

Approach to Prioritisation of EU Countries Regarding Cultural Economics

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Abstract

Cultural economics is an interdisciplinary field of scientific research described and analysed by various authors as the interaction of human-made activities with new technologies, various artistic forms, knowledge, and creativity. Consequently, cultural economics has received more and more attention; therefore, it is essential to study the factors of cultural economics and prepare a cultural economics index for a country. This study aims at identifying factors of cultural economics and ranking the countries according to the suggested index. In this study, the following factors have been determined: cultural heritage, culture-related education, cultural employment, cultural enterprises, international trade in cultural goods, use of ICT for cultural purposes, and government expenditure on culture.

Keywords: cultural economics, competitiveness, European Union countries, CRITIC, TOPSIS.

JEL Code: JEL Code, JEL Code, JEL Code (2 – 3)

Introduction

In today's world, culture plays a vital role in many ways. Culture promotes the improvement of the quality of products and services (Roberts & Townsend, 2016), increases social inclusion among vulnerable groups in society (Valverde-Moreno et al., 2021), and promotes sustainable development (Hayashi et al., 2013), develops collective consciousness and critical thinking. All of these contribute to the country's economic and social development and make the country more competitive in the global market, able to adapt more quickly to sudden market changes and maintain its position. Therefore, it is essential to analyse the indicators of the cultural economy in order to assess which country of the European Union (EU) is leading in terms of these indicators.

This article chooses to analyse these indicators of the cultural economy: cultural heritage, culture-related education, cultural employment, cultural enterprises, international trade in cultural goods, use of ICT for cultural purposes, and government expenditure on culture. These indicators were chosen because, in the scientific literature, they are identified as

the most reflective in the cultural sector (De Medici et al., 2020; Gautam & Basnet, 2020; Buljubašić et al., 2016; Karimzadi, 2019). The statistics of the research sample for 2019 were taken from the Eurostat database publication (Beck-Domzalska & Statistical Office of the European Communities., 2019), and all countries of the EU were analysed. The first part of the article discusses the selected indicators of the cultural economy and reviews the theoretical aspects of compiling cultural indices. The second part of the article uses the CRITIC method to determine the weights of indicators and integrated proportionality assessment method–TOPSIS. This method concluded a line of priorities for the countries of the EU and determines how far one country is from another. The third part of the article summarises the results of the research.

1 Theoretical Background

Cultural economics is the interaction of human-made activities between new technologies, various artistic forms of knowledge and creativity. It is an interdisciplinary field of research that includes many areas of social activities and is most commonly analysed: creativity, digital technologies, cultural institutions, creativity, and digital technologies. Table 1 presents the cultural economy indicators chosen to be explored in this study.

Tab. 1: Cultural economics indicators assessed in the research

Indicators	Sub-Indicators	Unit of measure
1. Cultural heritage	1.1. Number of heritage included in the UNESCO World Heritage List	Number of objects in the country
	1.1. Number of intangible heritage the UNESCO Representative List of the Intangible Cultural Heritage of Humanity	
2. Culture-related education	2.1. Students enrolled in tertiary education by education level	Number of students enrolled per year
3. Cultural employment	3.1. Cultural employment	Thousand persons
4. Cultural enterprises	4. Number of enterprises in the cultural sectors	Number of enterprises
5. International trade in cultural goods	5.1. Intra – EU trade in cultural goods by product	Thousand euro
	5.2. Extra – EU trade in cultural goods by product	
6. Use of ICT for cultural purposes	6. Households – level of internet access	Percentage of households
7. Government expenditure on culture	7. Government expenditure on culture, recreation and religion	percentage

Source: compiled by the authors based on Beck-Domzalska & Statistical Office of the European Communities (2019)

Cultural employment, international trade in cultural goods and services, cultural enterprises, and government spending on culture and cultural heritage are identified as essential indicators in analysing the impact of culture on national economies (De Medici et al., 2020; Gautam & Basnet, 2020; Buljubašić et al., 2016; Karimzadi, 2019). As could be seen from Table 1, each indicator is divided into sub-indicators, the statistics of which are analysed. Indicators that reflect the cultural sector have been distinguished to rank countries regarding the cultural economy. As culture is diverse and multifaceted, it is indexed, bringing together different sets of data so that such complex phenomena as a culture could be assessed. Therefore, in this study, an analysis of the scientific literature is performed, which reviews the theoretical aspects and assumptions of the latest cultural indices.

