

DATA BASE ANALYSIS FOR EXPLORATION OF EU COHESION AND COMPETITIVENESS¹

Michaela Staníčková

***Lukáš Melecký**

****Eva Poledníková**

VŠB-Technical University of Ostrava

Faculty of Economics, Department of European integration

Sokolská třída 33, 701 21 Ostrava 1, Czech Republic

michaela.stanickova.st@vsb.cz

*VŠB-Technical University of Ostrava

Faculty of Economics, Department of European integration,

Sokolská třída 33, 701 21 Ostrava 1, Czech Republic

lukas.melecky@vsb.cz

**VŠB-Technical University of Ostrava

Faculty of Economics, Department of European integration

Sokolská třída 33, 701 21 Ostrava 1, Czech Republic

eva.polednikova.st1@vsb.cz

Abstract

The question of EU competitiveness is usually associated with the problems of economic, social and territorial cohesion. In recent few years, the topics about measuring and evaluating competitiveness have generated keen interest among researchers. The problem is mentioned mainly in the context of the lack of a main stream approach to the evaluation of competitiveness measuring. The aim of the paper is to analyse the European Union's data base leading to the identification of convenient indicators for for evaluation of the level of EU cohesion and competitiveness across the EU Member States and regions. When focusing on differences among individual states and regions, evaluation of competitiveness and cohesion should be measured through the complex economic, social and environmental criteria that can identify the areas of countries and regions which cause the main disparities.

Introduction

The European Union (EU) is one of the most developed parts of the world, but nowadays it faces increasing economic, social and territorial disparities in all the EU Member States and especially regions [8, 9]. These significant differences affect the level of the balanced development, economic performance and competitiveness across the EU and have a negative impact on the EU position as a global player in the globalised economy. Strengthening the EU competitiveness and support to the coherent, sustainable and balanced development of the EU Member States and regions are two main objectives which, however, mutually exclusive, but on the contrary, complement each other. Alignment of cohesion and competitiveness as a pair of complementary objectives is thus no simple matter. In last few years, the topics about measuring and evaluation of competitiveness stand in the front of economic research. In most of empirical analysis, we often face the question of database relevancy that would have a

¹ This paper was created within Student Grant Competition of Faculty of Economics, VŠB-Technical University of Ostrava, project registration number SP2011/124.

correspondence with the theoretical definition of competitiveness on both national and regional levels [10].

The theoretical part of the paper is based on the descriptive approach origins from the empirical analysis of the existing and underlying systems. The practical part is based on using the methods of analysis and subsequent synthesis, as well as on using the methods of induction.

1 Database analysis of the European Statistical Office

The primary basis for selection of convenient indicators and subsequent measuring and evaluation of cohesion and competitiveness level is an analysis of the available database containing comparative data on the required level (both national and regional) and in the reference period. The European Statistical Office (Eurostat) provides exact statistical data based on a uniform methodology, both on national and regional levels. The statistics of Eurostat are divided into two sections, namely the EU Policy Indicators and Statistics by Theme [6].

1.1 Database analysis on national and regional levels

- **EU Policy Indicators**
The statistics of the EU Policy Indicators include the national data information for indicators in the EU Member States, which are in the EU core interest and primarily relate to the national level. Characteristics and the number of these indicators are shown in Annex 1.
- **Statistics by Theme**
Statistics by Theme are divided into 9 thematic categories; primarily regional statistics are separately introduced. The whole thematic statistical database consists of more than 3,600 indicators. Detailed characteristics and the number of these indicators are shown in Annex 2.
- **Regional and urban statistics**
Regional and urban statistics are provided separately in the category of General and regional statistics. They are divided into 2 thematic categories - regional statistics and city statistics in the frame of urban audit database. Characteristics and the number of these indicators are shown in Annex 3.

2 Identification of convenient indicators for evaluation of the EU cohesion and competitiveness

Creation of a cohesion and competitiveness evaluation system in terms of the EU is complicated by the heterogeneity of the EU countries and regions, and also because of the lack of a mainstream view of competitiveness evaluation [1]. Therefore, there is space for several different approaches to evaluation of the EU cohesion and competitiveness.

