ISSN 1822-8011 (print)
ISSN 1822-8038 (online)
INTELEKTINĖ EKONOMIKA
INTELLECTUAL ECONOMICS
2007, No. 1, p. 19–28

THE COMPETETIVENESS OF THE EU IN CONTEXT OF THE INTELLECTUAL CAPITAL DEVELOPMENT

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Abstract. The article attempts to show that macroeconomic measurement of intellectual capital and its efficiency helps to evaluate adequately the structural changes, the changing productive contribution of the intellectual resources in different sectors, regions and countries. It looks, as a result, that the last one is insufficient to aim purposefully the requirements of the Lisbon Agenda. Some aspects of criterial and indicators' system used for evaluation of intellectual resources are discussed, also the problematic directions and priority tasks for the expansion of intellectual potential of the new Baltic States are attempted to identify.

The author suggests for the renewing system of statistical indicators for intellectual development and, in particular, proposes to integrate some of them into national social accounts. It also remembers that social support in the EU, e.g., of rural inhabitants, and/or to retarding areas, on the one side, substantially break the acceleration of the intellectual resources, on the other.

Some other suggestions concerning the paradigm of economic significance of the intellectual potential, its measurement, economic evaluation and perspective tasks for the professional competence, management experience a/o indicators of the intellectual productivity were attempted to present in the report. The reasoning was based on the goal-oriented rule suggesting the pragmatic orientation to achieve the Lisbon Agenda objectives by metaeconomic trade-off between different values of social (first of all, intellectual) development.

JEL classification D800, O310.

Keywords: intellectual resources; multidimensional indicators of intellectual development; competitiveness in intellectual capital.

Reikšminiai žodžiai: intelektiniai ištekliai, daugiamačiai intelektinės plėtros rodikliai, intelektinio kapitalo konkurencingumas.

The strategic goal for the EU: "to become the most competitive and dynamic knowledge-based economy in the world, capable of sustainable economic growth with more and better jobs and greater social cohesion."

23–24 March 2000, Lisbon Agenda, the EC

Introduction

The universal and specialized information networks, sets of professional management procedures and stochastic evaluations of financial investment alternatives – all these and many other similar intellectual resources and applications play more and more important role: in the technical analysis of financial markets, projecting and / or producing of computing chips or biotechnologies and, at least, in the modern development of any technologies and growth of the national GNP. At the same time, the economic evaluations of their social utility and implementations are rather slowed by development of the criterial systems for the measurement of the efficiency of the disposable intellectual resources. The paradox of the situation is in fact that the high developed economies are based at 3/5 or even more on the knowledge potential but the statistical measurements still are oriented to disposable resources and effect of manufacturing industries, information technologies (IT) and material services so important until middle of 20th century.

The priorities of the EU FP7th (Framework Programme) for 2007–2013 are the development

of most perspective – nano-, nuclear and biotechnologies a/o important directions of *material* production (http://ec.europa.eu/research/future/index_en.cfm). In this context it is important to mention that last years the more attention was given to the social evaluations, measurement and analytical development of specific intellectual resources as a strategic objective determining the dynamism and creativity of the intellectual technologies. At the time, their significance for the perspective (strategic) and infrastructure decisions of innovations as well as their commercial dissemination – marketing, implementation, and management in total – is difficult to overvalue. However special methodical developments of these technologies are mostly beyond from accelerated systemic applications for the macro statistic evaluations of the economic growth proportions and intellectual productive power impact.

1. Indicators for the statistical measurement of intellectual resources

The evaluations of the intellectual resources (IR) and, as a result, of their return on the level of various companies (and even some branches) based on changes in their market value quoted on the stock exchanges or on the value of their intangible assets as a difference between their market capitalization and stockholders' equity amount in the finance balance value (it measures the value of brand and/or firm's name, disposable patents, experience of management, clients loyalty and other undifferentiated factors) were mostly developed the last 10-15 years, some specialized centres for the research and consulting in the IC appeared in the EU a/o high developed regions. Some

Table 1. **The Indicators for Measuring Intellectual Capital by Main Components**

Intellectual assets	Human capital 1. % of population with at least secondary education. 2. % of population using computer for profess. activity. 3. % of adult population participating in education and training. 4. % of researchers in population. 5. % of employment in knowledge intensive activities. 6. Skills and experiences measured by years employed in firm and rofession.	Structural capital 1. % of households with internet access. 2. % of enterprises with internet access. 3. Nr of patent applications to EPO per mln. inhabitants. 4. 44. Nr of scientific publicat. per mill. inhabitants. 5. Enterprise environment indicator, World Economic Forum. 6. Internal databases. 7. Venture capital investments as % of GDP.	Relational capital* 1. Registered intellect. property (patents, copyrights, design a/o authorship rights). 2. Co-operation in innovation and software 3. Net of loyal customers (or profitability per customer). 4. International mobility of students (exchanges).
Investments into intellectual development	1. % of expenditures on education in GDP. 2. % of public expenditures on education in GDP.	1. R&D as % of GDP. 2. Expenditures for IT as % of GDP. 3. Hardware and software for IC. 4. Patents, know-how, licensees bought.	1. Joint ventures with foreign capital in high tech SMEs.
Effects of intellectual resources	1. GDP per hour worked. 2. Value added in knowledge intensive activities in GDP. 3. Value added per employee. 4. Value added per salary dollar.	1. % of enterprises using internet for business. 2. % of new enterprises. 3. Value added in high tech industries in GDP.	1. High tech export **(incl. intellectual services) as % of GDP. 2. High tech import (incl. intellectual services) as % of GDP 3. Brand equity (and client loyalty) – on level of firms.