Although the topic of culture is widely investigated, the analysis of cultural economy indicators and the ranking of countries according to it still receives too little scientific attention due to the lack of complex statistics in this field. For this reason, the data from specific individual indicators is being analysed (Daubaraitė-Radikiene & Startiene, 2022). An index based on this principle was proposed by Collins and Murtagh (2018) – Cultural Economy Index. The index intends to assess the development of the cultural economy. This index consists of eight indicators for certain activities divided into three groups: cultural industries, cultural funding and cultural infrastructure. Weights of 50%, 25% and 25% were assigned to each group, respectively. The results of the index were obtained by standardising the data according to the population in the analysed regions. Another index is the Creative Economy Index developed by the same authors (Collins & Murtagh, 2018). The purpose of this index is to assess the development of the creative economy in selected regions. The index is based on the same principle as the Cultural Economy Index but includes more (26) indicators that are grouped into five groups: creative industries, creative entrepreneurship and innovation environment, cultural infrastructure and consumption, digital communication and cultural production, and population diversity and peripherality. Comparing these two indices, some indicators are repeated, but the Creative Economy Index is much more comprehensive. In the evaluation of the index, the authors stated that it was a pilot index and that its results should only be used as part of a broader study to assess the development of the cultural economy (Collins & Murtagh, 2018). Daubaraitė-Radikiene and Startiene (2022) proposed an index of the impact of the creative industries on the country's economy, which aims to assess the impact of the creative industries in specific areas of the countries in question: the economy, socio-culture and the environment. Daubaraitė-Radikiene and Startiene, (2022) state that this index could help to address issues related to the social and cultural environment, such as social development, improving the

quality of life, increasing social inclusion, etc. The index consists of three areas of impact: economics, socio-cultural, and the environment. After the calculations of the indicator statistics, the countries are ranked according to the above-mentioned areas of impact. According to the authors of the index, the limitation of this study is the lack of statistical data.

Foster et al. (2020) developed the Cultural Heritage Index, which contributes to the development of the circular economy through cultural heritage. The purpose of the index is to justify the renovation or restoration of existing cultural heritage sites. Using this index, cities can be ranked according to the efficiency of investment in the restoration of cultural heritage. In this way, it would be possible to analyse which cities are most effective in investing in the restoration of cultural heritage and which are less likely to do so. The index consists of selected indicators that have the greatest impact on cultural heritage sites. According to the statistics of the presented indicators, the authors assess the state of the cultural heritage of individual European cities, analyse the positive and negative examples, and look for solutions that could help the lagging countries.

The different indices examined, which can be attributed to cultural economy research, show that there are already individual attempts to analyse cultural economy indicators. Still, according to the authors, they do not cover the entire cultural economy sector but only individual parts. It is, therefore, worthwhile to analyse the selected indicators of the cultural economy in order to see how the different countries of the EU are ranked according to them, and such a study could be part of further research.

2 Methodology

The methodology is divided into two steps. The first step covers the assignment of weight to selected indicators. And the second step is devoted to the prioritisation of the indicators of cultural economics. The data used in this study are from 2019 (the latest available information). The data was collected from Eurostat (Beck-Domzalska & Statistical Office of the European Communities., 2019).

