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2022: Responsible Growth**

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THIRD MISSION OF HIGHER EDUCATION: CASE OF UKRAINIAN UNIVERSITIES

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Abstract. The article discusses an idea of a modern set of solutions for developing a business ecosystem at the universities to enhance students', teachers', graduates' entrepreneurship) which should be evaluated by National and International Rating Agencies while ranking universities for government funding and for educational services.

The aim of the paper is to analyse the university activity through the lens of third university mission indicators. The indicators of modern rankings enable assessment of the "traditional" mission of the university – the commercialization of knowledge and results of research activities of universities. This approach does not include new role of the university as a “third-generation” HEI capable to improve social, economic and legal environment. The “third mission” approach seeks to strengthen university position in highly competitive world education space. Such changes in the indicators for university ranking should be accepted for correct presentation of universities as innovation centers open to society and to relations with the business ecosystem.

The main findings of the article show that application of "third mission" in Ukrainian universities would lead to the acceleration of entrepreneurial activity in higher education. That means the formation of new cohort of young professionals, business ecosystem, professional consulting and mentoring system in the student environment. The other finding of the paper is rather limited coverage of the third university mission in the national rankings of Ukraine and the lack of the efforts to include new indicators in the assessment.

Keywords: *higher education, business ecosystem, university–business–society relationship, commercialization of knowledge.*

JEL code: I21, I23, I25

Introduction

Contemporary universities are actively involved in an entrepreneurial ecosystem alongside with investors, business companies, public bodies, regulatory institutions, local authorities and non-governmental organizations. These entities support and broaden the potential of a business-idea, cooperate on legal, social, technological and commercial basis with HEIs. Such type of entrepreneurial ecosystem based on university–business– society relations aims to produce new knowledge, develop and protect, finance and implement new technologies for new projects, new business and society wellbeing.

The universities have a vital role in the building of the sustainable relationships between the entrepreneur-starter and the academic and regulatory institutions' experts, business-professionals, local authorities and society. The universities provide technical support, train qualified and innovative personnel, improve entrepreneurial culture for student and academic staff, enrich study experience by solving practical cases from the theory to practice. These new functions expand the entrepreneurial university mission in which business ideas are not bound only to technological sectors. That means new business ideas emerge from “non-technological” social sciences promoting values of social entrepreneurship, creative or solidarity economics. Thus, entrepreneurship at the university is aimed at making a profit, and at building stable relations university – business – society, and at promoting the values of social equality, security and wellbeing.

According to “traditional” entrepreneurship university approach based on maximizing economic profit from intellectual property, key stakeholders are researchers, technology transfer offices, science parks, incubators, joint venture and big companies (Salun M. et al., 2020). In many cases this model results in domination of market forces over classical university functions that limit academic freedom and prioritizes the commercialization of university services.

Modern entrepreneurship university strives to involve new actors in entrepreneurial ecosystem by creating co-working spaces (not only students and academic staff but also alumni to develop long-standing relations) and by establishing entrepreneurial infrastructures (new generation of incubators, accelerators and venture companies). It is worth to mention that public institutions implementing entrepreneurship development strategies usually pay more attention to academic initiatives in this field that highlights the function of the entrepreneurship university as a coordinator of business ecosystem in the promotion of entrepreneurial culture.

To this end, the paper addresses research questions

- 1) What is a new role of the universities in the transformation of business ecosystem?
- 2) How do Ukrainian HEIs apply new basic indicators measuring involvement and participation of the university in the business ecosystem?

The paper is structured as follows. Next section describes the results of literature review. Then, the paper provides theoretical analysis of university third mission highlighting pros and cons of this phenomenon. Each of themes offers a measure which might support policy intervention of the university third mission. Next section provides case study and comparative analysis of third university mission at a sample of 10 Ukrainian HEIs. Conclusions and future avenues for research are suggested at the end of the paper.

Literature review

The transformation of university mission in the society and socio-economic system has been recently highlighted by the European Commission (Basso, A. et al., 2018), the evolution of the mission is extensively analysed in the research papers (Fronzizi, R. et al., 2019; Pinheiro, R. et al., 2015; Giuri, P. et al., 2019). The key idea of current research discussions on university mission in the knowledge economy is grounded on the shift to the planning of economic and technological progress supporting more proactive strategies of the academic involvement in business ecosystem. This new university mission is sometimes defined in contradictory ways.