Sources: Andriessen D. G., p. 14, 28-29; Sveiby K.; Roos G.; Eurostat, 2002-6.* As noticed K. Sveiby, it is not possible to compile a full balance sheet that expresses in monetary terms every intangible asset. It means that any aggregated comparisons of national IC's are still based on the rankings (compare graphs 1.1 and 1.2).**The value of ICT goods' export in the EU countries cannot be adequate indicator of their intellectual potential without account of export and import of ICT services, programs a/o groups of intellectual production.

criteria used and characterised below may be widened up to macroeconomic level, however it is clear that the cardinalistic approach have to be complemented by the ordinalistic one within most of known measurement methodologies used for the modelling of the invisible balance sheet. Many of the adopted methods for the evaluation of IR and their economic effect are complicated, not reliable for more long period and, by the realistic recognition, require too much efforts (e. g., Karl-Erik Sveiby, one of originator of the IR measurement and evaluations of their productivity, 2001–2004; see http://www.sveiby. com/Portals/0/articles/measuretolearn.pdf). Some opponents also mention a large number of measures used in valuing the respective components of the IC (The Intellectual Capital of the European Union, 2004).

After the Lisbon meeting in March 2000, the European Commission presented and published every spring the 14 structural indicators of the IC as the basis of measuring progress of the Lisbon Agenda. From 2004, the 38 indicators of intellectual development divided into those of structural capital, human and relational capital (intra-organizational relationships and linkages) were separated. This system of IC indicators is presented below in a modified form (some indirect indicators not measuring the IC were not included, and few added, see table 1). It is based on component-by-component evaluation of some existing indicators and grouping them according to operational goals what is undoubtedly rational, aiming to deepen the analysis of knowledge society development, as a result, deserves to be studied more carefully and developed.

This indicator system needs to be carefully re-evaluated from point of main criterion: correctness in weighing IC in financial standards. The work in this direction still continues: The Skandia group of researchers used up to 164 measures (91 new IC metrics plus 73 traditional ones) to measure the five areas making up the Navigator model. Anyway it served in identifying, valuing, and leveraging the IC on macro level. It is suitable to apply for evaluations esp. of developed countries; in newly developing countries including new Baltic States, the statistics of intellectual resources and their productive indicators are less adaptable; data comparable with the EU or the OECD are presented not in full amount (absent information on venture capital, entrepreneurial attitude and some other indicators) and they are less reliable as a result of much wider sector of the shadow economies. The best new ideas in such states are often patented through partners and/or published in more rich countries if not to speak about other multiple forms of brain drain through the information sector (IS) development.

At starting 21st century, the measurements of knowledge economy, also innovations and registration of productive indicators of the information industry a/o IC parameters were developed by the World Bank group on the basis of Knowledge assessment methodology. Knowledge assessment methodology (KAM) consists of 80 structural and qualitative variables to measure countries' performance on the four knowledge economy (KE) pillars: economic incentive and institutional regime, education, innovation, and information & communications technology. The KAM was designed by the Knowledge for development program to proxy a country's preparedness to compete in the knowledge economy. The comparison is undertaken for a group of 128 countries, which includes most of the OECD economies and more than 90 developing countries. The changes of KE indexes and main their ingredients as an illustration on the statistics of new Baltic states and some of their neighbours are presented in the tables 2 and 3.

The World Economic Forum last years published the aggregated comparative rankings of

Table 2. **Comparative Knowledge Indexes and their Changes Within 1995–2004**

Country, 2004	KEI 2004	Econ. incentive regime, 2004	Innovation, 2004	Education, 2004	ICT, 2004	KEI 1995	Econ. incentive regime, 1995	Innovation, 1995	Education, 1995	ICT, 1995
Estonia	8.05	7.95	7.29	8.14	8.83	7.78	7.94	7.27	7.93	7.97
Lithuania	7.26	7.24	6.46	8.32	7.01	6.05	5.20	6.21	7.10	5.70
Latvia	7.06	6.98	6.12	8.11	7.02	5.72	5.64	3.79	7.18	6.26
Poland	6.94	6.70	6.15	8.32	6.60	6.38	4.84	6.23	7.96	6.51
Belarus	4.93	1.06	5.83	7.64	5.20	4.94	1.88	6.77	7.93	3.16

Source: Knowledge for development (K2D), WB Group, 2006. The key innovation variables are weighted by population.