2.1 CRITIC method

The CRITIC method was selected for weights assignment as it is considered an objective methodology for that issue. The CRITIC method approach is described in the following steps (Krishnan et al., 2021; Paradowski et al., 2021):

Step 1. The decision matrix X showing the performance of different alternatives concerning selected criteria is constructed:

$$X = [x_{ij}]_{m \times n} = \begin{bmatrix} x_{11} & x_{12} & \dots & x_{1n} \\ x_{21} & x_{22} & \dots & x_{2n} \\ \vdots & \vdots & \ddots & \vdots \\ x_{m1} & x_{m2} & \dots & x_{mn} \end{bmatrix} \quad i \in \{1, 2, \dots, m\}, j \in \{1, 2, \dots, n\} \quad . \quad (1)$$

Step 2. The normalisation of the decision matrix:

$$r_{ij} = \frac{x_{ij} - x_j^{\min}}{x_j^{\max} - x_j^{\min}}, \quad i \in \{1, 2, \dots, m\}, j \in \{1, 2, \dots, n\}, \quad (2)$$

where:

m – the number of alternatives.

n – number of criteria.

Step 3. Calculation of the standard deviation σ_j of each r_j .

Step 4. Calculation of correlation of every pair of normalised criteria and construction of the symmetric matrix with elements R_{ij} .

Step 5. Determination of conflict measure between criteria:

$$\sum_{j=1}^n (1 - R_{ij}) \quad (3)$$

Step 6: Determination of information amount C_j released by the j -th criterion:

$$C_j = \sigma_j \sum_{j=1}^n (1 - R_{ij}) \quad . \quad (4)$$

Step 7. Determination of the weights of criteria:

$$w_j = \frac{C_j}{\sum_{j=1}^n C_j} \quad . \quad (5)$$

2.2 TOPSIS method

The essence of the TOPSIS method is to determine the relative distance of each alternative to the “ideally worst” option. The more higher that distance, the more appropriate the alternative being considered for the decision maker. This method differs from other multi-criteria methods that there are no restrictions on determining the significance of the indicators and the sum of

the significance of the indicators does not necessarily have to be equal to one (Çelikkbilek et al.,2020).

Step 1. Create a matrix of solutions and assign weights to criteria.

Step 2. Matrix normalisation:

$$n_{ij} = \frac{x_{ij}}{\sqrt{\sum_{i=1}^m x_{ij}^2}} \quad (6)$$

Step 3. Calculation of the weighted matrix:

$$v_{ij} = w_j n_{ij} \text{ for } i = 1, \dots, m; j = 1, \dots, n. \quad (7)$$

w_j – j - criterion weight.

Step 4. Identify the ideal positive and the ideal negative solution.

$$V^+ = (v_1^+, v_2^+, \dots, v_n^+) = \left(\left(\max_i v_{ij} \mid j \in I \right), \left(\min_i v_{ij} \mid j \in J \right) \right) \quad (8)$$

$$V^- = (v_1^-, v_2^-, \dots, v_n^-) = \left(\left(\min_i v_{ij} \mid j \in I \right), \left(\max_i v_{ij} \mid j \in J \right) \right) \quad (9)$$

where I equated with maximising, and J with a minimising criterion, $i = 1, \dots, m; j = 1, \dots, n$.

Step 5. Calculate the distances to ideal positive and ideal negative decisions:

$$S_i^+ = \sqrt{\sum_{j=1}^n (v_{ij} - v_i^+)^2}, \quad i = 1, 2, \dots, m. \quad (10)$$

$$S_i^- = \sqrt{\sum_{j=1}^n (v_{ij} - v_i^-)^2}, \quad i = 1, 2, \dots, m. \quad (11)$$

Step 6. Calculate the relative proximity to a positive ideal solution:

$$P_i = \frac{S_i^-}{S_i^- + S_i^+} \quad (12)$$

Step 7. Arrange the objects to be examined.