2.1 Approaches to measuring and evaluation of the EU Cohesion policy at national and regional level

Cohesion Reports

Although the reduction of disparities in the development of countries and their regions is a long-term and confirmed objective of the EU [2], there is no comprehensive index measuring the progress in achieving of economic, social and territorial cohesion (contrary of measuring competitiveness). The level of cohesion within the EU and the convergence of the 27 EU

Member States are evaluated by the Reports on economic and social cohesion (Cohesion Reports) published by the European Commission every 3 years [3]. These Reports are supplemented by Progress reports on economic and social cohesion, which are published by the European Commission, usually once a year between the “main” Cohesion reports. The assessment of the level of economic, social and territorial cohesion within Cohesion reports originates from the progress of indicators of disparities on the national or regional level (NUTS 2). The most frequently monitored indicators in the last two Cohesion reports (2007, 2010), reflecting the level of economic, social and territorial cohesion are provided in *Tab. 1*.

Tab. 1 Indicators for evaluation of economic, social and territorial cohesion

Dimension of cohesion	Indicator of disparities
Economic cohesion	Growth of real GDP per head (%)
	GDP per head in PPS (EU-27=100)
	Labour productivity (GDP per person employed, EU-27=100)
	Total expenditure on R&D (% GDP)
	EPO patents applications (applications per inhabitant, EU-27=100)
	Employment by sector (% of total employment)
Social cohesion	Employment rate (% of population 15-64, % of population 55-64, % of female)
	Unemployment rate (% of labour force, % of female labour force, % of youth labour force 15-24)
	Long term unemployment rate (% of total unemployed)
	Risk of poverty (% of men/women)
	Share of young people aged 25–34 with a university degree or equivalent (% of total population aged 25-34)
	Total population change (Per thousand inhabitants - annual average)
Territorial cohesion	Unemployment disparities in inner city areas (Standard deviation of neighbourhood unemployment rates, %)
	Density of motorways (Length of motorways in relation to population and surface area)
	Access to passenger flights (Number of passenger flights per day)
	Hospital beds (Number per 100.000 inhabitants)
	Households with broadband connection (% of all households)
	Urban waste water treatment capacity (Treatment capacity as % of generated load)

Source: Eurostat, 2011; Own elaboration

Structural indicators

An alternative concept for measuring national (regional) disparities, and thus for assessment of the level of cohesion in the EU, is provided by a group of EU Structural indicators, which were used to evaluate the implementation of the Lisbon Strategy in the years 2000-2010. A short list of the EU Structural indicators includes 14 indicators in six thematic areas, of which at least 8 indicators correspond to the most commonly used indicators of the Cohesion reports. The advantage of this database is the availability of indicators on the national level, monitoring data on regional level (NUTS 2) is limited [12].

2.2 Approaches to measuring and evaluation of EU competitiveness

In last few years, competitiveness and its evaluation are issues constantly in the forefront of economic sciences; a mainstream method of competitiveness monitoring and measuring is lacking. Because of the lack of the mainstream view of competitiveness evaluation, there is space for alternative approaches [7].

National level

The EU's Growth Strategies

The European Union makes an effort to restore the foundations of its competitiveness through increasing its growth potential and its productivity and strengthening economic and social cohesion. The last and not very successful attempt to gain world leadership in competitiveness was the EU Lisbon Strategy which has had, since 2010, its successor in the Strategy Europe 2020, the new EU's growth strategy for the coming decade. The progress of the EU Member States towards the goals of the Lisbon strategy was measured by the Short list of Structural indicators. The progress of the EU Member States towards the goals of Strategy Europe 2020 is measured through indicators Europe 2020. A database of these indicators is primarily available on national level.

