Mapping the Cultural and Creative Industry in the South Bohemia Region

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Abstract: This article aims to facilitate the establishment and coordination of an integrated network comprising current stakeholders in the cultural and creative sector, along with key entities in tourism. Fostering the growth of the creative sector within distinct regions plays a pivotal role in establishing a robust framework for planning, collaboration, and enhancing the efficacy of generating additional impacts within the cultural and creative industries. The focus is particularly on the South Bohemia Region and the adjacent border region encompassing the territory of the South Bohemia Region and Lower Bavaria. The objective is to bolster the development of a comprehensive system that encourages synergy among cultural and creative entities, contributing to the overall advancement and efficiency of the region's cultural and creative industries, while concurrently fortifying ties with significant tourism stakeholders.

1. Introduction

The National Research and Innovation Strategy for Intelligent Specialisation of the Czech Republic 2021-2027 (hereinafter "National RIS3 Strategy") ensures effective targeting of European, national and regional resources to support oriented and applied research and innovation. The National RIS3 Strategy directs support to selected priority areas that have a high potential for creating a long-term competitive advantage of the Czech Republic based on knowledge exploitation and innovation (for thematic areas see Figure 1). The identification and development of these promising areas, i.e. "smart specialisation", builds on the strengths of the Czech Republic and individual regions. It seeks to make targeted "smart" use of the unique combination of opportunities offered by our economic base and research and innovation capacities. At the same time, the strategy identifies and addresses weaknesses in the innovation system that ultimately represent barriers to the development of smart specialisation and the innovation environment as a whole.

These weaknesses are summarised in the analytical part of the National RIS3 Strategy, which is based on a wide range of background analyses. The analysis identifies low value added and a focus on lower-order innovations as a significant general problem of the Czech

economy compared to advanced economies, which, on the contrary, focus on knowledge-intensive activities. This is largely due to the type of manufacturing activity prevalent in the Czech Republic, which is located in the lower tiers of value chains. Moreover, the Czech Republic has a weak endogenous business sector and, despite its industrial tradition, technical competence and creativity of its population, does not have a broader base of technologically advanced firms located in the higher tiers of global value chains. Moreover, instead of diversifying the country's product base, it is concentrated in a few sectors, which increases the vulnerability of the whole economy in the event of external shocks.

The development of the economy towards higher innovation and added value is also hampered by a lack of qualified people and the absence of a stable, predictable and motivating business environment. A functioning public R&D system producing quality results can make a significant contribution to the development of an economy based on knowledge, added value and the ability to respond to current technological and societal trends. Despite the significant potential of some domestic research organisations and infrastructures, the overall quality and performance of public R&D in the Czech Republic still has reserves. A key issue in terms of RIS3 is also the insufficient exploitation of public R&D results for the needs of companies and society.
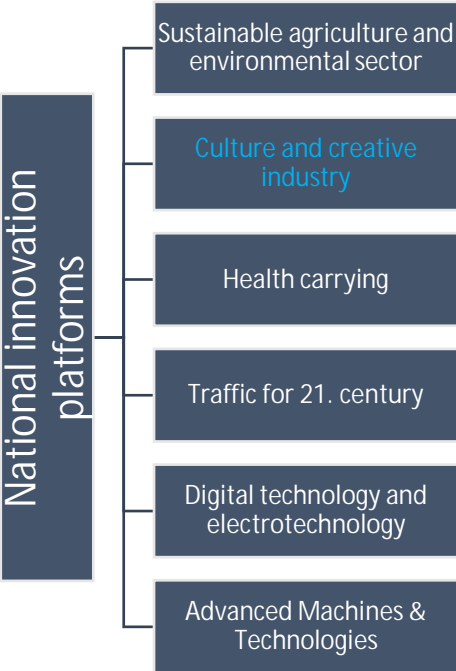

Figure 1. Thematic areas/National Innovation Platforms and domains of specialization (Hartley, 2004)

It should be noted that the Cultural and Creative Industries thematic area has two application sectors – Traditional Cultural and Creative Industries (Traditional Industries for short) and New Cultural and Creative Industries (New Industries) (Table 1).

R&D expenditures in the business sector are relatively high in both application sectors and continue to increase. R&D expenditure is particularly high in the application sector Traditional Industries. Both SMEs and large enterprises are involved in R&D here, but more than half of the R&D expenditure takes place in foreign-controlled enterprises. Research-

active enterprises are active in all regions of the Czech Republic, with the highest R&D expenditure in Prague and the Central Bohemia and Zlín regions. The concentration of R&D expenditure is not very high.

