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Article

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INTELLECTUAL CAPITAL STATEMENT MODEL FOR COUNTIES IN POLAND

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Abstract

The role of intellectual capital as a developmental factor has been constantly growing in both private and public sectors. World literature presents a variety of models for intellectual capital (IC) measurement, but so far IC in local government units such as counties (2nd tier local government unit in Poland) has been non-recognized. The purpose of this paper is to fill in this gap. The authors propose an original IC measurement concept developed on the basis of already existing models. The model was created following an analysis of the results of studies performed in local government units (counties) in Poland. The authors are of the opinion that the model can be used for developing IC measurement models for local government units in other countries.

Keywords: intellectual capital, human capital, organizational capital, relational capital, social capital, intellectual capital model, intellectual capital statement, intellectual city capital, intellectual capital at the level of counties in Poland, intellectual capital at the level of local government in Poland.

JEL Classification: H72, J 11, J 24, M12, M16

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Introduction

World literature offers less than twenty IC reporting models for cities, countries and regions. According to the European Union (UE) classification, cities have the same hierarchy as counties (i.e. NUTS-4 – the EU standard on the nomenclature of statistical territorial units). However, there are no all-inclusive approaches to the NUTS-4 level, i.e. approaches that take into account those counties that are not simultaneously cities.

In Poland, public administration is divided into central government structures and local government structures. The local government administration includes inter alia counties and cities that function as and have the tasks of counties. A county always covers a few municipalities (smaller territorial units, 'gmina' in Polish) and does not necessarily have to be a city. Simultaneously, big cities (due to their significant area and population) may constitute a local government unit in its own right, enjoying the rights of a county. These authors are of the opinion that IC of a county that is not a city and IC of cities enjoying the rights of a county can be measured using the same model. Thus far, IC measurement in counties/cities and publishing its results in annual reports have not been obligatory. Polish counties and cities are obliged to publish annual financial and budget statements. Bearing in mind the global evolution of regulations towards informing stakeholders about corporate social responsibility measures taken by public interest bodies and towards disclosure of information on intangible assets (Directive 2014/95/EU) it is to be expected that a similar obligation will be imposed in the future on public administration bodies as well.

The measurement of IC of a county is possible under a certain set of assumptions. IC is merely a metaphor. There are many metaphors used in social sciences, e.g. "intelligence", "personality", "creativity" etc. These are abstract notions defined by psychologists. Abstract definitions of such knowledge provide a basis for operationalization. The "ideological" foundations for the IC concept are formed by the incompleteness of the description of economic assets based on tangible and financial capital alone. It has been long since the economists and intellectuals pointed out that to fully explain the reasons of economic development in firms' other organizations, it is necessary to take into account the intangible assets related to human intellect.

A successfully developed IC reporting model will create the following opportunities: (1) Creating a ranking of counties based on new, previously ignored criteria; (2) It will contribute to better county management quality through greater transparency; (3) It will make it easier to promote counties, including in particular those whose who perform well, but are not generally recognized as "attractive" but nevertheless, and (4) Improved quality of social capital and – in a longer perspective – also other capitals, through providing residents with information necessary to make voting decisions and to evaluate the performance of local politicians.

The public sector is one of the least addressed spheres in the IC research. Guthrie and Dumay (2015) encourage public sector IC researchers to explore emerging issues alongside the changes in the social, political and economic realities impacting public sector IC in the future. The growing importance of counties (including cities) in the economic landscape requires intensified public sector IC research which is impactful and relevant. The research problem discussed in this paper concerns the applicability of Intellectual Capital measurement frameworks to describe the IC of a county. So far most of regional studies on IC concentrated on countries or regions (e.g. Nakamura, 1999; Bontis, 2004; Chen and Dahlman, 2004; Yeh-Yun Lin and Edvinsson, 2008; Ståhle et al. 2015; Giuliani, 2015) and this paper attempts to fill the void.

This article sets out to develop a county/city IC measurement model, thus filling a gap in world and Polish literature. Such a model will level out the deficiencies resulting from the European Classification at the NUTS-4 level, failing to address the administrative division in EU countries. Therefore, the primary objective of this paper is to analyze the possibility of using global IC measurement concepts in Polish counties and cities with a county status. The paper is based on the knowledge of theory and practice of annual reporting of Polish local government units.

1. Definitions of county intellectual capital

To properly define the IC of counties and cities with a county status, hereinafter referred to as county IC, definitions presented in Polish and international literature were analyzed. Furthermore, the authors reviewed various approaches to the structure of the components of: city/county IC and classical IC concepts. In the course of the analysis, definitions of IC were divided into four groups relating to: IC of a country, IC of a region, IC of a city, and IC of an organization (entity, public office).

For instance, Sánchez (2004; as quoted in Bradley, 1997) defines the **IC of a country** as a potential to transform knowledge and intangible resources into wealth. Edvinsson and Stenfelt (1999) see IC as the value of ideas created thanks to human and structural capital. In the opinion of Malhotra (2000), IC relates to a collection of hidden assets that support the development of a country.

IC of a region is the entirety of unobservable properties and attributes of the region's residents, businesses, institutions, organizations, communities and administrative units who are current and potential sources of improving the region's social wealth and economic growth in the future. IC is the value of concepts/ideas/solutions generated thanks to the joint effect of human and structural capital, whereby it is possible to create and share knowledge (Edvinsson and Stenfelt, 1999). These authors are of the opinion that the definition of the IC of a region is all-inclusive and can serve as a basis for defining the IC of a county and a city with a county status in Poland.

IC of an organization (public administration body, public office) can be defined as the combination of intangible resources and actions that allow such organizations to transform tangible, financial and human resources into a system capable of creating value for stakeholders (European Commission, 2006, p. 10).

Table no. 1 shows various approaches to the structure of county IC using classical concepts presented in international literature.

Table no. 1: Various approaches to the structure of county IC using classical IC concepts

Resource title	Internal components				
Intellectual capital (Edvinsson and Malone, 1997)	Human capital (individual knowledge, professional experience, skills and capabilities, motivation and creativity)	Customer Capital (business partnerships, organizational image)	Organizational Capital (organizational resources, processes, databases)	Renewal & development focus	Financial Focus

