Economic Dimension of Creativity: Measuring Creativity for the Modelling of Economic Growth[1]

Ekonomický rozmer kreativity: Meranie kreativity pre potreby modelovania ekonomického rastu

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Abstract

The paper analyses several methods to explain the economic dimension of the creativity. Even though the transmission mechanism of transformation of an asset as a result of creativity to the economic growth is not straightforward, the creativity can be measured or approximated. This can be done for example with creativity indexes or with defining creative industries. This concept enables us to build several models based on various approaches; models to measure contribution of creativity to economic growth. The paper suggests how to measure it with models multi-factorial production function.

Key Words: Creativity, Creative Industries, Model, Production Function.

Abstrakt

Článok analyzuje rôzne metódy objasňujúce ekonomický rozmer kreativity. Hoci transmisný mechanizmus transformácie nejakého aktíva do ekonomického rastu ako výsledku tvorivosti nie je jednoznačný, kreativitu je možné merať alebo aproximatizovať. Je to možné napríklad pomocou indexov kreativity alebo pomocou vymedzenia kreatívnych odvetví. Takýto koncept nám umožňuje vytvoriť viaceré modely založené na rôznych prístupoch. Tieto modely merajú príspevok

[1] This work has been supported by the Slovak Research and Development Agency under the contract No. APVV-0101-10

kreativity ku ekonomickému rastu. Náš článok uvádza návrhy takýchto modelov, ktoré vychádzajú z viacfaktorovej produkčnej funkcie.

Kľúčové slová: *kreativita, kreatívne odvetvia, model, produkčné funkcie*

JEL classification: E17, E32, C50

Introduction

Creativity in economic and other theories is defined as specific human activity, which brings results in something new, interesting and unusual. Defining creative activities or creativity was derived from psychology and then further from analysing human activities in arts, culture, education and also in economy. Even though psychology[2] and sociology are viewed by economy as exogenous disciplines when explaining creativity, still they can be utilized to help in clarifying economic dimension of creativity.

It could be in detecting general conditions and factors, which influence creativity in human activities perceived as economic.[3] It could include for example clarifying the sources of competitiveness, clarifying the conditions of emergence of economically significant scientific findings, clarifying the consumer's preferences. Sociology and psychology contribute to understanding of non-economic factors and conditions leading to intangible outcomes of creativity. They can further lead to tangible results of human activities in forms of innovations, growth in labour productivity, economic growth and development and other factors which are in the focus of economy.

[2] Boden (2004) tried to form detailed understanding of what could creative activity mean from the perspective of human intelligence. She understands creative activity as an ability of a person to come with new ideas and new human creations.

[3] Several researches, particularly in sociology and arts, tried to disclose what was a source of creativity. For example Mabile, Barsade, Mueller and Staw (2005) attempted to analyse how can social environment and its attributes in the work place lead from creativity to new ideas or to higher labour productivity.

Knowledge from other disciplines contributes to the deeper understanding and more accurate defining of economic dimension of the creativity, its sources and measuring it with economic indicators. It further leads to the possibility of modelling economic growth based on creativity and then to possibility of influencing and supporting thriving of creativity through policies, long-term growth strategies and development of modern societies. Policies could be in the form of creativity stimulus and support to enhance creativity growth, innovations, growth of labour productivity and economic growth. [4]

The paper elaborates on methodological questions to grasp economic dimension of creativity, mapping the ways to measure it in economy and then modelling economic growth using creativity. It describes basic approaches to measure creativity and its contribution to economic growth in sectors and on macroeconomic level.

Economic dimension of creativity

One of the first acknowledgments of economic dimension of creativity can be considered *Schumpeter's*[5] *definition of creativity* as "dynamic process of innovations which is endogenous in relation to economy." Creativity as a dynamic process of innovations is therefore one of the sources of endogenous growth. Schumpeter further developed his view on economic growth and cycle based on concept of *creative destruction*[6]. Competition among entrepreneurs leads to search of new ideas, which results in destruction of economic rivals. His idea of creative destruction is considered to be central in modern theory of endogenous economic growth. [7] Schumpeter's idea also offered an explanation of short-term fluctuations in production and explanation of relation between dynamic process of innovations and time dimension. It became the essence of explanation or approximation of aggregate process of innovations with time variable in models of economic growth – both exogenous and endogenous.