Table 3. **Comparative Knowledge Indexes and their Changes within 1995–2004**

Country	KI, 2004	Innovation, 2004	Education, 2004	KI, 1995	Innovation, 1995	Education, 1995	ICT, 1995	ICT, 2004
Estonia	8.09	7.29	8.14	8.83	7.72	7.27	7.93	7.97
Lithuania	7.26	6.46	8.32	7.01	6.34	6.21	7.10	5.70
Latvia	7.09	6.12	8.11	7.02	5.74	3.79	7.18	6.26
Poland	7.02	6.15	8.32	6.60	6.90	6.23	7.96	6.51
Belarus	6.22	5.83	7.64	5.20	5.96	6.77	7.93	3.16

Source: Knowledge for Development (K2D), WB Group, 2006. Knowledge index measures a country's ability to generate, adopt and diffuse knowledge; the key variables are weighted by population.

Table 4. **The World Competitiveness Index (WCI) of the New Baltic's in 2004**

Indicators	Lithuania		Latvia		Estonia	
	2004	2005	2004	2005	2004	2005
Place by WCI rankings	36	43	44	44	20	20
Human capital *	37	–	49	–	41	–
Human capital effect	34	35	47	37	24	24
Human capital progress*	27	–	29	–	24	–

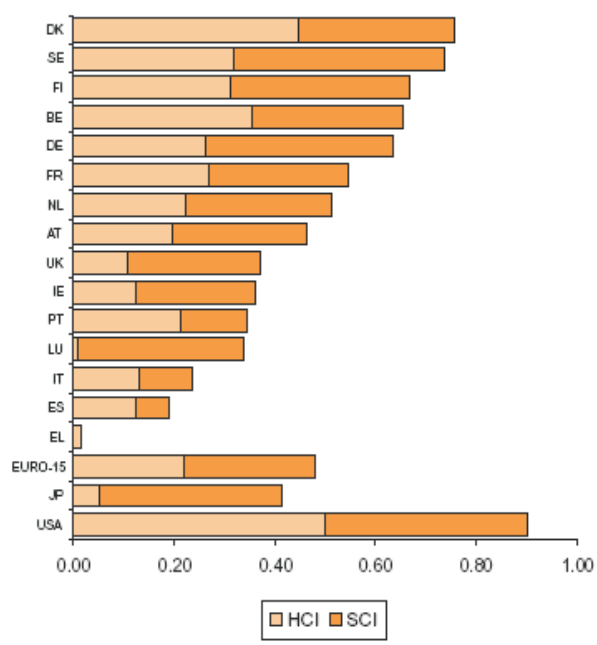
Source: http://www.weforum.org/site/homepublic.nsf/Content/…comparisons; Department of Statistics to the Government of the Republic of Lithuania, 2006. * The place between 117 countries according to human capital as WCI component

most world states including some indicators of human capital, its effect and its progress (the data for new Baltic states see at table 4). The IC and related indicators (e-activities) are presented and compared most often, but they characterize more the *means* of this activity in particular sectors than the results of applying the definite intellectual resources being themselves the international products of intellectual activity. Besides, on the case of Lithuania it is clearly seen some unclear instability of rankings when any of index components do not changed more substantial. Anyway HC is important component of the national intellectual potential, and its effect may show the competitive changes in this potential.

The possibilities to compare both the investments into IC and their effects by countries, their human and structural components based on the methodology presented by Roos G. G. are really significant. Interesting and important data with account of the national IC indicators enumerated above are shown below demonstrating the comparable parameters concerned with the structurized investments by macro levels of the IC (Figure 1) and comparative value of its components (Figure 2) in some OECD countries.

Dr. Andriessen D. G. attempted to evaluate the proportions of main IC components in most

Figure 1. **Investments into Intellectual Capital of Some OECD Countries**

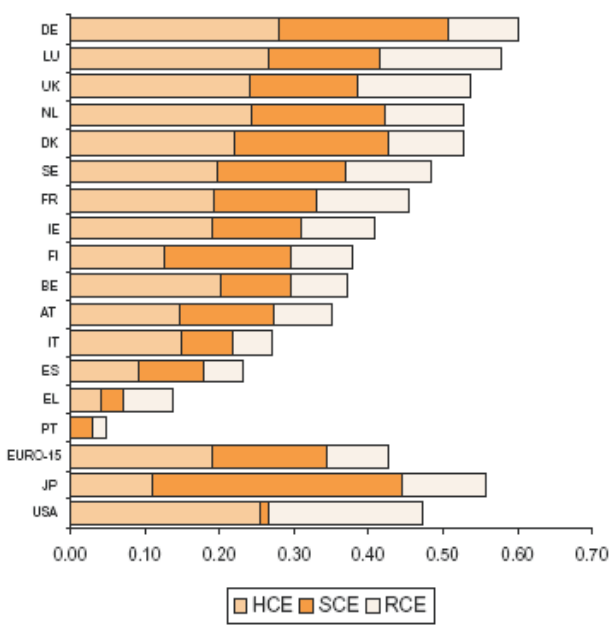


HCI – investments into human capital; SCI - investments into structural capital. AT – Austria, IE – Ireland, SE – Sweden, FI – Finland. The authors also mention the strong and significant correlation between human capital and structural capital assets (0.806).

