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What is the Key Element for the Territory's State of Development?

J. Lonska, and V. Boronenko

***Abstract*—**The result of process of territory's development is the *territory's state of development* (TSoD), which is pointed towards the provision and improvement of people's life conditions. The authors offer to measure the TSoD according to their own developed model. Using the available statistical data regarding the values of model's elements, the authors empirically show which element mainly determines the TSoD. The findings of the research showed that the key elements of the TSoD are the "Material welfare of people" and "People's health". Performing a deeper statistical analysis of correlation between these elements, it turned out that it is not so necessary for a country to be bent on trying to increase the material growth of a territory, because a relatively high index of life expectancy at birth could be ensured also by much more modest material resources. On the other hand, the economical feedback of longer lifespan within countries with lower material performance is also relatively low.

***Keywords*—**Development indices, health, territory's state of development, wealth.

I. Introduction

THE authors of the research consider the development of a territory as a whole process having a particular result: the process itself causes territory's capital, while the result achieved due to this process is territory's state of development (TSoD) [10]. According to the methodology of a competitive advantage proposed by M. Porter [10], the development of a territory is based upon "qualitative" existence of people within the particular territory, where these residents could create competitive advantages of this territory. In order to determine the level of territory's development or TSoD, scientists and researchers around the world use various approaches: calculation methods, indices and other evaluation instruments [8], [9], [14], [16], [19], [26], [27].

Considering that the practice of evaluation of TSoD lacks methodological grounds, ie., evaluation instruments, authors' clear comprehension and reasoned arguments regarding the reasons why particular indices for evaluation of TSoD are chosen, and why the particular indices are considered to be indicative of TSoD; the authors of this research offer their own vision of measuring the TSoD, working out a model having the individual, his/her existence and quality in the centre of it [10].

The methodological model for measuring TSoD, elaborated by the authors, consists of *6 elements* (see Fig. 1):

1) Number of population;
2) Material welfare of people;
3) People's health;
4) People's education;

} Objective indicators

5) People's spirituality;
6) People's life satisfaction.

} Subjective indicators

The authors substantiate elaboration of this model (see Fig. 1) by theoretical cognitions regarding human capital being the main factor of territory's development [4], [21] and M. Porter's [15] economical theory regarding competitive advantages of a territory. According to the theoretical cognitions regarding human capital as the main factor for the development of any territory, the more advantages to ensure and improve life quality, creating and developing knowledge-based economy, increasing society's welfare, have those countries that have accumulated the qualitative human capital, ie., countries having educated, healthy, optimistic and satisfied residents, globally competitive professional workers within all economic fields, education, science, government, etc. Human capital is formed upon the investments, which are used for perfection of life quality and intellectual activity. Inter alia, investments for upbringing the residents, their education, health, knowledge (science), business environment, safety, culture, art and other fields. A human becomes a capital when the investments take place and they begin to bring a profit. The authors of the model take into consideration the theoretical works of the American economist M. Porter [15] regarding the state competitive advantages, which have not been inherited but created by the means of manpower and within today' s circumstances of globalization, they have the leading motive power for development. M. Porter considers that one of the main advantages of state competitiveness is the educated and qualified labour force as well as the scientific basis which promotes the process of development and provides a possibility to reach a higher level of state of development of any territory. Therefore, the TSoD depends on residents' education and their ability to successfully exploit available natural and labour resources, to improve and develop infrastructure, thus promoting and increasing the national competitiveness [15]. However, the research issue is based upon the fact that governments have to choose only few priorities of territorial development, which at the same time could ensure or promote the development of the whole territory. Which are the priorities to be supported in the first place in order to reach the best total gain by limited support opportunities?

J. Lonska, Mag.sc.soc., is a student of doctoral study programme "Economic" in Daugavpils University, Latvia (e-mail: Jelena.Lonska@ru.lv).
V. Boronenko, Dr.oec., is a leading researcher in Institute of Social Investigations of Daugavpils University, Latvia (e-mail: Veraboronenko@inbox.lv).