[4] For example UK CEP (UK Creative Economy Program)
[5] Schumpeter (1911)
[6] Schumpeter (1927)
[7] Segerstrom (1990), Aghion, Howitt (1990) and others

Creativity in connection to economics can be generally defined as an human activity, which is focused on creation of *intangible asset*. Such asset has characteristics of either novelty, innovativeness or rareness. Even closer to the economic understanding is the part of production of ideas and inventions, which are new and useful for solving the economic issues.[8] Particularly issues of economic growth and development a global, macroeconomic, microeconomic, regional, local or individual level.

In the time of emergence of the "creative intangible asset" it is usually not possible to fully assess its economic benefits and particularly the future benefits. This can be done with ex post analysis.[9] Examining the transmission mechanism and the channels of transformation of intangible asset to economic effects is of a great value for the economy. Particularly channels of transmission which lead from ideas to concrete production innovations, to improvements of management, to accelerating the process of transformation of ideas into new technological processes etc. The process of transmission can be itself connected to many different outcomes of human creative activities. For example combining various ideas together, combining them with knowledge, skills, experience or even with completely random improvements or innovations.

Relation of creativity to economy can be considered a starting point of innovations, although many of the innovations are not directly useable for commercial purpose or they are not usable for that purposes in the particular time. They can be considered a basis of knowledge which is the source of long-term growth. Creation of ideas as well as a speed and ability of absorption of private sector play important role in today's global world. Lundvall and Johnson (1992) tried to define the relation between formation of creative ideas of individuals and ways of their absorption or their support in private and public sectors. Conclusions can be interpreted that it is in the interests of both private and public sector to not only maximize process of

[8] Amabile (1983), Weisnberg (1988)

[9] For example influence of decisive discoveries on long-term Kondratiev cycles.

creating the inventions by individuals, but also to connect inventions with further processes, namely with knowledge, networks and technology.

According to Clayton, Borgo, Haskel and Franklin (2009) "Economists and policymakers agree that ideas and innovation contribute to productivity and economic growth, but the transmission mechanisms are less clear".[10] Grasping the process of creativity and measuring the creativity by economic indicators has developed through various concepts and approaches. Some of them are derived from elaborate theoretical basis; some are determined by availability of economic indicators and other ones are based on combination of indicators accessible from statistic resources and from expertise.[11]

Basic approaches how to measure creativity

Measuring the creativity is examined in the next section. The first approach is based on a definition of creative industries as a creative part of production capacity of the economy. The second comes from the concept of creative class as a proxy for human capital. The third is measuring the creativity through various creativity indexes.

Creative industries

Definition of creative industries has to do with their origin being in individual creativity, skill and talent. Next they would have potential for wealth and job growth through creating, accumulating and using intellectual property. According to the UN report on creative economy the creative industries are defined as "the industries at the crossroads of the arts, culture, business and technology. In other words, they comprise the cycle of creation, production and distribution of goods and services that use intellectual capital as their primary input. They constitute a set of knowledge-based activities."[12]

[10] One of the attempts to clarify transmission on the level of a firm is identified by Towse (2010) in a following scheme: creator→ copyright work→ intermediary→ firm→ production→ distribution→ market→ consumption.

[11] For example: Florida's creativity index, Hong Kong creativity index, European creativity index.

[12] UNCTAD (2008)

Mapping of creative industries[13] started with a reports prepared by UK Department for Culture Media and Sports (DCMS) in 1998[14]. DCMS selected 13 sectors as sectors of creative industries [15] and analysed them with regard to the level of employment generated, the characteristics of the firms in the industry and the outputs including the value of exports and estimates of gross value added.

Since 2000 there were several extensive reports and researches undertaken in the area; a comprehensive and complex system of mapping and defining the creative industries has been developed. The system developed by ICC[16] suggested division of the creative activity in the economy into 6 "Creative Segments"[17]. These segments are further divided into detailed classifications (the 4-digit level) and the subtotal classification (the 3-digit level), which are to help to provide data for detailed analysis.[18] To enable more consistent comparisons between the activities IIC proposed to focus the analysis in the direct value chain consisting of the core creative activities and direct support activities value chains and dedicated venues.

