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THE INSTRUMENTARIUM FOR EXTERNAL ASSESSMENT OF AUTONOMOUS INNOVATIVE UNIVERSITIES AND THEIR EFFECTIVENESS

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Bilokonenko H. V., Yermachenko V. Ye. The Instrumentarium for External Assessment of Autonomous Innovative Universities and Their Effectiveness

The article is aimed at studying the potential of the Autonomy Scorecard instrumentarium (based on the EUA methodology), the world ranking methodologies for assessment of autonomous, innovatively active universities and their effectiveness. The relevance of the research is increasing due to the transition to a new generation university with a change in models (from the academic model (University 1.0) to an innovatively active research model (University 2.0) and an innovatively active model of entrepreneurial university (University 3.0). As a result of the study, 1) the features and limitations of the assessment of the components of university autonomy of the innovatively active research and entrepreneurial universities using the Autonomy Scorecard instrumentarium (based on the EUA methodology) are defined and systematized; 2) an in-depth analysis is carried out and recommendations on the possibilities and/or limitations of both the academic and the independent ratings for evaluating the effectiveness of autonomous, innovatively active universities are provided. The next steps of research are: 1) development of a system of indicators of autonomy of university, which will take into account the peculiarities of the activities of innovatively active research and entrepreneurial universities; 2) taking into account the components of academic freedom (according to the AFi index) in the external assessment of the effectiveness of autonomous, innovatively active universities.

Keywords: *university autonomy, academic freedom, innovatively active models of university, features and limitations of assessment of the components of university autonomy of the innovatively active research and entrepreneurial universities, possibilities and limitations of academic and independent ratings to assess the effectiveness of autonomous, innovatively active universities.*
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Білоконенко Г. В., Єрмаченко В. Є. Інструментарій зовнішнього оцінювання автономних, інноваційно активних університетів та їх результативності

Мета статті полягає в дослідженні потенціалу інструментарію Autonomy Scorecard (за методологією EUA), методологій світових рейтингів щодо оцінювання автономних, інноваційно активних університетів та їх результативності. Актуальність дослідження зростає завдяки переходу до університету нового покоління зі зміною моделей (від моделі академічного (Університет 1.0) до інноваційно активної моделі дослідницького (Університет 2.0) та інноваційно активної моделі підприємницького університету (Університет 3.0). У результаті дослідження було: 1) визначено та систематизовано особливості й обмеження оцінювання складових університетської автономії інноваційно активних дослідницьких і підприємницьких університетів із застосуванням інструментарію Autonomy Scorecard (за методологією EUA); 2) проведено поглиблений аналіз і надано рекомендації щодо можливостей та/або обмеженості академічних і незалежних рейтингів для оцінювання результативності автономних, інноваційно активних університетів. Наступними кроками досліджень є: 1) розробка системи індикаторів автономії університету, які враховуватимуть особливості діяльності інноваційно активних дослідницьких і підприємницьких університетів; 2) урахування компоненти академічної свободи (за індексом AFi) в зовнішньому оцінюванні результативності автономних, інноваційно активних університетів.

Ключові слова: *університетська автономія, академічна свобода, інноваційно активні моделі університету, особливості й обмеження оцінювання складових університетської автономії інноваційно активних дослідницьких і підприємницьких університетів, можливості й обмеженість академічних і незалежних рейтингів для оцінювання результативності автономних, інноваційно активних університетів.*
Рис.: *3.* ***Табл.:*** *8.* ***Бібл.:*** *59.*

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Every university, especially one that carries out innovative activities, has (or at least should have) the capability to make decisions about their own activities [17]. The capability of a university is its integral feature, which combines: the presence of the right ("I have the right") in accordance with a certain regulatory framework to make decisions about its own activity; the capacity ("I have the necessary institutional qualities / potential") to exercise the existing right to make decisions about its own activity; realization of the right and ability ("action") to make decisions on its own activity. As the experience of different countries shows, the autonomy and effectiveness of universities are crucial to maintaining their competitiveness. In general, scientists are unanimous in the opinion that those higher education institutions, or HEIs, are more productive, which are autonomous and compete with each other for the consumer and financial resources. If autonomy is provided in a non-competitive environment, there is an increased likelihood that HEIs use autonomy for purposes other than improving the general effectiveness of their activity. Therefore, it is pointless to stimulate competition between universities if they do not have a sufficient level of autonomy [15; 21].

Analysis of recent research and publications. Foreign scholars, studying the process of university autonomization, focus on the following issues: the essence of the HEIs' autonomy and its components (Th. Estermann [30; 33; 34], P. Aghion, M. Dewatripont, C. Hoxby, A. Mas-Collel, A. Sapir [26], P. Altbach, J. Salmi [8; 27], T. Nokkala, M. Steinel [33], I. Ordorika [41], E. B. Pruvot [34], R. Raza [47], and others); interdependence of academic freedom and academic autonomy (R. Berdahl [28], K. Guruz, G. Moodie [39]); models of university autonomy (O. Verdenhofa [5]); features of the autonomous management of research universities (P. Aghion, M. Dewatripont, C. Hoxby, A. Mas-Collel, A. Sapir [26]); the research quality, which increases with the increasing of university autonomy (Glasgow Declaration [31], J. Ritzen [48]); and so on. The "Transition to University Autonomy in Kazakhstan" (TRUNAK) [32] international project has resulted in determining the following: peculiarities of implementing institutional autonomy (by components) by university types, namely: in public (national, state) universities; in universities that have the status of a joint stock company; and in private universities; existing barriers to university autonomy; challenges to (and/or areas of) reforms (at the level of the national higher education system, as a whole and at the level of universities, in particular). And this experience, together with the results of assessing the autonomy of educational systems in European states in 2011 [33] and in 2016 [34] using the Autonomy Scorecard (according to the EUA methodology), is very interesting and useful.

Domestic scientists consider the following: the concept (L. Gusak, L. Martirosyan [7]) and models (L. Antonyuk, N. Vasilkova, D. Ilnytsky, A. Pavlenko [9], O. Rayevnyeva, O. Brovko [19], O. Verdenhof, I. Kalenyuk, L. Tsymbal [5], etc.) of university autonomy; the principles and distinctive features of university autonomy (by country) (I. Aksonova [2]); and methodological approaches to its evaluation (O. Rayevnyeva, I. Aksonova, V. Ostapenko [43]; V. Ambarchyan [3]; O. Morgulets [15], etc.); the evolution of university autonomy and the development of academic freedom, with the definition of its inherent characteristics for each stage (proposed by O. Rayevnyeva and K. Stryzhychenko [20], with further study of the hypothesis of increasing university autonomy (using evolutionary and cluster analysis (V. Ponomarenko, O. Rayevnyeva, K. Stryzhychenko [42]). Besides, Ukrainian scientists study the successful experience of implementing the mechanisms of universities' financial autonomy (Yu. Vitrenko, I. Vlasova, V. Vorona, D. Kirienko, V. Kovtunets, S. Melnyk [4]) and evaluate the potential for expanding the financial autonomy of universities (I. Vlasova [6]), etc.

The issues of university autonomy are especially relevant in the transition to a new generation university, i.e. from the academic model (University 1.0) to innovatively active research models (University 2.0.) [8; 9], and to the entrepreneurial university (University 3.0) [10–13; 23; 29; 37].

A study conducted by P. Aghion, M. Dewatripont, C. Hoxby, A. Mas-Collel, and A. Sapir for both European and American universities [26] shows that university autonomy and competition are positively correlated with the results of research universities measured by patents and world rankings of university research (*Fig. 1*) (the size of the circles varies depending on the size of the universities, for which the national averages have been determined and weighed by size).

Given the transition of HEIs from the academic model (University 1.0) to innovatively active research models (University 2.0.) [8; 9] and entrepreneurial model (University 3.0) [10–13; 37; 23; 29; 40; 49], it is necessary to determine the following: what indicators can be used to assess the activity of innovatively active universities; whether the university autonomy level (by components) influences the activity of HEIs, and if it does, then to what extent; whether academic freedom really is the key to the effectiveness of an innovatively active university.