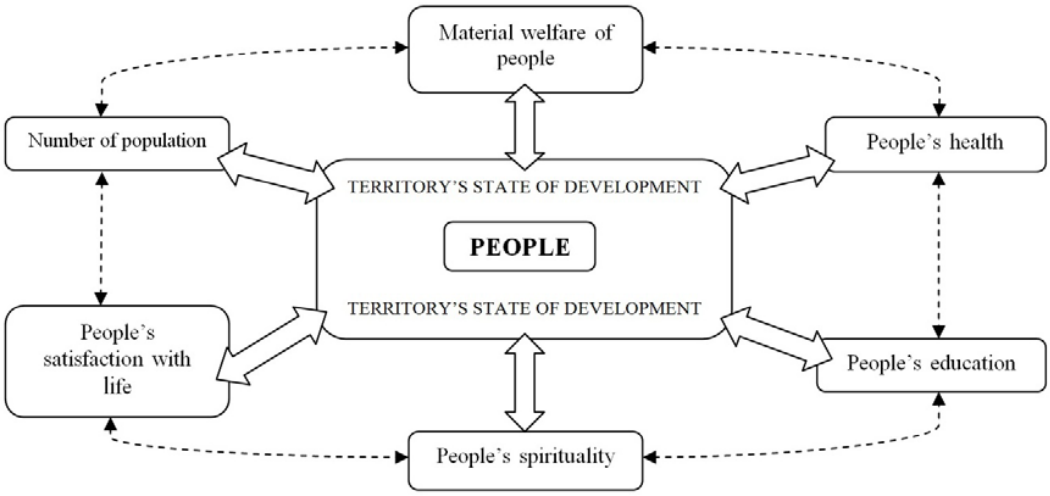

Fig. 1 Elements of the Own Created Methodological Model for Measuring TSoD and Their Interrelation [11]

Therefore, according to the authors' developed model for measuring the TSoD, the *objective* of the research is to define the elements of the model which determine TSoD on a global scale. In other words, to define which are the elements the government should invest into, in order to promote the TSoD.

Object of the Research – 144 countries at different stages of development.

Subject of the Research – elements of the state of development of the studied countries according to the model elaborated by the authors.

Issue of the Research **–** for the present moment there is unknown the key element of the author's developed model for measuring the TSoD, influencing the development of other model's elements.

Hypothesis of the Research **–** there are one or several key elements which ensure the state of development of the whole territory and into which the government should invest resources most of all. In order to prove the hypothesis empirically, the authors used method of correlation analysis with detailed further study of interrelated elements of the model within 144 countries, studying the stage of their development individually

II. Findings of Theoretical and Empirical Research

The authors do not use a united index as a part of their TSoD measurement methodology, considering that it is not useful to make one integral index of different elements. The authors pay attention to the study of interrelation between the elements of the model, ie., indices TSoD. In order to perform such analysis, the following indices regarding each of the model's elements were selected:

1) *„Material welfare of people"* – GDP per capita, year 2011 (USD) [19];

2) *"People's health"* – Life expectancy at birth, year 2010 [19];

3) *"People's education"* - Tertiary education enrolment rate, year 2010 or most recent year available (%) [19];

4) *"Number of population"* - Population average annual growth, years 2010/2015 (%) [9];

5) *"People's spirituality"* - Freedom of Expression and Belief index of year 2009 [3];

6) *"People's satisfaction with life"* – Overall life satisfaction [9].

By the SPSS software there was carried out the analysis of correlation between the model' s elements measuring TSoD, using the Kendall's Coefficient being applicable for variables of different ranges. Worldwide research practice considers that there is a stronger correlation when the coefficient of correlation is ≥ 0,5 [1], [7]. The data obtained as a result of correlation calculation are indicative of the fact that stronger connection with other elements have such elements as "Material welfare of people" (GDP per capita) and "People's health" (life expectancy at birth), these elements have three strong connections with values ≥ 0,5, they are followed by the elements "People's education" (tertiary education enrolment rate) and "People's satisfaction with life" (overall life satisfaction), which have two strong connections with the values ≥ 0,5 (see Fig. 2).

