INTELLECTUAL CAPITAL OF THE COMMUNITY OF LUBELSZCZYZNA REGION – HUMAN INTELLECTUAL CAPITAL ACCORDING TO THE PILOT SURVEY

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Key words: intellectual capital of region, human intellectual capital, people’s intellectual potential.

CONCLUSIONS

The new approach to measurement of IC of community was presented. In the conceptualization of the problem it was proposed to treat the IC as a latent construct that is measured via directly observable proxies. The results presented are the final obtained after having discarded some variables due to their lack of fit to the estimated models. It is worth mentioning that such a situation concerned only two constructs – the most complex one – activity, and orientation on self-education. The reason in the former case was its complexity and in the latter – the variable the expenses on education despite highly correlated with willingness to update knowledge, professional skills, take part in workshops (P3) was not significant and therefore discarded. Nonetheless CFA performed provided proofs that the conceptualization was quite good as all observable variables loaded strongly to the factors where they were expected to load. All fit indices, despite not always at the maximum level, were acceptable given the small sample size. The most stipulations concerned the activity factor but it was understandable as this construct was the most complex. Finally, it is important to stress that this model is not and cannot be the only one proper and possible. This is the very first one conceptualized for Lubelszczyzna region and in the future it will be reformulated but do so more research and thus more time and data is needed.

ABSTRACT

XXI century is called the era of knowledge-based economy and is connected with the existence of knowledge-based society. Each time we talk about it, we should remember that another factor of production – knowledge – became as important as the three known earlier: labor, land and capital. And however „knowledge is like light, weightless and intangible, it can easily travel the world” (World Bank, 1998, p.1) and influences the development and competitiveness of organizations, nations, regions, societies. The importance of it was stressed in the Lisbon Strategy prepared and presented at the summit of EU countries in Lisbon in March 2000. The heads of member countries decided that by the year 2010 Europe will have become the most competitive and dynamic knowledge-based economy in the world. This target will be achieved by among others higher investment in R&D, improved lifelong learning, people mobility and social cohesion. The aim of project Intellectual capital of Lubelszczyzna is to work out
the procedure to measure the intellectual capital of the region. The aim of the research is to check the conceptualization of the project and to estimate the intellectual capital of human part of region e.g. of people (households).

INTRODUCTION

XXI century is called the era of the knowledge-based economy and is connected to the existence of knowledge based-society, society that uses information and knowledge both tacit and explicit one to develop. The growing importance of people potential has been noticed more frequently for the last several years. For example Von Mutius noticed that „an information and knowledge increasingly become our most important economic resources, humans themselves with their knowledge and abilities increasingly take center stage in the value creation process” (Von Mutius, 2005). Much earlier in 1991 Thomas Schultz in the report prepared for UNESCO states that „one-fourth of our income is explained by our physical capital while the rest is generated by human-beings, highlighting the importance of human capital” (Bontis, 2005). World Bank in its report from 1995 claimed that the two third of wealth of the nation comes from the human and social capital (Kwiatkowski, 2001). Although there is no agreement on how much wealth human capital generates, there is no doubt the amount is significant and the hypothesis are made that the higher intellectual wealth is, the better people’s lives are (World Bank, 1998, World Bank Institute, 2004, World Bank Institute, 2005, Goldberg, 2004). To conclude the above, it is people who are the prime carriers of knowledge and therefore of wealth. Given that the problem of human intellectual capital is worth considering. To date the intellectual capital (IC) is generally observed or measured via economic indicators and in the dimension of human capital (the crucial component of IC) they are for example adult literacy rate, average years of schooling, tertiary enrolment, public spending on education as % of GDP and others (World Bank Institute, 2004; Chen – Dahlman, 2005). The problem is that this construct (IC) is not observable directly regardless if it is IC of region, of city or of people and the proxies used seem insufficient particularly in the human capital dimension. To do so better, it is necessary to cover the dimensions associated with people’s opinions, attitudes, endowments and knowledge that are not commonly covered by national statistics. The proposal is to measure it by the factors generated using the structural equation modeling. In order to decide which factors are the most important to measure human IC, it was necessary to check how human capital is defined. According to OECD (OECD, 2001) human capital is knowledge about facts, laws, specialized principles, teamwork and communication skills as well as education and competencies of individuals acquired during the human beings’ life. Pasher – Shachar (2005) describe it as education, equal opportunities, culture, health but also intuition, motivation, entrepreneurship and openness to the foreign cultures. According to Wikipedia – The Free Encyclopedia human capital is defined as people’s skills, abilities and knowledge used in employment or otherwise contributing to the economy (Wikipedia, The Free Encyclopedia). According to human development theory the term human capital is broader and refers to social capital (social trust), instructional capital (sharable knowledge) and individual capital (the individual leadership, creativity, personal traits such as courage, enterprise, wisdom, in-
vention, empathy etc.). There are many other definitions but what they have in common is the focus on the factors crucial for value creation resulting in the following list of components:

- willingness to learn and ability to share knowledge;
- quality of education;
- creativity and activity both in professional and everyday life;
- brain power and mind satisfaction;
- talent and endowments;
- tolerance and openness to new experience (foreign cultures, foreigners, different races);
- strong collective sense of action;
- involvement in collective performance on the regional level, involvement in any network of personal ties both palpable and intangible;
- interests in matters of community;
- openness to interact in a network society;
- not being passive and not interested;
- information and communication technology usage.

All of them lead to enriching people’s knowledge but more the tacit than the explicit one. Although the explicit knowledge is becoming more and more important these days, this is the tacit one that is still undervalued and for that reason will get more attention. In the literature the importance of ability to use the knowledge acquired or already possessed is also underlined. Intellectual capital of community depends as well on the presence of market economy, democracy, strong civil rights, high quality of life – all what in human development theory is defined as social capital. Its importance to knowledge and this way to intellectual capital creation is stressed by among others Schuller (2002). According to him „merely increasing the stock of human capital (my own words: Schuller understands human capital as knowledge capital) in any given society will not ensure social and economic progress. It may even impede it by further isolating some groups...”. Taking all of it into account the following latent factors – components of human intellectual capital – will be generated: durable good possession index as the indicator of people’s wealth and quality of life, tolerance index, attitude towards democracy, orientation to self-education, inclination to social network involvement, inclination to aid and collaboration, orientation to cultural life, orientation to activity (second-order factor) that consists of two other factors: orientation to future and aptitude to risk-taking and Information and Communication Technology (ICT) usage index.

**MATERIAL AND METHODS**

Data used comes from the pilot survey that has already been administered to a small sample size of 55 respondents living in Lubelszczyzna. They were of the same type as the respondents who are eligible to participate in a full-scale survey and came from 11 different communities and municipalities out of about 200 that are to be included in a full-scale survey. The survey was conducted in January 2006 in respondents’ homes. It was administered as an face-to-face interview with the questionnaire. Using confirmatory factor analysis (CFA) and the Rasch analysis several construct, crucial to human intellectual capital measurement, were to be created. Although the sample size was not big enough, the methods mentioned above were used because the aim of research was to check the conceptualization and the only data available was this data from the pilot study. The relations between the constructs created are beyond the scope of this article and will not be
The only aim was to verify if the factors anticipated could be obtained from the data gathered. All analyses were done with AMOS 5.0.1, SPSS 14.0 and Facets for Windows 3.57.

**RESULTS AND DISCUSSION**

To measure the tolerance index three questions were proposed (all measured on 11-point scale with only two extreme categories labeled):

- **T. Would you accept person of different race or denomination who?**
  - **T1.** is to become a member of your family?
  - **T2.** is to live in your home?
  - **T3.** is to live in the same street as you live?