Autonomy Scorecard, the universal method of assessing the autonomy of European education systems, developed by the European University Association (EUA) in 2007 in accordance with the Lisbon Declaration [33; 34], allows researchers to determine the university autonomy level by components of organizational autonomy, financial autonomy, personnel autonomy, and academic autonomy upon indicators.

Based on the analysis and synthesis of data on the autonomy level and ranking achievements of higher education institutions in 26 European countries, including Ukraine, the following conclusions were made [1]:

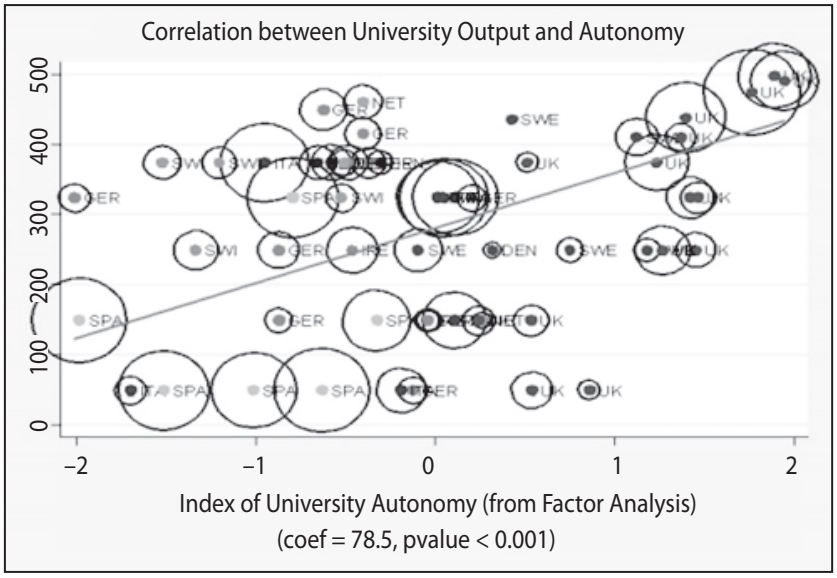

Fig. 1. Relationship between the effectiveness of research universities and their autonomy level (by country) [26]

- autonomy, especially organizational, personnel and academic autonomy, is an important factor for achieving high positions in the leading international universities rankings (The Times Higher Education World University Rankings [52], Shanghai World University Rankings [25]);
- autonomy in itself, if not supplemented by other developed components of activity, e.g. research, cannot guarantee the competitiveness of HEIs, because though autonomy is a necessary condition [17], it is not sufficient for the successful work of higher education;
- an integrated university autonomy has a greater impact than its differential components (organizational, financial, personnel, academic).

Continuing the research made by O. Rayevnyeva, K. Azizova, V. Ostapenko [18] as for the phenomenon of "autonomous, innovatively active university", one should explore the potential of Autonomy Scorecard tools (according to the EUA methodology) to evaluate innovatively active research university (University 2.0) and innovatively active entrepreneurial university (University 3.0) (*Tbl. 1*), taking into account the key criteria for the HEI development and its innovatively active educational environment, which are discussed in detail in the publication by G. Polyakova, G. Bilokonenko [16].

We are currently facing a conflict, because the autonomy of research is an integral part of university autonomy.

It is no coincidence that the Parliamentary Assembly of the Council of Europe in its official documents emphasizes the necessity to ensure autonomy for HEIs on the basis of academic freedom in research, which provides for the freedom of expression, action, information, research. and knowledge dissemination without restriction. But the Autonomy Scorecard (according to the EUA methodology) does not contain indicators that will allow it to be determined, measured, and evaluated, nor does it take into account the impact of the "academic freedom" factor. The system of university autonomy indicators for all intents now rather allows measuring the autonomy level of the academic University 1.0 by components, and partly the autonomy level of the University 2.0 with regard to the implementation of educational activities. Peculiarities of implementing research activity and entrepreneurial-innovative activity remain beyond consideration.

J. Iwinska and L. Matei in their methodological recommendations for assessing the autonomy level of the university [38] suggest to measure and evaluate the "Institutional autonomy to decide on issues related to research and freedom to publish" indicator.

This issue was studied in more detail by Kazakh researchers, who worked on a project on implementing a flexible form of HEI management and developed a strategic framework for HEIs in the field of academic, financial, personnel, and management policy to be used at the institutional level [14]. *Tbl. 2* gives a fragment of this strategic framework (as for the financial autonomy component), containing indicators for research autonomy.

Currently, various international and independent rankings exist assessing the research and innovative activities of research universities (model 2.0) and rankings of research and / or innovative activities of entrepreneurial universities (model 3.0) [25; 46; 50; 52], in particular: international and independent rankings of entrepreneurial universities [24], HEIs training future businessmen, the international ranking measuring the impact made by HEIs on society [51].

The study in question suggests a critical analysis of the methodology used in global [25; 46; 50–58] and na-

Table 1

Potential of Autonomy Scorecard tools (according to EUA methodology) to evaluate innovation-active universities

Indicators of organizational autonomy (OA)	The context in which the indicator matters. Does the content of the university autonomy components take into account the features of:	
	innovatively active research university	innovatively active entrepreneurial university
Selection procedure for executive head	Takes into account on a general basis	The value of the indicator is enhanced by entrusting academic leadership with the functions of strategizing development, carrying out legal control over academic resources (including property, e. g. university buildings, intellectual property, etc.). Takes into account on a general basis
Selection criteria for executive head		
Dismissal of the executive head		
Term of office of the executive head		
Inclusion of external members in university governing bodies	Takes into account on a general basis	Takes into account on a general basis
Selection of external members in university governing bodies	Takes into account on a general basis	Takes into account on a general basis
Capacity to decide on academic structures	The value of the indicator is enhanced due to the delegation of powers [11; 40; 49]: – departments (centers for the quality of educational programs and applied research); – research institutes, doctoral / scientific schools (centers for the quality of educational and scientific programs), research centers, research laboratories, etc. (centers for the quality of fundamental and applied research); – elements of the innovation infrastructure: centers for marketing and commercialization of research, collective use of technology / equipment, innovation consulting, intellectual property management; – research, production and experimental complexes (centers for improving and organizing research service), etc. Takes into account on a general basis	The value of the indicator is enhanced due to the delegation of powers [11; 40; 49]: – institutes /schools (centers for financial responsibility); – departments (resource center, center for applied research); – doctoral / scientific schools (centers for the quality of educational and scientific programs, quality of fundamental research); – Directorate of Educational Programs (Center for the Quality of Educational Programs); – Technology Transfer Center (center for the quality of innovation and business projects); – engineering center (providing high-tech services, technology adaptation and research). Takes into account on a general basis
Capacity to create legal entities	Takes into account on a general basis	The indicator is important (with respect to establishing: 1) independent legal entities – centers for the organization of research, cooperation with firms and government agencies involved in the creation and dissemination of information; 2) research and service organizations (on the initiative of university staff). Does not take into account / takes into account on a general basis