The UNCTAD classification of creative industries is divided into four broad groups: heritage, arts, media and functional creations. These groups are further divided into nine subgroups[19]. There are few other classifications of what creative industries are, they often define a group of "core" industries which are the source of creativity and next to it other layers or circles spreading and diffusing creativity from the centre.[20]

[13] The concept of Creative industries was introduced in Australia with the report DCA (1994)

[14] DCMS (1998)

[15] 13 selected sectors are: Advertising, Architecture, Art & Antiques Market, Crafts, Design, Designer Fashion, Film & Video, Interactive Leisure Software, Music, Performing Arts, Publishing, Software & Computer Services and Television & Radio

[16] Higgs, Cunningham (2007). Research took into consideration similar researches from UK, Australia, Hong Kong, New Zealand, France

[17] Creative Segments: 1.Music and Performing Arts Segment; 2.Film, TV, Radio Segment; 3.Advertising and marketing Segment; 4.Software, Web and Multimedia development Segment; 5.Writing, Publishing and Print Media Segment; 6.Architecture, Design and Visual Arts Segment

[18] For example, under ANZSIC06 classification the methodology uses 28 classifications at the 4-digit level and only 14 at the 3-digit level.

[19] Subgroups are: Traditional cultural expressions, Cultural sites, Visual arts, Performing arts, Publishing and printed media, Audiovisuals, Design, New media, Creative services.

[20] Such classifications were developed by KEA (2006) and Hesmondhalgh (2008)

When defining and analysing creative industries, important factor is the existence of beneficial spill-overs from the creative sector to other sectors of the economy. It could be knowledge spill-overs, where firms benefit from new ideas and discoveries developed by other firms; training spill-overs, when labour that is trained on one industry moves to another one; product spill-overs, network (location) spill-overs and others.

Creative class

Florida[21] defines "creative class" as a key driving force for economic development of post-industrial cities. Florida distinguished 3 groups of creative occupations: creative core, creative professionals and bohemians. "Creativity is not intelligence. Creativity involves the ability to synthesize. It is a matter of sifting through data, perceptions and materials to come up with something new and useful".[22] He presents "The 3 Ts theory" for economic growth: technology, talent and tolerance. Tolerance is needed to attract human capital in the particular city or region; it is the concept underlying the broad definition of bohemians as a part of creative class. Florida suggests that creative class is the key factor of the urban and regional growth. Regions with higher proportion of creative people will achieve better economic performance, because they will generate more innovations, they will be more creative in entrepreneurship and thus they will further attract creative businesses. According to Florida, job opportunities will follow creative people and not the other way around. Florida emphasizes the role of creative individuals, who ensure knowledge and innovations spill-overs within the city or a region; opposing the concept of spill-over between companies and sectors. Some authors[23] connected this influence of creative class with endogenous growth theory.

Florida's views are also a source of controversy, particularly his assumption that members of the creative class are not necessarily skilled and experienced people neither people with high education. According to Glaeser (2004) creative capital is

[21] Florida (2002)

[22] Florida (2005)

[23] Knudsen, Florida, Gates a Stolarick (2007)

strongly connected with human capital, which is traditionally measured by level of education.[24] In his view majority of creative class has achieved high level of education. There are empirical studies[25] which confirmed that indicators for creative class and education are both good predictors of urban and regional growth and that indicators for the creative class perform better than do the indicators for education. Both types of indicators – creative class and traditional educational attainment – are proxies to measure human capital.

Creative indexes

Measuring creativity through set of indexes developed in the last decade. They evolved based on Florida's 3 Ts as anticipated drive of technological innovation and of economic output growth. Set of sub-indexes and detailed indicators was broadened by each model / index. Some of indexes incorporated also factors of the social and cultural environment, other indexes added additional emphasis on arts and culture. There is a variety of indexes which measure some area of the creativity[26]; this section will focus on creativity indexes in particular. Table 1 gives a basic overview of creativity indexes.

[24] According to Glaeser, the regression analyzing the factors of regional growth showed results that the variables of creative class are not statistically significant if the model contains variables of levels of education.

[25] Marlet a van Woerkens (2004), McGranahan a Wojan (2007), Florida, Mellander a Stolarick (2008)

[26] Among many we can mention Cultural Life indexes, Innovation indexes, Global competitiveness indexes etc.