3 Results and Discussion

In the first part of the study, the CRITIC method was used to determine the weights for the selected cultural economy indicators, and the results are presented in Table 2. As can be seen

from Table 2, the most significant indicators are the number of intangible heritage, the UNESCO Representative List of the Intangible Cultural Heritage of Humanity, households – level of internet access, government expenditure on culture, recreation and religion. This is a likely result, as the identified indicators are important for the international awareness of the country's culture, promote international cooperation and have a significant impact on the consumption of cultural products and services and the development of the cultural sector as a whole.

Tab. 2: Obtained weights of sub-indicators

Sub-Indicators	Weights of Sub-indicators
1.1. Number of heritage included to the UNESCO World Heritage List	0,0965
1.1. Number of intangible heritage the UNESCO Representative List of the Intangible Cultural Heritage of Humanity	0,1876
2.1. Students enrolled in tertiary education by education level	0,0788
3.1. Cultural employment	0,0764
4. Number of enterprises in the cultural sectors	0,0953
5.1. Intra – EU trade in cultural goods by product	0,0831
5.2. Extra – EU trade in cultural goods by product	0,0831
6. Households - level of internet access	0,1517
7. Government expenditure on culture, recreation and religion	0,1475

Source: authors' calculations

In the second part of the study, the TOPSIS method was used to assess the priority ranking of the EU countries according to the established indicators of the cultural economy. The obtained results are shown in Table 3.

Tab. 3: Cultural economics indicators ranking of EU country

Country	P_i Result	Rank	Country	P_i Result	Rank
France	0,742	1	Estonia	0,211	15
Germany	0,595	2	Slovakia	0,206	16
Spain	0,554	3	Portugal	0,203	17
United Kingdom of Great Britain and Northern Ireland	0,538	4	Slovenia	0,167	18
Italy	0,520	5	Sweden	0,166	19
Croatia	0,396	6	Denmark	0,149	20
Belgium	0,363	7	Cyprus	0,137	21
Poland	0,332	8	Bulgaria	0,136	22
Hungary	0,301	9	Finland	0,134	23
Czechia	0,272	10	Lithuania	0,132	24
Netherlands	0,246	11	Latvia	0,125	25
Austria	0,246	12	Luxembourg	0,109	26
Romania	0,231	13	Ireland	0,079	27
Greece	0,227	14	Malta	0,077	28

Source: authors' calculations

According to the obtained results, the most advanced countries according to the selected indicators of the cultural economy are France with 0.742 points and Germany with 0.595 points. The findings can be logically justified in comparison with the 2019 Global Competitiveness Index. In this global ranking, the mentioned countries are in the top 20 of the most competitive countries in the world, with Germany in 7th place and France in 15th place.

Conclusions

Culture is a widely analysed topic, but an analysis of the scientific literature on indices related to the cultural economy shows that the analysis of cultural economy indicators and the ranking of countries according to it still receives too little scientific attention as part of cultural research. Cultural employment, international trade in cultural goods and services, cultural enterprises, and government spending on culture and cultural heritage are identified in the scientific literature as essential indicators in analysing the impact of culture on national economies.

In this study, the countries of the EU were ranked according to the selected indicators of the cultural economy. The CRITIC method was used to determine the weight of the selected indicators, and the TOPSIS method was used to compile a series of priorities for the EU countries. According to the weighted procedure, the most significant indicators are the number of intangible heritage, the UNESCO Representative List of the Intangible Cultural Heritage of Humanity, households – level of internet access, government expenditure on culture, recreation and religion. This is not a surprising result, as the identified indicators are essential for the international awareness of the country's culture and significantly impact the consumption of cultural products and services and the development of the cultural sector. The results of the TOPSIS method showed that the most advanced countries in terms of selected cultural economy indicators are France with 0.742 points, Germany with 0.595 points, and least advanced Ireland with 0.079 points and Malta with 0.077 points.

