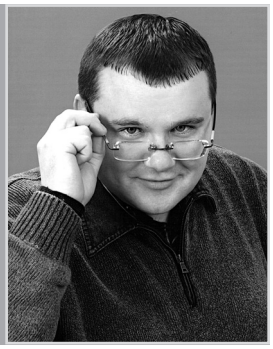

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NATIONAL ECONOMIES INTELLECTUALIZATION EVALUATING IN THE WORLD ECONOMY

Abstract. The state of national economies development varies and is characterized by many indicators. Economically developed countries are known as doubtless leaders that are in progress and form political stability, social and economics standards, scientific and technical progress and determine future priorities. It is worth mentioning that the progressive development of national economies in conditions of globalization can take place only in case of the increase of their intellectualization level, through saturation of people`s life, economic relations and production by brain activity, knowledge, creativity, innovation, culture, ethical considering of the historical heritage.

The main aim of the research is national economies intellectualization evaluating in globalization conditions. In order to gain this aim, the following tasks were defined: to identify existing indices of the national economies intellectualization level evaluation, develop the authors' methodological approach to the national economies intellectualization level, determine the areas of measurement results application. While conducting the research, systematic approach, the methods of analysis, synthesis, grouping, abstracting, generalization, imaginary experiment and grounding were used.

In the modern world, there are a large number of indicators which characterize differences in intellectual state of the national economy. When comparing the state of national economies intellectualization, the problems arise with different number of countries, duplication of indicators, disproportionate number of the components of indicators, various years of publication, etc. Therefore, to ensure comparability, we choose four general indicators – the index of human development, the global innovation index, the global competitiveness index and the knowledge economy index. Using these indices, we do the research and determine the state of national economies intellectualization in the world economy.

According to the calculated results, as of 2013, we have divided 190 national economies by level of intellectualization into five groups: countries with the highest (30 countries), high (30 (countries), low (30 countries), the lowest (35 countries) and the countries with uncertain state of intellectualization (65 countries).

The leaders in the state of intellectualization are Switzerland, Sweden, The Netherlands, Finland and the USA. The countries with the highest level of intellectualization serve as an example to all other countries of the world. These countries are characterized by developed market economy; a dominant position in the international economy, which allows actively engaging own and imported resources in the economic turnover; the shift of the center of gravity of economic activity into the services sector and the dominance of service economy; the greatest exhaustion of sources and factors of industrial development; advanced post-industrial development. The economic policy of the first group of countries has a decisive influence on the state and dynamics of the global economy, defining the main directions of its scientific and technological development and structural adjustment.

The average index of the national economy intellectualization (AINEI), calculated by the authors, shows the place of each country in the world community as to their intellectual capital. Considering the continued deployment of R&D progress, the growing role of high-tech production and the complexity of social and economic relations, AINEI can serve as a reliable indicator of the macroeconomic environment intellectualization state. Therefore, the following organizations, bodies and individuals can use the comparative results of this study: the international organizations while developing international economic development programs; the state authorities of the countries in foreign and domestic policy forming; companies that create innovative and investment policy; migrants, tourists and persons who perform professional and transit activity for the formation of human potential and capital; scientists and teachers who develop mechanisms of intellectualization.

Keywords: intellectualization; national economy; world economy; index.
JEL Classification: F01, F29, O11, E19, E60

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ОЦІНЮВАННЯ СТАНУ ІНТЕЛЕКТУАЛІЗАЦІЇ НАЦІОНАЛЬНИХ ЕКОНОМІК У СВІТОВОМУ ГОСПОДАРСТВІ

Анотація. У статті досліджено показники оцінки рівня інтелектуалізації національних економік, які дозволяють здійснити їх міжнародне порівняння. Розроблено авторський методологічний підхід до оцінювання стану інтелектуалізації національних економік на основі розрахунку усередненого індексу інтелектуалізації національної економіки за допомогою індексу розвитку людського потенціалу, глобального інноваційного індексу, індексу глобальної конкурентоспроможності, індексу економіки знань, мовного фактору та інших критеріїв інтелектуалізації. Визначено сфери використання результатів виміру стану інтелектуалізації національних економік, насамперед у формуванні зовнішньої та внутрішньої політики країн.