The traditional goals of knowledge and technologies transfer (i.e. education) are seen as the mission aspects (Berghaeuser, Hoelscher, 2020; Perkmann et al., 2013; Rampersad, 2015; Veugelers, 2016). The researchers put the emphasis on expanding the traditional vision of the university education mission. Many researchers underlined social justice and interaction as aspects of the universities' mission (Berghaeuser, Hoelscher, 2020; Bezanilla et al., 2020; Compagnucci, Spigarelli, 2020; Fernández et al. 2000; Haugh, 2007).

Economic efficiency achievement is becoming a topical issue in universities development (Compagnucci, Spigarelli, 2020; Fernández et al., 2000). It's about commercialization that combines the social and economic universities role in society (Biranvand, Seif, 2020; Scholz, 2020), ensuring their capacity (Perkmann et al., 2013; Rampersad, 2015).

Moreover, the sustainable development aspects emerge in recent research (Bezanilla et al. 2020; Hirsuet et al., 2021). Experts emphasize

the universities project activities need, their focus on the communities development and society as a whole (Community Partnership and Extension Office, 2016; Culkin, 2016; García-Peñalvo, 2020; Gulbrandsen, Slipersaeter, 2007; Pinheiro et al., 2015), communication with external stakeholders and coordination of activities with the industry and society needs (Giuri et al., 2019; Veugelers, 2016). This new university mission is sometimes defined in contradictory ways (Table 1).

Table 1

Third university mission

Source(s)	Definition
Berghaeuser, H., Hoelscher, M. (2020)	Three main dimensions of universities' activities can be described as third mission, following from this definition: knowledge and technology transfer, further education and social engagement
Bezanilla, M.J., García-Olalla, A., Paños-Castro, J., Arruti, A. (2020)	Universities have recognized the role of education in building societies based on values of equity, social justice and sustainability
Biranvand, A., Seif, M. (2020)	Commercialisation is accounted as the third mission of the universities; it is the idea expressing that the universities play a socio-economic role
Compagnucci, L., Spigarelli, F. (2020)	The TM is a multidisciplinary, complex, evolving phenomenon linked to the social and economic mission of Universities in a broad sense. Existing studies mainly focus on Universities in accomplishing their traditional missions, or they offer a narrow perspective of the TM
Community Partnership and Extension Office (2016)	"extension", i.e. "[t]he extension projects, programs, and activities aim to develop its adopted communities to become empowered, responsible, and sustainable"
Culkin, N. (2016)	Universities can be actively engaged in these projects, as they are close to the markets and have sound knowledge of the different trends as they emerge
Etzkowitz (2003)	Third mission is a relatively new function that universities assume
Fernández, I., Castro, E., Conesa, F., Gutiérrez, A. (2000)	In today's knowledge society, universities are increasingly and more directly becoming promoters of economic and social development
García-Peñalvo, F.J. (2020)	third key mission for society should be incorporated into universities: Fostering entrepreneurial projects or conducting development projects working together with other agents within the regional system
Giuri, P., Munari, F., Scandura, A., Toschi, L. (2019)	Third mission is a complex and evolving phenomenon which, over the past few decades, has been being articulated in policy as a result of dialogue between university, industry, government and society
Gulbrandsen, M., Slipersaeter, S. (2007)	Governmental and societal demands that universities work for society by going beyond their traditional teaching and research missions to visibly contribute to societal and economic problem-solving has been labeled the "third mission"
Haugh, H. (2007)	an innovative approach to achieve social mission
Hirsu, L., Quezada-Reyes, Z., Hashemi, L. (2021)	Universities play a critical role in the delivery of the Sustainable Development Goals through the third mission, i.e. public engagement activities
Perkmann, M., V. Tartari, M. McKelvey, E. Autio, A. Broström, P. D'Este, R. Fini (2013); Rampersad, G. (2015)	Processes such as capability building reflect one of the major points for universities' so-called third mission alongside with traditional objectives, such as teaching and research
Pinheiro, R., Langa, P.V., Pausits, A. (2015)	Re-engagement of the university in helping to tackle the great challenges facing societies and local communities have propelled the third mission to the forefront of policy discussions
Pinheiro, R., Langa, P.V., Pausits, A. (2015)	TM refers to the changing roles and functions of universities which, despite recent developments, have always been a matter of debate amongst academics and society at large
Scholz, R.W. (2020)	An unreflected commercialization following of the idea of the (market oriented) third mission contrasts with developing socially robust orientations for sustainable development, in mutual learning processes between science and society and for learning as well as in mitigation in multi-stakeholder discourses
Scholz, R.W. (2020)	We elaborate on the conception that an unreflected commercialization following of the idea of the (market oriented) third mission contrasts with developing socially robust orientations for sustainable development, in mutual learning processes between science and society and for learning as well as in mitigation in multi-stakeholder discourses.

