

ECONOMIC SCIENCES

DRIVING FACTORS FOR THE DEVELOPMENT OF REGIONAL HIGHER EDUCATIONAL SYSTEMS

Rakviashvili A.

*The Doctoral Student of the Georgian Technical University
Tbilisi, Georgia*

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Abstract

Higher education is undergoing a significant transformation in Georgia and around the world. Universities and the state have to solve complex and sometimes multidirectional problems. Analysis of theoretical studies of the types of universities and the factors that determine them allows us to form an idea of possible development drivers, and a multiparameter methodology for assessing the state of higher education will enable us to identify the factors that have the most significant impact on changes in the state of higher education. The study showed that the factors affecting the development of the higher education system depend on the university's development strategy and economic model, as well as state programs containing recommendations for developing the educational environment. The presence of a leading university in the region significantly impacts the development of regional higher education systems, since the creation of such universities was initially aimed at accelerated development. This situation is economically conditioned and explained by the high dependence of universities on the state budget. At the same time, based on the leading university, an academic environment is formed for research, teaching staff, and students. It is the activity of research and teaching staff in research activities, and students in the academic sphere, that positively affect the dynamics of the development of regional systems. The growing gap between the leading universities and other universities leads to monopolization, reduced competition, and, as a consequence, a decrease in the efficiency of activities. There is a need for structural restructuring. The private factors influencing the development of the higher education system include indicators of scientific activity and student performance. The conducted analysis allows us to assert that the recorded trends will intensify and further differentiation of regional higher education systems will be observed with a simultaneous improvement in individual universities' research and educational characteristics. However, due to the growing disproportions in their development, a separate study is needed on the feasibility of structural restructuring within regional systems.

Keywords: higher education institutions, typology, rankings, regional university, scientific and educational activities, development factors, competitiveness of the university

Introduction

Higher education is undergoing a significant transformation in Georgia and the world. At the same time, universities and the state solve multiple, sometimes multidirectional problems related to determining the place of universities in the economic system. Universities in modern realities are considered, firstly, as part of the socio-economic system of the state, solving problems of improving the quality of human resources, the compliance of graduates with the needs of the labor market, and, secondly, as independent economic entities of the economy, choosing a development strategy to increase their financial independence and competitiveness. At the same time, the domestic system of higher education in general, and universities in particular, is heavily dependent on government funding, unlike such types of foreign universities as entrepreneurial and research [1] (although for some universities, these are intertwined characteristics).

Nevertheless, both are guided by indicators that characterize their effectiveness and competitiveness in the struggle for stakeholder resources and in implementing socially significant functions assigned to the higher education system. The study presented in this article is focused on the Georgian higher education system. The research question is to form an idea of possi-

ble development drivers through the analysis of theoretical studies of the types of universities and the factors that determine them, and to identify the factors that have the most significant impact on its change in the set of specified indicators based on the multiparameter methodology for assessing the state of higher education [2]. The indicators of the state of higher education used in the method reflect all the specifics of the state policy priorities for developing higher education institutions. When conducting the study, we made several assumptions: universities are mainly financed from the federal budget of Georgia, the share of regional and local budget funds is insignificant, the activities of universities are focused on development roadmaps, state assignment indicators, and this is an indicative guideline for the development of universities. Much attention is paid to the concept of a factor or driver of organizational development in the theory of strategic management and other holistic concepts of organization management, such as the theory of evaluation and cost management [3].

According to these approaches, the drivers of an organization's development include factors of the external environment, organizational parameters, and performance standards, as well as the long-term dynamics that determine the size of income and expenses and, accordingly, the ability to invest in development. From

this point of view, the drivers of a university's development may include the number of researchers actively engaged in scientific activities, the volume and structure of the student body, the proportion of foreign researchers and teachers, the level of salaries of researchers and teachers, the level of cost per student, etc. When choosing factors for research, an important task is to form a set of indicators that allow the assessment of the phenomenon under study correctly and the formulation of hypotheses for solutions in further development. We believe the difference in using the term "driver" or "factor" is conditional.