Ключові слова: інтелектуалізація; національна економіка; світове господарство; індекс.

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ОЦЕНИВАНИЕ СОСТОЯНИЯ ИНТЕЛЛЕКТУАЛИЗАЦИИ НАЦИОНАЛЬНЫХ ЭКОНОМИК В МИРОВОМ ХОЗЯЙСТВЕ

Аннотация. В статье исследованы показатели оценки уровня интеллектуализации национальных экономик, которые позволяют осуществить их международное сравнение. Разработан авторский методологический подход к оценке состояния интеллектуализации национальных экономик на основе расчета усредненного индекса интеллектуализации национальной экономики с помощью индекса развития человеческого потенциала, глобального инновационного индекса, индекса глобальной конкурентоспособности, индекса экономики знаний, языкового фактора и других критериев интеллектуализации. Определены сферы использования результатов измерения состояния интеллектуализации национальных экономик, прежде всего при формировании внешней и внутренней политики стран.

Ключевые слова: интеллектуализация; национальная экономика; мировое хозяйство; индекс.

Introduction. National economies of the world differ from each other and are characterized by numerous indicators. Economically developed countries are known as doubtless leaders. They are in constant progress, form political stability, social and economic standards, scientific and technical environment and determine future priorities. It should be mentioned that progressive development of national economies in conditions of globalization can take place only due to increasing level of their intellectualization, saturation of people's life, economic relations and production by brain activity, knowledge, creativity, innovation, culture, ethics considering the historical heritage. According to V. O. Sukhomlynskiy «…intellectual feelings are a fruitful ground for the seeds of knowledge and intellect» [1, p. 1-2].

Brief Literature Overview. Multisided aspects of intellectualization are considered in the works of foreign scholars: S. Brue (2003), I. Bushmarina (1967), D. Bell (2007), V. Goyle (1995), P. Drucker (1985), V. Inozemtseva (2007), A. Toffler (1980), P. Stonier (1986), E. Todd (2004) et al. A specific accent on creative activity among Ukrainian scholars is made in the studies of O. Hrishnova (2009) [2], D. Boginya (2003) [3], V. Kutsenko (2006) [4], S. Sardak (2010) [5], M. Semykina (2003) [3], V. Semynozhenko (2004) [6]. However, there is no complex index in the world economy that would determine the level of national economy intellectualization, and comparison of the macroeconomic system intellectualization level in the world economy does not have a complex character.

Purpose. The main aim is national economies intellectualization evaluating in globalization conditions. The following tasks were defined in order to gain the aforementioned aim: to determine existing indicators of the national economies intellectualization level evaluation, to develop the authors' methodological approach to the national economies intellectualization level, to specify the areas of measurement results of national economies intellectualization level application. While doing the research, a systematic approach, the methods of analysis, synthesis, grouping, abstracting, generalization, imaginary experiment and grounding were used by the authors.

Results. Global tendencies of the world economic system development witness the sings of transfer from an industrial to a post-industrial type of н, from resource-consuming technologies to science-consuming production. In these conditions, the priorities of regional economy management are shifting objectively towards increased attention to intellectualization processes of the countries in the world economy, which open new possibilities for intellectual abilities of employed population efficient usage and serve as an important indicator of a country's transfer to an innovative road of development.

In the world, especially in the developed countries, intellectualization processes of the population employment are justified by the decrease of labor-consumption in contemporary material production. Dramatic changes are taking place in the employment structure in favor of information and services production, science, education, appearing and expansion of new, more complicated professions connected with new electronic technologies, emergence of a new category of employed people – «virtual collars» who provide development and function of information products. According to different assessments, at the beginning of the XXI century, as a result of labor intellectualization in the USA, the information sphere comprises over 80% of total intellectual potential of employed population (IPEP), in Japan – 88%. Thus, obtaining the biggest part of economic effect in the form of GDP (in the USA – 73%, EU countries – 63%, Japan – 56%) is connected, first of all, with the activity of information sector [7, p. 56].