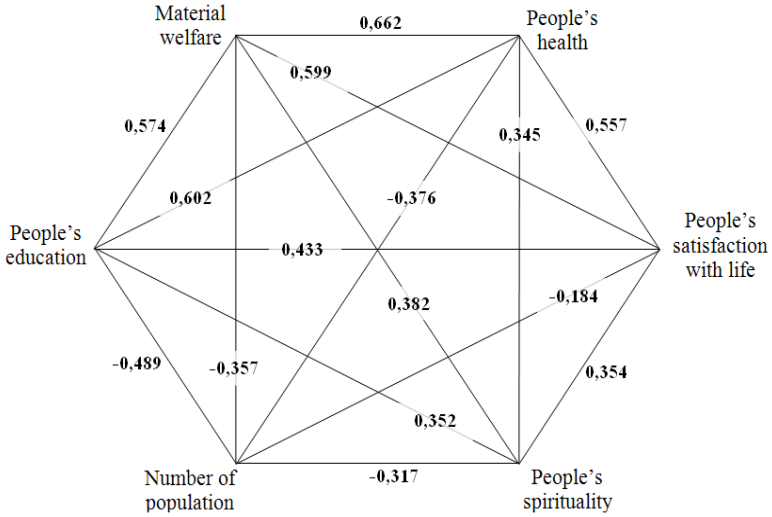

Fig. 2 Values of Correlation between the Elements of TSoD Model, Kendall's Coefficient, 2009, 2010, 2011 years, 144 countries
Data source: Model elaborated by the authors

According to the performed analysis, the total TSoD is mostly determined by such model's elements as "Material welfare" and "People's health", a bit weaker power of determination has "People's education" and "People's satisfaction with life". Therefore, it can be concluded that in order to achieve the territory's state of development, first of all there have to be made investments into the spheres determining territory's state of development.

Such economists as McConnel and Brue [12] argue about the following two main kinds of investments into human capital: expenditure on health and expenditure on education. Investments in health are carried out with the aim of formation, maintenance and improvement of human health and working capacity. Health, in essence, is the most important part of the human capital. Human's state of health is his/her natural capital, and one part of this capital is inherited, the other one is acquired. The acquired part is formed on the basis of investments of both the human himself and the society. Investments in education make a further impact on the value of human capital, wages and social status. Therefore, in order to ensure healthy, longeval, highly educated, competitive human capital, it is necessary to invest into both spheres mentioned above.

The correlation analysis, performed by the authors, shows that the main determining power upon TSoD have such model's elements as "Material welfare" and "People's health". According to the previously performed worldwide researches, the key point is that the relationship between both elements runs both ways and that a bidirectional relationship of this kind means that one problem cannot be solved without simultaneously tackling the other one [5], [2], [18].

For a long while there has been a predominant view that good health is a consequence of a favourable economic status, for an individual as well as for a country as a whole. Sala-i-Martin [17] gives few examples of the ways when poor economic status contributes to poor health in general:

1) Poor people and poor countries do not have adequate material resources to obtain the money necessary to pay for the health care, or to buy substantial amount of good quality food.

2) Since poor people are more likely to be malnourished, immunodeficient and thus vulnerable to infectious diseases, they are more likely to be unhealthy.

3) The poor are more likely to live in massively overcrowded areas without clean water and sanitation. As a result they have a greater propensity to suffer from otherwise readily avoidable diseases.

4) Some poor people live far from doctors and hospitals, making it expensive and difficult to search for help when problems arise. They are more likely to go untreated and to suffer from worsening state of health.

5) Poor people are more likely to have poor education; education, in its turn, is an important determinant of health (for example, by way of better coping mechanisms, improved understanding of health risks, successful adoption of new health technologies).

6) Economic status affects health through a social network effect that has "material" and psychological dimensions: poor people tend to have less intense social support networks.

Some of researchers argue that health impact on economic development is any more important than the converse.

For example, as discussed by Fogel [6] estimates indicate that about 50% of the economic growth experienced by the United Kingdom between 1780 and 1980 can be attributed to improved health and nutrition. Another study of 10 industrialized countries over periods of at least a century made by Arora [2] found out that improvement in the state of health increased the rate of economic growth by 30-40%. Sala-i-

Martin, Doppelhofer and Miller [18] found out that countries that had a higher life expectancy in the 1960s are those that grew the fastest over the following four decades.

A significant amount of research from the United States demonstrates a negative impact of bad health on both labour productivity and labour supply. Mitchell and Burkhauser [13] used the Survey of Disability and Work in 1978 to determine that arthritis reduced wages by 27.7% for men and 42.0% for women. Moreover, it reduced the number of hours at worked by 42.1% and 36.7%, respectively, for men and women. Stern [20], using the Panel Study on Income Dynamics of 1981, shows that limited ability to work due to illness reduced wages by 11.7% and 23.8% for men and women, respectively, when a selection correction for participation in the labour force is introduced.

In 1973 Usher [25] introduced the value of mortality reductions into national income accounting. He used the concept of "full income" to capture the sum of the value of growth in GDP and the value of years of life expectancy gained. The initial study applied this concept to six political entities (Canada, Chile, France, Japan, Sri Lanka and Taiwan) and covered the middle decades of the twentieth century. In the higher-income states, about 30% of the growth in total income was attributable to decline in mortality.