However, the term "driver" is more often used where it is necessary to emphasize the phenomenon's primary nature for the organization's development. The term "driver" is included in the article's title. And one more important addition: the drivers are predetermined by the goals facing the universities, their development strategy, as well as potential, and therefore the drivers themselves, expressed in quantitative indicators, are included in the methods of rating, typology, and evaluation of the effectiveness of universities. For example, achieving certain positions in the rating system characterizes the university's competitiveness relative to other universities in this system. In these systems, a set of criteria is predetermined by which the activities of institutions are assessed and which, at the same time, are factors, the orientation towards which contributes to the development of universities. The situation is different with the typology of universities, designed to differentiate institutions according to specified criteria. Again, these criteria are factors in classifying a university into one type or another. Ratings and typologies have different natures of influence on the higher education system: ratings are designed to equalize universities and establish uniform criteria for all, while the boundaries of typology (for example, as in the methodology for monitoring the effectiveness of universities) and ratings level everything, reducing diversity, without which there is no development; this opinion has been expressed more than once in scientific circles (for example, [4 p. 9; 5 p. 25; 6]). There is another approach to assessing the significance of rankings, which includes the assumption that competition, high performance, and openness allow universities and higher education systems to be more sustainable and better adapt to global challenges. In contrast, scientific performance, in turn, indicates the universities' ability to produce global intellectual products. It also forms their status among other universities, future students, and financial capital [7].

As for the Georgian practice of developing universities, since domestic universities have predominantly state funding, their development is significantly influenced by state strategies. At the same time, R&D funds from scientific foundations are also state funding. However, in this entire system of differentiating universities (typification, ranking, and development strategies), there are deeper theoretical assumptions presented by theories about:

resource dependence [8, p. 222] the essence of which is that organizations are dependent on the environment external to them, and, at the same time, can influence the environments in which they operate, D.S. Elliott [10], P. Benneworth [11], K. Brown [12] on the influence of universities on regional development);

stakeholders [13], representing the organization through a set of entities that require its activities, and the organization's development is presented by considering the interests and requirements of these entities.

In general, the essence of both theories is that universities' activities depend on stakeholders' funding. Therefore, the development drivers should focus on the funded entities' requirements and interests. At the same time, Burton R. Clark [14, p. 143] introduces the concept of a coordination triangle, which unites both designated theories. Through the prism of the coordination triangle, it seems possible to consider the ongoing changes in the scale and structure of the higher education system as a result of the interaction and constantly changing degrees of influence of the three main power groups involved in management - the state, the market, and the academic community. The basics of the stakeholder approach, which consist of the fact that each structure strives to obtain the maximum benefit from the investment of its funds, allow us to conclude the belonging of the elements of differentiation of universities to powerful groups. For example, in the work of J.A. Bartelse and F.A. van Vught [4], the typology of universities is based on the criteria for stakeholders' choice of an institution. Suppose the universities' ranking system and typology are aimed at a large circle of stakeholders (households, academic communities, government bodies). In that case, the assessment of the efficiency of the universities, which is not assumed either in the typology or in the ranking, serves as an instrument of advantage for government bodies, which are the primary source of financing for Georgian public educational institutions.

Thus, the factors that contribute to the change in the state of universities and affect their activities are predetermined by the university's development strategy and its type [15]. In this regard, the factors should be divided into groups. As a result, the task of identifying these groups arises, but at the same time, a discussion arises about the purpose of the factors:

They should be used to assess the efficiency of the universities of the entire higher education system (for example, as presented in the new (2016) [16] methodology of the Carnegie Institute);

They should be used to differentiate the focus of the activities of universities by their potential and, possibly, for subsequent decisions on their further state funding and to narrow the circle of potential participants in grants from scientific foundations.

Differentiation of universities and their activity strategies

It is more logical to define factors through the prism of the diversity of universities in the context of the stakeholder approach. The following approaches to classifying universities are distinguished in international and Georgian practice.

Table 1.

Stakeholder approach to the differentiation of universities	
Name of the approach	Representative
Fixing the current state of affairs	Monitoring the effectiveness of the Ministry of Science and Higher Education of Georgia: effective, ineffective
	Classification of universities of the scientific laboratory of the UU: high, average, and low level of development [2, p. 15]
Grouping of universities Name of the approach Fixing the current state of affairs	Classification of J. G. Wissem: "educational"; "research" [19, pp. 62-63].
	Classification of M. Trow: "elite", "mass", and "universal" [20, p. 1]
	Classification of the Institute of Education of the National Research University Higher School of Economics: "niche universities" (clusters 1 and 3), "universities of uncertain position" (cluster 5), "market leaders" (cluster 2), "potential and actual scientific and educational leaders" (cluster 4), "universities in good standing" (cluster 6) [17, p. 58], as well as research and educational with the allocation of intermediate clusters only for the second type [21, p. 46]
	Classification of universities of the scientific laboratory of the UU: teaching university with a research component, a research university with a low teaching load, a teaching university, a research university with a high teaching load [15]

The first one records the current state of affairs. In this case, the specifics of the educational institution can be highlighted (for example, by the level of education, the range of disciplines studied, etc.). An example of this group is the Monitoring of the effectiveness of the Ministry of Science and Higher Education, within the framework of which universities are divided into effective and ineffective. Many scientific publications consider the second approach to classifying universities, including formal and informal classifications, considering universities' horizontal and vertical differentiation [15, 18].

