power.

That dynamic of center-periphery, "can and has been used for describing mutual -perhaps unequal - relationships between two different entities. True, its contemporaneous form was given by economists specialized in development inequalities (Amin, 1973, Wallerstein, 1974)." (Blaho, 2012) It has been since extended well beyond development inequalities to a broad range of other types of inequalities. While much work has been done on centerperiphery analysis in the context of the post-colonial system as a perpetuation of structural violence, less attention has been paid to the center-periphery dynamic within the current European system. Within that system, there is evidence of both an American/EU centerperiphery and a Western European/ Eastern European center-periphery within certain fields. "The theoretical model discussed here makes reference to quite an abstract perception of the 'centre' and the 'periphery', which may correspond to various levels of spatial organisation, from the global level of intercontinental relations to the local level of an internal structure of a given country's regions or other smaller territorial units." (Zarycki, 2007) Zarycki's primary contention in this application of the theoretical model to the 'sub-case' of Western European/ Eastern European center-periphery is significant because it lays the groundwork for a number of studies that contextualize the global place of Eastern European cultural and knowledge capital.

In one study, for example, the field of Polish sociology, as an academic field, is studied within the center-periphery framework. In other words, Zarycki and Warczok analyze the the position of Polish sociology within the world system of sociology. Their study comes to two conclusions, one of which is particularly striking in the context of this study. Firstly, from a methodological perspective, they, " link patterns of the application of western critical thought to structures of (semi-)peripheral intellectual and political fields following their conceptualizations proposed by Bourdieu. [Their] approach constitutes an innovative attempt at extending world-systems theory by combining it with Bourdieu's concept of the field, in particular, the field of power." (Warczok & Zarycki, 2014) What they discover initially fits within the expected model of a center-periphery discursive relationship, and we expect that dynamic to be mimicked in examining global rankings. They observe, "The Polish social sciences discourse can serve as an example of tension between periphery and central logic of the social world, with the majority of its representatives making attempts to describe the Polish peripheral social reality by means of a theoretical language developed in the center." (Zarycki, 2007) Polish sociologists are, in essence, accepting their position on the periphery by focusing their research on the usage and reproduction of the theoretical language from the center. According to Warczok and Zarycki, "Due to its strong relationship with the forces of the global core, the western-oriented sector of the sociological field is much more powerful and has absorbed not only the main elements of 'public' sociology but 'professional' and 'policy' sociologies as well." (Warczok & Zarycki, 2014) This is a direct example of an academic field in Poland acting in a peripheral capacity by co-opting the discursive elements of Western European and American sociologists.

There is also an indirect dimension to this dynamic. "Numerous Polish sociologists, while trying to supplement their meagre salaries, often work at the same time for state agencies and private companies, including international and local consultancies, which tend to impose their frames of neoliberal orthodoxy." (Warczok & Zarycki, 2014) These companies are often Western multinationals that use local experts in the same way that colonial powers used local experts to reinforce their hegemony. Furthermore, "The rhetoric of 'modernization' and 'catching up with the West' is typical of discourses of these organizations and often legitimizes the imposition of neoliberal institutional arrangements across various social areas. In the social conditions described above, sociology is dominated by normative approaches (in which ideal models are almost always borrowed from the West) and, consequently, there is little space for critical sociology." (Warczok & Zarycki,2014) Another study by Juszczak (2011) validates this dynamic from a different perspective. Professors at a top-tier business school in Poland were interviewed about their framing of innovation management as a subject of study. The majority of their responses indicated that they viewed teaching innovation management as an act of both consumption and imitation (consuming and purchasing the technologies of the Western center and imitating their discursive practices).