Veugelers, R. (2016)

The TM can include activities ranging from university patenting and collaborations with the industry for economic development, spin-offs, technology transfer and knowledge exchange for innovation, public engagement and work with communities

Source: author's construction based on literature review

The transformation of HEI mission has resulted in the emergence of entrepreneurship universities model. The latter suggests entrepreneurship approach to the operation and strategic management; developing entrepreneurial partnerships with actors external academic environment (society, institutions, business ecosystem etc.), strengthening entrepreneurship skills of students and academic staff (Salun, M., Zaslavska, K., Kolisnyk, M., 2020). In this context, traditional indicators covering teaching quality and financing of research would not suffice for correct evaluation of HEIs' outcomes and support of entrepreneurship universities in Ukraine. Moreover, third mission assessment in current rankings would enable universities to improve governance and quality culture based on involvement of students, researchers and academic staff in solving practical tasks of entrepreneurship. This new indicator may add real value to the university mission in the modern society.

For the purpose of assessment and ranking of "traditional" university mission Ukraine has an information system that embraces sources as follows:

- Public bodies and organizations with standard report forms for universities including financial reporting;
- Interviews and surveys of university stakeholders.
- Research databases (Scopus, Web of Science, Google Scholar);
- Universities that provide the most complete and exact information;
- Other sources as social media or website statistics, the information from these sources is often not comparable so it is used very seldom.

The assessment results serve as a basis for the ranking of the universities and, consequently, for the amount of HEIs financing (Cabinet of Ministers of Ukraine, 2019). The HEIs ranking "Top-200 Ukraine" includes the criteria listed in table 2.

Table 2

Ranking assessment of Ukrainian universities

Rankings/Indicators	Assessment of University action	Open source
QS World University Rankings	Academic	https://www.topuniversities.com
Scopus	Research	http://ru.osvita.ua
Webometrics	Research results of the HEIs through comparison of their web-sites	http://webometrics.info
Participation in the Erasmus+ program of the European Union	International cooperation	https://erasmusplus.org.ua/erasmus/novyny-i-baza-proektiv.html
Google Scholar Citations	Citation of university research papers	http://www.webometrics.info/en/transparent
UniRank	Quality of presence and popularity of a HEI in the Internet on the basis of independent webometric indicators	https://www.4icu.org/ua/
Results of Ukrainian national student education competitions and Olympiads (sum of points)	Quality of education	https://imzo.gov.ua/2019/08/07/nakaz-mon-vid-5-08-2019-1060 https://imzo.gov.ua/2019/08/07/nakaz-mon-vid-05-08-2019-1059
Scholarships of the President of Ukraine and the Cabinet of Ministers of Ukraine for young researchers	Education and research	http://www.kdpu-nt.gov.ua
Number of patents obtained by the researchers of the University in 2019	Research	http://www.eurosvita.net https://ukrpatent.org
Average value for HEIs ranking in number of applications to the University and average admission level in 2019	Attractiveness of the University for applicants	https://vstup2019.edbo.gov.ua/statistics/

Source: author's construction based on open data and opinion polls

The Consolidated ranking of the HEIs is also known in Ukraine and presented on the information educational resource "Osvita.ua". It summarizes the rankings "Top-200 Ukraine", "Scopus" and "External Evaluation scores for a contract". All rankings above have precise objective (assessment of concrete activity) but, in fact, they neither cover the technologies and innovations aspect (in terms of knowledge or technology transfer) nor include social impact of the HEI on the business ecosystem of district, region, territory or state (regional development and international orientation of a HEI).

In 2012 the European Commission and OECD (European Commission & OECD, 2012) have elaborated Guiding principles for effective management of institutional and cultural change designed to accompany the universities in their self-assessment under seven areas: leadership and governance; organization capacity, people and incentives; entrepreneurship development in teaching and learning; pathways for entrepreneurs; university – business/ external relations for knowledge exchange; the entrepreneurial university as an international institution; measuring the impact of entrepreneurial university. First of all, European Commission & OECD framework seeks to help universities in self-assessment identifying their current situation and potential areas of action taking into account innovations in research, teaching and learning, knowledge exchange, governance and internationalization in the relations with their local and national environments. As authors highlighted, this framework is not a benchmarking tool; it supports the universities in determining their strengths, weaknesses and finding ways for improvement.