Continuation of Table1

Indicators of financial autonomy (FA)	The context in which the indicator matters. Does the content of the university autonomy components take into account the features of:	
	innovatively active research university	**innovatively active entrepreneurial university**
Length of public funding	The indicator is important (with respect to funding fundamental and applied research). Does not take into account / takes into account on a general basis	Takes into account on a general basis
Type of public funding	The indicator is important (especially with respect to priority funding of fundamental and applied research, opportunities for (re) distribution of funds). Does not take into account / takes into account on a general basis	Takes into account on a general basis
Ability to keep surplus	The value of the indicator is enhanced by the need of a research university (with respect to cross-subsidizing research on teaching and teaching research; investing in the development of educational infrastructure, innovation infrastructure, research facilities, providing researchers / scientists with access to national and global information resources conducting academic research (scientific publications, scientometric databases, etc.).	The value of the indicator is significantly enhanced by the need to provide financial support for: – the entrepreneurial and innovative activities of a university, including educational, research and development programs, namely, sourced internally / jointly with foreign HEIs / scientific institutions and / or foreign companies; – the organization of innovative activities focused on society and sustainable development, etc.; – the need to freely administer funds received from the commercialization of innovations or the use of intellectual property. Takes into account on a general basis
Ability to borrow money	The value of the indicator is enhanced by the need of a research university to receive additional funds for world-class research, investment in the development of educational and innovation infrastructure, research-and-development plant, information resources and so on. Takes into account on a general basis	The value of the indicator is significantly enhanced due to the need of an entrepreneurial university to receive additional funds for: 1) long-term investments (in material and technical conditions for learning and carrying out research, service backup infrastructure for research, service backup infrastructure for entrepreneurial activity, etc.); 2) implementation of educational, research and development programs, namely, sourced internally / jointly with foreign HEIs / scientific institutions and / or foreign companies; 3) organization of socially beneficial innovative activity, etc. Takes into account on a general basis
Ability to own buildings	The value of the indicator is enhanced by the necessity for a research university to have / create a modern educational infrastructure, innovation infrastructure and research and development plant providing for research and educational activities at the global level. Takes into account on a general basis	The value of the indicator increases due to the necessity for an entrepreneurial university to provide additional material and technical conditions for learning and carrying out research through: construction of new high-tech and multifunctional university campuses, location of service backup infrastructure for research (research marketing centers, technology transfer centers, engineering center), spin-offs, created with the help of the intellectual property of an HEI, service backup infrastructure for entrepreneurial activity (business incubators, science parks, career centers, support for the entrepreneurial initiatives of students). Takes into account on a general basis

Continuation of Table1

Indicators of financial autonomy (FA)	The context in which the indicator matters. Does the content of the university autonomy components take into account the features of:	
	innovatively active research university	**innovatively active entrepreneurial university**
Ability to charge tuition fees for national/EU students	The indicator is important (with regard to training highly qualified specialists (master's degree-postgraduate-doctoral)). Takes into account on a general basis	The indicator is important (with regard to training specialists (at the bachelor's or master's level) who will be able to / already can initiate new activities, create new industries / jobs in existing industries (participate in high-tech projects, startups). Takes into account on a general basis
Ability to charge tuition fees for non-EU students	The indicator is important (with regard to training highly qualified specialists (master's degree-postgraduate-doctoral)). Takes into account on a general basis	The indicator is important (with regard to training specialists (at the bachelor's or master's level) who will be able to / already can initiate new activities, create new industries / jobs in existing industries (participate in high-tech projects, startups). Takes into account on a general basis
Indicators of staffing autonomy (SA)	**The context in which the indicator matters. Does the content of the university autonomy components take into account the features of:**	
	innovatively active research university	**innovatively active entrepreneurial university**
Capacity to decide on recruitment procedures (senior academic staff)	The indicator is important (with regard to competition with other HEIs for the best researchers / scientists [50], heads of scientific schools, etc.). Does not take into account / takes into account on a general basis	The indicator is important (with regard to attracting active academic staff, ready not only to conduct research, but also to commercialize innovations). Does not take into account / takes into account on a general basis
Capacity to decide on recruitment procedures (senior administrative staff)	The indicator is important (with regard to recruitment of heads of research institutions, doctoral schools, research centers, centers for improvement and organization of research services, research and production facilities, etc.). Does not take into account / takes into account on a general basis	The indicator is important (with regard to search for / recruitment of managers: 1) of independent legal entities - centers for the organization of research and cooperation with firms and government agencies involved in the creation and dissemination of information; 2) of research and service organizations (on the initiative of university staff). Does not take into account / takes into account on a general basis
Capacity to decide on salaries (senior academic staff)	The indicator is important (with regard to competition with other HEIs for the best researchers / scientists [50], heads of scientific schools, their stimulation, etc.); promoting innovative behavior of employees, increasing their research productivity. Does not take into account / takes into account on a general basis	The indicator is important (with regard to incentives for active academics willing to conduct research and commercialize the results of their own research, promoting their innovative behavior. Does not take into account / takes into account on a general basis
Capacity to decide on salaries (senior administrative staff)	The indicator is important (with regard to incentives for the heads of research institutions, doctoral schools, research centers, centers for improvement and organization of research services, research and production complexes, etc.). Does not take into account / takes into account on a general basis	The indicator is important (with regard to incentives for managers: 1) of independent legal entities – centers for the organization of research and cooperation with companies and government agencies involved in the creation and dissemination of information; 2) research and service organizations (on the initiative of university staff). Does not take into account / takes into account on a general basis
Capacity to decide on dismissals (senior academic staff)	The indicator is important (with regard to competition with other HEIs for the best researchers / scientists [50], heads of scientific schools, etc.). Does not take into account / takes into account on a general basis	The indicator is important (with regard to protection / retention of active academics ready to conduct research and commercialize innovations). Does not take into account / takes into account on a general basis

Indicators of financial autonomy (FA)	**The context in which the indicator matters. Does the content of the university autonomy components take into account the features of:**	
	innovatively active research university	**innovatively active entrepreneurial university**
Capacity to decide on dismissals (senior administrative staff)	The indicator is important (with regard to dismissal of heads of research institutions, doctoral schools, research centers, centers for improvement and organization of research services, research and production complexes, etc.). Does not take into account / takes into account on a general basis	The indicator is important (with regard to dismissal of managers: 1) of independent legal entities – centers for the organization of research and cooperation with companies and government agencies involved in the creation and dissemination of information; 2) research and service organizations (on the initiative of university staff). Does not take into account / takes into account on a general basis
Capacity to decide on promotions (senior academic staff)	The indicator is important (with regard to competition with other freelancers for the best researchers / scientists [50], heads of scientific schools, their stimulation, promotion of innovative behavior of employees, increasing their research productivity, etc.). Does not take into account / takes into account on a general basis	The indicator is important (with regard to incentives for active academics ready to conduct research based on joint / internal resource and commercialize their results). Does not take into account / takes into account on a general basis
Capacity to decide on promotions (senior administrative staff)	The indicator is important (with regard to promoting heads of research institutions, doctoral schools, research centers, centers for improvement and organization of research services, research and production complexes, etc.). Does not take into account / takes into account on a general basis	The indicator is important (with regard to promoting managers: 1) of independent legal entities – centers for the organization of research and cooperation with companies and government agencies involved in the creation and dissemination of information; 2) research and service organizations (on the initiative of university staff). Does not take into account / takes into account on a general basis
Indicators of academic autonomy (AA)	**The context in which the indicator matters. Does the content of the university autonomy components take into account the features of:**	
	innovatively active research university	**innovatively active entrepreneurial university**
Capacity to decide on overall student numbers	The indicator is important (with regard to students admission (at the level of master or doctor of philosophy) – to train highly qualified professionals; with regard to students admission (at the bachelor's level) – as a source of additional income that will allow competing for the best researchers / scientists [50]. Takes into account on a general basis	The indicator is important (with regard to students admission (at the bachelor's and master's levels), who in the future will be able to initiate new activities, create new industries / jobs in existing industries / to participate in high-tech projects, startups). Does not take into account / takes into account on a general basis
Capacity to select students	The indicator is important with regard to choosing applicants to train highly qualified professionals; (master's-post-graduate-doctoral). Partially takes into account	The indicator is important (with regard to choosing applicants (at the bachelor's, master's level), who in the future will be able to initiate new activities, create new industries / jobs in existing industries) /to participate in high-tech projects, startups). Partially takes into account
Capacity to introduce and terminate programmes (bachelor, master, PhD)	The indicator is important (with regard to the introduction and termination of educational programs) (at the level of master of doctor of philosophy). Takes into account on a general basis	The indicator is important (with regard to introduction and termination of educational programs (at the bachelor's and master's level), continuous professional education programs). Partly takes into account on a general basis