In the modern world, there are a large number of indicators which characterize differences in intellectual state of the national economy. For example, to indirectly determine the level of intellectualization of the national economy in terms of the indicators, such of them are commonly applied: the human development index, the index of globalization, global innovation index, global competitiveness index, the index of knowledge economy, the knowledge index, the index of prosperity of the countries of the world, the reliability index of foreign direct investments, the index of global services, the international security index, the freedom of press index, the international index of development of the Internet, as well as the rankings of countries by the level of development of e-government, knowledge-intensive economies, exports of high-tech products, literacy of the population, public expenditure on education, the number of Internet users, the applications for patents, the costs of research and development, the number of researchers in the country and so on [8].

However, using the above data when comparing the state of intellectualization of national economies, problems occur with different number of countries, duplication of indices, disproportionate number of the components of indicators, various years of publication, etc. Therefore, to ensure comparability, we choose four general indicators – the human development index [9], the global innovation index [10], the global competitiveness index [11] and the knowledge economy index [12]. Using these indices, we conduct research and determine the state of the national economies intellectualization in the world economy.

Human development index (HDI) is an integral index, calculated annually for cross-country comparisons and measurement of quality of life, literacy, education and longevity as the main characteristics of the human potential of the countries under study. It is a standard tool in the overall comparison of the standard of living of various countries and regions. The HDI is calculated by three indicators: life expectancy (evaluates longevity); the literacy rate of the population (the average number of years spent in training) and expected years of schooling; the standard of living, as measured by GNI per capita at purchasing power parity (PPP) in US dollars.

Global innovation index (GII) is compiled by the world intellectual property organization, Cornell University and international business school «Insead». In 2013, it covered 142 countries around the world and used 81 indicators on a range of topics. GII provides a rich data set for analysis of global trends in the field of innovation.

Global competitiveness index (GCI) is global research and the ranking of countries accompanying it in terms of economic

competitiveness. Calculated according to the methodology of the World Economic Forum (WEF), it is composed of 113 variables which characterize in detail the competitiveness of countries at different levels of economic development. The set of variables by two-thirds consists of the results of the global survey of CEOs (to cover a wide range of factors affecting the business climate in the countries studied), and one third from publicly available sources (statistical data and research results carried out on a regular basis by international organizations). All variables are combined into 12 benchmarks, defining national competitiveness: quality of institutions, infrastructure, macroeconomic stability, health and primary education, higher education and training, market efficiency of goods and services, labor market efficiency, financial market sophistication, level of technological development, the size of the domestic market, the competitiveness of companies, innovative potential.

Knowledge economy index (KEI) reflects the situation that is conducive for knowledge to be used effectively for economic development. This is a General indicator that reflects the overall level of development of a country or region as to the knowledge economy. KEI is developed by experts of the World Bank. It is calculated on the basis of the average normalized performance scores of a country or region of all 4 indicators related to the knowledge economy: quality of the motivation using existing and new knowledge; involvement of innovation and new technology to address local needs and create new technology solutions; level of education and training of the population; development of information and telecommunication infrastructure.

We carry out the evaluation and comparison of the state of intellectualization of national economies in the world economy by the average index of the national economy intellectualization (AINEI) as a simple average of the four above-mentioned indexes, normalized to unity, assuming that every component represented by these indexes comprehensively characterizes and has the same effect on the level of intellectualization:

$$AINEI = \frac{HDI + GII/100 + (GCI - 1)/6 + KEI/10}{4}$$

Calculated by the authors, AINEI takes values from zero to one. Given the coincidence of the values of the indices in the countries, we consider the language factor for their ranking (priority is given to countries where the official language is one of UNO languages) and other above indices that characterize the level of intellectualization [8].

According to the calculated results, as for 2013, we have divided 190 national economies by level of intellectualization into five groups: countries with the highest (30 countries), high (30 countries), low (30 countries), the lowest (35 countries) and with the uncertain state of intellectualization (65 countries).