Ukrainian education quality assurance system consists of several layers including the Ministry of Education and Science of Ukraine, Ukrainian Center for Education Quality Evaluation (established in 2005), Ukrainian State Quality Evaluation Service (created in 2017), National Agency for Higher Education Quality Assurance (launched in 2015). However, any of these public bodies did not evaluate higher education outcomes in terms of third university mission criteria covering openness to the society and involvement in the business ecosystem.

The search and choice of assessment criteria seek to measure concrete outcomes of university-business relations: research contracts, consulting of external clients; patent commercialization; intellectual property management; establishment of experimental, industrial and/or non-profit undertakings, participation in incubators, technology transfer offices etc. Such criteria evaluate generation of new knowledge to

improve social welfare that is complicated to perform due to heterogenous outcomes above. Moreover, the criteria should cover university activities as a part of university third mission that are not typical for HEI's, in particular, networking and promotion events, local socio-cultural and development projects, partnerships and contracts with external actors, business centers and co-working spaces, leasing and entrepreneurship centers. In order to measure HEI's relations with business ecosystem it is reasonable to apply criteria aggregated per each activity and intangible capital:

Human capital refers to knowledge, skills, innovations and abilities acquired by individuals (students, academic, research and administrative staff) at the universities. Therefore, university achievements in the human capital development would serve as a basis for research and publication activity assessment (there is no original publications without research) including citation index, intellectual property protection documents, number of theses defended, government scholarships and fellowships for young researchers etc.;

University structural capital could be defined as existing organizational culture that embraces organization procedures, processes and technological components. Possible evaluation criteria for structural capital are licensing and accreditation, databases and management processes;

Communication capital looks over all university – external relations (stakeholders, business ecosystem) through the lens of quantitative and qualitative criteria.

The authors have chosen the sample of 10 universities to analyse and compare their ranking indicators of third mission. The sample covers all fields of study including defence and public security. The paper examines the concept and indicators of third university mission by comparing the ten largest Kharkiv universities: Kharkiv National University of Radio Electronics, Simon Kuznets Kharkiv National University of Economics, Kharkiv National University of Internal Affairs, V. N. Karazin Kharkiv National University, Kharkiv National Medical University, National Technical University – "Kharkiv Polytechnic Institute", O. M. Beketov National University of Urban Economy in Kharkiv, Ivan Kozhedub Kharkiv University of Air Force, H.S. Skovoroda Kharkiv National Pedagogical University, Kharkiv National Automobile and Highway University.

Research results and discussion

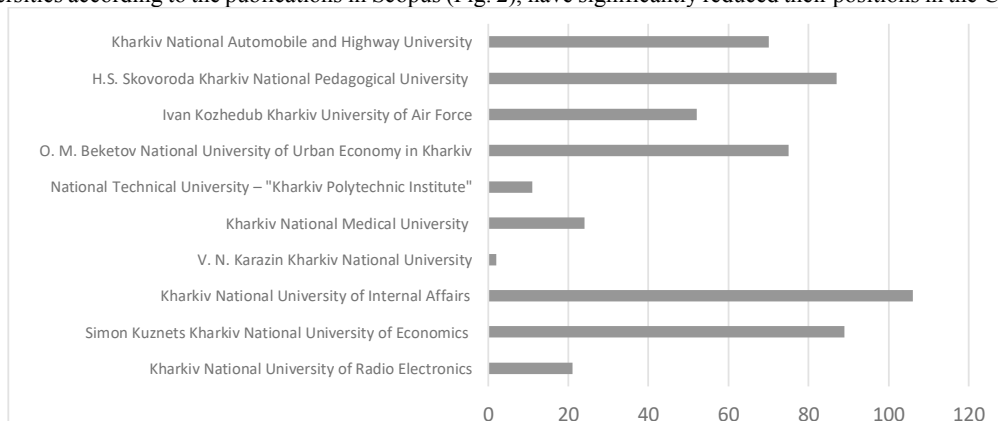
The ranking comparison of ten Kharkiv universities (Fig. 1) shows significant indicators gaps in the "Top-200 Ukraine" ranking and the Consolidated ranking. Significant differences in the ranking are observed for all listed HEIs in the city of Kharkiv.