Lisbon Review Reports

The World Economic Forum (WEF) has published The Lisbon Review reports (LRR) every two years since the EU first articulated the Lisbon Strategy. The LRR compared the performance of the individual EU Member States to provide a sense of which countries are making the most progress and which are lagging behind. The LRR assessed the extent to which the EU Member States were competitive vis-à-vis an international standard. The United States provided one key benchmark, as it was widely seen as the world's most competitive area. The EU's performance was compared to the average performance of five of the most competitive economies in East Asia – Hong Kong SAR, Japan, Republic of Korea, Singapore and Taiwan, China – a highly competitive region attracting increasing attention given the rising importance of Asia in the global economy. The LRR assessed the economic competitiveness of the EU candidates and potential candidate countries, providing a sense of the challenges they currently face. The LRR have broken the Lisbon Strategy into eight dimensions. The overall Lisbon score for each country was calculated as an unweighted average of the individual scores in the eight dimensions. The scores were on a scale from one to seven, with larger values indicating stronger performance [13].

Regional level

Evaluation of regional competitiveness is determined by the chosen territorial region level, especially in terms of the European Union through the Nomenclature of Territorial Units Statistics (NUTS). No less important is the reference period, availability and periodicity of data, and selection of convenient specific factors. For evaluation of regional competitiveness it is necessary to note that the data availability decreases in direct proportion to the lower territorial unit (NUTS) [5, 11].

The EU's Growth Strategies

Regional competitiveness can be evaluated by selected Lisbon structural and Europe 2020 indicators. These indicators measure progress of European regions towards the goals of the Lisbon strategy and nowadays to Strategy Europe 2020. A database of these indicators is primarily available on national level; it covers economic, social and environmental area of interest. Compared to the national level, the database on regional level is different especially in a shorter time period. But not every dimension and database of indicators are available on regional level, especially environmental area and its convenient indicators.

The Regional Lisbon Index

The Lisbon Index is an indicator for measuring how close an EU region is to achieving the main targets for 2010 in the area of employment, education, and research and development, as set out in the EU's Lisbon Strategy. A region scores 100 if it has reached all targets, while the region farthest away from all eight targets scores 0 [4].

Synthetic index (4th Cohesion Report)

To obtain a regional perspective on the Lisbon Agenda, a synthetic index has been created based on six of the short-listed Lisbon indicators relevant on the regional level. Before aggregating, these six indicators were re-scaled relative to the EU 27 average. The composite indicator is the min-max rescaled average of the 6 transformed indicators (all six received the same weight). Hence, it varies between 0 and 1. Although it is intended only to provide a rough indication of how regions are performing in relation to the Lisbon Agenda, it is nevertheless the case that a region which scores high will be well on its way to achieving several of the Lisbon targets, while a region with a low score will be a long way off [3].

Regional Competitiveness Index (5th Cohesion Report)

This index incorporates several indicators of well-being as well such as life expectancy, health perception and gender equality. This measures the institutions, policies and factors that determine the level of productivity of a region and the region's ability to higher and rising incomes and a good quality of life to its residents. A new regional competitiveness index has been created for all NUTS 2 regions. It consists of eleven pillars based on a total of 69 indicators organised into three groups. It ranges from 100 high to 0 low in the EU. Each of the pillars allows the performance of a region to be assessed in relation to all the other EU regions. As a result, they can be seen as indicating the strengths and weaknesses of every NUTS 2 region in an EU perspective [2].

Conclusion

The analysis of indicators suitable for economic, social and territorial cohesion evaluation in the EU reveals significant disparities in terms of (1) indicators availability on the territorial levels (and within the EU Member States), (2) the reference period and (3) the dimension of cohesion. The evaluation of the EU cohesion is mostly based on the Cohesion reports, which monitor the development of indicators of economic, social and territorial disparities reflecting the level of cohesion within the EU. In the Cohesion reports, there is no exact and strict segmentation of these indicators which reflect all three dimensions of cohesion. Instead, the Cohesion reports monitor such of selected indicators, which naturally and with regard to the concept of cohesion can be identified and designated as suitable for assessing the level of economic, social and territorial cohesion. The most frequently observed indicators in the Cohesion reports, which are also available in the Eurostat database, can be, in terms of data availability on national level, evaluated as appropriate for measurement of the economic, social and territorial cohesion, although in the terms of the reference period, the availability of data is not comparable. As a suitable database for cohesion evaluation on the national level the EU Structural indicators can be considered. Evaluation of cohesion on regional level is, in comparison with national statistics database, limited by 13 selected regional categories with quite restricted availability on NUTS 2 and mainly NUTS 3 level. The most available amount of regional indicators reflects the level of economic and social cohesion, but with a time delay.