Source: Andriessen D. G. a/o, 2004, p. 16.

of the OECD countries (Figure 2). It shows not only the national peculiarities of intellectual resource development but also confirms the fact that most effective are the human and structural components in the advanced economies (the last one prevailing esp. in Japan and about at insignificant level – in the USA). The relational capital, vice versa, is most effective in the USA, UK, and Luxembourg. Comparing both graphs is possible also to conclude logically those amounts of investments into IC and even their proportions are mostly correlated except USA where investments into structural component possibly may result in relational capital (the relation of IC data for EL – Greece – is not clearly expressed, partly depending from low significances of investments). Il looks that esp. Scandinavian countries as Denmark, Sweden, Finland, also UK, attempt to invest more aggressively into IC for growing more quickly its intellectual assets, and this fact corresponds to common opinion.

Figure 2: **The Values of Intellectual Capital Components in Some OECD Countries**



HCE – effect of human capital; SCE – effect of structural capital, RCE – effect of relational capital. The abbreviations for the EU States are the same as in graph 1.1.

Source: Andriessen D. G. a/o, 2004, p. 18.

The ratio between assets and effects in leveraging of IC in the EU for 1999–2001, by presented evaluations, was better than in the USA (Andriessen, p. 22). Another important conclusion is that richer countries do not invest relatively (per capita) more in human capital then poorer countries, although they will invest more in *absolute* terms. However, this fact is followed by less opportunities for the new Baltic states to overcome the depressive retardation from the IC development level in more advanced EU countries and, as a result, to integrate their intellectual efforts suitably for aiming to become part of most competitive European economic area. So, in 2004, only 60 % of the all Baltic Region (exclusive of Russia) households have access to a computer at home, compared to an EU25 average of 54 per cent; in Lithuania – only 27 % (Indicators for the Information Society in the Baltic Region, 2005, p. 24).

In fact it is only approximation for the measuring rather complicated processes of IC influence to national economic potential. In fact, e. g., the development in value of IC assets depend not only on the value of some employment indicators, the number of scientific publications and the number of patents – but such intellectual assets as professional competences in management or creative abilities are much more difficult to measure.

Many researchers of the knowledge economy and intellectual resources propose to evaluate the approximate estimates of IC by comparing the value of company's balance value and its market value based on the stock exchange listing statistics by their components (Mitchell S. Williams a/o). This method most fruifull at now is suitable for integration with data of national statistics and sociological evaluations of IC but still appears to be much less applicable in cases of lower market capitalization of the property and/or on macroeconomic level esp. With inadequate account of shadow sector influence.

In the EU statistics still now too much attention is given to the material components of the IC much easer to evaluate. Even the broad meaning of the innovations does not exhaust the economic efficiency and productivity of the intellectual resources. The structure of inflows from innovations by sectors of activity is presented on the following Eurostat data (see table 5). The intellectual component in NACE classification of services in other aspects mostly is not attributed.

The mentioned problemic aspects less concern the traditional economic evaluations, e. g., the indicators of the comparative unit labour cost growth which can be evaluated as a material component of intellectual resources (until not weighed according to accumulated knowledge and professional abilities, table 6). Anyway, the data of Eurostat presented below do not show clear trends of unit labour cost growth in selected countries within presented period 1996–2003 what would be indirect indicator of growing intellectual value of disposable labor force (under other conditions not changed).

Table 5. **Turnover from Innovation in the EU Countries (2000, by Economic Sectors)**