This absence of a critical management field and a critical sociology that is local and original is significant, because it manifests across other fields as well. This is true in both social sciences and in natural sciences; both fields, within Universities, co-opt the tools and language of the West through mechanisms of the afore-mentioned consumption or imitation, both of which are mistakenly represented as innovation within local discourses. "The process of change in Sztompka's model is correlated to, among other factors, a general perspective of a 'cultural lag' or 'cultural inertia' suffered by the less successful Poles (Sztompka, 2000). Such a view can be related to what Bourdieu describes as 'implicit evolutionism, which enables the dominant to perceive their way of being or of doing things as the realized ideal' (Bourdieu, 1984: 384)." (Warczok & Zarycki, 2014) This dynamic matters because it represents a skew in global rankings. A number of ranking systems (such as the one used by QS) are based on peer-reporting. If the peers at a local university in the periphery primarily use the theoretical and technical models of the West, they are far more likely to interpret that West as a better 'realized ideal' than any models that are local.

What is even more interesting, and a derivative discovery found in the study by Warczok and Zarycki, is that academics within a field will not only use models of the West as a 'preference' and as an ideal, they will also produce a 'paradoxical situation': "the usage of original critical discourse by local sociologists for legitimization of the social order and naturalization of its hierarchies." (Warczok & Zarycki, 2014)

This dynamic hurts ranking in two ways: first of all, it means that Eastern European scholars are more likely than not to use Western scholars and Western theoretical models as the basis for their work, thereby increasing the citation indices of their Western counterparts and reinforcing the very disparity that they are situated in. Second of all, it appears that they may also use local and original theories to further legitimize the position of dominant Western models and discourses. In essence, we see here a particular and, as Warczok and Zarycki point out, troubling paradox: not only do Eastern European scholars generate original theories and models that are effective and used in research, but they use them to reinforce their own position at the periphery.

This complicates the idea of bias, since it is both imposed and also self-reinforced. Ultimately, it means that the idea of bias itself may need to be re-framed. Perhaps the issue is not so much the question of why Eastern European universities fairly poorly in global ranking systems? But, why don't global ranking systems differ enough from each other to include other models of quality and excellence that may be relevant at the national level. In other words, the specific needs of a nation far outweigh the particular dynamics of global ranking. A country may have a deficit in a certain field and may over-time re-arrange education to meet that deficit. At the local level, that re-organization is both quality and excellence. At the international level, it may not even be noticed.

Conclusion

There is bias in global ranking systems, with respect to Eastern European universities. But that bias is not specific to Eastern Europe. Rather, it appears to represent a bias that favors the elements that are uniquely amassed in global 'top brand' universities: very large endowments, high research output, globally recognized brand names and highly regarded programs in high-demand areas, such as business and technology. In addition, "The existence of an Anglo-American academic hegemony in the early 21st century is evident in the strong representation of US and British universities in the top tiers of the Shanghai and THE-QS rankings. Out of the 100 highest ranked institutions in 2009, the majority were located within the United States (Shanghai: 55 institutions; THE-QS: 32)." (Jöns & Hoyler, 2013) This Anglo-American hegemony dovetails with the current world system that puts the US and Western Europe at the center of global power.

The main problem with this dynamic is that ultimately, it produces a standardization and normalization of knowledge production processes that nullify the very advantages in innovation and advancement that these global institutions possess. In other words, a world where universities at the periphery only aspire to appropriate and use the concepts, technologies and discursive practices of a Western center is one that will only undermine that center. "As world university rankings heavily rely upon these data and universities strive to improve their status in such rankings (IHEP, 2009), it can be argued that they reinforce the

homogenization of publication practices across the sciences and humanities." (Jöns & Hoyler, 2013) This homogenization of publication practices is the tip of the iceberg. Universities at the periphery must not blindly accept those models and discursive practices that increase rankings only to increase rankings.

Essentially, the world needs the diversity of ideas that universities at the periphery possess, because those ideas are the key to long-term true innovation and evolution of human civilization. The ultimate loss of not seeking out and incorporating technologies, concepts, theories and discursive practices from the periphery is to the center. The center needs the periphery, not the other way around. It is hubris to believe that, just because there has been a Western-dominated world order, there will always be one.