Figueras and McKee [5] consider that increasing the retirement age might allow health to finally "deliver" its positive impact on the labour market and thus on the economy by keeping more and healthier people in the workforce as they age. Increasing the working-age population (thus reducing the dependency ratio) should mitigate some of the pressures on health and social expenditures. It also has the potential to contribute positively to the economy at large, although this effect will depend crucially on whether the larger working-age population also participates actively in the labour market and whether employers demand the extra labour.

Tompa [24] argues that life expectancies now differ relatively little among rich countries, unlike among poor countries, so research in rich countries necessitates the use of health indicators that can better discriminate level of health. For example, Suhrcke and Urban [22], making analysis of 26 rich countries in period from 1960 till 2000, conclude that 10% reduction in cardiovascular mortality was associated with 1% increase in growth of per capita income. But Suhrcke, Rocco and McKee [23] through analysis of countries of Central and Eastern Europe and the Commonwealth of Independent States, argue that the poorer the country at the start, the bigger the growth effect is which in its turn will result from a reduced adult mortality rate. Figueras and McKee [5] conclude: the healthier the population is, the more difficult (and costly) it will be to realize additional health gains and thus any associated economic benefits.

The analysis of elaborations described above is indicative of the fact that for the present moment it is impossible to determine which of the both spheres - Material welfare or Health, - is primary and more determining accordingly the total TSoD. There is a bilateral connection between them, and when affecting the one, the other one could also be affected: by improving the material welfare of residents and increasing the state funding for health care, the total health of the nation could be improved as well, which, in its turn, by the productivity of the labor force and increasing supply of the labor force, could positively influence both the material welfare of people at a microlevel, and state's economic growth at a macrolevel.

Therefore, the objective of the research seems to be achieved, determining two key elements determining TSoD – "Material welfare of people" and "People's health". However, there is available interesting information provided for the global science and society regarding the polysemantic correlation between countries, which is reflected in Fig. 3.

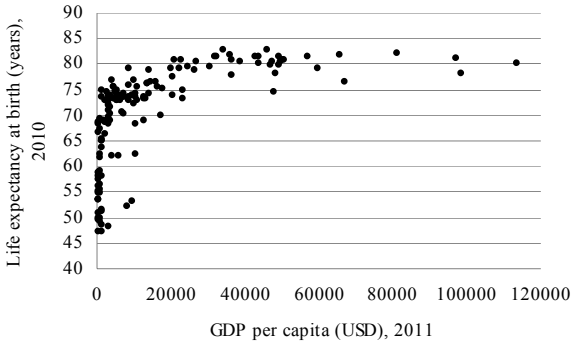

Fig. 3 Interrelation between the Indices of GDP per capita and life expectancy at birth
fData source: The table elaborated by the authors

The most interesting and controversial facts reflected in Fig. 3 are that irrespective of interrelation between the average GDP and people's life expectancy at birth, however, there are too many cases when the life expectancy at birth (within the developed model for measuring the TSoD it refers to population's health element) could be reached by various amounts of GDP per capita. In other words, in order to have a long life, it is not necessary to live in a territory with high material provision. Or otherwise: high level of territory's material provision not always determines the state of health of its inhabitants.

In order to study the collision of interrelation between wealth and state of health more carefully, the authors have divided 144 countries into three groups according to the index of life expectancy at birth, grounding on the relative equity principle of the number of countries within each group.

TABLE I
AMOUNT OF GDP PER CAPITA OF COUNTRIES WITH LOWEST LEVEL OF LIFE EXPECTANCY AT BIRTH – AGE 47-69, N = 48 COUNTRIES, 2011

	N	Min.	Max.	Mean	Std. Deviation
GDP per capita 2011	48	279	12993	2231,44	3052,833
Life expectancy at birth	48	47	69	58,79	7,265
Valid N (listwise)	48				

Data source: the table elaborated by the authors.

According to the TABLE I, the group having the lowest index of life expectancy at birth includes countries having GDP per capita between 279 and 12993 USD per annum. For instance, in Russia with the highest GDP per capita - 12993 USD per annum – life expectancy at birth is 69 years. And the same age of life expectancy at birth – 69 years – has also Kyrgyzstan having GDP per capita - 1070 USD per annum.