EU countries	All NACE branches Total	Industry	Mining and quarry	Manufacturing	Electricity, gas and water supply	Services excluding public administr	Wholesale and retail trade; repair of household goods	Transport, storage and communications	Financial intermediation	Real estate, renting and business activities
Belgium	13.9	13.5	n.a.	13.8	n.a.	14.3	6.7	13.9	5.6	79.0
Denmark	18.0	21.9	8.6	23.7	4.1	15.4	16.2	8.2	15.7	27.4
Germany	23.3	35.2	6.4	36.5	22.3	13.1	7.4	16.0	16.0	20.3
Greece	8.9	7.5	n.a.	7.6	n.a.	13.6	20.2	4.0	10.3	24.4
Spain	33.1	31.0	32.3	32.5	2.7	35.7	26.4	49.5	34.4	36.5
France	11.9	12.2	0.5	12.9	3.1	11.2	6.6	24.9	13.9	13.6
Italy	16.1	19.1	8.3	19.9	9.4	12.1	6.7	13.2	14.3	32.3
Luxembourg	7.4	11.7	n.a.	12.6	0.0	6.7	7.8	3.6	6.4	31.6
Netherlands	12.1	18.1	n.a.	19.8	n.a.	8.9	6.0	12.2	11.5	12.0
Austria	22.0	26.4	2.4	26.7	26.0	16.3	19.0	15.4	13.3	32.6
Portugal	15.1	18.2	n.a.	15.5	n.a.	12.3	10.4	11.0	12.4	48.6
Finland	17.5	24.1	7.8	27.3	4.6	7.0	2.9	15.9	n.a.	20.9
Iceland	7.7	16.8	n.a.	22.8	n.a.	4.7	1.4	3.1	3.8	32.6
Norway	7.0	7.8	2.1	12.5	3.6	6.2	4.5	3.7	5.1	23.2

Source: Eurostat, 2006, Third community innovation survey (CIS3). N. a. – data not available.

Table 6. **Unit Labour Cost Growth in some Industries of the EU Countries, %**

Countries, regions	1996	2000	2001	2002	2003
EU (25 countries)	-.48	-.80	0.68	-0.63	0.24
EU (15 countries)	-.63	-.76	0.52	-0.32	0.42
Denmark	-.37	-.31	3.16	-1.65	0.27
Germany	-.94	2.30	0.52	-2.17	-.94
Estonia	-.08	-.31	-.40	2.02	3.03
Greece	2.67	-.57	-.48	-0.26	-.27
Spain	1.20	0.01	1.28	0.83	-.20
France	1.20	-.66	-.29	-0.66	n.a.
Ireland	-.92	-.01	-.30	-2.54	n.a.
Italy	1.65	-.16	-.96	1.88	1.62
Latvia	7.26	0.56	-.19	-4.56	-.61
Lithuania	2.24	-.60	-.05	-3.02	3.62
Luxembourg	-.10	2.65	0.70	-1.75	-.49
Hungary	-.14	3.65	4.44	-5.91	n.a.
Netherlands	-.37	-.69	0.31	3.33	n.a.
Austria	-.90	-.31	-.28	-1.71	-.45
Poland	9.25	-.17	5.37	-7.79	n.a.
Slovakia	1.10	4.32	-.38	5.28	-.82
Finland	5.51	-.23	7.54	1.47	0.29
Sweden	7.21	3.32	6.58	-0.42	-.35
United Kingdom	-.67	-.06	0.97	2.60	0.75
Croatia	1.80	2.91	8.91	n.a.	n.a.
Norway	-.87	-.36	6.58	14.64	-.95

Source: Eurostat, 2006. *Unit labour cost is the ratio of the compensation per employee divided by gross value added (GVA) per total employment. The variables used in the numerator (compensation, employees) refer to employed labour only, while those in the denominator refer to all labour, including self-employed.

2. Connections between indicators of intellectual resources and information technologies in the new Baltics

The statistics of information and communication technologies (ICT) is undoubtedly most developed field after the works of F. Machlup. Last 10–15 years it was substantially reconstructed under revolutionary influence of total computerization and Internet. Besides, in many cases the official data are abundantly complemented by the sociological researches concerning, e. g., detailed characteristics of internet or e-commerce users. However, firstly, only some of ICT indicators can be fruitfully used for the purpose of determining their impact on the intellectual resources and productive intellectual effect. Secondly, it is necessary to fix the most important estimates of IR or IC and integrate them into national social accounts.

In 2003, the % of ICT in national total services of the EU countries augmented to more than 28 % in Finland (about 20 % in Lithuania), see table 8 (data for some countries not comparable).

Some interesting comparisons follow from data characterizing widespread of Internet and directions of its usage, with account that some of these indicators are tightly connected with intellectual capabilities and disposable assets. At the same time, Internet is a mean for developing both the professional competence and new ideas, and different level of its usage opens inadequate possibilities to multiply personal, companies' and nations wealth.

It is interesting to notice that when Nordic countries and Germany use very naturally the Internet first of all for communications, new Baltic states (by this indicator lower to the level of Baltic region and EU25) lead using it for reading online news. Besides, Estonia is substantially ahead to the level of EU25 in Internet banking (also playing music and games). The similar conclusions concerning the levels of other indicators of ICT in the new Baltic states and Poland comparing to Nordic countries and Germany: access to computers and internet at home and frequency of their usage (op. cit., p.19–22), e-commerce and e-government, share of teleworking employment (i.e. possibility for