Table 1: Overview of creativity indexes

Index	Key concept	Specifics
Euro-Creativity Index (by Florida)[1]	Defines 3 areas to measure creativity based on 3 Ts' theory: Talent, Technology and Tolerance. Each area defined by 3 indicators totalling in 9 creativity indicators.	Contains 2 additional measures of short-term trend: Euro-Creative Trend Index and the Euro-Creativity Matrix
Hong Kong Creativity Index[2] (HKCI)	It is built on 5Cs with over 100 indicators: 1.Structural/institutional Capital, 2.Human Capital, 3.Social Capital, 4.Cultural Capital, 5.Manifestations of Creativity.	It captures the characteristics of the socio-cultural parameters and illustrates the interactions of various creativity factors.
Composite Index of the Creative Economy[3] (CICE)	Creative capacity is defined in 3 dimensions: Innovation, Entrepreneurship and Openness. Each dimension offers 3 indicators thus 9 in total.	It introduces a novel method – endogenous weighting. Each entity has its own unique set of the most appropriate weights.
European Creativity Index (by KEA)[4]	It is comprised of 32 indicators divided among 6 sub-indexes: 1.Human capital, 2.Opennes and diversity, 3.Cultural environment, 4.Technology, 5.Regulatory incentives to create, 6.Outcomes of creativity.	Index aims to combine culture-based indicators in existing frameworks related to creativity, innovation and socioeconomic development.

Source: Own elaboration based on Florida, R. and Tinagli, I. (2004), Home Affairs Bureau HKSARG (2004), Bowen, Sleuwaegen, Moesen (2006), KEA European Affairs (2009)

Florida's Euro-Creativity Index has extended and adapted the Florida's concepts of 'creative class' and it's indicators to the European context. It developed new indicators for the creative class and the 3Ts of economic development. It defines indicators that would attract the creative class to a particular location.

In the Hong Kong Creativity Index the four forms of capital (structural/ institutional, human, social and cultural) are the determinants of growth of creativity. Accumulated effects of the interplay of these determinants are the manifestations of creativity in terms of outcomes or outputs. Manifestation of creativity is measured through economic contribution of creativity, inventive activity of economic sector

and inventive activity of economic sector in total over 20 indicators. Each of the 4 forms of capital is defined by 20-30 indicators.

Hong Kong model defines 3 additional principles for operating[27]:

1. Mutually reinforcing relationship, where the relationship among the determinants is not based on hierarchy.
2. Multifaceted perspective of capital: each composing concept in the index is illustrated with different dimensions so as to reflect the status and dynamic changes of the respective form of capital as well as the outcomes of creativity.
3. Multifaceted perspective of capital: each composing concept in the HKCI is illustrated with different dimensions so as to reflect the status and dynamic changes of the respective form of capital as well as the outcomes of creativity

Composite Index of the Creative Economy (CICE) has been developed to benchmark and evaluate regional creative capacity. The endogenous weighting method has been introduced to determine the weight each sub-dimension should contribute to the total value of the CICE. This method isolates achievement on the underlying dimensions as the source of a higher or lower CICE score value.

European Creativity Index (ECI) was developed by KEA as a part of study to evaluate impact of culture on creativity. The concept is built upon including indicators related to culture-based creativity into existing socioeconomic indicator schemes (i.e. European Innovation Scoreboard). The goal is to highlight the socioeconomic impacts that culture has. Culture-based creativity has the capacity to break conventions, the usual way of thinking, to allow the development of a new vision, an idea or a product. The nature of culture-based creativity is closely linked to the nature of artistic contribution as expressed in art or cultural productions. The study emphasizes that in order for culture-based creativity to emerge it requires personal abilities, technical skills and a social environment. Social environment

[27] Home Affairs Bureau HKSARG (2004)

represents a social context through education and learning that encourages, and appreciates creativity as well as an economy that invest in culture and culture-based creativity.

Creativity based model approaches

Mapping studies of creative industries suggest that the economic value of the creative industries may have a role in driving and facilitating the process of change across the entire economy. The research of Potts and Cunningham[28] defines the foundations for the models to explore *dynamic significance of creative industries*. Authors propose four models as an answer to what is the dynamic relation between the creative industries and the rest of the economy. One focus of the examination is how a change in activity of creative industries (dCI) affects aggregate economic activity (dY). Next analytical focus is whether change in the creative industries (dCI) changes aggregate utility welfare (or utility dU) and whether this change is positive or negative.