Table 1. Traditional/new cultural and creative industries (Hartley, 2004)

Traditional cultural and creative industries	Fine Art Theatre Music Dance Literature Museums Design Architecture
New cultural and creative industries	Animation Film Media Television and radio Advertisement Digital platforms Intermedia Computer games

It is expected to be complemented by other areas such as the development of advanced materials and technologies and their use in a range of areas, including traditional craft techniques, art, design, heritage conservation and other cultural and creative professions and possibly others including the use of natural, renewable and recycled materials, reducing environmental impact; the development of digital technologies (including ICT and artificial intelligence) and their wider use in all areas, including media production, performing arts, architecture, archiving, librarianship and other cultural and creative industries; open access to data, databases and other information.

2. Methodology

In the context of the growing importance of the creative economy, there is a growing need for statistical coverage of the output of the creative sector, which is then linked to efforts to quantify the impact of this sector on the economy of individual countries and regions. However, this is an area that is not uniform and where there are no well-defined and used definitions of terms. There are different definitions at different levels. However, definitions sometimes leave some room for interpretation.

The American economist Solow (1957) published a study on the impact of technology on economic growth. Lucas (1988) and Glaeser (1995; 1998; 1999; 2000) also discuss the impact of human capital on the economy. The relationship between the educational attainment of the population and economic growth is discussed by Barro (2001).

Florida and Tinagli (2004) identified three types of creative activity: technological/innovative, economic and artistic. These three types of creativity are interrelated, interdependent and complementary. They are key to the emergence and development of creativity in the economy. Florida himself stated, "Creativity, whether

cultural, scientific, civic, technological, or social, etc., is the driving force of the modern global economy." Urban regions are key laboratories where this process takes place and where all types intersect.

Existing tools according Jeřábek (1993) used to capture and assess the economic performance of different sectors of the economy are not suitable for our two-pronged approach, but are in principle based on them. Current statistical tools do not allow for an assessment of the creative industries and the creative economy. At European and national level, the statistical categories are often too broad, making the data collected incomparable. According to Hartley (2004), the problem with the definition of a creative area, creative economy, creative sector, etc. and the subsequent statistical investigations can be seen in how creative industries differ from traditional industries. This is primarily the inability to fit the creative industries into the chain of traditional definitions, primary, secondary and tertiary sectors. The products of the creative economy can be found in each of these sectors. It is problematic to identify the creative industries on the basis of the output of the product, as is the case in traditional industries such as the automotive industry, the steel industry, etc., because creativity is an input, not an output (Surynek, 2001).

The creativity index (CI) is an indicator that can be used to calculate and measure creativity and its development in different geographical areas. The creativity index is based on research by Richard Florida, who uses the so-called 3Ts of creativity, which stands for talent, technology and tolerance. He explains this theory by saying that creative people prefer places that are different, tolerant and open to new things and ideas. Each of the 3T indices is composed of other sub-indices and has different measurement parameters (Figure 2).
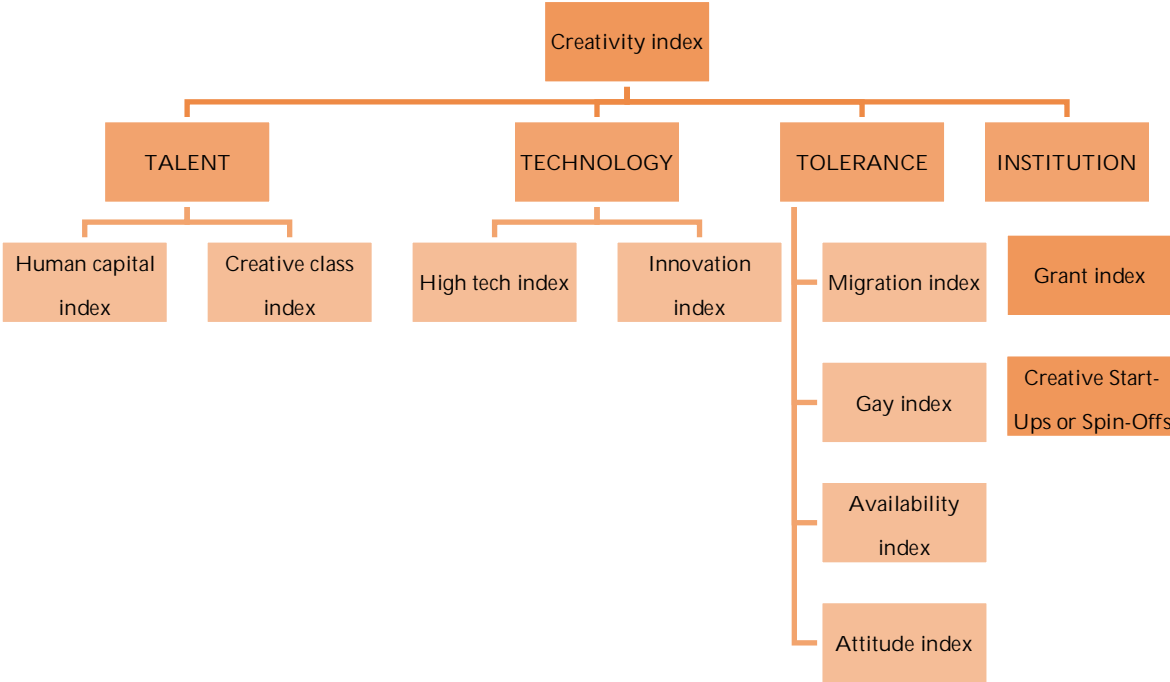