Resource title	Internal components				
Knowledge-Based Assets (Sveiby, 1997)	Individual Competence – takes a narrow definition of human capital which excludes administrative personnel. Such approach corresponds with the views of Florida (2002) who defined the creative core of population in his creative class concept.	Internal Structure – includes administrative personnel. Differentiates between the creative core of an organization and auxiliary staff which is not classified as “Human Capital”	External Structure – relates to external links and actors such as clients, suppliers and competitors. In the case of a county it may relate to the relationships with investors, expatriots, central government and foreign partners.	Undefined	Undefined
Intellectual capital (Stewart, 1997)	Human capital (individual knowledge, professional experience, skills and capabilities, motivation and creativity)	Customer capital (business partnerships, organizational image)	Structural capital (organizational resources, processes, databases)	Tangible assets	Financial capital
Knowledge city capital (Carrillo, 2004)	Human capitals - Individual base (ethnic diversity, health, education and learning, socioeconomic) - Collective base (live culture(s), evaluative capacities)	Meta-capitals - Referential (identity; intelligence) - Articulation (relational, financial)	Instrumental capitals - Tangible (geographic, environmental, infrastructural) - Intangible (systems and procedures, information Platform, etc.)	Undefined	Undefined
Intellectual capital (Veda, 2005)	Human capital (knowledge, wisdom, expertise, values of the culture, and philosophy of the city, etc.)	Market capital (national and international contacts, customer-city loyalty, value of brands, etc.)	Process capital (information systems, databases, laboratories, an organizational structure, management focus, etc.)	Renewal and development capital (investment in city's development and research, patents, trademarks, start-ups, etc.)	Undefined
Knowledge – based capital (Schiuma and Lerro, 2008)	Human capital (tacit and explicit knowhow owned individually or collectively by region's stakeholders)	Relational capital (knowledge resources linked to internal and external relationships, established and maintained by regional stakeholders)	Structural capital (infrastructural assets that are tangible in nature but play a fundamental role in the diffusion of knowledge; intellectual property)	Social capital (knowledge assets related to the soft infrastructure including values, culture, behaviours, networking, identity, etc.)	Undefined

Resource title	Internal components				
Creative capital (Cabrita and Cabrita, 2010)	Human assets (talented individuals and creative professionals who work in a wide range of knowledge intensive industries)	Institutional assets (cultural and government institutions that support the integration of culture-related industries into their development strategies)	Organizational assets (assets related to companies, economy and management)	Social assets (relationships established between the governors, individuals and institutions, related to different forms of collaboration)	Physical assets (buildings, museums, gardens, etc.)
City's Intellectual Capital (Uziene, 2013)	Human capital (individual competences, collective competences, community social values)	Structural capital (organizational resource, processes, innovation resource, intellectual property)	Relational capital (community networking, organizations' networking, urban connections)	Undefined	Undefined
Intellectual Capital in regional universities (Secundo et al., 2017)	Human capital Staff is recruited among local academics. Unless the local regulations prohibit 'inbreeding' a large proportion of academic staff are recruited from university's graduates. Good understanding of local context enables quality teaching.	Organisational capital (OC) Organizational capital aims to support that the university can serve the needs of the local community and educational demand by regional economy and specific social needs.	Social capital (SC) Strong local brand usually not recognized beyond the region, serving local communities and business needs	Undefined	Undefined

Source: by the authors, based on: Sveiby, 1997; Stewart, 1997; Uziene, 2013; Secundo et al, 2017.

The concepts proposed by Sveiby (1997), Edvinsson and Malone (1997), and Stewart (1997) presented in Table 1 focus on the measurement of IC in business organizations. These models also have the possibility of applying in IC measurement in local authority areas, towns and municipalities in different regions but require more adequate definitions. The other concepts, namely by Carrillo (2004), Viedma (2005), Schiuma and Lerro (2008), Cabrita and Cabrita (2010), as well as Uziene (2013) only partially rely on the IC factors mentioned in the first three definitions. They include newer approaches to IC measurement of cities and regions and can be used for the development of an IC model for a county.

2. Models of intellectual capital of a city

A literature search performed by the authors provided a basis for identifying globally used IC measurement methodologies and models relating to cities, regions and countries.

Concepts relating to the IC of cities and public sector entities have been proposed by such authors as: Viedma Marti, 2004; Ergazakis et al., 2007; Alfaro Navarro, López Ruiz and Nevado Peña, 2013; Uziene, 2013; PwC, 2014; Fazlagić et al., 2014. Concepts referring to the IC of regions have been developed for instance by: Martins Rodriguez and Viedma Marti, 2006; Sanchez Medina, Melian Goznazles and Garcia Falcon, 2007; Schiuma, Lerro and Carlucci, 2008; Kotenkova and Korablev, 2014; Nitkiewicz, Pachura and Reid, 2014. The last group of analyzed IC measurement models, i.e. those applicable to countries, have been published by such authors as: Edvinsson and Stenfelt, 1999; Malhotra, 2003; Sanchez Medina, Melian Goznazles and Garcia Falcon, 2007; Schiuma, Lerro and Carlucci, 2008; Kotenkova and Korablev, 2014; Nitkiewicz, Pachura and Reid, 2014; Lin and Lin, n.d.

Importantly, apart from city IC the literature also contains the notion of “knowledge city” (e.g.: Ergazakis et al., 2007; Navarro et al., 2013). On the one hand, the concept of city IC measurement should take into account the existing theoretical knowledge on IC measurement, and on the other hand it should address the specific nature of the “measured entity”, i.e. a territorial unit such as a county, a city or an individual authority. To combine these two perspectives one should refer to how a city and its functions are defined today. Ergazakis, Metaxiotis and Psarras (2004) presented the following positive features of modern cities: high quality of life, well-developed infrastructure available for residents, urban design, centralized education strategy, including services and cultural infrastructure, sufficient city size (critical mass) allowing it to compete internationally, presence in cooperation networks and in marketplaces, business-friendly culture, well-functioning public offices, and society open to strangers.

Furthermore, to become a „knowledge city”, in the opinion of Ergazakis et al. (2004) a city should have the following features: internet access for all residents: research excellence, availability of knowledge, instruments to make knowledge accessible to residents, ability to educate and to attract talented people from outside, attracting educated people from other regions, and existence of meeting places for residents.

Many IC measurement models presented in literature describe indicators that can be used to describe IC. For instance, in their report, the experts from PwC (PwC, 2014) listed 10 indicators based on 59 variables. Those variables were selected because they are relevant, cohesive (for the examined sample), generally accessible, up-to-date, unbiased – they do not refer to site-specific parameters and make it possible to reflect on the condition of a city. These variables include: public libraries, students’ performance in mathematics and science, literacy level and participation in primary and secondary education, percentage of people with a degree, position of the city’s universities in global university rankings, innovation indices, intellectual property protection, and business environment.

Table no. 2 presents some examples of city IC indicators proposed by Uziene (2013).