The welfare model

The development of creative industries is expected to have a net negative impact on the economy; creative industries consume more resources than they produce. In other words rate of total factor productivity (TFP_{CI}) growth is less in the creative industries than in other sectors (TFP_{Y}).[29] Nevertheless the overall of creative industries effect is welfare positive. This is due to the production of commodities of high cultural value ($dU/dCI > 0$) but low market value ($dY/dCI < 0$).[30]

[28] Potts, Cunningham (2008)

[29] This however does not take away the expectation that knowledge spill-overs linked to creative industries would increase TFPY.

[30] $dU/dCI > 0$ means that increase in the creative industries increases aggregate utility (or utility welfare), while $dY/dCI < 0$ indicates that growth in creative industries will occur at the costs of aggregate output.

If this model is valid then implications for policy makers should be to consider intervention in order to ensure survival of a valuable product or service. Economic sustainability within the creative industries is dependent on reallocation in order to maintain prices, demand or supply. Thus the growth in the creative industries comes at the cost of aggregate economic growth, it occurs through transfers and it is not market based. When considering further implication, we can expect that there would be lower performance levels in this sector noticeable in return on investment, incomes, low growth etc. This could be verified through empirical research and evaluation.

The competition model

This model considers creative industries to be normally competitive with all other industries. It also presumes that the growth impact is neutral; meaning that the creative industries in aggregate contribute to technological change, innovation or productivity growth same way as the average of other sectors[31]. Their effect on income, productivity or welfare is the same as effect of all other sectors ($TFP_{CI} = TFP_{Y}$).

Model implies that in aggregate there is no marginal welfare utility of transfer of resources into creative industries ($dU/dCI = 0$). There would be no welfare gains as a result of particular policies supporting this sector. The expansion of the creative industries will have the same aggregate welfare benefit as the expansion of any other sector. At the same time the expansion of the sector of creative industries doesn't come at the costs of aggregate output ($dY/dCI = 0$)

Model accepts specific problems of the CI sector (i.e. complex labour markets and property rights, highly strategic factor markets) however any such problems are solved with institutional arrangements and specific coordination structures under competitive conditions. The model holds that the creative industries have

[31] Chai, Earl, Potts (2007)

comparable industry statistics to other sectors.[32] There should be no special policy treatment to this sector from other sectors.

The growth model

The model suggests the strong positive influence of the growth in the creative industries on the growth of the aggregate output ($dY/dCI > 0$). The rate of total factor productivity (TFP_{CI}) growth in creative industries is expected to be higher than in other sectors (TFP_Y). Just like information and communication technologies were the main factors of the economic growth at the end of 20th century; creative industries are in such position now. They bring new ideas into economy, support their adoption in other sectors and have positive spill-over effects (knowledge, skills etc.). These all can have positive impact on the growth of the economy – explaining such growth from the side of supply. However involvement of creative industries in economic growth can be also explained from the side of demand. Then model suggests that growth in output causes a proportionate increase in demand for services of creative industries. In any case policy should consider the creative industries to be a very special sector, vital for economy. It is expected that increase in the creative industries will increase aggregate utility, but zero increase is also possible within this model ($dU/dCI \geq 0$). Even if there is no such increase there is a very good reason and justification for redirecting resources towards CI sector, for the benefit of all economy. The creative industries are expected to create new industries and to stabilize and further develop existing industries. Without investments into CI sector the economic growth would suffer.

Jorgenson, Ho, Samuels, Stiroh (2007) created a methodology for analysis of effects on economic growth in the USA based on the multifactor production function, through production possibility frontier. They assumed that capital in ICT sector and more educated workforce contribute to the growth of labour productivity more than the other sectors and their workforce.[33] This model can be adjusted

[32] Such assumptions are supported by Caves (2000), De Vany (2004), Scott (2002, 2006)

[33] There is an analogy found in the research of Ochotnický(1987), which analysed impact of changes in labour and capital in non-energy sector and impact of technology on economic growth and the

through a transformation to the model of growth based on creativity as follows. Let us consider aggregate production function:

$$Y = f(K, L, TFP) \qquad (1)$$

Where: Y is real volume of value added
f is an aggregate production function,
K is capital,
L is labour (or workforce)
TFP is total factor productivity

At the same time it holds for nominal value added:

$$Py.Y = Pk.K + Pl.L \qquad (2)$$

where *P* represents respective prices indexes.