Figure 2. Creativity index (own processing based on Florida and Tinagli (2004))

The 3T creativity index has been adapted for Europe in the form of a Eurocreativity index, which consists of three sub-indices: the Eurotalent index, the Eurotechnology index and the Eurotolerance index. Similarly, the 3T creativity index – tolerance, technology and talent – was constructed for each of the 14 regions of the Czech Republic (Kloudová, 2009).

Naylor and Florida (2003) introduced a new framework for measuring the creative economy. In this work, authors describe the growth of the creative economy and the changing layers of American society in the second half of the 20th century. They emphasize the geographic concentration of creative capital and relativizes the concentration of creative capital, economic growth, and regional development.

For the application of the creativity index Mellander and Florida (2007) to the border region of South Bohemia and Lower Bavaria, we rely on the Florida 3T model, i.e., the model of technology, talent and tolerance. For each of these indices it was necessary to select sub-indices that can be applied to the conditions of the mentioned border areas.

The method of constructing the creativity index consists of the following calculation steps:

1. First, the individual sub-indices are added up, i.e., all the sub-indices of talent, tolerance, technology and institutional for both areas.
2. The next step is to rank the scores of both territories from best to highest.
3. The better county gets 2 points, the other counties get a score proportional to the distance from the best index using a "trinomial".
4. The scores thus allocated for all indices are added together to give us the score for each territorial area.

Measuring the creativity index. In this project, the Florida approach was chosen and the creativity index was based on the so-called 3T model. The 3T's include talent, technology and tolerance. The main rationale for his theory is that creative people choose cities for their lives that are different because they are tolerant and open to new ideas, which leads to a concentration of creative capital in the region. Each 3T indicator is composed of other sub-indicators and has split measurement parameters.

In calculating our creativity index – Culture Creative Index (CCI), sub-indexes of talent, technology, tolerance and institution were determined, while economic performance indicators were also considered (Table 2). It is primarily about capturing the conditions, the environment for the development of creative industries. In the next section, the areas of calculation of the indices and within each area, the individual indicators from which the creativity index is calculated are presented.

However, Florida's approach has been modified to match the temporal evolution and accuracy as well as the availability of data in the survey region. In addition, the approach was adjusted during the bilateral coordination of data availability.

The overall index is the simple sum of the individual sub-indices without any weighting of the individual sub-indices, or the weights are equal. Some sub-indices have a major

Table 2. Structure of the CCI and the importance of each sub-index according to the methodology. (own processing based on Florida and Tinagli (2004))