Comparing the instruments for measuring and evaluation of competitiveness in terms of the EU is no simply matter. There are linkages among instruments for measuring the EU competitiveness on both national and regional levels. There are different time period series on

both levels, overlap of indicators of the EU's Growth Strategies on national and regional levels. Further there is a continuity between the approach of the World Economic Forum and approach of the EU to measuring and evaluation of the EU competitiveness. Between the EU Competitiveness and Cohesion policies a link exists in terms of the Cohesion reports – 4th and 5th reports articulated a special indices for measuring and evaluation of competitiveness of the European regions. Indicators and indices cover a broad area of economic, social and environmental interests, but coverage and reference period decrease in direct proportion to the lower territorial unit (NUTS). Because of these clear and close links among the instruments (indicators and indices) for measuring of competitiveness it is difficult to choose just the best approach to evaluation. Possibilities of measuring both national and regional levels of the EU competitiveness are characterized by high coverage in the monitored areas, which can indicate the similar informative ability of the indicators and indices.

Literature

- [1] ABRHÁM, J. *Komparativní ekonomika EU*. 1. vyd. Praha: MAC, 2008. 239 s. ISBN 978-80-86783-34-5.
- [2] EUROPEAN COMMISSION. *Fifth Report on Economic, Social and Territorial Cohesion. Investing in Europe's future*. Luxembourg: Publications Office of the European Union, 2010. 286 pp. ISBN 978-92-79-16978.
- [3] EUROPEAN COMMISSION. *Growing Regions, Growing Europe. Forth Report on Economic and Social Cohesion*. Luxembourg: Office for Official Publications of the European Communities, 2007. 222 p. ISBN 92-79-05704-5222.
- [4] EUROPEAN COMMISSION (2010b). *Regional Focus – the Regional Lisbon index [online]*. 2010. [cit. 9. 3. 2011]. Available on WWW: <http://ec.europa.eu/regional_policy/sources/docgener/focus/2010_03_lisbon_index.pdf>.
- [5] EUROPEAN COMMISSION. *Sixth Periodic Report on the Social and Economic Situation of Regions in the EU [online]*. 1999. [cit. 1. 3. 2011]. Available on WWW: <http://ec.europa.eu/regional_policy/document/pdf/document/radi/en/pr6_complete_en.pdf>.
- [6] Eurostat [online]. Statistics. 2011. [cit. 5. 3. 2011]. Available on WWW: <<http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/themes>>.
- [7] KRUGMAN, P. Competitiveness: A Dangerous Obsession. In *Foreign Affairs March/April*: pp. 28-44, 1994.
- [8] LEONARDI, R. *Cohesion Policy in the European Union: The Building Europe*. Palgrave Macmillan, 2005. 232 p. ISBN 1403949557.
- [9] MOLLE, W. *European Cohesion Policy*. London: Routledge, 2007. 342 p. ISBN 978-0-415-43812-4.
- [10] PORTER, M. E. The Economic Performance of Regions. In *Regional Studies*, 37, 6/7, pp. 549-578, 2003.
- [11] SKOKAN, K. *Územní soudržnost v Evropě*. Disputationes Scientifical Universitatis Catholicae in Ružomberok. Roč. VIII, 2008, číslo 1. s. 85-95. ISSN 1335-9185.
- [12] STANÍČKOVÁ, M., MELECKÝ, L. Hodnocení regionální konkurenceschopnosti České republiky v kontextu Lisabonské strategie, In *13th International Conference MEKON 2011*. Ostrava: VŠB-TU Ostrava, 1-20, CD ROM.
- [13] WORLD ECONOMIC FORUM. *The Lisbon Review 2010 – Towards More Competitive Europe? [online]*. 2010. [cit. 23. 2. 2011]. Available on WWW: <http://www3.weforum.org/docs/WEF_LisbonReview_Report_2010.pdf>.