End of Table 1

Indicators of academic autonomy (AA)	The context in which the indicator matters. Does the content of the university autonomy components take into account the features of:	
	innovatively active research university	**innovatively active entrepreneurial university**
Capacity to choose the language of instruction	The value of the indicator is enhanced through the opening of joint doctoral and PhD doctoral programs with foreign HEIs / research institutions, the growing academic mobility of masters, graduate students, invited academic staff, etc. Partially takes into account on a general basis	The value of the indicator is enhanced by the opening of joint educational programs with foreign HEIs, the possibility for higher education seekers to gain experience in entrepreneurial innovation (during training in HEIs, in the process of continuous professional training) under strategic partnership agreements with foreign HEIs / companies, etc. Partly takes into account on a general basis
Capacity to select QA mechanisms	The value of the indicator is enhanced by the necessity to ensure the quality of educational and scientific-and-educational programs in accordance with international and national standards. Partially takes into account on a general basis	The value of the indicator is enhanced by the necessity to ensure the quality of educational programs and continuous professional training programs in accordance with national and international educational and professional standards. Partially takes into account on a general basis
Capacity to select QA providers		
Capacity to design content of degree programmes	The indicator is important (with regard to regulating the content of educational and scientific-and-educational programs in accordance with national educational and / or professional standards). Takes into account on a general basis	The indicator is important (with regard to regulating the content of educational programs (in accordance with national educational and / or professional standards) and continuous professional training programs (in accordance with international / national professional standards)

Source: author's development.

Table 2

A fragment of the strategic framework for the financial policy of universities

Indicator, %	0	1	2–5	6–7	8–10
The share of income from research projects commercialization in the overall revenue structure of HEIs					
The share of income from companies ordering HEIs to carry out research projects					
The share of income from activities other than research					
The share of income from Monitoring and Assessment					
The share of each funding source in the HEI revenue structure					

Source: compiled by [14].

tional [22] rankings as for the potential for external evaluation of the effectiveness / competitiveness of an autonomous and innovatively active university (*Tbl. 3 – Tbl. 5*) and determines the acceptability of some of them as tools for external evaluation of research and innovative activity and effectiveness of both foreign and national HEIs (University 1.0, University 2.0, University 3.0) (*Tbl. 6*).

As Tbl. 3 – Tbl. 6 show, individual methodologies used by academic rankings of universities differ greatly, but so far none of them contains an indicator that would make it possible to assess the level of academic freedom enjoyed by HEIs. However, regardless of the chosen method, the academic ranking of universities should include respect for academic freedom in their assessments [35].

Being a benchmark for academics, university management, and governments, such academic rankings as Academic Ranking of World Universities [25], Times Higher Education World University Ranking [52], QS World University Ranking [46], or U-Multirank [55–58] have a unique opportunity to improve academic freedom by changing incentive structures for students, academics, universities, and governments.

Academic freedom is an important factor that makes a university a more attractive place for students and scholars. If a certain country performs poorly with regard to academic freedom, this must be taken into account.

Table 3

Possibilities of rankings as tools for the external assessment of an autonomous and innovatively active HEI, its effectiveness / competitiveness in the educational services market

Ranking name	Criteria and indicators for ranking (positioning) the HEI	Strengths and weaknesses of the ranking as a tool for the external assessment of the effectiveness / competitiveness of an HEI (and the quality of its educational, research, and entrepreneurial activities)		
		Academic university (University 1.0)	Innovatively active research university (University 2.0)	Innovatively active entrepreneurship university (University 3.0)
1	2	3	4	5
Shanghai Ranking(Academic Ranking I of World Universities (ARWU) [25]	**Quality of Education: 10%** (Alumni of an institution winning Nobel Prizes and Fields Medals (Alumni) – 10%). **Quality of Faculty: 40%** (Staff of an institution winning Nobel Prizes and Fields Medals (Award) – 20%; Highly Cited Researchers (HiCi) – 20%). **Research Output: 40%** (Papers published in Nature and Science* (N&S) – 20%; Papers indexed in Science Citation Index-Expanded and Social Science Citation Index (PUB) – 20%. **Per Capita Performance:** 10% (Per capita academic performance of an institution (PCP) – 10%)	*Strengths:* – transparency and openness of information sources to determine the ranking criteria. *Weaknesses:* – disproportion of indices. Excessive focus on assessing the quality of research activity (effectiveness) of HEIs; – one-dimensional ranking using different assessment indicators in one aggregate indicator	*Strengths:* – transparency and openness of information sources to determine the ranking criteria; – focus on assessing the quality of research activity (effectiveness) of HEIs (in particular, the quality of training scientists / researchers, the effectiveness of research carried out at HEIs). *Weaknesses:* – limited coverage due to assessing the quality of research activity (effectiveness) of HEIs only by the top results: Alumni & Staff of an institution winning Nobel Prizes and Fields Medals; only papers published in Nature and Science* are taken into account	*Weaknesses:* – focus on assessing the quality of research activity (effectiveness) carried out at research HEIs; – does not take into account the specifics of an entrepreneurial university at all
QS World University Rankings [46; 44]	QS World University Rankings [46]: Academic reputation (40%); Employer reputation (10%); Faculty/Student Ratio (20%); Citations per faculty (20%); International student ratio (5%); International faculty ratio (5%). QS EECA University Rankings [44]: Academic reputation (30%); Employer reputation (20%); Faculty/Student Ratio (10%); Staff with a PhD (5%); Citations per paper (5%); Papers per faculty (10%); International research network (10%); International faculty (2,5%); International students (2,5%); Web Impact (5%)	*Strengths:* – combination of formal data and expert assessment; – due to QS Global Academic Survey and QS Global Employer Survey, it is possible to identify top universities with effective performance, the greatest impact (in research area), and high competitiveness (in training best professionals in corresponding fields).	*Strengths:* – 60% of the world ranking is accounted for by assessing the quality of research activity (effectiveness) of HEIs (in particular, 40% on the QS Global Academic Survey; 20% on the citation of publications by university scientists);	*Weak sides:* – the focus of QS World University Rankings and QS EECA University Rankings on assessing the quality of research activity (effectiveness) of HEIs; – does not take into account the specifics of an entrepreneurial university (partly it can be assessed by the HEI reputation among employers, but the main purpose of QS Global Employer Survey is to assess the quality of education and identify universities training the best professionals in their fields);

Continuation of Table 3

1	2	3	4	5
		Weaknesses: – minor informational and methodological openness, which complicates using the results of participation in international rankings for the HEIs self-assessment; – the presence of only aggregate assessments by relevant indicators, which passes over the comparison of the absolute indicators on the basis of which the university ranking is made; – the level of university coverage is constantly changing; – a significant share is taken by subjective expert assessments	– 55% of the regional ranking is inter alia accounted for by assessing the quality of research activity (International research network) (10%) and its effectiveness (academic reputation of an HEI (30%), the publishing activity of scientists (in Scopus per 1 academic) (10%), recognition and citation (5%), which is based on the quality of its research and teaching staff (5%)	– the rating methodology does not provide for assessing the following: joint entrepreneurial innovation activities with business partners (creation of spin-offs, strategic partnership with a focus on knowledge transfer); results of the commercialization of innovations made by an HEI / with its participation (receipts; patents, certificates) [56; 58]
U-Multirank	**Teaching & Learning** (Bachelor graduation rate, Master graduation rate; Graduating on time (bachelors, masters) **Research** (External research income; Research publications; Art related output; Citation rate; Top cited publications; Interdisciplinary publications; Post-doc positions) **Knowledge Transfer** (Income from private sources (per fte academic staff; Co-publications with industrial partners; Patents awarded; Industry co-patents; Publications cited in patents; Spin-offs; Graduate companies; Income from continuous professional development) **International Orientation** (Foreign language bachelor programs; Foreign language master programs; Student mobility; International academic staff; International doctorate degrees; International joint publications);	*Strengths:* – covers various dimensions of HEIs activity (according to different criteria); – assesses all types of HEIs and research institutions; – meets the needs of various stakeholders; – makes is possible to compare universities in general or by fields of study; – is interactive (there are no fixed weights for individual indicators); – gives an objective external assessment of the quality of educational, research and international activities of a university in comparison with other domestic and foreign HEIs;	*Strengths:* – ranking methodology provides for compiling both an institutional ranking containing individual indicators of the quality of research activity (including agreements on strategic partnerships with research institutions and / or firms) with a focus on research / knowledge exchange, and readymade rankings: 1) the "Research and Research Linkages Ranking" [57], which consists of individual indicators: – the **«Research»** criterion (Citation rate, Research publications, Top cited publications); – the **«Knowledge Transfer»** criterion (Co-publications with industrial partners); – the **«International Orientation»** criterion (International joint publications);	*Strengths:* – rating methodology provides for compiling both an institutional ranking containing individual indicators of activity (effectiveness) of an entrepreneurial HEI (issued patents, joint patents with industrial partners, spin-offs created by the university for knowledge transfer) and readymade ratings: 1) «Applied Knowledge Partnerships Ranking» [55], comprising such individual indicators: – the **«Research»** criterion (Professional publications); – the **«Knowledge Transfer»** criterion (Co-publications with industrial partners, Income from continuous professional development, Graduate companies);