The first group – countries with the highest state of intellectualization: 1. Switzerland (0.812), 2. Sweden (0.800), 3. The Netherlands (0.794), 4. Finland (0.791), 5. USA (0.785), 6. Norway (0.783), 7. UK (0.777), 8. Denmark (0.774), 9. Singapore (0.772), 10. Hong Kong (China, SAR (0.771), 11. Canada (0.767), 12. New Zealand (0.759), 13. Ireland (0.754), 14. Japan (0.743), 15. Luxembourg (0.741), 16. Belgium (0.741), 17. Austria (0.741), 18. Iceland (0,733), 19. Israel (0.730), 20. France (0.727), 21. The Republic of Korea (0.722), 22. Germany (0.721), 23. Australia (0.720), 24. Estonia (0.699), 25. Spain (0.698), 26. Czech Republic (0.683), 27. Malta (0.680), 28. Italy (0.677), 29. Slovenia (0.673), 30. Cyprus (0.661).

The second group – countries with high state of intellectualization: 31. Hungary (0.658), 32. United Arab Emirates (0.656), 33. Portugal (0.650), 34. Lithuania (0.649), 35. Latvia (0.643), 36. Poland (0.638), 37. Qatar (0.638), 38. Chile (0.638), 39. Slovakia (0.633), 40. Saudi Arabia (0.632), 41. Malaysia (0.631), 42. Croatia (0.621), 43. Barbados (0.617), 44. Bahrain (0.610), 45. Greece (0.607), 46. Bulgaria (0.606), 47. Romania (0.598), 48. Kuwait (0.585), 49. Oman (0.584), 50. Costa Rica (0.582), 51. Uruguay (0.579), 52. Azerbaijan (0.577), 53. Mauritius (0.570), 54. Russian Federation (0.567), 55. China (0.561), 56. Brazil (0.555), 57. Turkey (0.552), 58. Thailand (0.552), 59. Panama (0.549), 60. Argentina (0.547).

The third group – countries with low state of intellectualization: 61. Mexico (0.547), 62. Serbia (0.547), 63. Trinidad and Tobago (0.543), 64. Ukraine (0.543), 65. Kazakhstan (0.539), 66. Jordan (0.537), 67. Peru (0.535), 68. South Africa (0.529), 69. Columbia (0.528), 70. Bosnia and Herzegovina (0.527), 71. Jamaica (0.521), 72. Georgia (0.516), 73. Moldova (0.514), 74. Tunisia (0.511), 75. Lebanon (0.509), 76. Mongolia (0.489), 77. Sri Lanka (0.488), 78. Albania (0.488), 79. Botswana (0.487), 80. Ecuador (0.485), 81. Iran (0.481), 82. Philippines (0.478), 83) Indonesia (0.476), 84. Ghana (0.476), 85. Dominican Republic (0.474), 86. Salvador (0.466), 87. Vietnam (0.464), 88. Venezuela (0.462), 89. Bolivia (0.453), 90. Paraguay (0.452).

The fourth group – countries with the lowest state of intellectualization 91. Namibia (0.452), 92. Morocco (0.451), 93. India (0.450), 94. Algeria (0.448), 95. Egypt (0.446), 96. Guatemala (0.440), 97. Kyrgyzstan (0.427), 98. Honduras (0.416), 99. Nicaragua (0.405), 100. Kenya (0.400), 101. Zambia (0.390), 102. Swaziland (0.390), 103. Cambodia (0.384), 104. Senegal (0.378), 105. Rwanda (0.375), 106. Uganda (0.360), 107. Nigeria (0.354), 108. Pakistan (0.354), 109. Bangladesh (0.351), 110. Nepal (0.348), 111. Cameroon (0.344), 112. Lesotho (0.341), 113. Zimbabwe (0.339), 114. Tanzania (0.337), 115. Benin (0.331), 116. Madagascar (0.327), 117. Mali (0.317), 118. Malawi (0.315), 119. Cote d'Ivoire (0.314), 120. Angola (0.307), 121. Ethiopia (0.307), 122. Burkina Faso (0.304), 123. Mozambique (0.304), 124. Yemen (0.304), 125. Guinea (0.294).