Annex 1: Database of Eurostat indicators – EU Policy Indicators

Database	Breakdown of database			Dimension*	Database Period**	Number of indicators
	Number of categories	Title of categories	Number of subcategories			
1. Indicators of EU's Growth Strategies	9	Smart Growth; Sustainable Growth; Inclusive Growth General Economic Background; Employment; Innovation and Research; Economic Reform; Social Cohesion; Environment	/	Ec, En, S	2000-2009	25
1. a) Europe 2020 Indicators	3	Smart Growth; Sustainable Growth; Inclusive Growth	/	Ec, En, S	2000-2009	11
1. b) Structural Indicators	6	General Economic Background; Employment; Innovation and Research; Economic Reform; Social Cohesion; Environment	/	Ec, En, S	2000-2009	14
2. Euro Indicators (PEEs)	8	Balance of Payments; Business; Consumer Prices; External Trade; Industry, Commerce and Services; Labour Market; Monetary and Financial Indicators; National Accounts	31	Ec, M	2008- 2011***	135
3. Sustainable Development Indicators	10	Socio-economic Development; Sustainable Consumption and Production; Demographic Changes; Public health; Climate Change and Energy; Sustainable Transport; Natural Resources; Global Partnership; Good Governance	28	Ec, En, M, S, T	1995- 2008/2009	126
4. Employment and Social Policy and Equality Indicators	4	Employment; Education and Training; i2010; Gender equality	10	S	2000/2005- 2009	151+45****
5. Globalisation Indicators	5	Persons; Technology; Goods and Services; Global Responsibility; Business and Capital	/	M	2005-2009	25
Total	36	/	69	/	/	507

Note: * Ec – Economic, En – Environmental, S – Social, T – Territorial, M – Miscellaneous

** Average period corresponding to the most frequent availability rate across indicators

*** Monthly or quarterly data available

**** Under preparation

Source: Eurostat, 2011; Own elaboration

Annex 2: Database of Eurostat indicators – Statistics by Theme

Database	Breakdown of database			Dimension *	Database Period**	Number of indicators
	Number of categories	Title of categories	Number of subcategories			
General and regional statistics	4	Regions and cities; International cooperation; Cooperation with Mediterranean countries; Candidate and potential candidate countries	31	Ec, En, S, T, M	1997-2009	348
Economy and finance	10	National accounts (including GDP); ESA 95 Input-Output tables; European sector accounts; Government finance statistics; Exchange rates; Interest rates; Monetary and other financial statistics; Harmonized Indices of Consumer Prices (HICP); Purchasing power parities (PPPs); Balance of payments	58	Ec, S, T, M	2001-2009	290****
Population and social conditions	9	Population; Health (Public health/ Health and safety at work); Education and training; Labour market (including LFS - Labour Force Survey); Income, Social Inclusion and Living conditions; Social protection; Household Budget Surveys; Crime and criminal justice; Culture	55	Ec, S, M	1999-2009	1 230
Industry, trade and services	5	Structural business statistics; Short-term business statistics; Tourism; Manufactured goods; Information society	29	Ec, En, M	1996-2007	618
Agriculture and fisheries	6	Agriculture; Forestry; Fisheries; Food; Agri-Environmental Indicators; Land cover/use statistics	24	Ec, S, M	1998-2009	395
External trade	1	External trade	2	Ec	1999-2009	36
Transport	1	Transport	8	T	1998-2009	359
Environment and energy	2	Environment; Energy	11	Ec, En, T	1997-2008***	99
Science and technology	1	Science, technology and innovation	5	Ec, M	1996; 2008; 1998-2008	260
Total	39	/	227	/	/	3 635

Note: * Ec – Economic, En – Environmental, S – Social, T – Territorial, M – Miscellaneous

** Average period corresponding to the most frequent availability rate across indicators

*** Monthly data available

**** Indicators of category ESA 95 Input-Output tables under construction

Source: Eurostat, 2011; Own elaboration

Annex 3: Database of Eurostat indicators – Regions and cities

Database	Breakdown of database			Dimension *	Database Period **	Number of indicators
	Number of categories	Title of categories	Number of subcategories			
Regional statistics	13	Regional agriculture statistics; Regional demographic statistics; Regional economic accounts - ESA95; Regional education statistics; Regional science and technology statistics; Regional structural business statistics; Regional health statistics; Regional tourism statistics; Regional transport statistics; Regional labour market statistics; Regional labour costs statistics; Regional information society statistics; Regional migration statistics	25	Ec, En, S, T, M	1997-2008	208
City statistics – Urban audit	1	Urban audit data collection	9	Ec, En, S, T, M	1989-1993; 1994-1998; 1999-2002; 2003-2006; 2007-2010	20