These three questions are of rising intensity, the first one is the strongest whereas the last one is the weakest. With regard to that fact, the tolerance index could be calculated using the Guttman scalogram but taking into consideration its weaknesses the Rasch analysis was used instead. For each of the questions the intensity estimate was calculated and their order confirmed the order of questions resulting from the conceptualization. Question **T1** turned out to be the most intensive (demanding the strongest tolerance) – the intensity estimate \( d_1 = 0.46 \) with the standard error of 0.1, the second most intensive was question **T2** \( d_2 = 0.39, S(d_2) = 0.1 \) and the least intensive question **T3** \( d_3 = -0.85, S(d_3) = 0.1 \). The reliability of this scale assessed by the separation reliability was at the satisfactory level of 0.79.

Durable goods possession index was created using Rasch analysis too, as proposed by Soutar and others (1990) and Soutar and others (1997). The separation reliability was at the level of 0.93 that was very good result given the small sample size. Order of acquisition of consumer durables resulting from the Rasch model was as following: telephone and color TV-set, washing machine, computer, car, video, access to Internet, microwave. This index will be used as an indicator of wealth of the society and of its quality of life. Although the area of constructs concerning the quality of life is much more complex, this index was all what was possible to get from the pilot study. The full-scale research will cover more areas of quality of life. As was mentioned above leaving in democratic society is very important to increase the intellectual capital of society. To assess the level of democracy perception, six following statements with 11-point scale with 0 – I strongly do not accept and 10 – I strongly accept were presented to respondents:

- **P30. Democracy in Poland:**
  - **P30_1.** cannot be accepted;
  - **P30_2.** is not working in reality;
  - **P30_3.** need to be reformed profoundly;
  - **P30_4.** it is proper way but all of us has to learn how to use it;
  - **P30_5.** need to be reformed only slightly;
  - **P30_6.** is working correctly.

Since it was expected that the items P30_3 and P30_5 would be correlated and the same applied to the items P30_1 and P30_2, the CFA was performed taking it into regard. The result obtained is presented on the Figure 1.

Given the sample size the result was satisfactory. The fit indices were high enough with the exception of AGFI, but the variable P30_4 was insignificant regardless of the estimation method. It was likely to result from the statement construction. It was noticed that the problematic item consisted of two sentences concerning two different problems. In the full-scale study these item should be divided into two separate ones. The wor-
rying was also the reliability of this scale measured by Cronbach – α, it was at a very low level of 0.36. In order to measure the people’s willingness to learn, orientation to self-education construct was generated. The questions and items used to its creation were following:

P3. Are you interested in updating your knowledge, professional skills, taking part in workshops? (from 0 – I am strongly not interested to 10 – I am strongly interested);

P24. How many books have you read last year?

P25_2. I like learning new things; (from 0 – I strongly disagree to 10 – I strongly agree);

P25_3. If I had to I would be able to gain new qualifications and skills by myself; (from 0 – I strongly disagree to 10 – I strongly agree).

Figure 1

Attitude towards democracy

The result obtained is presented on the Figure 2. Although the fit indices were high enough, the variable P_24 was significant on the level of 0.11 which was not satisfactory but not disqualifying either. This situation could have been the result of different style of answers to these questions. Whereas the former three were measured on a 11-point ordinal scales, the latter one on a ratio scale from 0 to infinity.

Involvement in social network (collective non-profit action) was observed and measured using 5 following questions:

P15. If you are to participate in common non-profit action would you do it with:

P15_1. a member of your family;

P15_2. your nearest neighbors;

P15_3. your acquaintance;

P15_4. people from the same organization;

P15_5. people having the same views.

Respondents could have chosen one out of eleven possible categories of answer with 0 labeled I am strongly not ready to do so and 10 – I am strongly ready to do so. The reliability of the scale used was very good with the Cronbach-α amounting to 0.99. The generated factor is presented on Figure 3.