Table no. 2: City Intellectual Capital indicators

Human capital	Structural capital	Relational capital
Individual competences (Individual knowledge, professional experience, skills and capabilities, motivation and creativity, personal qualities)	Organizational resource (urban architecture, administration system, knowledge and information dissemination system)	Community networking (personal connections, social interactions, professional connections, participation in associated structures)

Human capital	Structural capital	Relational capital
Collective competences (collective knowledge, collective professional experience, collective skills and capabilities, propensity to innovation, community qualities)	Process (mass communication mechanisms, market mechanisms, public services and finance mechanisms, transportation system, energy system, education system, population security assurance system, health care system, social values nurturance system)	Organizations' networking (business partnerships, non-profit organizations' involvement, public sector activity, government institutions' activity, clustering activity, clustering activity, organizational image, popularity of goods and services)
Community social values (common values, behavior and habits, culture, attitude towards science and learning, self-esteem and ambitions, urban identity)	Innovation resource (research and development infrastructure, knowledge development and application mechanisms, innovation promotion system, virtual networking) Intellectual property	Urban connections (city partnerships, global awareness, city image, citizens' loyalty, investment attractiveness, environmental development)

Source: by the authors, based on Uziene, 2013

The literature points out to ten creative city domains (Hartley and Potts, 2012, p. 44) that can be taken into account in the county IC measurement model: (1) public and legal framework, (2) uniqueness, diversity, vitality and expression, (3) openness, tolerance and accessibility, (4) entrepreneurship, exploration of resources and innovation, (5) strategic leadership, response to change, vision, (6) talent and learning environment, (7) communication, connections and networking, (8) place and city-forming factors, (9) quality of life and well-being, and (10) professionalism and efficiency.

To conclude, measurement of the IC of counties and cities with a county status in Poland should take into account the mission and functional objectives of the territory of the county /city. IC value should be eventually determined by the degree to which postulates on the quality of life in the city, business activity, natural environment, etc. are satisfied.

3. Research methodology

In 2015 a survey on IC was held in Polish counties and cities with a county status. The survey sample size was 826 respondents. The sample was intentionally selected for the purpose of the survey and consisted of both central and local government officers (from municipal, county and regional (voivodship offices) and other stakeholders representing county residents (e.g. entrepreneurs, teachers). Female respondents (54.7%) slightly outnumbered male respondents (45.3%). The share of both groups in the survey sample is comparable, although government officers slightly outnumber the other group, constituting 59.9% of the entire sample. The two largest shares of the respondents were aged 36-45 (30.3%) and below 36 (27.1%). The respondents represented all sixteen of the Polish regions with the largest response rate from the Warmińsko-Mazurskie region (95.2% of all counties from the region) and the lowest from the Lubuskie region (64.3% of all counties from the region). To obtain the e-mail addresses of prospective informants, the authors researched the websites of all Polish counties was conducted. As a result, they collected a total of 7,000 e-mail addresses were collected. They sent a request to participate in the survey was sent twice to all addresses. The respondents represented 315 out of the 380 Polish counties, 65 of counties (17.1%) did not respond to the survey.

3.1. Survey on IC factors in Poland

The respondents were asked to comment on various factors of importance for their counties' development in the past (2005 to 2015) and in the future (2016 to 2025). Three groups of factors were differentiated: (a) IC-related factors; (b) factors primarily related to tangible infrastructure, or tangible capital; (ab) factors related both to IC and to tangible capital. The survey was used to evaluate the following county development 15 factors (Table no. 3).

Table no. 3. The groups of factors in the survey

Factors	Description
Active local government authorities (a)	Local leaders who take pro-active role, demonstrate entrepreneurial skills, participate in expert networks etc.
Well-developed educational institutions and higher education (a)	An extensive network of educational institutions including primary and secondary schools and higher education institutions provides the supply of talent to the labor market. Additionally, the education sector builds bridges with the cultural institutions thus contributing to the growth of creative industries.
Research and development activities within the county's territory (a)	Local research institutions support clusters of companies and strengthen the competitive advantage of local businesses.
Well educated administration staff (a)	According to Sveiby (1997) administration staff are essential for IC development as they support the core staff.
Involvement and passion of local leaders	This factor relates to the emotional dimension of IC. It can be described as "going the extra mile" attitude which characterizes those leaders who fight bureaucracy (see: Rieger 2010).
High level of social activity of local residents (a)	Relates to civic participation, voluntary activities. Closely interlinked with the social capital in the local community.
Attractive cultural and entertainment options (a)	They increase the quality of life and help the local economy by attracting tourism.
Well-educated residents (a)	Well educated residents create demand for knowledge-intensive services, attract high-end investors,
Good quality of natural environment (b)	Factors such as air quality or access to clean water have a strong impact on the quality of life and investment attractiveness, for example in Poland, air pollution in Krakow poses a significant danger to human health and life and may in the long term.
Accessibility (b)	Good road, railway and air connections are crucial for socio-economic development. Although Accessibility is explained by such elements of physical infrastructure as railway stations, airports, motorways etc., they have direct impact on the development of intellectual capital.
Existence of tourist attractions (b)	Tourist attractions are elements of physical capital but it is the services which they offer which provide real added value. Tourist attractions are very often used to build customer capital and the image of a county (e.g. the Eiffel Tower, The Statue of Liberty to name just a few).
Location in the proximity of a metropolitan area (b)	Counties located in the proximity of large metropolitan areas gain benefits from the infrastructure and other forms of capital in the centre. Such situation is described in economics as the free-rider problem. It occurs when those who benefit from resources, public goods, or services do not pay for them (Venugopal 2005).
Proximity to Warsaw (the capital of Poland) (b)	In some countries, including Poland, France, Russia, Austria or Poland the dominance of the capital city overshadows other cities. The centralization of government structures gives additional benefits to all players locating their activities in, or nearby the country capital.

Factors	Description
Existence of one or more successful large companies (ab)	Some regional economies are strongly dependant on the fate of one or a few local companies which are major sources of tax revenues and innovation. The positive spill-over effects often mitigate the risks ensuing from the dependence on one single local employer.
Large number of small and medium enterprises (ab)	The diversification of local economy is a positive factor which can provide shelter against business cycle wage shocks.

4. Results of research

4.1. Key factors to importance for counties' development in the years 2005-2015 and 2016-2025

Out of the five factors of key importance for county development in the past (2005-2015) reported by the respondents (government officers and other respondents alike), three factors were related to tangible capital (group b), one was related to IC (group a), and one factor was related to both capitals (group ab). In the respondents' opinion, the following indicators (>20%) were the most important for counties' development in the past: Active local government authorities (a) – 38,6%, Good quality of natural environment (b) – 38,6%, Accessibility (b) – 35,5%, Existence of tourist attractions (b) – 34,1%, Large number of small and medium enterprises (ab) – 31%, Well-developed educational institutions and higher education (a) – 30,6%, Location in the proximity of a metropolitan area (b) – 27%, Existence of one or more successful large companies (ab) – 26,5%, Involvement and passion of local leaders (a) – 24,6%, High level of social activity of local residents (a) – 23%, Attractive cultural and entertainment options (a) – 22,2%, Well-educated residents (a) – 21,7%, and High level of competence of local government officers (a) – 21,2%

As for the future (2016-2025), most respondents reported that the following factors (>20%) will be the most important for counties' development: Active local government authorities (a) – 45,9%, Accessibility (b) – 41,4%, Large number of small and medium enterprises (ab) – 35,4%, Existence of tourist attractions (b) – 33,5%, Good quality of natural environment (b) – 33,1%, Involvement and passion of local leaders (a) – 29,2%, Well-developed educational institutions and higher education (a) – 27,8%, High level of social activity of local residents (a) – 27,7%, Well-educated residents (a) – 26,5%, Existence of one or more successful large companies (ab) – 25,5%, Attractive cultural and entertainment options (a) – 22,2%, Location in the proximity of a metropolitan area (b) – 22%, High level of competence of local government officers (a) – 21,2%, and Research and development activities within the county's territory (a) – 20,9%.