The fifth group of countries – countries with uncertain state of intellectualization which are not included in the first four groups due to lack of all indicators for adequate international comparisons. These 65 countries, namely, Afghanistan, Andorra, Antigua and Barbuda, Armenia, Aruba, the Bahamas, Belarus, Bhutan, Brunei-Darussalam, Burundi, Cape Verde, Central African Republic, Chad, Comoros, Congo, Congo (Democratic Republic), Cuba, Djibouti, Dominica, Equatorial Guinea, Eritrea, Fiji, Gabon, Gambia, Grenada, Guinea-Bissau, Guyana, Haiti, Iraq, Kiribati, Lao People's Democratic Republic, Liberia, Libya, Liechtenstein, Macedonia, Maldives, Mauritania, Micronesia, Montenegro, Myanmar, Niger, Palau, Palestine, Papua New Guinea, Puerto Rico, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Samoa, Sao Tome and Principe, Seychelles, Sierra Leone, Solomon Islands, Sudan, Suriname, Syrian Arab Republic, Taiwan (China), Tajikistan, Macedonia, Timor-Leste, Togo, Tonga, Turkmenistan, Uzbekistan, Vanuatu.

The leaders in the state of intellectualization are Switzerland, Sweden, The Netherlands, Finland and the USA. The countries with the highest level of intellectualization serve as an example to all other countries of the world. These countries have a developed market economy, a dominant position in the international economy, which allows actively engaging own and imported resources in the economic turnover, the shift of the center of gravity of economic activity into the services sector, and the dominance of predominantly service economy, the greatest exhaustion of sources and factors of industrial development, advanced post-industrial development. The economic policy of the first group of countries has a decisive influence on the state and dynamics of the global economy, defining the main directions of its scientific and technological development and structural adjustment.

The top position among the former Soviet republics has Estonia which joined the group of countries with the highest level of development. The former socialist countries, such as the Czech Republic and Slovenia, belong to this group, too. Ukraine occupies the 64th position and refers to countries with low state of intellectualization. Following Ukraine by the level of intellectualization among post-Soviet countries are Kazakhstan, Georgia and Moldova. Ethiopia, Burkina Faso, Mozambique, Yemen and Guinea have the worst indices of intellectualization.

Conclusions. Calculated by the authors state of intellectualization of national economies by AINEI shows the place of every country in the world community as to their intellectual capital. Considering the continued deployment of R&D progress, the growing role of high-tech production and the com-

plexity of social and economic relations, AINEI can serve as a reliable indicator of the state of the macroeconomic environment intellectualization. Therefore, the following organizations, bodies and individuals can use the comparative results of this study: the international organizations while developing international economic development programs, the state authorities of the countries at the formation of foreign and domestic policy, companies that create innovative and investment policy, migrants, tourists and persons who perform professional and transit activity for the formation of human potential and capital, scientists and teachers who develop mechanisms of intellectualization.