Again high values of fit indices proved the good conceptualization of inclination to social network construct. All observable variables were significant but
such a good result was the effect of imposing the correlation between error terms $d_3$ and $d_4$. Although such a correlation could have been explained it had not been predicted. The interests in collaboration in social actions undertaken by the local or regional community as well as and their intensities were measured using four following questions:

P16. In what kind of collective non-profit action would you like to take part in:

- P16_1. renovation of pavement;
- P16_2. clean the world action;
- P16_3. help people after flood;
- P16_4. collection for charity organization.

Figure 2

Orientation to self-education

![Diagram of Orientation to self-education]

Again the responses were measured on the 11-point scale and the reliability was not excellent but satisfactory – Cronbach-$\alpha = 0.72$. All fit indices were very good provided the imposed correlation on error terms $d_3$ and $d_4$. This correlation could be explained as both variables $P16_3$ and $P16_4$ are associated with helping people whereas variables $P16_1$ and $P16_2$ are more general but still they were not foreseen earlier. Nevertheless the final effect presented on the Figure 4 can be assessed as satisfactory.

Figure 3

Inclination to social network

![Diagram of Inclination to social network]
Inclination to social network

Activity in everyday life of habitants of Lubelszczyzna was designed to be measured using several variables concerning both involvement in cultural life and readiness of books and newspapers. These were as follow:

- cinema: How often do you watch films at the cinema?
- theatre: How often do you watch plays at the theatre?
- concert: How often do you listen to the music concerts?
- P22. How often do you read newspapers?
- P24. How many books have you read last year?

Orientation to cultural life

The consecutive factor created was orientation to cultural life and it is presented on graph 5. The CFA preformed and obtained through it the fit indices (all between acceptable boundaries) let draw the conclusion that orientation to
cultural life can be measured through proposed variables with moderate precision. The last construct created was the most complex one because consisted of three latent variables (orientation to future and inclination to risktaking constituting activity factor – second-order factor) as presented on graph 6. This construct was designed to reflect creativity and activity both in professional and everyday life as well as openness and lack of fear of future events. To achieve so the eight following statements were included in the questionnaire:

P30_7. I will do everything possible to improve my fate (life);
P30_8. I have no influence on my fate (life);
P30_9. I can accomplish everything I have planned;
P30_10. I am not afraid of difficulties and I am satisfied with overcoming them;
P30_11. I like taking risk if it can be profitable;
P30_12. I prefer running my own business to working in somebody’s else company (to employ myself);
P30_13. I am not afraid of difficulties of live;
P30_14 I have a lot of plans and ideas to accomplish in future.

All of them were measured on 11-point response scale with only two extreme categories labeled in this way: 0 – I strongly disagree and 10 – I strongly agree. The result is presented on Figure 6.

**Figure 6**

**Orientation to activity**

![Diagram](attachment:image.png)

Standardized estimates
- chi-square=24.086 df=18 p-value=.152
- GFI=.906 AGFI=.813 RMSEA=.081 NFI=.830 CFI=.947
Due to the relative complexity of the model it was expected the fit indices would be worse than in the previous analyses. On the other hand they still were not so bad to reject the model. They could have been improved by imposing some correlations on the errors terms but that solution was in this case abandoned as too much artificial. To sum up, all variables used in this case would be included in the full-scale survey and after its administration the model would be checked once again. The reliability of scale used to generate orientation to activity was at the moderate level of 0.63 with mean inter-item correlation of 0.17. These results were a little bit alarming. One factor planned to generate was not able to be constructed – ICT usage index. It was important to have it, given the increasing role of information and education in the knowledge-based society. Although respondents were asked several questions about frequency of usage of mobile phone, computer, Internet or electronic mail as well as their ability to send e-mail or SMS, to prepare Power Point presentation, to write a letter, to make their own website or transfer money via Internet the construction of latent variable reflecting ICT skills did not succeed. For all of that, these questions will not be discarded from the survey but only reformulated as ICT skills are very important to the whole project.

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