SUBINDEX TALENT
A. Human Capital Index (HCI) – percentage of people from the South Bohemian Region with higher education to the total population in the South Bohemian Region
B. Creative Class Index (ICT) – share of art schools in South Bohemia in the population of South Bohemia
C. Technical Information Index (ITJ) – percentage of students studying technical fields and informatics at schools of all types in the population of South Bohemia
D. Language index (IJ) – percentage of population in South Bohemia with language education in the population of South Bohemia
TECHNOLOGY SUBINDEX
E. Research and Development Index (RDI) – expenditure on technology as a share of GDP in South Bohemia
F. Innovation index (II) – number of granted patents per capita in South Bohemia
TOLERANCE SUBINDEX
G. Migration Index (IM) – share of foreign migrants in the South Bohemia Region in the total population of the South Bohemia Region
H. Attitude index (IP) – percentage of tolerant people to the total number of respondents in South Bohemia
I. Gay Index (GI) – number of registered partnerships per population in South Bohemia
INSTITUTIONAL SUBINDEX
J. Grant Index (GrI) – share of EU projects per capita in South Bohemia
K. index start-up or spin-off (ISU) – number of start-ups or spin-offs per population in South Bohemia
L. availability index (ID) – percentage of transport connections in the region per capita in South Bohemia

Table 3. Calculation of CCI (part 1)

	Period or date to which the data used relate	Subindex value in %
SUBINDEX TALENT		
A. Human Capital Index (HCI) – 58,268 persons aged 15 and over with higher education out of 537,217 persons of this age in South Bohemia, recalculated with respect to 2021 (Český statistický úřad, n.d.)	26. 3. 2021	9.146
B. Creative Class Index (ICT) - 45 art schools in South Bohemia, recalculated with respect to 2021 (Český statistický úřad, n.d.)	30. 6. 2022	0.0071
C. Technical Information Index (ITJ) – 3,705 students and graduates of technical fields and computer science at universities in South Bohemia, recalculated with respect to 2020 (Soukupová, 2022)	School year 2020	0.5757
D. Language index (IJ) - The necessary data are not officially available (CSU), the results of the own questionnaire survey were used, only good and very good knowledge of a foreign language was taken into account, a total of 593 cases, i.e. 67% of 882 all respondents... necessary assumption - the sample is representative (own survey)	2022/2020	67.2335 Only a very rough, rather highly optimistic estimate[1]

Table 3. Calculation of CCI (part 2)

	Period or date to which the data used relate	Subindex value in %
TECHNOLOGY SUBINDEX		
E. Research and Development Index (RDI) - Share of expenditure on R&D in South Bohemia - CZK 3.4 billion, i.e. EUR 136,000,000, recalculated with respect to 2020, (Český statistický úřad, n.d.)	2020	1.2
F. Innovation index (II) - Number of granted patents (granted to companies, public research institutions, public universities and individuals) - 17, recalculated in relation to 2020 (Úřad Průmyslového Vlastnictví, n.d.)	2020	0.00264
TOLERANCE SUBINDEX		
G. Migration Index (IM) – 23,601 foreigners in South Bohemia in 2020[2], recalculated with respect to 2020 (Český statistický úřad, n.d.)	2020	3.6673
H. Attitude index (IP) – The data is not officially available (CSU), the results of our own questionnaire survey were used, only rather high and very high openness towards new futuristic buildings was taken into account, 333 cases in total, i.e., 37.755% of 882 all respondents... necessary assumption - the sample is representative (own survey)	2022	37.7551 Only a very rough, rather highly optimistic estimate[3]
I. Gay Index (GI) – Number of couples in registered partnerships in South Bohemia - 209, recalculated with respect to 2021 (Český statistický úřad, n.d.)	2021	0.032806
INSTITUTIONAL SUBINDEX		
J. Grant Index (GrI) - Number of EU projects in South Bohemia – 2,876, recalculated for 2021 (Kohesio, n.d.)	1. 12. 2021	0.4514
K. index startup or spin-off (ISU) - Number of supported start-ups in 2021 - 3, recalculated in relation to 2021 (Jihočeská Univerzita v Českých Budějovicích, n.d.)	2021	0.000471
L. availability index (ID) (Jikord, n.d.)	2022	0.958741
CCI VALUE AFTER ROUNDING TO HUNDREDS		121.03

[1]The estimate would mean that about 67% of the entire population in the South Bohemian Region speaks one or more foreign languages well or very well. The value is probably strongly influenced by the more than half of the respondents aged 18-24.

[2]The data used take into account the migration wave associated with the war in Ukraine.

[3]The estimate would mean that about 37.755% of the entire population in the South Bohemian Region has a high or very high degree of friendliness towards new futuristic buildings. The value is probably greatly influenced by more than half of the respondents being aged 18-24.

impact on the overall value, others have a minimal impact. In my view, comparisons of scores that take more account of how a region is moving towards or away from another region for a given sub-index are more relevant to the overall assessment.