In accordance with Jorgenson, Ho, and Stiroh (2005) the contribution of TFP to economic growth is a following function:

$$tpf = \Delta ln\ Y - w_k \Delta ln\ K - w_l \Delta ln\ L \qquad (3)$$

where *w* represents weights of respective factors on value added.

It is possible to further decompose capital and labour inputs; the contribution of capital contains a creative industry component (*KCI*) and a non-CI component (*KNCI*). The same can be done with the decomposition of the labour input to *LCI* and *LNCI*. Depending on statistical data availability another possibility is to directly

growth of energy intensity of SSR's economy.

define the creative capital (KC) and creative labour (LC) and the rest of the inputs as (NKC) and (NLC) across the whole sector. In this case we can analyse the growth contribution of creativity by using alternative expressions:

$$\Delta lnY = w_{kci.} . \Delta ln\ KCI + w_{knci.} . \Delta ln\ KNCI + w_{lci.} . \Delta ln\ LCI + w_{lnci.} . \Delta ln\ LNCI + tpf \quad (4)$$

or

$$\Delta lnY = w_{kc.} . \Delta ln\ KC + w_{nkc} . \Delta ln\ NKC + w_{lc.} . \Delta ln\ LC + w_{nlc.} . \Delta ln\ NLC + tpf \quad (5)$$

where *w* represents weights of respective factors on value added.

It is possible to use production function approach if the aggregate production function is not restricted for aggregation by sectors or industries on both sides – output and input aggregation. If there are restrictions it is more appropriate to analyse creativity impact by using the production possibility frontier approach[34].

The innovation model

This model doesn't consider creative industries to be a specific sector, but considers them to be important factor of the innovation system of the whole economy. Here "creative industries" are the space of economic activity where markets and organizations meet and are shaped by interactions, creativity and new ideas of each other.[35]

Model doesn't assume dynamic relation between the creative industries and the rest of the economy. The significance of creative industries is not measured in their contribution to economic value (dY/dCI is not considered). Instead, the model considers the creative industries to be a particular system that operates on the economic system. Similar model is suggested by various authors to describe

[34] See Jorgenson, Ho, Samuels, Stiroh (2007).
[35] See further Potts et al. 2008

the effect of science, education and technology.[36] The creative industries, in this view, originate and coordinate change in the knowledge base of the economy. Their economic value comes from the facilitation of economic evolution and the process of innovation. Therefore they are vital and policies should support them.

Development in the creative industries creates structural and not just operational change in the economy. New unforeseen opportunities and possibilities will emerge, therefore their welfare effect cannot be known in advance (dU/dCI is open).[37] The creative industries are a part of the system launching and coordinating the growth of knowledge process that is the core of economic evolution.[38] Understanding the role of creative industries as an evolutionary process brings different policy implication than previous models; it suggests economic engagement with respect to innovation and not to welfare.

Conclusion

Measuring the creativity by economic indicators has developed through various concepts and approaches. Particularly creativity indexes enable us to empirically define the creativity process as an indicator, which can assist us in comparing levels of creativity on national and also on regional level. The paper followed the main goal to clarify how creativity can contribute to productivity and to economic growth. It indicates basic channels and indicators of transmission mechanism form ideas to innovation and growth. Measuring "creative capacity" of economy through creative industries, while separating creative human and physical capital, enables us to construct several analytical models mostly based on multifactor production functions.

All models mentioned describe activity of creative industries across the spectrum; different models are more appropriate at different times and places.

[36] See further Lundvall (1992), Nelson (1993, 2002), Freeman (1995), Edquist (1997).

[37] Such economic evolution is proposed by Dopfer and Potts (2008)

[38] See further Loasby (1999) and Freeman (2002)

Cultural policy is traditionally understood in the context of the welfare model. The competition model would apply to e.g. film, TV and publishing; the established companies in these sectors have relative stability over several decades. Then there is a range of new media which facilitate economic growth; they fit into concept of the growth model. Evidence for innovation model comes from continuous regeneration of existing industries and the emergence of new industries as a result of operations of CI. This model requires observation of continuous structural change and regeneration across the whole economy, while observing and analysing origins of it in the activities of creative industries.

The models are built with awareness that creative industries have dynamic and not just static economic value. They support the process of economic growth and development more than just with their contribution to culture and society. Models are good foundation for detailed research and analysis in order to correctly understand dynamics in economy and derive appropriate policies from it.

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(Footnotes)

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