Table 7. **Value Added in ICT of Some EU coUntries (by Sectors of Activity)**

	ICT manufacturing	ICT wholesale	Telecommunications	ICT Consultancy	Total ICT	Total manufacturing	Total services
	mill. euros						
Denmark	1 164	1 714	2 527	2 911	8 316	25 446	49 517
Estonia	66	46	234	56	401	1 280	2 476
Finland	5 813	736	2 112	1 .727	10 388	29 730	36 622
Germany	n.a.	n.a.	31 478	31 838	63 316	n.a.	n.a.
Iceland	4	75	28	113	220	n.a.	n.a.
Latvia	21	129	341	63	555	1 260	3 511
Lithuania	111	144	315	58	628	1 889	3 147
Norway	924	761	2 675	2 549	6 908	18 926	54 724
Poland	1 273	462		1 141	n.a.	36 562	37 501
Sweden	1 832	1 396	3 433	5 876	12 536	46 205	80 857

Source: Indicators for the Information Society in the Baltic Region 2005, p. 117. Turnover in mln. EUR.

Table 8. **Internet Usage by Main Purposes, in Some EU Countries (%, 2004)**

	Communication	Finding information about goods and services	Using services related to travel and accommodation	Internet banking	Purchasing/ ordering goods or services	Reading/ downloading online newspapers/ news magazines	Playing/ downloading games, images or music
	per cent						
Poland	24	15	8	4	4	14	14
Lithuania	25	15	5	7	1	21	15
Estonia	39	32	n.a.	35	9	38	20
Latvia	41	19	9	12	2	19	16
EU25	41	37	23	18	17	18	17
Baltic Region	**47**	**43**	**25**	**24**	**23**	**19**	**16**
Germany	52	52	32	26	32	15	15
Finland	63	59	42	50	26	37	38
Sweden	65	59	29	40	27	28	23
Denmark	65	59	32	45	22	36	19
Norway	66	62	40	55	31	56	23
Iceland	75	72	51	54	28	61	34

Source: Indicators … 2005, op. cit., p. 24. Baltic Region averages without Russia.

persons to work away from the premises of the enterprises, p. 32, 37, 40).

The information presented in the Figure 3 permits to compare visually not only how developed is using of PC and Internet in the enterprises of the EU and Russia, but also the levels of interaction of those both indicators. They are best coordinated in Nordic countries, Germany and Estonia; but in Russia access of enterprises to Internet still amounts about have to level of computerization and even lover to medium level of EU 25.

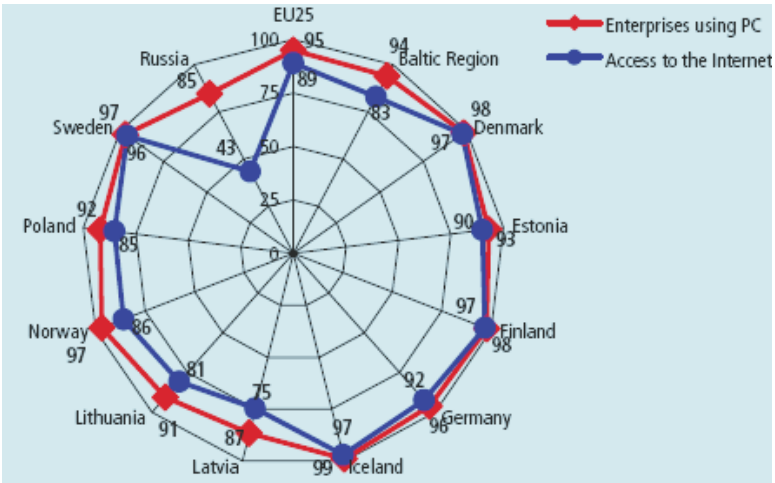
Important indicator for evaluation of IC on branch or national level is % of companies with new or improved products. Available data shows that retardation of Lithuania and esp. Estonia from high-developed Scandinavian countries by this indicator is minimal. This may be explained partly by fact that Lithuania has smaller proportion of SMB companies.

So, the development of IC in new Baltic states is tailing the medium levels in Baltic's but by some important indices of IT is slowly approaching, e. g., in computerisation and Interneting. Characteristic view are represented on the levels of comparative aggregates of intellectual development in the Lithuania (cf. table 9):

It is possible to compare the part of value added in information technologies (cf. table 10):

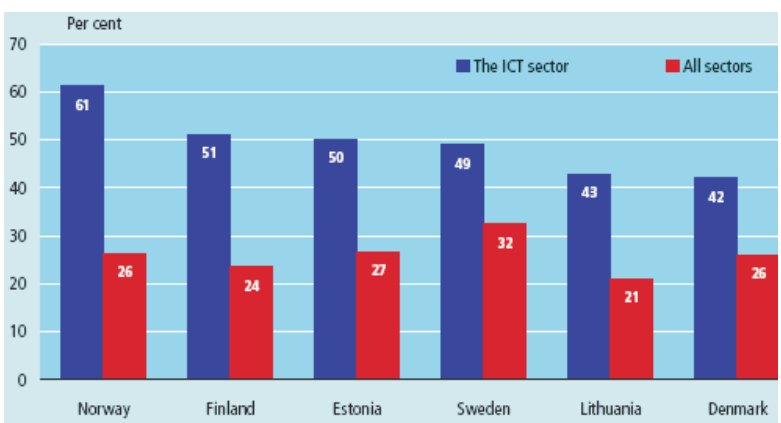
It looks like the sector of IT in Lithuania produces about proportional part of the GNP and 1/7-1/10 higher part of the value added. But in fact this part may be bigger as a result of inadequacies in the methodology of measurements of the components in IT esp. those in other productive sectors of the macroeconomy.