Source: author's construction based on Ranking table of HEIs "Top-200 Ukraine" – 2021 and the Consolidated ranking of Ukrainian HEIs in 2021

Fig. 1. Kharkiv universities ranking comparison

This situation can be explained by several factors. First reason is double-counting the Scopus criterion (the first time it is taken into account when calculating the Top-200 rating, the second time is during the Consolidated ranking). Thus, Kharkiv HEIs having the lowest rates among the surveyed universities according to the publications in Scopus (Fig. 2), have significantly reduced their positions in the Consolidated ranking.

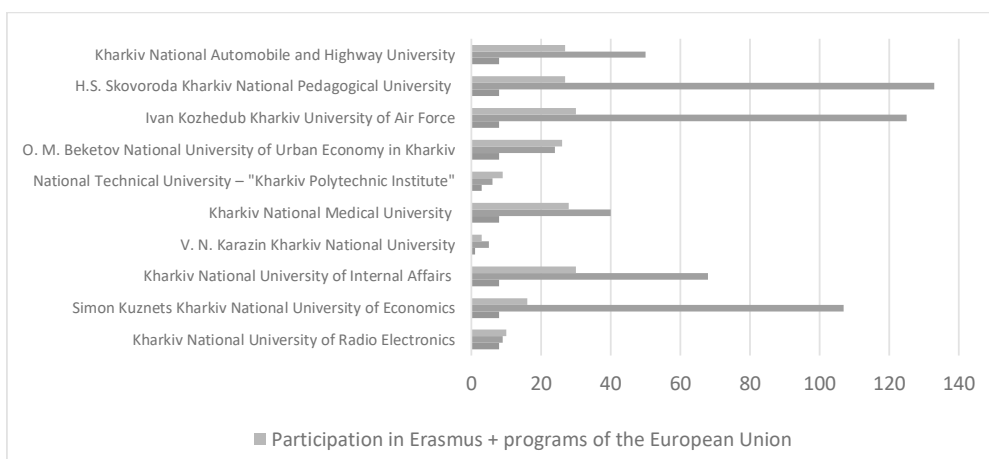


Source: author's construction based on the Ranking table of HEIs "Top-200 Ukraine" – 2021

Fig. 2. Ranking of Kharkiv universities by the Scopus criterion

Second factor, the results of the Consolidated ranking are influenced by the external evaluation score for entering into a contract study. At the same time, the criterion is significantly influenced by the universities volume of licensed field due to certain criteria included in the Top 200 ranking, as well as the amount of funding, which also depends on the rating position.

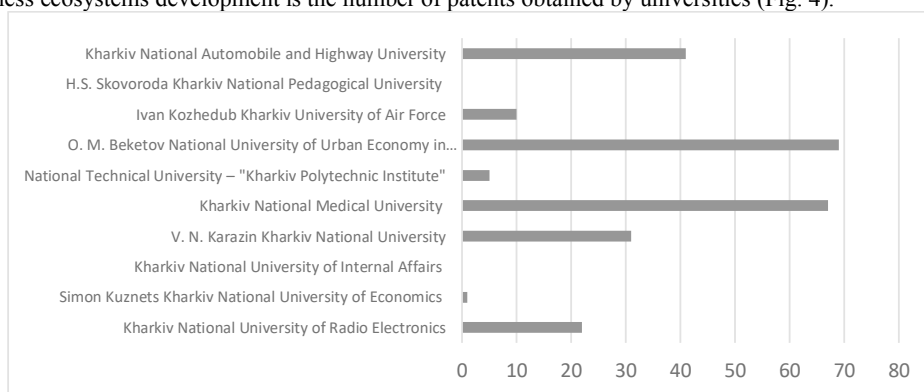
Thus, in addition to Scopus the most significant impact on the ranking position has the criteria of Academic Activity, Webometrics, Participation in Erasmus + programs of the European Union (Fig. 3).



Source: author's construction based on HEIs Ranking table "Top-200 Ukraine" – 2021

Fig. 3. The most influential factors of Kharkiv universities ranking

Such evaluation criteria relate mainly to traditional aspects of the universities' mission. The only criterion that is closest to the third mission – to promote the business ecosystems development is the number of patents obtained by universities (Fig. 4).