Continuation of Table 3

1	2	3	4	5
U-Multirank	**Regional Engagement** (Bachelor graduates working in region; Student internships in region; Regional joint publications; Income from regional sources; Master graduates working in region; Strategic research partnerships in the region)	– based on the results of HEIs participation in the ranking, the development trends of HEIs in priority areas are determined, the priorities for HEIs development in the following periods are selected. *Weaknesses:* – classical universities with educational programs in various fields of knowledge, as opposed to professionally oriented ones, are in advantage with regard to the possibility to participate in the U-Multirank ranking every year; – a previously registered participant can update the information on its HEI annually as for the institutional ranking (through Institution-Data-Questionnaire); as for the industry-based ranking (through Fieldbased-Data-Questionaire) it is only possible if the HEI has some educational programs participating in the assessment during the current year; – orientation of information sources on the coverage of research results (Web of Science, PATSTAT) on the scientific activities of research universities in the humanities and technical sciences	– the **«Regional Engagement»** criterion (Regional joint publications); 2) institutional and industry-based "Universities of Science and Technology Rankings" [58], which consists of individual indicators: – the **«Teaching & Learning»** criterion (Bachelor graduation rate, Master graduation rate); – the **«Research»** criterion (Citation rate, Research publications, Art related output, Top cited publications); – the **«Knowledge Transfer»** criterion (Co-publications with industrial partners, Spin-offs, Patents awarded, Publications cited in patents); – the **«International Orientation»** criterion (Student mobility, International academic staff, International doctorate degrees, International joint publications). *Weaknesses:* – though data on research income (by sources) is available, the ranking agency uses summarized information, income from cooperation inclusively, but does not analyze the size of grants on or income from applied and fundamental research received by HEIs	– the **«Regional Engagement»** criterion (Income from regional sources); 2) «Economic Involvement Ranking» [56], comprising such indicators: – the **«Knowledge Transfer»** criterion (Co-publications with industrial partners, Income from private sources, Patents awarded; Industry co-patents; Spin-offs; Publications cited in patents; Income from continuous professional development); – the **«Regional Engagement»** criterion (Bachelor graduates working in region, Master graduates working in region; Student internships in region, Regional joint publications), taking into account the applicants' experience in entrepreneurial innovation (while receiving training at HEIs, or during continuous professional training). *Weaknesses:* – subjectivity of information about the number of spin-offs and enterprises created by graduates
The Times Higher Education World University Rankings (THE) [52]	**Teaching (the learning environment): 30%** Reputation survey – 15%; Staff-to-student ratio – 4.5%; Doctorate-to-bachelor's ratio – 2.25%; Doctorates-awarded-to-academic-staff ratio – 6%; Institutional income – 2.25%	*Strengths:* – covers various dimensions of HEI activity; – combines formal data and expert assessment (by interviewing the parties concerned).		

End of Table 3

1	2	3	4	5
The Times Higher Education World University Rankings (THE) [52]	**Research (volume, income and reputation): 30%** Reputation survey – 18%; Research income – 6%; Research productivity – 6%. **Citations (research influence): 30%** **International outlook (staff, students, research): 7.5%** Proportion of international students – 2.5%; Proportion of international staff – 2.5%. **Industry income (knowledge transfer): 2.5%**	*Weaknesses:* – the ranking does not include HEIs dealing with specific areas of research, of HEIs publishing very few works; – the results of the teaching survey are based on the opinions of experienced scientists (authors of journals from the Elsevier database) instead of the opinions of students from these universities.	*Strengths:* – focus on training highly qualified specialists (Doctorates-awarded-to-academic-staff (6%) and Doctorate-to-bachelor's ratio (2.25%) indicators); – assessment of the quality of educational, and scientific and educational programs (15% is given to the survey to determine (teaching) reputation); – assessment of the quality and effectiveness of scientific and innovative activities (18% is given to the survey to determine (research) reputation; research productivity of the HEI (6%); demand and impact of research by the HEI researchers (30% is given to the citations of publications in Scopus); research income (6%)). *Weaknesses:* – as for a ranking assessing, first of all, the scientific activity of an innovatively active research HEI (University 2.0), it has a surprisingly low interest in international relations and prospects (the weight of the corresponding indicators is 7.5% (the share of joint publications with foreign authors in Scopus is the only indicator accounting for 2.5% of the overall ranking))	*Weaknesses:* – this ranking hardly takes into account the possibility of knowledge transfer from HEIs to the business environment (only 1 indicator (Industry income) is calculated, accounting for 2.5% of the overall ranking)

Table 4

Possibilities of rankings with regard to assessing the effectiveness / competitiveness of a research university

Ranking name	Criteria and indicators for ranking (positioning) HEIs	Strengths and weaknesses of the ranking as a tool for assessing the effectiveness / competitiveness of an innovative research university (University 2.0) (quality of its educational and R&D activities)
The Top American Research Universities [50]	Total Research, Federal Research, Endowment Assets, Annual Giving, National Academy Members, Faculty Awards, Doctorates Granted, Postdoctoral Associates, SAT Scores	*Strengths:* – covers only the cost of funding research and innovation activities of an innovative research university, and success in training and attracting research staff. *Weaknesses:* – scientometric indicators of the innovative activity of an HEI, as well as indicators of knowledge and technologies commercialization of an innovatively active HEI are not estimated at all
National Ranking of Research Entities of Ukraine (according to Sciverse Scopus Database) [22]	HEIs ranking according to the Sciverse Scopus Database: – number of publications (affiliated with the HEI); – number of citations; – institutional Hirsch index (h-index)	*Strengths:* – transparency and openness of the information source to build up the rating (institutional profiles of an HEI in the Sciverse Scopus Database); – coverage of all HEIs (regardless of the scale of their publishing activity (which have institutional profiles in Sciverse Scopus): public and private HEIs; classical universities and specialized HEIs; large, medium and small HEIs). *Weaknesses:* – covers only the publication dimension of the scientific and innovative activities of an innovatively active research university; – surprisingly lacks assessment of the publishing activity of scientific institutions as research entities (although the URAN publishing service determines the indicators of publication activity and dynamics of citations of the works by academics, working at Ukrainian scientific institutions of various systems and departments, in the framework of the scientometric monitoring of the scientific and publishing subjects of Ukraine); – coverage of all HEIs (which have institutional profiles in Sciverse Scopus) does not take into account the scale of their activities (it does not give the number of publications per 1 academic), or industry orientation, due to which fact results are distorted

Table 5

Possibilities of tools for the external evaluation of the effectiveness of an autonomous, innovatively active entrepreneurial university in the educational services market

Ranking name	Criteria and indicators for ranking (positioning) HEIs	Strengths and weaknesses of the ranking as a tool for the external assessment of the effectiveness / competitiveness of an innovatively active entrepreneurial university (University 3.0) (and the quality of its educational, research, and entrepreneurial activities)
1	2	3
Ranking of entrepreneurial universities and business schools [24]	The ranking is based on 7 indicators, grouped into 2 groups: **scale and success** (65%): number of startup graduates (20%); number of startups (20%); share of supported projects (20%); the amount of investment in a startup founded by graduates (5%); **demand (35%):** average number of visits to the project site during the last 6 months (15%)	*Strengths:* – sources of information are: Crunchbase, AngelList, Startup Ranking international databases, and LinkedIn and Facebook services (Crunchbase and AngelList databases contain a large number of indicators of the activity and success of startups collected from various sources by machine learning methods and verified by the community of already registered startups and site moderators).