Figure 3: **EU Enterprises using computers and Internet, in %, 2004.**



Source: Indicators.., op. cit., p. 28.

Figure 4: **Percent of the EU enterprises with new or improved products**



Source: Indicators.., op. cit., p. 76.

Table 9: **Some indicators of intellectual development in Lithuania, 2004**

Indicators	2004
Inhabitants with high education, %	25.2
Participants in continuing learning, %	7.9
Employment in high technologies, %	2.6
Inhabitants using Internet at home (16-74 years), %	15.7*
Expenses for high technologies in the GDP, %	9.6
Part of high technologies in total value added by manufacturing, %	19.9*
Part of direct foreign investments in the GDP, %	25.9

Source: Lithuanian Department of Statistics. Preliminary data for 2005.

When analyzing the intellectual potential of different countries, the IT and education indicators usually are integrated within more wide system of knowledge development outside of its financial metrics what helps to appraise better the intangible-intensive environment. Below are some comparisons of indicators for 2000–2004 for Estonia, Latvia and Lithuania within upper middle-income group countries based on the scorecards of the World Bank modelling system (table 11):

Table 10. **The Production and Value Added of Information Technologies in Lithuania, 2000–2004.**

Indicators	2000	2001	2002	2003	2004
Production of information technologies, mln. Lt	3697.1	4494.1	4891.3	5207.7	5446.8
Part in total production, %	4.8	5.4	5.5	5.4	5.1
Value added in information technologies, mln. Lt	2316	2616.8	2995.1	3107.8	3249.8
Part in total value added, %	5.6	6.0	6.4	6.1	5.8
Part in GDP, %	5.1	5.,4	5.8	5.5	5.2

Source: Department of Statistics to the Government of the Republic of Lithuania.

Table 11. **Comparative Intellectual Indicators of New Baltic States within Upper Middle Income Group* According to the WB *Knowledge for Development* Program**

Variables of intellectual development	Lithuania		Latvia		Estonia	
	actual	normalized	actual	normalized	actual	normalized
GDP Growth (%)**	6.70	8.98	7.46	9.45	6.54	8.90
Human Development Index	0.852	7.06	0.836	6.35	0.853	7.14
Tariff & Nontariff Barriers	2.00	7.04	2.00	7.04	2.00	7.04
Regulatory Quality	1.16	8.05	1.02	7.66	1.61	8.98
Researchers in R&D / million	1823.58	6.28	1476.05	5.58	2252.57	6.98
Scientific and Technical Journal Articles / mil. pop.	78.12	6.85	66.55	6.61	248.53	7.80
Patent Applications Granted by the USPTO / mil. pop.	0.87	6.25	0.87	6.17	1.48	7.11
Adult Literacy Rate (% age 15 and above)	99.65	7.72	99.80	8.03	99.80	8.03
Secondary Enrollment	100.52	8.20	94.52	7.03	95.90	7.42
Tertiary Enrollment	64.45	9.04	68.53	9.28	63.93	8.96
Telephones per 1,000 people	1230.90	7.58	948.20	6.56	1299.50	7.97
Computers per 1,000 people	154.70	6.50	219.20	7.08	949.50	9.92
Internet Users per 10,000 People	2809.14	6.95	3543.31	7.42	5122.32	8.59

Sources: WB *Knowledge for Development Program*, 2006. Upper Middle Income Group countries – average $3,256–$10,065 GNP per head.** Average annual GDP, 2000–2004.

The variation of the main indicators' weights is mostly not significant except PCs per 1000 and regulatory quality; they are noticeable for not so important variables as researchers, journal articles and phones. The differences comparing the normalized weights of PCs per 1000, HDI, and regulatory quality are also splitting.

The author expects to present comparative evaluations of the methods most widespread for the measurement of IC in the Baltic states in the continuation of this article, esp. balanced scorecard, market-to-book value ratio (book value equal to tangible assets minus visible debt); and value added intellectual coefficient. They are significant for the solutions of the widespread and integration of IC and IR components into national system of social accounts what would help to reconstruct all system of macroeconomic evaluations according to requests of modern knowledge society.