TABLE II
AMOUNT OF GDP PER CAPITA OF COUNTRIES WITH MEDIUM LEVEL OF LIFE EXPECTANCY AT BIRTH – AGE 70-75, N = 49 COUNTRIES, 2011

	N	Min.	Max.	Mean	Std. Deviation
GDP per capita 2011	49	1239	47982	8776,27	7950,573
Life expectancy at birth	49	70	75	73,22	1,415
Valid N (listwise)	49				

Data source: the table, elaborated by the authors.

According to the data reflected in the TABLE II, the group of medium rate of life expectancy at birth includes countries having GDP between 1239 and 47982 USD per annum. For instance, Oman with its GDP per capita - 23315 USD per annum – life expectancy at birth is 73 years. And the same age of life expectancy at birth – 73 years – has Jordan with its GDP per capita – 4675 USD per annum.

TABLE III
AMOUNT OF GDP PER CAPITA OF COUNTRIES WITH HIGHEST LEVEL OF LIFE EXPECTANCY AT BIRTH – AGE 76-83, N = 47 COUNTRIES, 2011

	N	Min.	Max.	Mean	Std. Deviation
GDP per capita 2011	47	3992	113533	38076,02	24910,624
Life expectancy at birth	47	76	83	79,45	2,067
Valid N (listwise)	47				

Data source: the table elaborated by the authors.

As it is reflected in the TABLE III, the group having the highest index of life expectancy at birth includes countries by their GDP per capita between 3992 and 113533 USD per annum. For instance, Australian GDP per capita - 65477 USD per annum – life expectancy at birth is 82 years. And the same index of life expectancy at birth – 82 years – has Italy having GDP per capita – 36267 USD per annum, i.e., by almost two times lesser material performance could be ensured the same life expectancy.

However, while studying the correlation between GDP indices per capita and life expectancy at birth among groups of different countries from the point of view of material performance, determined by principle of relative equity of the same countries of each group, the following facts were established:

– Group of countries having GDP per capita up to 3500 USD per annum has statistically significant, but weakly connected elements of welfare and health – Kendall' s Coefficient is 0.378, p-score is 0.000;

– Group of countries having GDP per capita between 3500 and 15000 USD per annum has statistically connected elements of welfare and health – Kendall' s Coefficient is 0.147, p-score is 0.138;

– Group of countries having GDP per capita more than 15000 USD per annum has statistically significant, but weakly connected elements of welfare and health –Kendall' s Coefficient 0.281, p-score is 0.008.

III. DISCUSSION AND CONCLUSION

Using the own-elaborated model for measuring TSoD, which is methodologically grounded on competitive advantages theory of M. Porter, the authors have tried to define, which elements of the model determine the total TSoD most of all. The analysis of data regarding 144 countries allows making a conclusion that there are two elements like that: GDP per capita and life expectancy at birth, i.e. Material welfare of people and People's health, because these elements have the strongest and statistically most significant correlation to other elements. The elements of GDP per capita and life expectancy at birth are statistically strongly connected with each other, however this correlation is polysemantic.

The empirical findings obtained by the authors make us doubt whether the higher level of welfare makes it easier to live a healthy life, both at the individual and the population level? Higher individual welfare allows choosing healthy diets, living in healthier places, taking exercises and accessing effective health care when it is needed, but there are many territories around the world where even having a lower level of GDP per capita, there the same level of life expectancy at birth is reached. True is the fact that the "economic meaning" of each additional year differs among countries with different levels of GDP per capita. For instance, analyzing the case of Kyrgyzstan and Russia, monetary value of each additional life year in Kyrgyzstan is 306 USD according to PPP, while in Russia – 2894 USD according to PPP (in comparison to Estonia where it is 4207 USD) [5]. So, in Kyrgyzstan the state of health is "cheaper"; at the same time its economic return is

poor. In general, the expenses regarding health and economic return compensate each other.

There is the following situation regarding key elements determining TSoD: on the one hand, in order to make people live longer, countries do not have to be bent on reaching higher financial development of a territory, because quite high level of life expectancy at birth could be ensured by much more modest material resources. On the other hand, economic return of longer life in countries with lower material performance is relatively low. Therefore, when making the policy on territorial development of a particular country, there shall be made a choice between human life itself and economically beneficial life. It should be understood, that every choice is connected with particular costs – economically beneficial life demands higher initial investments before giving economic return from it. Furthermore, there are also investments of high risk, especially among the countries of group with relatively medium economic performance – where the rate of GDP per capita is between 3500 and 15000 USD per annum (Russia, Poland, Latvia, Lithuania, Croatia, etc.), where there is no statistically significant correlation between welfare and state of health, i.e., "money does not determine health, and health does not determine money".

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