References

1. Sukhomlinsky, V. (1983). *About mental education.* Kyiv: Soviet School (in Ukrainian).
2. Hrishnova, O. A. (2009). Labor intellectualization – a defining characteristic of post-industrial society. *Teoretychni i praktychni aspekty ekonomiky ta intelektualnoi vlasnosti (Theoretical and Practical Aspects of Economics and Intellectual Property),* 147-150 (in Ukrainian).
3. Boginya, D., Lisohor, L. et al. (2003). *The competitiveness of the labor force in the system of social and labor relations.* Kyiv: Institute of Economics of NAS of Ukraine (in Ukrainian).
4. Kutsenko, V. (2006, September 15). Economy requires skillful hands. *Zerkalo Nedeli (Mirror of the Weak),* 34. Retried from http://www.zn.kiev.ua/nn/show/613/54426/
5. Sardak, S. E. (2010). International movement intellectualization of human resources, as the leading means of solving global problems and challenges of economic development. *Visnyk Kryvorizkoho ekonomichnoho instytutu KNEU (Herald of Kryvyi Rih Economic Institute KNEU), 4,* 6-11 (in Ukrainian).
6. Semynozhenko, V. (2004, April 27). Knowledge Economy: need game on their field. *Den (Day), 75.* Retried from http://www.day.kiev.ua/ru/article/podrobnosti/ekonomika-znaniy-nuzhna-igra-na-svoem-pole
7. Onikienko, V. V., Emelianenko, L. M. et al. (2006). In V. V. Onikienko (Ed.). *Innovative paradigm social and economic development of Ukraine.* Kyiv: NAS of Ukraine (in Ukrainian).
8. The Russian International Affairs Council (2014). *Database of the international statistics and indices.* Retrieved from http://russiancouncil.ru/spec/stat/index.php?active_id_10=33#top (in Russ.).
9. The United Nations Development Programme *(Official website).* Retrieved from http://www.undp.org
10. The Global Innovation Index *(Official website).* Retrieved from http://www.globalinnovationindex.org
11. The World Economic Forum *(Official website)*. Retrieved from http://www.weforum.org
12. The World Bank *(Official website).* Retrieved from http://www.worldbank.org

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References (in language original)

1. Сухомлинский В. А. Об умственном воспитании / В. А. Сухомлинский. – К. : Рад. школа, 1983. – 224 с.
2. Грішнова О. А. Інтелектуалізація праці – визначальна ознака постіндустріального суспільства / О. А. Грішнова // Теоретичні і практичні аспекти економіки та інтелектуальної власності : Зб. наук. праць Приазов. держ. техн. ун-ту. – Маріуполь, 2009. – С. 147–150.
3. Конкурентоспроможність робочої сили в системі соціально-трудових відносин : монографія / Д. П. Богиня, Л. С. Лісогор, М. В. Семикіна, Г. Т. Куліков, О. В. Павловська, В. М. Шамота, В. О. Тимофеєв, Н. Б. Ільченко. – К. : Ін-т економіки НАН України, 2003. – 214 с.
4. Куценко В. Економіка знань потребує умілих рук [Електронний ресурс] / В. Куценко // Дзеркало тижня. – 2006. – № 34.– 15.09. – Режим доступу : http://www.zn.kiev.ua/nn/show/613/54426/
5. Сардак С. Е. Інтелектуалізація міжнародного руху людських ресурсів як провідний засіб вирішення глобальних проблем і викликів економічного розвитку / С. Е. Сардак // Вісник Криворізького економічного інституту КНЕУ : Збірник наукових праць. – 2010. – № 4. – С. 6–11.
6. Семиноженко В. Економіка знань: потрібна гра на своєму полі [Електронний ресурс] / В. Семиноженко // День. – 2004. – № 75. – 27.04. – Режим доступу : http://www.day.kiev.ua/ru/article/podrobnosti/ekonomika-znaniy-nuzhna-igra-na-svoem-pole
7. Онікієнко В. В. Інноваційна парадигма соціально-економічого розвитку України / В. В. Онікієнко, Л. М. Ємельяненко, І. В. Терон ; за ред. В. В. Онікієнка. – К. : РВПС України НАН України, 2006. – 480 с.
8. База данных международной статистики и индексов [Электронный ресурс] / Российский совет по международным делам. – 2014. – Режим доступа : http://russiancouncil.ru/spec/stat/ index.php?active_id_10=33#top
9. Офіційний сайт Програми розвитку ООН [Електронний ресурс]. – Режим доступу : http://www.undp.org
10. Офіційний сайт Глобального інноваційного індексу [Електронний ресурс]. – Режим доступу : http://www.globalinnovationindex.org
11. Офіційний сайт Світового економічного форуму [Електронний ресурс]. – Режим доступу : http://www.weforum.org
12. Офіційний сайт Світового банку [Електронний ресурс]. – Режим доступу : http://www.worldbank.org

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