Note: * Ec – Economic, En – Environmental, S – Social, T – Territorial, M – Miscellaneous

** Average period corresponding to the most frequent availability rate across indicators

Source: Eurostat, 2011; Own elaboration

ANALÝZA DATOVÉ ZÁKLADNY PRO ZKOUMÁNÍ SOUDRŽNOSTI A KONKURENCESCHOPNOSTI V PODMÍNKÁCH EU

V Evropské unii jsou otázky konkurenceschopnosti obvykle spojovány s problematikou hospodářské, sociální a územní soudržnosti. V posledních letech se problematika měření konkurenceschopnosti dostává do popředí zájmu řady ekonomických analýz, především s ohledem na neexistenci hlavního proudu názorů na její hodnocení. Cílem příspěvku je analýza datové základny Evropské unie, jež vede k identifikaci vhodných indikátorů pro hodnocení úrovně soudržnosti a konkurenceschopnosti členských států EU a jejich regionů. Hodnocení konkurenceschopnosti a soudržnosti z hlediska diferencí mezi jednotlivými státy a regiony je třeba sledovat v širokém komplexu ekonomických, sociálních a environmentálních kritérií, na jejichž základě lze vymezit problémové oblasti zemí a regionů, které způsobují tyto rozdíly.

DIE ANALYSE DER DATENBASIS FÜR DIE UNTERSUCHUNG VON KOHÄSION UND WETTBEWERBSFÄHIGKEIT IN DER EU-BEDINGUNGEN

In der Europäischen Union werden Fragen der Wettbewerbsfähigkeit in der Regel mit den Problemen der wirtschaftlichen, sozialen und territorialen Kohäsion verbunden. Die Frage der Messung der Wettbewerbsfähigkeit ist in den letzten Jahren Gegenstand des Interesses in einer Reihe ökonomischer Analysen, hauptsächlich wegen des Mangels an Mainstream-Ansichten über die Bewertung der Wettbewerbsfähigkeit. Das Ziel des Beitrags ist die Analyse der Datenbank der Europäischen Union, die zur Identifizierung geeigneter Indikatoren für die Bewertung des Niveaus der Kohäsion und Wettbewerbsfähigkeit in den EU-Mitgliedstaaten und ihren Regionen führt. Die Bewertung der Wettbewerbsfähigkeit und der Kohäsion in Bezug auf die Unterschiede zwischen den Ländern und Regionen sind in einem großen Komplex von wirtschaftlichen, sozialen und ökologischen Kriterien zu untersuchen. Auf der Grundlage dieser Indikatoren können Problembereiche der Länder und Regionen abgegrenzt werden, die diese Unterschiede verursachen.

ANALIZA BAZY DANYCH DO BADANIA SPÓJNOŚCI I KONKURENCYJNOŚCI W WARUNKACH UE

W Unii Europejskiej kwestie konkurencyjności zazwyczaj łączone są z zagadnieniami spójności gospodarczej, społecznej i terytorialnej. W ostatnich latach pomiar konkurencyjności stanowi główny przedmiot wielu analiz ekonomicznych, przede wszystkim z powodu braku istnienia głównego nurtu poglądów na jej ocenę. Celem niniejszego opracowania jest analiza danych Unii Europejskiej, której celem jest identyfikacja odpowiednich wskaźników służących do oceny poziomu spójności i konkurencyjności państw członkowskich UE i ich regionów. Ocenę konkurencyjności i spójności z punktu widzenia różnic między poszczególnymi państwami i regionami należy prowadzić w szerokim kontekście kryteriów ekonomicznych, społecznych i środowiskowych, na których podstawie można określić problemowe obszary krajów i regionów, będące przyczyną tych różnic.