Table no. 4 presents the ranking of key factors to importance for counties' development in the past and future.

The quantitative study is in line with the expectations. Key factor ranking to importance for counties' development in the past and future is "Active local government authorities". This is the key factor of Intellectual Capital, which can be assessed on the basis of such Human Capital factors as: (1) loyalty, creativity and leadership skills of politicians' and public officers'; and (2) loyalty and creativity of local residents.

**Table no 4: Key factors ranking to importance for counties' development
in the past and future**

Position	Key factors in the past (years: 2005-2015)	Position	Key factors in the future (years: 2016-2025)
1	Active local government authorities (a)	1	Active local government authorities (a)
2	Good quality of natural environment (b)	2	Accessibility (b)
3	Accessibility (b)	3	Large number of small and medium enterprises (ab)
4	Existence of tourist attractions (b)	4	Existence of tourist attractions (b)
5	Large number of small and medium enterprises (ab)	5	Good quality of natural environment (b)

One of the unique characteristics of IC in counties is that it consists both of private and public goods. The measurement approaches should take under consideration the fact that many components of a county's IC can and should be used simultaneously by many actors: companies, NGOs, local citizens etc. Thus a useful conceptual framework to explain IC of a county is Bioeconomics.

Contrary to neoclassical production theory, Georgescu-Roegen (1971) identifies nature as the exclusive primary source of all factors of production and argues that man's economic struggle to work and earn a livelihood is largely a continuation and extension of his biological struggle to sustain life and survive. Attempts to radically change the distribution of access to material resources in society are causes to imbalances. The natural resources flow through the county economy and end up as waste and pollution. Georgescu takes a different stance towards the production function: the resources flow through the economy, being transformed and manufactured into goods along the way; and invaluable waste and pollution ('high entropy') eventually were accumulating by the output end. The application of Bioeconomics to the valorization of IC offers new opportunities to respond to the new economic imperatives. Georgescu's social theory can be used to explain the development of IC as the continuation of man's economic struggle to work and earn a livelihood which is an extension of his biological struggle to sustain life and survive.

4.2. The quality of leadership in respective counties

The respondents were also asked to comment on the quality of leadership in their respective counties. They were asked to comment on the current Mayor/Starost (county's governor). Out of a total of 12 Likert scale statements, 10 were positive: (1) Residents trust him/her, (2) Adequately represents the county at the national level, (3) Supports authors of innovative ideas, (4) Fights xenophobia and hostility towards minorities, (5) Supports trust-building among residents, (6) Cooperates with other counties, (7) Takes care of entrepreneurial growth, (8) Is a competent leader, (9) Can cooperate well with municipalities forming the county/surrounding the city and (10) Supports the cooperation of local government authorities with non-governmental organizations, as well as 2 were negative: (1) Usually takes care exclusively of the interests of selected people and institutions and (2) Avoids taking important but unpopular decisions. Most people agreed with the following positive opinions about Mayors/Starosts: cooperates with other counties (62.5%); can cooperate well with municipalities forming the county/surrounding the city (61.8%); supports the cooperation of local government authorities with non-governmental organizations (63.0%).

The percentages of respondents agreeing with the negative statements (“usually takes care exclusively of the interests of selected people and institutions” and “avoids taking important but unpopular decisions”) were relatively low, amounting to 32.3% and 31.2%, respectively. The respondents were also asked for an opinion about the perspectives offered by their counties to entrepreneurs and talented people. The answers allow one to evaluate the local climate for entrepreneurship. The respondents spoke on whether: Well-educated and creative residents can develop their talents; A motivated and innovative entrepreneur is highly likely to succeed; Local government is supportive to entrepreneurs; Foreigners starting a business in a city with a county status/county would not face any antagonism or hostility; Well-educated and creative residents do not move out of the city/county searching for better development perspectives elsewhere; All entrepreneurs have equal opportunities for success.

Most respondents (as much as 66.7%) agreed with the statement that a motivated and innovative entrepreneur was highly likely to succeed in their county. This statement was followed closely by a view that local government was supportive to entrepreneurs (65.6%). There were far fewer respondents claiming that well-educated and creative residents do not move out of the city/county searching for better development perspectives elsewhere (22.3%).

The survey confirmed that the climate for entrepreneurship in the county grows in line with the growth of preferences for IC factors both in the past and in the future. The stronger the preferences for IC factor in the future, the more conducive the climate for entrepreneurship growth. Building entrepreneurship in the county requires more emphasis to be put on the growth of IC factors. The survey helped the authors to determine a number of key assumptions for constructing a county IC model.

5. Definition, components and assumptions for the Polish county IC model – authors' proposal

For the purpose of this paper, the IC of a county or a city with county rights can be defined as the ability to generate social, organizational and product innovation and value and to improve the quality of life in a county/city by people (local residents), social organizations, institutions, business enterprises and public administration bodies. Value creation simultaneously means economic growth in the region. The all-inclusive IC structure division proposed by J.M. Viedma Marti and other authors can be applied to county /city IC model, i.e. division into: human capital, process capital, market capital as well as renewal and development capital.

These authors are of the opinion that in this model the Polish county IC structure can be formed by the following components: (1) human capital – qualifications, skills and personal features of county/city residents; (2) structural (process, organizational) capital – infrastructure, IT systems, databases, organizational and management structures; (3) relational (market) capital – services offered to residents, entrepreneurship level and conditions for investors, competitive advantage over neighboring counties/cities; and (4) renewal and development capital – educated people come back after graduation, new businesses and investors are attracted (unless this capital is a component of the first three components).

These authors are of the opinion that county IC should be analyzed from two perspectives:

- *Macroeconomic perspective*, consisting of two layers a:
 - Top-down – a county is seen as an entity competing with other counties for resources, including residents, investments, tourists, talent, projects, etc.
 - Bottom-up – a county is looked at as an area of interwoven categories (e.g. education, transport, public services, culture) and people operating in these areas (e.g. teachers, transport companies' staff, public officers, artists). On the basis of their actions, features and behaviors a holistic picture of city/county IC is created;
- *Microeconomic perspective* – a county is analyzed from the point of view of the quality of performance of public finance sector entities operating in its territory (i.e. staff competence; organizational, technical and communication infrastructure of public bodies; relationships between authorities and stakeholders).