Continuation of Table 5

1	2	3
	average number of views / visits per 1 project (15%); app downloads in the App Store / Google Play (5%)	*Weaknesses:* – the ranking includes only those universities that have more than 4 startups visible in international databases (Crunchbase, AngelList, Startup Ranking); – the activity of an HEI on training innovatively active businessmen is assessed, while the innovative activity of an entrepreneurial HEI is not assessed
BI Global world rankings of business incubators and Accelerators [54]	**1. Value for Ecosystem** 1) Economy Enhancement (22.2%): KPI 1. Jobs created & sustained (6.7%); KPI 2. Sales revenue (6.7%); KPI 3. Graduates (4.4%); KPI 4. Self-generated revenue (4.4%); 2) Talent Retention (11.1%): KPI 5. Client startups accepted (6.7%); KPI 6. Graduate retention (4.4%). **2. Value for Client Startups (33.3%):** 3) Competence Development (8,9%): KPI 7. Services offered (4,4%); KPI 8. Coaching & mentoring hours (4,4%); 4) Access to Funds (11.1%): KPI 9. Total investment attracted (6.7%); KPI 10. Average investment attracted (2.2%); KPI 11. Seed funding attraction (2.2%); 5) Access to Network (13.3%): KPI 12. Partners (6.7%); KPI 13. Events (4.4%); KPI 14. Alumni engagement (2.2%) **3. Value for Program (33.3%):** 6) Program Attractiveness (15.5%): KPI 15. In-state applications (6.7%); KPI 16. Out-of-state applications (4.4%); KPI 17. Sponsorship attraction (4.4%); 7) Post-Graduation Performance (17.8%): KPI 18 1-year survival rate (4.4%); KPI 19 5-year survival rate (4.4%); KPI 20 High-growth enterprises (4,4%); KPI 21 Qualified exits (4.4%)	*Strengths:* – assessment of innovative, organizational, service, and educational activities of an entrepreneurial HEI
The Times Higher Education. THE Impact Ranking [51]	Measuring the success of an HEI in achieving the Sustainable Development Goals (SDGs) set by the UN for the period up to 2030: SDG 1 – no poverty; SDG 2 – zero hunger; SDG 3 – good health and well-being; SDG 4 – quality education; SDG 5 – gender equality; SDG 6 – clean water and sanitation; SDG 7 – affordable and clean energy; SDG 8 – decent work and economic growth; SDG 9 – industry, innovation and infrastructure; SDG 10 – reduced inequalities; SDG 11 – sustainable cities and communities; SDG 12 – responsible consumption and production; SDG 13 – climate action; SDG 14 – life below water; SDG 15 – life on land;	*Strengths:* – the THE experts try to assess the third mission of the HEIs, considering an HEI as an open system; to determine the extent to which an HEI is integrated in public life and its social environment; how much its partnership is developed; what ecosystem it forms around itself; – different HEIs are assessed on the basis of different sets of SDG, depending on their orientation (Table 1.21); – for each SDG, a specific query is created in Scopus that narrows the scope to articles related to that very SDG. *Weaknesses:* – most HEIs will not be able to properly fill in the **"Research"** and **"Teaching"** areas due to their specifics of the fields of study;

End of Table 5

1	2	3
	SDG 16 – peace, justice and strong institutions; SDG 17 – partnerships for the goals. Indicators to provide comprehensive and balanced comparisons across four broad areas: **Research** (on relevant topics). **Stewardship** (HEIs are custodians of significant resources; not only physical resources, but also their employees, teachers and students). **Outreach** (which HEIs fulfill together with their local, regional, national, and international communities). **Teaching** (both by providing enough qualified practitioners to perform the SDG and by ensuring that all their graduates advance key sustainability lessons into their future careers). The total HEI score in the aggregate table is calculated by combining its scores in SDG 17 (22 percent of the total score) with the top three scores from the remaining 16 SDGs (26 percent each).	– the academic approach to assessing the success of innovative activities of the University 3.0 in achieving the Sustainable Development Goals (by the number of publications and their citations). Only starting with SDG9 (industry, innovation and infrastructure) the following indicators appear: "Research income from industry" (weight 38.4%), "Patents citing university research" (15.4%), and "University spin-offs (companies registered at least three years ago, that continue operating, and are created in order to exploit intellectual property originating from an HEI) (weight 34.6%)
QS Graduate Employability Rankings [45]	The ranking is based on the following indicators: **Employer Reputation** (according to the QS Global Employer Survey) (30%); **Alumni Outcomes** (through inclusion in the lists of successful people) (25%). **Partnerships with Employers (25%)** 1) knowledge transfer cooperation with 2000 leading global Fortune and/or Forbes companies (according to Scopus data, two or more joint projects during 2013-2017); 2) partnerships related to student employment) per 1 academic). **Employer-Student Connections (10%)** (due to the employers' "active presence" at the university (participation in career fairs, organization of company presentations or any other self-promotion). **Graduate Employment Rate (10%)** (excluding those who choose to continue their studies or are unavailable for work) full-time or part-time within 12 months after graduation.	*Strengths:* – orientation of the ranking indicators on the educational mission of University 3.0, i.e. training specialists who will be able to initiate new activities, transform the internal environment and modify the interaction with the external environment: 1) the HEI reputation level among employers (30%) (QS Global Employer Survey): the Survey places those HEIs on top, which train the most competent, innovative and effective graduates; 2) QS own survey (25%) of those people who appear in more than 220 lists of successful people (among more than 40,000 richest and most innovative, creative, entrepreneurial, and / or charitable people in the world) to determine, which HEIs train people who change the world; 3) partnership with employers (with regard to student employment); 4) close links between employers and students (10%); – assessment of the success of cooperation / partnership between HEIs and global Fortune and Forbes companies on knowledge and research transfer (according to Scopus data). *Weaknesses:* – "academic" cooperation in knowledge and research transfer (published research results are assessed, while income from research is not taken into account); – graduates' achievements are assessed by their appearing on the list of successful people (instead of the number of start-ups that are supported by investors and / or the amount of investment in a startup founded by graduates, etc.)

Source: author's development.

Table 6

Acceptability of rankings as tools for assessing the effectiveness / competitiveness of innovatively active Ukrainian HEIs

Ranking name	Acceptability for assessing research and innovative activity and effectiveness of an HEI (University 1.0, University 2.0, University 3.0)	Participation (current / potential) of Ukrainian HEIs in the ranking
Academic Ranking of World Universities (ARWU) [25]	University 2.0	Limited by the capability to comply with ranking indicators
QS Rankings	QS World University Rankings [46] (University 1.0, University 2.0); QS EECA University Rankings [44] (University 1.0, University 2.0); QS Graduate Employability Rankings [45] (University 1.0, University 3.0 partially)	Regular since 2011. Potentially for any HEI
U-Multirank	Research and Research Linkage Rankings [57] (University 1.0, University 2.0); Applied Knowledge Rankings [55] (University 1.0, University 3.0 partially); Economic Engagement Rankings [56] (University 1.0, University 3.0); Universities of Science and Technology Rankings [58] (University 2.0)	Regular since 2014. Potentially for any HEI
The Times Higher Education World University Rankings (THE) [52]	University 1.0, University 2.0	Limited by access conditions (by number of publications)
The Times Higher Education THE Impact Rankings [51]	partially University 3.0	Regular since 2019. Potentially for any HEI
The Top American Research Universities [50]	University 2.0	Impossible (US HEIs only)
National Ranking of Research Entities of Ukraine (according to Sciverse Scopus database) [22]	University 1.0, University 2.0	Regular
Ranking of entrepreneurial universities and business schools [24]	University 3.0	Impossible (HEIs from the Russian ederation only)
UBI Global World Rankings of Business incubators and accelerators [54]	World Top University Business Incubators (University 3.0); World Top University Business accelerators (University 3.0)	Potentially possible

Source: author's development.