3. Results

The cultural and creative industry is a highly structurally complex sector of the economy, and it is not easy to capture its development statistically; it is still in a state of development. One possibility is to calculate the CCI.

The aim is to determine the current value of the CCI for the South Bohemia Region.

The calculated CCI will apply to the South Bohemia Region with all its districts: České Budějovice, Český Krumlov, Jindřichův Hradec, Písek, Prachatice, Strakonice, Tábor.

For each sub-index, the source of the data is indicated, as well as the period or date to which the data used relate (Table 3).

Population of the South Bohemia Region as of 31 December 2020 – 643,551.

Population of the South Bohemia Region 26 March 2021 – 637,085.

4. Conclusions

In terms of evaluating the calculation of the CCI index and comparing it to Lower Bavaria, where the CCI index was prepared using the same methodology, we can state that both areas have comparable ILK, ICT, IJ and GI sub-indices. On the other hand, there are significant differences in the ITJ, IVV, II, IM, IP, GRI, ISU and ID indices. In addition to that, we can conclude the following:

a) The higher value of the technical-information sub-index (ITJ) in favour of Lower Bavaria confirms the higher percentage of students studying technical disciplines and computer science in schools of all types per population than in South Bohemia.

b) Technology expenditure as a share of GDP (IVV sub-index) is lower in South Bohemia than in Lower Bavaria.

c) The number of granted patents (sub-index II) per capita is higher in Lower Bavaria than in South Bohemia.

d) The Migration Index (IM) showed a higher proportion of migrants in the population in Lower Bavaria than in South Bohemia. The values of the sub-indices in both cases are strongly influenced by the migration wave caused by the war in Ukraine.

e) The percentage of tolerant people to the total number of respondents in South Bohemia (IP) can be considered as a more valid result (estimate) than the value of the same sub-index in the case of Lower Bavaria due to the sufficient number of respondents in the implemented questionnaire survey.

f) The value of the Grant Guarantee Index (GRI) is higher in South Bohemia than in Lower Bavaria (this is a comparison of the number of EU projects, not a comparison of the total amount of grant funding received).

g) Not surprisingly, the value of the sub-index start-up and spin-off is higher in Lower Bavaria than in South Bohemia, which indicates a more developed state of R&D and new technologies and their support.

h) An interesting result was obtained by comparing the accessibility sub-indices; the accessibility by public transport is roughly twice as good in South Bohemia as in Lower Bavaria. It seems that people in South Bohemia rely on transport accessibility much more than in Germany.

It can be summarized that the two geographically and historically close areas are comparable in a number of criteria; for example, both areas have approximately the same population of university-educated people, have a comparable proportion of art schools in

the population, the people of both areas have approximately the same language skills, or show approximately the same level of tolerance towards persons entering into registered partnerships.

On the other hand, the two territories differ considerably in a number of indicators. For example, in Lower Bavaria, more students study technical fields and computer science, and Lower Bavaria invests more in the development of new technologies than South Bohemia, which is also reflected in a higher number of patents granted and a higher value of the sub-index start-up and spin-off. The German region also shows a higher tolerance of attitudes and openness to new futuristic constructions than the South Bohemia region. Given the EU's long-standing support for the development of former European post-communist countries, it is not surprising that the number of projects in South Bohemia is higher per capita than in Lower Bavaria. Probably for historical reasons, we observe a higher availability of public transport on Czech territory than on German territory.

Also, the comparison of the region's scores in the individual sub-indices and the comparison of the total scores shows that South Bohemia is lagging behind the Lower Bavaria region. The significance of these values would increase if all sub-indices were monitored over a long period of time, for example over several years, and it would be possible to model a certain trend and development of both regions in the CCI.

The data for the comparison of the CCIs come mainly from available databases, especially the CSO or the South Bohemia Region and similar institutions on the German side, or were drawn from the results of our own questionnaire survey and its analysis. However, it is the results used from the questionnaire survey that have brought with them (especially on the German side) a considerable bias in the resulting comparison. It is therefore necessary to identify the values on the language skills of the population or the values on tolerance towards migrants, which are affected by the migration wave due to the war in Ukraine, as biased. Finally, it should also be pointed out that, due to the unavailability of data from certain years, recalculations of some sub-indices have been made with respect to years other than those from which the data originated. However, the resulting errors have a rather negligible impact on the resulting CCI value. The comparison of the CCIs for the two areas mentioned above should therefore be considered as indicative only.

Conflict of interest: none.

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