References

Antonowicz, D., Kohoutek, J., Pinheiro, R., & Hladchenko, M. (2017). The roads of 'excellence'in Central and Eastern Europe. European Educational Research Journal, 16(5), 547-567.

Anowar, F., Helal, M. A., Afroj, S., Sultana, S., Sarker, F., & Mamun, K. A. (2015). A critical review on world university ranking in terms of top four ranking systems. New trends in networking, computing, e-learning, systems sciences, and engineering, 559-566.

Blahó, A. (2012). Centre-periphery tensions regarding Central and Eastern Europe Prepared for the closing conference "Centre-periphery relations in a global world", organised by Sorbonne III., Paris, December 12-13, 2012.

Bourdieu P., 1986, "The forms of capital", in: J.G. Richardson (ed.), Handbook of Theory and Research for Sociology of Education, New York–Westport, Connecticut, London: Greenwood Press.

Boyadjieva, P. (2017). Invisible higher education: Higher education institutions from Central and Eastern Europe in global rankings. European Educational Research Journal, 16(5), 529-546.

Çakır, M. P., Acartürk, C., Alaşehir, O., & Çilingir, C. (2015). A comparative analysis of global and national university ranking systems. Scientometrics, 103, 813-848.

Collyer, F. (2013). The production of scholarly knowledge in the global market arena: University ranking systems, prestige and power. Critical Studies in Education, 54(3), 245-259.

Dill, D. D. (2009). Convergence and diversity: The role and influence of university rankings. University rankings, diversity, and the new landscape of higher education, 97-116.

European Commission Directorate General for Education and Culture (DG EAC) (2014a) Education and training monitor 2014, volume 1. Luxembourg: Publications Office of the European Union.

European Commission Directorate General for Education and Culture (DG EAC) (2014b) Education and training monitor 2014, volume 2 – country analysis. Luxembourg: Publications Office of the European Union.

European Commission/Education Audiovisual and Culture Executive Agency (EACEA)/ Eurydice/ Eurostat (2012) Key data on education in Europe 2012. Eurydice and Eurostat report. Luxembourg: Publications Office of the European Union.

Goetzmann, W. N., & Oster, S. (2013). Competition among university endowments. In How the financial crisis and great recession affected higher education (pp. 99-126). University of Chicago Press.

Ianoş, I., & Petrişor, A. I. (2020). An overview of the dynamics of relative research performance in Central-Eastern Europe using a ranking-based analysis derived from SCImago Data. Publications, 8(3), 36.

Jöns, H., & Hoyler, M. (2013). Global geographies of higher education: The perspective of world university rankings. Geoforum, 46, 45-59.

Juszczak, M. D. (2011). Teaching innovation management in Poland: An exploratory study of perception and power in institutional task failure (Doctoral dissertation, Teachers College, Columbia University).

Kilias, J. (2017). Reflections on the Provincialism of Polish Political Science: Tomasz Warczok, Tomasz Zarycki, Gra peryferyjna. Polska politologia w globalnym polu nauk społecznych. Stan Rzeczy, (13), 307-312. Taylor, P., & Braddock, R. (2007). International university ranking systems and the idea of university excellence. Journal of Higher Education Policy and Management, 29(3), 245-260.

Teichler U (2011a) Social contexts and systemic consequence of university rankings: A meta-analysis of the ranking literature. In: Shin J, Toutkoushian R and Teichler U (eds) University Rankings: Theoretical Basis, Methodology and Impacts on Global Higher Education. London and New York: Springer, pp.55–72.

Warczok, T., & Zarycki, T. (2014). Bourdieu recontextualized: Redefinitions of western critical thought in the periphery. Current Sociology, 62(3), 334-351.

Zarycki, T. (2007). An Interdyscyplinary Model of Centre-Periphery Relations: A Theoretical Proposition. Studia Regionalne i Lokalne, 8(Spec. Iss.), 110-130.