To solve this problem, analysts from the Global Public Policy Institute (GPPi) (K. Kinzelbach, I. Saliba, J. Spannagel, & R. Quinn) have developed the methodology for the Academic Freedom Index (AFi) [35] and conducted calculations by country (by year).

The Academic Freedom Index (AFi) consists of eight components [35]:

- three components are based on actual data ("Constitutional Protection of Academic Freedom"); "International Legal Commitment to Academic Freedom Under International Covenant on Economic, Social and Cultural Rights (ICESCR)"; "Existence of Universities");
- the other five are determined by expert surveys ("Freedom to Research and Teach"; "Freedom of Academic Exchange and Dissemination", "Institutional Autonomy") (an integrated indicator), "Campus Integrity" (degree of freedom of campuses from politically motivated supervision or security violations [36] ("Freedom of Academic and Cultural Expression") (*Fig. 2*).

The results of the current year are presented in *Tbl. 7*.

The division between institutional autonomy and freedom of research and teaching is presented in *Fig. 3*.

The developers of the index claim that university rankings can be adjusted up or down according to the conditions of academic freedom in the countries in which they are located: «Academic Freedom Index (AFI) country scores can be used to improve established university rankings. At present, leading rankings narrowly define academic excellence and reputation as a function of outputs. As a result, institutions in repressive environments have climbed the reputation ladder

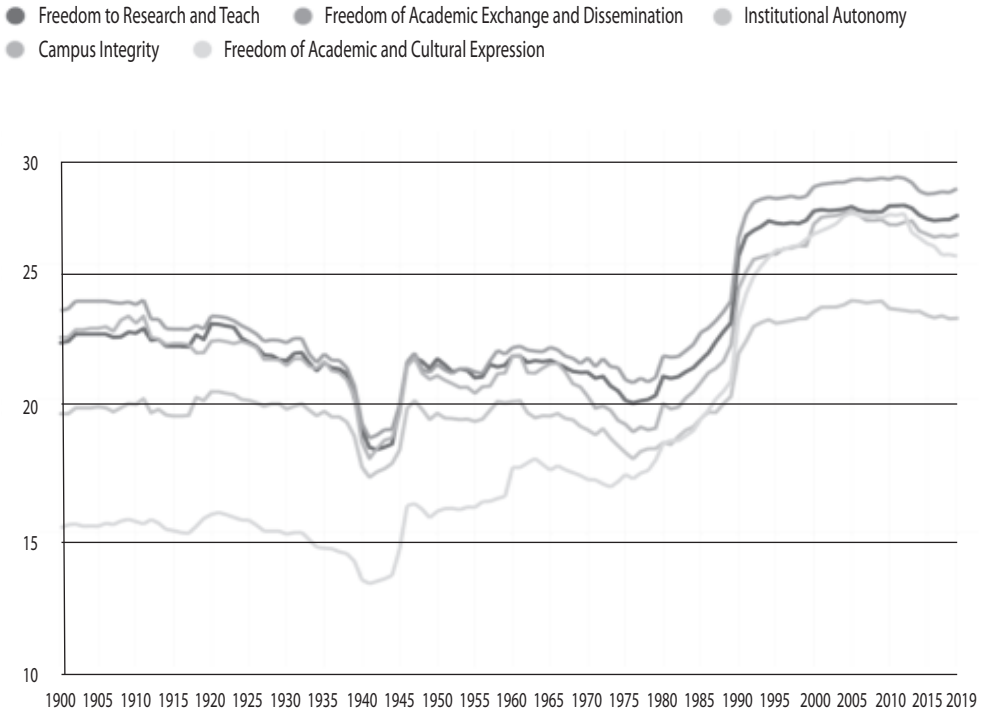

Fig. 2. Global trends in academic freedom indicators in 1900–2019 [35]

Table 7

Grouping of countries according to the Academic Freedom Index (AFI) [35]

Status A: AFi (0.8–1.0)	Status B: AFi (0.6–0.8)	Status C: AFi (0.4–0.6)	Status D: AFi (0.2–0.4)	Status E: AFi (0.0–0.2)
56 states (including UK (0.934))	33 states (including Japan (0.736))	21 states (including Ukraine (0.422))	16 states (including Russia (0.364)	19 states (including China (0.101))
(min Comoros (0.8) – (max Portugal, Uruguay (0.971))	(min Lebanon (0.622) – (max Indonesia (0.794))	(min Uganda (0.401) – (max Malaysia (0.582))	(min Belarus (0.225) – (max Vietnam (0.379))	(min N. Korea (0.011) – (max Bangladesh (0.195))

Insufficient Data – 35 states are not included in the AFi due to an insufficient number of codes (e. g., Australia, Luxembourg, USA, Switzerland, etc.)

Source: A complete list of participating states is given in [35].

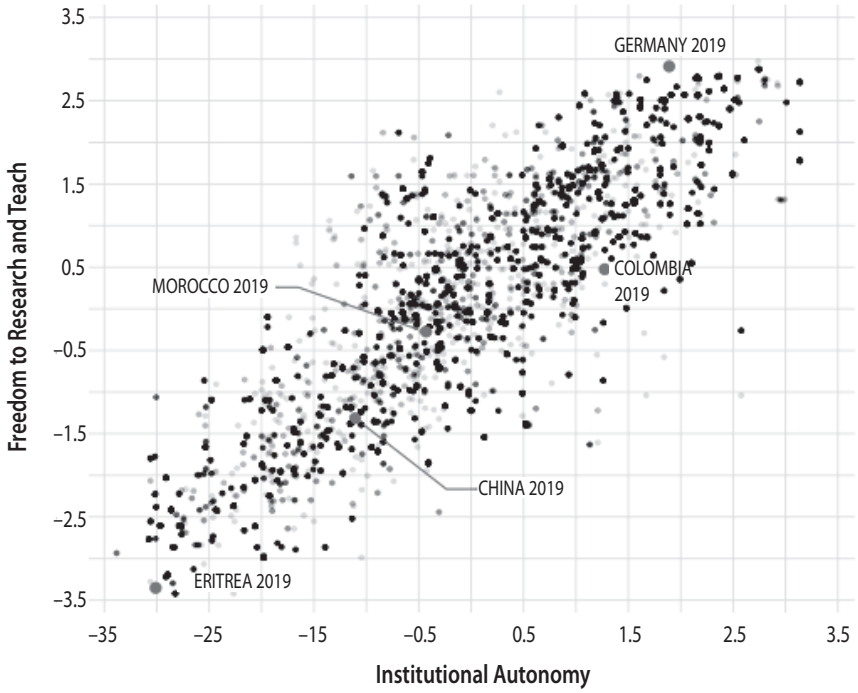

Fig. 3. The division between institutional autonomy and freedom of research and teaching [35]

and now occupy top ranks. They thereby mislead key stakeholders and make it possible for repressive state and higher education authorities to restrict academic freedom without incurring a reputational loss» [35].

Taking into account all these features of assessing the level of autonomy of universities, the possibility of taking into account the subjective component, i.e. academic freedom through the AFi index, and using the existing external rating of innovative universities (see Tbl. 3 – Tbl. 6), we tried to analyze, whether they can be applied to fulfilling our task (*Tbl. 8*). According to the results of the EUA analysis of the university autonomy level carried out in 2011 [33], 2017 [34] (by component), we have identified countries whose higher education systems show excellent results (according to indicators), which should have encouraged the innovative activity of universities, but the results of the ranking assessment of the HEIs in these countries are somewhat unconvincing.