An IC structure that is much more adequate for the essence of the measured entity was presented in the Polish Intellectual Capital Report (2008). The Report looks at IC measurements from a generative perspective, i.e. one that makes it possible to assess Poland's development potential connected with individual human generations. This approach is by all means reasonable and adequate for the measured entity. A country is made of people – birth and death are indispensable elements of the dynamic nature of a country's intellectual capital. A business enterprise may only dismiss or employ a new person. A country does not choose its residents; it is the residents who form the national community. This way of thinking about Poland's intellectual capital can be used at the county level subject to the following considerations:

- A country is bound by international laws (and a county is not);
- Borders of a country do not change (except through war, etc.);
- Migrations within a country basically do not change its intellectual capital – in fact, they tend to cause a better use of existing human capital. Meanwhile, emigration out of a county means a change of intellectual capital (not necessarily a reduction, for instance if the emigrant is a criminal);
- Only a small share of all tax revenues collected from residents is retained in county budgets. Key beneficiaries of tax revenues from county residents and businesses are the state budget (e.g. VAT) and budgets of municipalities;
- Greater relative weight of one-off events for the intellectual capital of counties; for instance, the Polish scientists who decrypted the Enigma code are a heritage of the entire country (i.e. 379 counties), but in fact they owe their discovery not to "entire Poland" but to the intellectual community of the University of Poznań (they also make the historical intellectual capital of the city and county of Poznań). Similarly, Copernicus was both a "Pole" and a former citizen of Toruń, etc. Other examples of one-off events include various kinds of festivals (e.g. International Festival of Highland Folklore in Zakopane);
- The intellectual capital of a county is significantly affected by decisions taken by external authorities, e.g. location of Copernicus Science Centre in Warsaw or National Science Centre in Krakow; on the other hand, delays in the construction of Nowy Tomyśl-

Świecko highway (highway connecting Poznań and Berlin) made Wrocław relatively more attractive to investors at a time when many new international investments were pouring in to Poland.

Human capital (Who?)

The intellectual capital of a county or a city with a county status can be broken down by various criteria. The key division of this capital by age can differentiate between three age groups: (1) young people in the pre-working age, (2) working population, aged 16-64, (3) older people, aged 65+. Human capital can also be broken down by specializations at the county level. From this perspective, the following key groups should be differentiated: public officers, teachers, R&D staff (scientists, researchers), entrepreneurs (also social entrepreneurs?), people working for culture, volunteers, others. Human capital is not owned by the county/city, but by its residents.

These authors are of the opinion that human capital in a county/city should be considered in a: (1) macroeconomic scale, as human capital in the entire county/city territory; and (2) microeconomic scale, as human capital in a given public finance entity in the county and the county office; it is particularly important because this particular capital sets directions and manages the county, its investments, development and renewal.

Organizational capital (What? By what means? In what way?)

The structural capital of a county or a city with a county status should also be considered in a: (1) macroeconomic scale (i.e. tangible capital and investments as well as access, all over the territory) to infrastructure, public services, IT systems, databases about the region and its services available to residents and visitors; organizational and management structures); and (2) microeconomic scale, i.e. structural capital in each individual public office, including in particular investments in and management of infrastructure, IT systems, databases, as well as internal organizational and management structures.

The development and renewal level of structural capital depends on the human and financial capital of the county /city, including public funds generated and retained in the local budget as well as subsidies from the state budget.

Relational capital (How and with whom?)

The structural capital of a county or a city with county rights should also be considered in a: (1) macroeconomic scale, including first of all services available to residents in the area, resident-friendliness, policy towards entrepreneurs and definition of conditions for investors; competitive advantage over neighboring counties/cities; (2) microeconomic scale, i.e. a capital generated in individual public offices in the form of relations with external actors, including in particular each office's image, friendliness to various groups of stakeholders: residents, external stakeholders (e.g. politicians), external investors (e.g. from the Business Process Outsourcing industry), and entrepreneurs from the region, tourists, etc; and (3) the development and renewal level of relational capital is affected by human, structural and financial capital of the county/city, including public funds generated and retained in the local budget as well as subsidies from the state budget.

If development and renewal capital is to be analyzed as a separate IC component, then it would also have to be seen from macro and micro perspectives, i.e. separately for the entire county/city territory and separately for individual public offices. However, this particular

capital cannot be isolated out of human, structural and relational capital. All these components are somehow interconnected and their joint action has an effect on the ultimate performance level and accomplishment of county/city objectives.

Importantly, one of the characteristic features of a county/city's IC is mutual synergies influencing IC, the tangible capital (TC) and financial capital (FC). While in the theory of IC of organizations some authors insist on the separateness of the individual types of capital, in the case of counties, attention should also be paid to those mutual synergies and to the inseparable nature of all types of capital. For instance, roads and the related physical accessibility (TC) enable the mobility of human capital. School facilities such as buildings (TC) should also support the development of human capital (IC). In their turn, cultural events (IC) can be both a cost suffered by local governments or private companies, and a source of revenues (FC) and can contribute to building a better image of the county (IC). Cultural events usually require some infrastructure, such as a concert hall or exhibition area (TC). It is a great dilemma how to ensure an optimum balance between investments and individual capital types. It is equally important to discover and strengthen positive feedback between how much is spent (FC) on IC and TC (see also: Fazlagić, 2016).

6. The Model of Intellectual Capital Statement Model for Counties in Poland

As previously mentioned, most of the current IC measurement models and methodologies are based on a certain set of quantitative and qualitative indicators. In this article, the authors propose a number of key IC measurement factors in each of the perspectives presented above. All indicators are defined and appropriate units of measurement are proposed. Table no. 5 presents indicators for the measurement of IC in counties or cities with county rights in a macroeconomic perspective.

**Table no. 5: Examples of county IC measurement indicators
in a macroeconomic perspective**

IC indica tor	Indicator name	Definition	Unit of measure -ment
Human capital			
HC-1	Education and qualifications	Level of education in the region, secondary school final examination success rate, number of university students, unique qualifications of specialists and experts in the region	scale 1 to 5, 1 to 10, %, number
HC-2	Loyalty	Residents', politicians' and public officers' identification with the county, its objectives and achievements; sense of responsibility for the region's development	scale 1 to 5, 1 to 10
HC-3	Creativity	Residents', politicians' and public officers' openness to new challenges/tasks, investments in the region; self-sufficiency of authorities in attracting new funds	scale 1 to 5, 1 to 10
HC-4	Leadership skills of regional development and policy creators	Trustworthiness of politicians; ability to ensure citizens' security in such aspects as economy, natural environment, or terrorism; ability to communicate and efficiently implement the region's strategy	scale 1 to 5, 1 to 10
HC-5	Leadership skills of research and development activities within the county's territory	Ability to efficiently implement the region's strategy	scale 1 to 5, 1 to 10