References

- Beck-Domzalska, M., & Statistical Office of the European Communities. (2019). *Culture statistics : 2019 edition*.
- Buljubašić, I., Ham, M., & Pap, A. (2016). Factors Influencing the Implementation of Unconventional Marketing in Cultural Institutions – Evidence from Croatia. *Scientific Annals of Economics and Business*, 63(2), 247–272. <https://doi.org/10.1515/saeb-2016->

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- Çelikkbilek, Y., & Tüysüz, F. (2020). An in-depth review of theory of the TOPSIS method: An experimental analysis. *Journal of Management Analytics*, 7(2), 281–300. <https://doi.org/10.1080/23270012.2020.1748528>
- Collins, P. and Murtagh, A. (2018). *Cultural Economy Index*.
- Collins, P. and Murtagh, A. (2018). *Creative Economy Index*.
- Daubaraitė-Radikiene, U., & Startiene, G. (2022). Index-Based Measurement of Creative Industries' Impact on National Economy. *Engineering Economics*, 33(1), 13–26. <https://doi.org/10.5755/j01.ee.33.1.27869>
- De Medici, S., De Toro, P., & Nocca, F. (2020). Cultural heritage and sustainable development: Impact assessment of two adaptive reuse projects in Siracusa, Sicily. *Sustainability (Switzerland)*, 12(1). <https://doi.org/10.3390/su12010311>
- Foster, G., Saleh, R., Murtagh, A., Daubaraitė-Radikiene, U., Startiene, G., Sanchez Salgado, R., Arseneault, R., Roulin, N., Baluku, M. M., Kikooma, J. F., Bantu, E., Onderi, P., Otto, K., Koltsova, A., Alpatov, G., Volkova, A., Grillitsch, M., Tavassoli, S., de Santana Ribeiro, L. C., ... Ali, I. S. (2020). Index-Based Measurement of Creative Industries' Impact on National Economy. *Journal of Cultural Economics*, 12(4), 605–624. <https://doi.org/10.5897/AJBM10.145>
- Gautam, D. K., & Basnet, D. (2020). Organisational culture for training transfer: the mediating role of motivation. *International Journal of Organizational Analysis*, 29(3), 769–787. <https://doi.org/10.1108/IJOA-04-2020-2147>
- Hayashi, N., Boccardi, G., & Al Hassan, N. (2013). Culture In The New International Development Paradigm. *Culture in the Post-2015 Sustainable Development Agenda: Why Is Culture Key to Sustainable Development?*, September 2012, 1–10. http://lali-iniciativa.org/descargas/foros/4-UNESCOHangzhouCongress2013/FinalENG_Background_paper_HangzhouCongress.pdf
- Karimzadi, S. (2019). Culture in Economics. *Advances in Economics and Business*, 7(1), 8–14. <https://doi.org/10.13189/aeb.2019.070105>
- Krishnan, A. R., Kasim, M. M., Hamid, R., & Ghazali, M. F. (2021). A Modified CRITIC Method to Estimate the Objective Weights of Decision Criteria. *Symmetry*, 13(6), 973. <https://doi.org/10.3390/sym13060973>
- Paradowski, B., Shekhovtsov, A., Bączkiewicz, A., Kizielewicz, B., & Sałabun, W. (2021). Similarity Analysis of Methods for Objective Determination of Weights in Multi-Criteria

Decision Support Systems. *Symmetry*, 13(10), 1874.
<https://doi.org/10.3390/sym13101874>

Roberts, E., & Townsend, L. (2016). The Contribution of the Creative Economy to the Resilience of Rural Communities: Exploring Cultural and Digital Capital. *Sociologia Ruralis*, 56(2), 197–219. <https://doi.org/10.1111/soru.12075>

Valverde-Moreno, M., Torres-Jimenez, M., & Lucia-Casademunt, A. M. (2021). Participative decision-making amongst employees in a cross-cultural employment setting: evidence from 31 European countries. *European Journal of Training and Development*, 45(1), 14–35. <https://doi.org/10.1108/EJTD-10-2019-0184>

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