According to the results of positioning European leading states with regard to components of university autonomy and the academic freedom index in the top 100* academic and independent rankings that can assess the activities of innovative universities (Table 8), the following groups can be identified:

- a group of innovatively active universities (University 3.0), which demonstrates effectiveness in both the main academic rankings for assessing research and innovation activity and the effectiveness of HEIs (Shanghai World University Rankings (ARWU) [25], QS World University Rankings [46], The Times Higher Education World University Ranking [52], U-Multirank, Research and Research Linkages Ranking [57], U-Multirank, Universities of Science and Technologies Rankings [58]), and in rankings that allow measuring and assessing the activity and effectiveness of entrepreneurial universities (academic U-Multirank, Economic Engagement Ranking [56], independent UBI Global World Ranking of Business Incubators and UBI Global World Ranking of Business Accelerators [54]) (leaders here are Great Britain, the Netherlands (with its liberal model of HEI management), and Belgium: economies of the first two states are among the best economies by income brackets (taking the 4th and 5th places in the GII-2020 ranking, respectively [59]), while the last 2 despite the size of the country and higher education system), and others);
- a group of innovatively active research universities (University 2.0) demonstrating effectiveness in academic rankings for assessing research and innovative activity and effectiveness of HEIs (Shanghai World University Rankings (ARWU) [25], QS World University Rankings [46], The Times Higher Education World University Ranking [52], U-Multirank Research and Research Linkages Ranking [57], U-Multirank Universities of Science and Technologies Rankings [58]);
- and the transitive group (Portugal, Austria, Sweden, and others).

The focus of Asian universities on advancing in academic rankings is very clear, despite a certain lack of academic freedom (Japanese and Chinese examples). Still, in the ranking of the most innovative economies (according to the Global Innovation Index 2020) [59] South Korea,

Table 8

Positioning of the leading countries by components of university autonomy and according to the academic freedom index in the top 100* rankings that can assess the work of innovatively active universities

2016 Leading states (by components of the HEIs' autonomy [34]	2020 THE WUR [52]	2020 ARWU [25]	2020 QS WUR [46]	2020 U-Multirank (top-50)			2020 THE WUR [52]	2020 UBI Global [54]	
				Research & Research Linkages [57]	Universities of Science & Technology [58]	Economic Engagement [56]		Top 20 Universities Business Incubators	Top 5 Universities Business Accelerators
1	2	3	4	5	6	7	8	9	10
Estonia (SA = 1; AA = 1; OA = 5–6; FA = 4–5)	#5 (AFI = 0,957)	– (1 in top-500)	– (3 in top-1000)	–	–	–	– (2 in top-600)	–	–
Finnland (SA = 6; AA = 2; OA = 3; FA = 11)	#14 (AFI = 0.936)	1 (8 in top-300–1000)	– (9 in top-600)	–	–	–	– (9 in top-600)	–	1: Partner – 1 HEI
Great Britain (SA = 3; AA = 3–5; OA = 1; FA = 3)	#16–17 (AFI = 0.934)	8 HEIs (57 in top-101–1000)	18 HEIs (66 in top-110–1000)	19 HEIs	15 HEIs	9 HEIs	7 HEIs	Partner – 1 HEI	–
Luxembourg (SA = 5; AA = 3–5; OA = 29; FA = 1)	none	– (1 in top-700)	–	–	–	–	– (1 in top-200)	–	–
To compare									
Portugal (SA = 18; AA = 20; OA = 7; FA = 7–9)	#1–2 (AFI = 0.971)	– (6 in top-150–600)	– (7 in top-350–1000)	–	–	1 HEI	– (7 in top-350–600)	1: Partners – 2 HEIs	–
Germany (SA = 15-17/20–21; AA = 6–7/8; OA = 10/14/21; FA = 29/26/25)	#4 (AFI = 0.960)	4 HEIs (45 in top-101–1000)	3 HEIs (42 in top-110–1000)	2 HEIs	–	2 HEIs	9 HEIs (28 in top-101–600)	–	–
Austria (SA = 12–13; AA = 12–13; OA = 8–9; FA = 17)	#6–7 (AFI = 0.947)	– (14 in top-150–1000)	– (8 in top-150–800)	–	1 HEI	1 HEI	– (7 in top-500)	1: Partners – 9 HEIs	–
Sweden (SA = 2; AA = 15; OA = 19; FA = 19)	#6–7 (AFI = 0.947)	3 HEIs (11 in top-101–900)	2 HEIs (6 in top-120–400)	–	–	–	3 HEIs (8 in top-350)	2: Partners – 2 HEIs	–

End of Table 8

1	2	3	4	5	6	7	8	9	10
Italy (SA = 12–13; AA = 22; OA = 16–17; FA = 7–9)	#8 (AFI = 0.944)	– (46 in top-150–1000)	– (36 in top-130–1000)	–	–	5 HEIs	– (34 in top-500)	1: Partner – 1 HEI	–
Spain (SA = 23; AA = 17; OA = 24–25; FA = 20)	#9 (AFI = 0.942)	– (40 in top-150–1000)	– (26 in top-180–1000)	5 HEIs	–	9 HEIs	– (34 in top-101–800)	–	–
Belgium (SA = 11/24–26; AA = 28/29; OA = 4/12; FA = 6/22)	#10 (AFI = 0.941)	2 HEIs (6 in top-101–700)	1 HEI (8 in top-130–700)	2 HEIs	2 HEIs	4 HEIs	1 HEI (6 in top-400)	–	1: Partner – 5 HEIs
Ireland (SA = 27–28; AA = 3–5; OA = 11; FA = 13)	#15 (AFI = 0.935)	– (5 in top-150–800)	– (8 in top-101–1000)	–	–	1 HEI	– (9 in top-101–800)	–	–
Netherlands (SA = 12–13; AA = 22; OA = 13; FA = 4–5)	#19 (AFI = 0.931)	4 HEIs (9 in top-101–700)	2 HEIs (11 in top-110–400)	7 HEIs	1 HEI	4 HEIs	8 HEI (5 in top-300)	2: Partners – 5 HEIs	–
France (SA = 27–28; AA = 25; OA = 20; FA = 24)	#44 (AFI = 0.846)	5 HEI (25 in top-101–1000)	3 HEIs (25 in top-130–1000)	1 HEI	2 HEIs	3 HEIs	1 HEI (26 in top-101–800)	–	–
Ukraine* (SA = 11; AA = 17; OA = 14; FA = 23)	#108 (AFI = 0.422)	–	– (6 in top-400–1000)	–	–	–	– (2 in top-600–800)	–	–
Turkey (2011) (SA = 22; AA = 25; OA = 29; FA = 24–25)	#136 (AFI = 0.097)	– (11 in top-401–1000)	– (9 in top-400–1000)	–	–	3 HEIs	– (11 in top-250–800)	1: Partner – 1 HEI	–
To compare									
South Korea	#54 (A) (AFI = 0.802)	– (32 in top-101–1000)	6 HEIs (23 in top-120–1000)	–	–	–	1 HEI (23 in top-110–800)	–	–
Japan	#69 (B) (AFI = 0.736)	3 HEIs (37 in top-101–1000)	5 HEIs (36 in top-120–1000)	–	–	3 HEIs	– (41 in top-200–800)	–	–
China	#134 (E) (AFI = 0.101)	6 HEIs (138 in top-101–1000)	6 HEIs (45 in top-120–1000)	–	–	–	2 HEIs (35 in top-200–800)	–	–

Source: compiled by the authors.

China and Japan rank the 10th, 14th and 16th, respectively. So it's just a matter of time and government policy (Chinese version) to reorient from innovative models of research (University 2.0) to the entrepreneurial university model (University 3.0).

CONCLUSIONS

Thus, the existing system of assessing university autonomy by components (according to the EUA methodology) should, but cannot assess the autonomy of innovative universities, because it: 1) does not contain any of the direct indicators (by components); 2) does not take into account the degree of academic freedom of universities in the country. The above also refers to the existing methodologies of academic and independent university rankings, which differ greatly, but so far none of them contains an indicator that would make it possible to assess the level of academic freedom of HEIs.

Further research should: 1) develop a system of university autonomy indicators, which would take into account the peculiarities of innovative research and entrepreneurship universities; 2) take into account the academic freedom component (AFi index) in the external assessment of autonomous and innovatively active universities. ■

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