IC indicator	Indicator name	Definition	Unit of measurement
Organizational capital			
OC-1	Databases about the region	Collection of files relating to the region	yes/no, number
OC-2	Bringing databases up-to-date	Bringing region's databases up-to-date and making them genuinely accessible	yes/no
OC-3	Investments; beneficiaries of regional investments and services available in the region	Number of initiated, progressing an completed investment projects of regional importance. Clients of completed investment projects	Number
OC-4	IT systems in the region	IT systems coefficient	%
OC-5	Unique resources of the region	E.g. resources for tourism, natural resources	
OC-6	Competitiveness of the region	E.g. good climate for entrepreneurship	
OC-7	Market of training services for specialists	Existence and development of educational resources; vocational schools, secondary schools, universities, training centers, adaptation to the needs of regional employers	scale 1 to 5, 1 to 10
OC-8	Research and development activities within the county's territory	Ability to efficiently implement the region's strategy	scale 1 to 5, 1 to 10
Relational capital			
RC-1	Access for employers to the labor market / to competent employees / specialists / experts in the region	Need for qualified employees and seasonal workers	
RC-2	Relationships with clients (from clients' perspective)	Types of clients: residents, entrepreneurs, institutions, employees. Relations with former, current and potential clients.	
RC-3	Relationships of public offices with other public institutions	Relationships with public institutions (offices), ministries, international organizations (including external communication, public relations, press relations, supporting regional activity).	%
RC-4	Relationships between public offices and banks/investors	Availability of financial capital. Entirety of relationships with investors	
RC-5	Competitiveness	E.g. tourism, clusters	

Source: by the authors based on Szczepankiewicz, 2011a, 2011b, 2012a, 2012b, 2013a, 2013b

The proposal of HC1 in Table 5 in a macroeconomic perspective is closely related to the fact that the important factor identified by the respondents of the quantitative study for the future development of the counties was: (1) "Well-developed educational institutions and higher education (a)" and (2) "Well-educated residents (a)". The proposal of HC2, HC3 and HC4 (Loyalty, Creativity and Leadership Skills of politicians' and public officers') is closely related to the fact that the most important factor identified by the respondents of the quantitative study for the future development of the counties was the active involvement of local authorities – the factor of Table 4: "Active local government authorities (a)". The proposal of HC2 and HC3 (Loyalty and Creativity of local residents) in a macroeconomic perspective is closely related to the fact that the important factor identified by the respondents of the quantitative study for the future development of the counties was e.g.: (1) "Involvement and passion of local leaders (a)" and (2) "High level of social activity of local residents (a)". The HC2 and HC3 (Loyalty and Creativity of local residents) is also closely related to the fact that the most important factor identified by the respondents of the quantitative study for the future development of the counties was the active involvement of local authorities (the factor of Table 4: "Active local government authorities (a)"). The proposal of HC5 in Table 5 is closely related to the fact that the important factor identified

by the respondents of the quantitative study for the future development of the counties was "Research and development activities within the county's territory (a)".

In a microeconomic perspective, county IC can be measured by means of a classical set of indicators presented in Table no. 6. The key factors proposed by Sveiby (1997), Edvinsson and Malone (1997), Stewart (1997) and other authors regarding the IC in organizations were used here. The factor definitions in Table 6 have been adapted to the needs of public administration bodies (public offices) in counties. The authors assumed that each indicator can be further broken down into more detailed, region-specific indicators for a given county/city and a given public office. Therefore, indicators for a county office will differ from those for a small local government budget entity. The starost of a given county should decide on the choice of the most adequate indicators for IC measurement in the county/city, because the county will ultimately use those indicators for IC management in the region. Likewise, the management of a given entity should determine the choice of the most adequate indicators for IC measurement in that entity, because the purpose of such indicators is to assist the management in IC management in the entity.

The model of IC measurement in a county/city and in a public entity serves the purpose of determining planned indicator values and then measuring the actual performance for three IC components. In this model, the actual value of a given indicator is compared against its planned value. Subsequently, the performance is calculated (e.g. as a percentage) and potential for improvement is determined. The ultimate goal is to reach the originally planned value. The next step in applying this model in practice, after determination of indicators for human, organizational and relational capital, involves definition and then detailed analysis of: (1) weaknesses of the county/city/administrative entity that must be addressed by the management (i.e. analysis of the indicators with the greatest potential for improvement); and (2) strengths of the county/city/administrative entity (indicators with little potential for improvement that do not need to be addressed). The other indicators should be monitored and their underlying areas should be regularly managed.

A comprehensive collection and analysis of IC indicators covering human, organizational and relational capital also points out to desired future behaviors of a county, a city or an administrative entity. These authors are of the opinion that such analysis should be regularly repeated at certain intervals (e.g. once a year).

Table no. 6: Examples of IC measurement indicators in a microeconomic perspective, i.e. with regard to public administration bodies (public offices) in counties

IC indicator	Indicator name	Definition	Unit of measurement
Human capital			
HC-1	Qualifications and experience	Practical skills of employees acquired internally and externally, professional training, internal training, in particular indicators presenting: professional experience, number of employees with a degree, cost of training, multi-skilled employees	yes/no years of experience, %
HC-2	Interpersonal skills	Team working skills, ability to work under time pressure, negotiation skills, customer service skills	yes/no
HC-3	Self-sufficiency	Versatile knowledge, self-sufficiency, resourcefulness, problem-solving skills, ability to manage crises and reach a compromise,	scale 1 to 5, 1 to 10
HC-4	Loyalty	Identification with the entity, its objectives and achievements, sense of responsibility for the implementing tasks and taking decisions	scale 1 to 5, 1 to 10