Conclusions

1. The Lisbon strategy aims the EU economy to become the most competitive in the world, and that means first-of-all to outwork for it the intellectual achievements in the process of globalization. However, at the date the Eurostat only aims to the adequate sophisticated methodology of the macroeconomic measurement of intellectual resources and their efficiency. This also complicates to evaluate the structural changes in the renewed production functions, the changing productive contribution of the intellectual resources in different sectors, regions and countries.

2. The new Baltic states stand behind the level of the EU by main indicators of intellectual resources and information technologies. So their perspective development strategies, according to the Copenhagen aims, have to be accelerated for overcome the retardation. This is one of impor-

tant preconditions for the competitive ability of all EU. Some more problematic directions and priority tasks for the expansion of intellectual potential of the new Baltic states are attempted to identify.

3. The Copenhagen strategic aims and Lisbon objectives were formulated without necessary analytical economic calculations so their inconsistency with perspective political programs of the EU and distribution of financial funds is obvious. The urgent task is the legislative validation of the renewed *system* of the statistical indicators of intellectual capital, more exact and realistic determination of perspective tasks for the development of the EU intellectual potential as a most competitive factor of economic growth. It is necessary to integrate the more important estimates of intellectual resources and IC into national social accounts.

4. The primary task for the EU at 2010–2015, first of all, is do not diminish its intellectual and productive competitiveness comparing with the productive (and intellectual, in particular) potential of the US, China and Japan superpowers as it happen in previous 1995–2005. In this aspect it is important to ameliorate the subordination, with account of the perspective development, of the solutions of the EU for the social support, esp. of rural inhabitants, on the one side, and support for the intellectual resources, on the other.

References

1. Andriessen D. G., Stammba C. G. 2004. *The Intellectual Capital of the European Union / Measuring the Lisbon Agenda*. <http://www.intellectualcapital.nl/artikelen/ ICofEU 2004.pdf>.
2. *Indicators for the Information Society in the Baltic Region* 2005. Nordic Council of Ministers. Copenhagen. <http://www.norden.org/pub/uddannelse/IT/TN2005577.pdf>.
3. *The Intellectual Capital of the European Union. Measuring the Lisbon agenda*. In: Holland University, Version 2004. <www.intellectualcapital.nl/artikelen/ICofEU2004.pdf>.
4. *Intellectual Capital for Communities in the Knowledge Economy: Nations, Regions, Cities and Emerging Communities* (2005, 2006). World Bank Conferences.
5. *Knowledge for Development* (K2D), WB Group, 2006. <http://web.worldbank.org/wbsite/external/wbi/wbiprograms>.
6. *Measuring Intellectual Capital at Skandia Group (FPM)*. <www.fpm.com/script/UK/Jun93/930602.htm>.
7. Mitchell, S. W. 2000. *Is a company's intellectual capital performance and intellectual capital disclosure practices related*? Evidence from publicly listed companies from the FTSE 100. University of Calgary. <www.vaic-on.net/downloads/Paper1.pdf>.
8. Roos, G. G. 2003. *An Intellectual Capital Primer*. <http://www.euintangibles.net/library/ localfiles/Roos_AnIntellectualCapitalPrimer.PDF>.
9. Sveiby, K.-E. 2004. *Methods for Measuring Intangible Assets*. <http://www.sveiby.com/ Portals/0/articles/IntangibleMethods.htm>

ES KONKURENCINGUMAS INTELEKTINIO KAPITALO PLĖTROS KONTEKSTE

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Santrauka. Straipsnyje siekiama parodyti, kad intelektinio kapitalo (IC) ir jo efektyvumo makroekonominis išmatavimas padeda tiksliau įvertinti struktūrinius makroekonomikos pokyčius, skirtingų ūkio sektorių, regionų bei šalių intelektinių išteklių gamybinį produktyvumą. Pastarasis, matyt, yra nepakankamas, kad būtų įgyvendinti Lisabonos perspektyvos tikslai. Diskutuojama dėl kai kurių kriterijų bei rodiklių sistemos, taikomos vertinant intelektinius išteklius, aspektų bei šių išteklių potencialo naujose Baltijos valstybėse plėtros prioritetinių uždavinių ir probleminių krypčių.

Autorius siūlo patikslinti intelektinės plėtros statistinių rodiklių sistemą bei integruoti reikšmingiausius iš jų į socialinės sąskaitybos nacionalinę sistemą. Atkreiptas dėmesys į tai, kad ES socialinės paramos programos, pavyzdžiui, atsiliekantiems regionams bei kaimo gyventojams, tuo pat metu sulėtina intelektinių išteklių plėtrą. Pateikti ir kiti samprotavimai dėl intelektinio potencialo ekonominės reikšmės ir jo matavimo paradigmos, taip pat dėl profesinės kompetencijos, vadybos patirties ir kitų intelektinio produktyvumo rodiklių. Siekiant ES Lisabonos tikslų, būtina plačiau taikyti skirtingų intelektinės bei socialinės plėtros vertybių metaekonomines suderinamumo metodikas.

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