Source: author's construction based on the Ranking table of HEIs "Top-200 Ukraine" – 2021

Fig. 4. The number of received patents by Kharkiv universities

Thus, it is possible to conclude the limited coverage of the assessment in the university-business relations ranking and the lack of the university communication capital assessment.

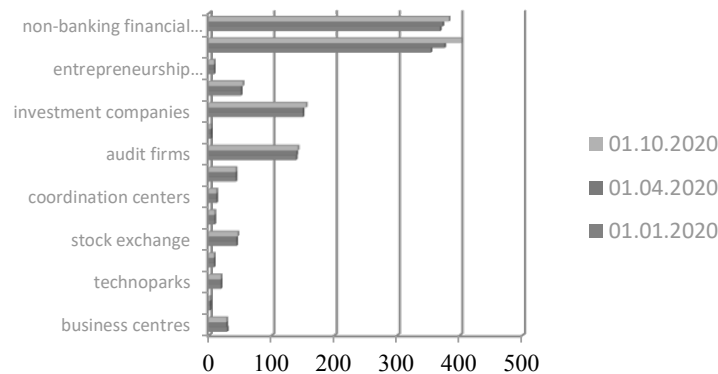
The analysis of university – business relations in Kharkiv region shows that SME support infrastructure consists of 28 business centers, 2 business incubators, 19 technological parks, 8 clusters, 46 stock exchange, 9 leasing centers, 12 coordination centers, 43 insurance companies, 142 audit companies, 3 innovation funds, 155 investment companies, 54 entrepreneurs professional unions, 8 entrepreneurship development funds, 403 consultancy firms, 384 non-banking financial institutions.

University-business relations analysis in Kharkiv region shows that the SME infrastructure consists of the objects listed in table 2 and their dynamics see Fig.5

Table 2

Objects	01.01.2020	01.04.2020	01.10.2020
business centers	29	28	28
business incubators	2	2	2
technoparks	19	19	19
clusters	8	8	8
stock exchange	44	44	46
leasing centers	9	9	9
coordination centers	12	12	12
insurance companies	43	43	43
audit companies	139	140	142
innovation funds	3	3	3
investment companies	150	150	155
entrepreneurs professional unions	51	51	54
entrepreneurship development funds	8	8	8
consultancy firms	354	376	403
non-banking financial institutions	369	373	383

Source: author's construction



Source: author's construction based on analytical reference to the promotion development of SMEs in Kharkiv region

Fig. 5. Dynamics of infrastructure facilities

The analysis shows that University-business cooperation has taken various forms depending on the specialisation. The common feature is the involvement in expertise of national and regional strategic documents. The HEIs actively improve innovation infrastructure to offer new opportunities for students, professors and business. Thus, it is of utmost importance to include concrete outcomes in evaluation criteria because they better reflect the development of knowledge economy. The latter stimulates universities to make use of human and structural capital to attain regional development goals conjointly with public bodies, local authorities, experts and society.

Conclusions, proposals, recommendations

1. Having observed social and economic added value created by the HEIs, the emergence of entrepreneurship universities has a significant effect on analysis of third university mission outcomes (university-business ecosystem relations). Although international rankings seek to evaluate academic, research and publication activity without considering university-external relations, the paper suggests incorporate third university mission in the rankings indicators to assess integration of the universities into business ecosystem with three major components – human, structural and communication capital.
2. European Commission and OECD have developed Guiding Principles for effective management of institutional and cultural change to support the HEIs in their self-assessment effort to identify their strength, weaknesses, opportunities and threats. However, this approach is of limited use in Ukrainian universities since self-assessment is mostly applied to study program evaluation than in the considering university as a whole. HEIs still cope with outdated paper reporting forms for institutional evaluation.
3. European scholars on third university mission are divided as to the evaluation of a new university role and efficiency indicators meaning that active university-business relations do not always lead to measurable economic or image outcomes. In addition, interdisciplinary nature of the third university mission complicates identification of this phenomenon due to active involvement of various social groups and economic sectors.
4. Comparative analysis and case-study of the sample (10 biggest Kharkiv HEIs) has demonstrated contingent results in the sense of third university mission. Current rankings rather focus on indicators of “traditional” university activities. Such an approach does not reflect evolving role of HEIs in the innovation and business ecosystem development.
5. Further investigation on third university mission will be focused on the innovative university activity in the society. Evidence from different approaches to evaluate communication capital would provide more complete insight of third university mission implementation.

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