IC indicator	Indicator name	Definition	Unit of measurement
HC-5	Creativity	Openness to new challenges / tasks, unassisted development of performance improvement tools	scale 1 to 5, 1 to 10
HC-6	Leadership skills	Trustworthiness, ability to ensure team's security, ability to manage, delegates tasks and motivate employees, to develop a vision and a strategy of the entity's development; ability to communicate and implement vision and strategy; negotiation skills	scale 1 to 5, 1 to 10
Organizational capital			
OC-1	Technical equipment	Each workstation equipped with a PC, software, availability of modern office equipment, servers, IT network, intranet, company cars.	yes/no
OC-2	Bringing databases up-to-date	Bringing up-to-date databases about stakeholders, employees (professional experience, actual availability) and about the entity's operation	yes/no
OC-3	Completed projects	Employees as stakeholders of completed organizational and investment projects	number
OC-4	Adaptation of organizational structure and internal processes	Permanent organizational structure: entity manager, county council, administration, finance, legal department. Internal procedures: procedure specification, description of responsibilities, assignment of responsibilities. Fixed parts of the structure: e.g. number of existing procedures that clearly define administrative processes, employee evaluation program, public finance management system, project accounting system. Variable organizational structure: operating structure adapted to the services provided. Flexibility of organizational structures for the management of ordered services.	Scale 1 to 10, %, number
OC-5	Organizational culture	Transparent rules of cooperation with clients, employees and business partners. A set of rules for employees („dos and don'ts") / code of ethics. Rigorous adherence to rules and procedures. Exchange of information between departments, transfer of specific knowledge among job positions, internal training system, working climate – information exchange pathways, staff's customary behaviors	yes/no
Relational capital			
RC-1	Access to job market / competent employees	Need for qualified employees, specialists, experts. Training and development of specialists.	yes/no
RC-2	Relations with the entity's clients	Types of clients: county residents, entrepreneurs, employees. Relations with former, current and potential clients.	scale 1 to 5, 1 to 10
RC-3	Relations with other public institutions	Relations with public institutions (offices), ministries, international organizations (including external communication, public relations, press relations, supporting regional activity).	scale 1 to 5, 1 to 10
RC-4	Relations with banks/investors	Ease of attracting capital. Entirety of relationships with investors and authorities managing EU funds	scale 1 to 5, 1 to 10
RC-5	Image	A professional entity capable of securing EU funding, cooperating with entrepreneurs, implementing public-private partnership agreements. employees see it as a friendly organization – opinion expressed by employees, clients, business partners and subcontractors. Building a sense of security	scale 1 to 5, 1 to 10
RC-6	Relations with other public offices	Access to knowledge, active exchange of knowledge and experience, transfer of best practices and actions.	scale 1 to 5, 1 to 10
RC-7	Relations with suppliers	Relations with former, current and potential suppliers. Entirety of relations with cooperating partners and subcontractors in public investments.	scale 1 to 5, 1 to 10
RC-8	Relations with universities	Access to knowledge, active exchange of knowledge and experience, transfer of best practices and actions.	scale 1 to 5, 1 to 10

Source: by the authors based on Szczepankiewicz, 2011a, 2011b, 2012a, 2012b, 2013a, 2013b

Each subsequent analysis will allow for a comparison against historical data, thus making it possible to analyze trends in the achievement of the planned values. The model offers an excellent view of those IC components that have the greatest potential for improvement, as well as those that need to be further developed, or stabilized and analyzed. Therefore, the starost/entity manager gains the most comprehensive insight into what actions need to be taken in different IC areas in order to enable the achievement of goals defined by the management. The authors are of the opinion that the model presented here can be used for the benchmarking of IC of all counties and cities with county rights, as well as individual public administration entities. The model can be used in all public sector entities in Poland, at the level of both central and local government.

Conclusions

Counties, cities and local government entities (public offices) that make attempts at measuring IC enjoy a number of benefits. The key benefit is that the very preparation for IC reporting requires rearrangement, unification and possibly improvement of county city/entity management in this particular area.

The proposed county/city IC measurement model filling a gap in world and Polish literature. Such a model will level out the deficiencies resulting from the European Classification at the NUTS-4 level, failing to address the administrative division in EU countries. IC statement can also be an excellent public relations and marketing tool for the county /city/entity. It can contribute to its development and attract IC to the region. Easier access to capital is another important benefit, because IC statements can make its author more trustworthy for creditors and investors. The proposed model for measuring the IC of a county is based on the assumption that previously developer frameworks are not fully adequate to explain the specificity of a region's intangible assets. Specifically, the co-existence of public and private goods makes the IC of a county distinct from the IC of a business organization, as the IC in business organizations is predominantly a private good. On the other hand the Bioeconomics perspective explains that the carrying capacity of the earth is decreasing as earth's finite stock of material resources is being extracted and put to use; but on the other hand. The same can be said of IC, which, though intangible, relies on the supply of material capital, e.g., the mobility of human capital depends on good transportation networks, the structural capital components depend on the supply of energy (derived from natural resources) and other factors.

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References

Alfaro Navarro, J.L., López Ruiz, V.R. and Nevado Peña, D., 2013. A Theoretical Intellectual Capital Model Applied to Cities. *Amfiteatru Economic*, 15(34), pp. 455-468.

- Alfaro Navarro, J.L., López Ruiz, V.R. and Nevado Peña, D., 2011. Estimation of intellectual capital in the European Union using a knowledge model. *Zb. rad. Ekon. fak. Rij*, 29(1), pp. 109-132.
- Bontis, N., 2004. National Intellectual Capital Index: A United Nations initiative for the Arab region. *Journal of Intellectual Capital*, 5(1), pp. 13-39.
- Chen, H.C. and Dahlman, C., 2004. *Knowledge and Development: A Cross-Section Approach*. Working Paper No. 3366. World Bank Policy Research.
- Edvinsson, L. and Stenfelt, C., 1999. Intellectual capital of nations – for future wealth creation. *Journal of Human Resource Costing and Accounting*, 4(1), pp. 21-33.
- Ergazakis, K., Metaxiotis, K., Psarras, J. and Askounis, D., 2007. An integrated decision support model for a knowledge city's strategy formulation. *Journal of Knowledge Management*, 11(5), pp. 65-86.
- Fazlagić, J. and Erkol, A., 2016. *Images of Intellectual Capital*. Cambridge: Cambridge Scholars.
- Florida, R., 2002. Bohemia and Economic Geography. *Journal of Economic Geography*, 2, pp. 55-71.
- Georgescu-Roegen, N., 1971. *The Entropy Law and the Economic Process*. Boston: Harvard University Press.
- Giuliani, M., 2015. Rome wasn't built in a day ... reflecting on time, intellectual capital and intellectual liabilities. *Journal of Intellectual Capital*, 16(1), pp. 2-19.
- Guthrie, J. and Dumay, J., 2015. New frontiers in the use of intellectual capital in the public sector. *Journal of Intellectual Capital*, 16(2), pp. 258-266.
- Hartley, J. and Potts, J., 2012. *CCI Creative City Index 2012*. [online] Available at: <<http://www.cci.edu.au/sites/default/files/CCI%20Creative%20City%20Index%202012%20Final%20Report.pdf>> [Accessed 20 August 2014].
- Hervas-Oliver, J.L. and Dalmau-Porta, J.I., 2007. Which IC components explain national IC stocks?. *Journal of Intellectual Capital*, 8(3), pp. 444-469.
- Kotenkova, S. and Korablev, M., 2014. Evaluation of Intellectual Capital in Regions of Volga Federal District of Russian Federation. *Procedia Economics and Finance*, 14, pp. 342-348.
- Labra, R. and Sánchez, M.P., 2013. National Intellectual Capital Assessment Models: A literature review. *Journal of Intellectual Capital*, 14 (4), pp. 582-607.
- Leitner, K.-H., Curaj, A., Elena-Perez, S., Fazlagić, J., Kalemis, K., Martinaitis, Z., Secundo, G., Sicilia, M.-A. and Zaksa, K., 2014. *A Strategic Approach for Intellectual Capital Management in European Universities. Guidelines for Implementation*. Bucharest: UEFISCDI.
- López Ruiz, V.R., Nevado Peña, D., Alfaro Navarro, J.L., Badea, L., Grigorescu, A. and Voinea, L., 2011. Measurement of national non-visible wealth through intellectual capital. *Romanian Journal of Economic Forecasting*, 3, pp. 200-212.
- López-Ruiz, V.R., Alfaro Navarro, J.L. and Nevado-Peña, D., 2014. Knowledge-city index construction: An intellectual capital perspective. *Expert Systems with Applications*, 41(12), pp. 5560-5572.

- Malhotra, Y., 2003. *Measuring knowledge assets of a nation: knowledge systems for development*. Research Papers prepared for the Invited Keynote Presentation at meeting „Knowledge Systems for Development”.
- Martins Rodriguez, B. and Viedma Martí, J.M., 2006. The region's intellectual capital benchmarking system: enabling economic growth through evaluation. *Journal of Knowledge Management*, 10(5), pp. 41-54.
- Nakamura, L., 1999. Intangibles: what put the new in the new economy?. *Federal Reserve Bank of Philadelphia, Business Review*. July/August iss., pp. 3-16.
- Nitkiewicz, T., Reid, N. and Pachura, P., 2014. An Appraisal of Regional Intellectual Capital Performance Using Data Envelopment Analysis. *Applied Geography*, 53, pp. 246-257.
- PwC, 2014. *Cities of Opportunity 6*. [online] Available at: <<https://www.pwccn.com/en/cities-of-opportunity/cities-of-opportunity-6.pdf>> [Accessed 4 February 2018]
- Raport o kapitale intelektualnym Polski, 2008. *Raport o kapitale intelektualnym Polski*. [online] Warszawa. Available at: <http://kramarz.pl/Raport_2008_Kapital_Intelektualny_Polski.pdf> [Accessed 4 February 2018].
- Rieger, T., 2010. How to Fight Bureaucracy. *Gallup Business Journal*. [online] December 8. Available at: <<https://news.gallup.com/businessjournal/145085/fight-bureaucracy.aspx>> [Accessed 4 February 2018]
- Rószkiewicz, M. and Węziak-Białowolska, D., 2008. Pomiar i modelowanie kapitału intelektualnego regionu na przykładzie Polski. *Gospodarka Narodowa*, 10, pp. 45-67.
- Ruiz, V., Nevado Peña, D., Navarro, J. and Grigorescu, A., 2014. Human Development European City Index: Methodology And Results. *Romanian Journal of Economic Forecasting*, XVII(3), pp. 72-87.
- Sanchez Medina, A.J., Melian Gonzales, A. and Garcia Falcon, J.M., 2007. Intellectual capital and sustainable development on islands: an application to the case of Gran Canaria. *Regional Studies*, 41(4), pp. 473-487.
- Schiuma, G., Lerro, A. and Carlucci, D., 2008. The Knoware Tree and the Regional Intellectual Capital Index: An Assessment within Italy. *Journal of Intellectual Capital*, 9(2), pp. 283-300.
- Secundo, G., Perez, S.E., Martinaitis, Z. and Leitner, K.-H., 2017. An Intellectual Capital framework to measure universities' third mission activities. *Technological Forecasting & Social Change*, 123, pp. 229-239.
- Seleim, A. and Bontis, N., 2013. National intellectual capital and economic performance: Empirical evidence from developing countries. *Knowledge and Process Management*, 20(3), pp. 31-140.
- Stähle, P., Stähle, S. and Lin, C.Y.Y., 2015. Intangibles and national economic wealth – a new perspective on how they are linked. *Journal of Intellectual Capital*, 16(1), pp. 20-57.
- Stewart, T.A., 1997. *Intellectual Capital: The New Wealth of Organizations*. New York: Doubleday.
- Sveiby, K.E., 1997. Intangible assets monitor. *Journal of Human Resources Costing and Accounting*, 2(1), pp. 73-97.
- Szczepankiewicz, E.I., 2011a. *Definitions and Selected Aspects of Measuring and Improving Social Capital in Organisations* [online] Available at: <<http://static.epnp.pl/>>

- public/images_repository/pliki_uczelni/0189/spis_tresci/A06001_social_aspects_spis_tresci.pdf> [Accessed 14 April 2015].
- Szczepankiewicz, E.I., 2011b. The use of InCaS model for estimating the value of intellectual capital within an organization. *Management*, [online] 15(2/2011), pp. 183-197. Available at: <<https://yadda.icm.edu.pl/baztech/element/bwmeta1.element.baztech-article-BPZ4-0022-0016>> [Accessed 4 February 2018].
- Szczepankiewicz, E.I., 2012a. The use of InCaS model for estimating the value of human capital in future-oriented organizations. *Human Resources Management & Ergonomics*, [online] 6(1). Available at: <http://frcatel.fri.uniza.sk/hrme/files/2012/2012_1_07.pdf> [Accessed 20 December 2012].
- Szczepankiewicz, E.I., 2012b. The use of InCaS model to identification and measuring of structural capital in small and medium enterprises. *Management*, [online] 16(2/2012), pp. 102-116. Available at: <<http://yadda.icm.edu.pl/yadda/element/bwmeta1.element.baztech-article-BPZ3-0043-0009>> [Accessed 4 February 2018].
- Szczepankiewicz, E.I., 2013a. Concept of using the InCaS model to identification, measuring and presenting relational capital of a network enterprises. *Management*, [online] 17(1/2013), pp. 136-152. Available at: <http://zbc.uz.zgora.pl/Content/32030/PDF/9_szczepankiewicz_concept.pdf> [Accessed 4 February 2018].
- Szczepankiewicz, E.I., 2013b. Measurement and active improvement of relational capital in a socially responsible companies. In: Hradec Králové, Magnanimitas Assn. European Academics, *MMK 2013 International Masaryk Conference for Ph.D. Students and Young Researchers*. Hradec Kralove, Republic Czech, n.d. Hradec Králové: Magnanimitas Assn. European Academics.
- Uziene, L., 2013. City's Intellectual Capital Framework: The Performance Measurement Point of View. *Economics and Management*, 18(2), pp. 198-208.
- Venugopal, J., 2005. Drug imports: the free-rider paradox. *Express Pharma Pulse*, 11(9), p. 8.
- Viedma Marti, J.M., 2004. CICBS: A Methodology and a Framework for Measuring and Managing the Intellectual Capital of Cities – A Practical Application in the City of Mataró. In: s.n., *Fifth European Conference on Organizational Knowledge, Learning and Capabilities OKLC 2004*. Innsbruck, Austria, 2-3 April 2004. s.l:s.n.
- Yeh-Yun Lin, C. and Edvinsson, L., 2008. National intellectual capital: comparison of the Nordic countries. *Journal of Intellectual Capital*, 9(4), pp. 525-545.