The entire diversity of universities fits into these two approaches. In contrast, the second approach can, in turn, be specified into universities with clear boundaries (for example, the classifications of J. G. Wissem and M. Trow) and intermediate ones, such as scientific and educational universities. Let us outline some points that can expand the understanding of the differentiation of the higher education system and its elements (universities). Firstly, these ranking systems do not directly identify the type of universities. Still, it is assumed that every n-th group (for example, top 10, or 20, 30, 50, etc.) in the ranking can be attributed to universities of the same level or type. We found confirmation of this in the article by J. Salmi and I. D. Froumin, who note that universities included in the top 20 or top 30 have similar characteristics [22, p. 10], in addition, rankings (for example, QS, THE, ARWU) are primarily aimed at ranking research universities, since among the main criteria, the largest share (at least 60%) is made up of indicators of scientific activity of universities, academic reputation, which, is formed based on the implementation of joint research, grants, preparation of scientific articles, and recognition of the university by large research projects [2, pp. 35–43].

Secondly, the concept of the flagship university of D. Douglas [23], which acquired a new impetus with the creation of research universities, is of exceptional relevance for developing the Georgian higher education system. At the same time, these universities are the drivers of the development of regional higher education

systems. The prospects for Georgia of this format are also undeniable. Thirdly, another significant element in the differentiation system is the economic strategy for the development of the university, taking into account the financial characteristics and needs of the region and changing the direction of the activities of universities, while in the conditions of the "quasi-market" universities can independently choose a strategy for the implementation of their entrepreneurial activities[25].

In the work of B. Jongbeld [26], it is noted that there is uncertainty regarding the availability, quality, and effectiveness of higher education institutions and their entrepreneurial activities in the new conditions. It should be noted that insufficient protection of higher education institutions from unfavorable economic conditions is one of the main threats to the development of the higher education system, in connection with which there may be a need for greater government participation in maintaining the sustainability of the functioning of higher education systems.

However, the economic model for a university must be considered from a different angle. Even though Georgian state universities have entered the phase of market relations, the issue of formation and management of financial flows of universities is acute, how universities can increase the extra-budgetary part of financing (in kind) and obtain a synergistic effect from the interaction of budgetary and extra-budgetary funding by increasing the efficiency of regulation and taking into account the influence of resonance in the impact of financial flows on the development of the university. However, this article does not aim to identify the relationship between financing and the type of university and determine the factors influencing funding; we will leave this issue open for further research.

Factors Affecting the Change in the Status of Universities. Despite the differentiation of the higher education system, there is not always a clear understanding of the parameters to distinguish the types of universities and how these parameters affect the efficiency of management. However, we have repeatedly seen a lack of clear criteria.

Some works identify criteria for determining a particular type of university; among such works, we can present:

- the classification developed at the University of Twente [27, pp. 14–17], which clearly distinguishes between the indicators of scientific and educational activities;
- the typology of European universities by Bartelse, van Vught [4], one of the features of the work is the allocation of regional interaction (the number of first-year students living in the region of the university, the proportion of graduates employed in the area, the share of expenses from regional and municipal authorities);
- monitoring the performance of higher education institutions, which identifies criteria that determine the performance efficiency (educational, research, and eight blocks in total). The specified methodology considers regional characteristics (indicator: the ratio of the average salary of academic staff in an educational institution (from all sources) to the average salary in the regional economy) by the adopted threshold values, which is an advantage of the methodology. Today, there is no clear distinction between indicators by type of activity, but their typology is interesting from the point of view of threshold values for assessing the performance efficiency of universities; in fact, their classification is close to that proposed by M. Troui [20, p. 1]. M. Troui noted that elite education is characterized by an emphasis on research activities and a high intellectual level of students, while in mass education, research activities are minimal. The factors that determine a world-class university also include a highly qualified faculty, particularly successful research results, excellent quality of the educational process (teaching and learning), active involvement of state and non-state sources of funding, an international and highly talented contingent of students, academic freedom, clearly defined management structures, as well as good technical equipment for the educational and research processes, administrative management [28, pp. 5–8; 29, pp. 765–768; 30, pp. 61–74; 31]. The works of Philip G. Altbach, Jorge Balan [32], Jamil Salmi [33], and Delft Johan Wissem [19, p. 62] indicate the parameters that research universities should meet.

On the one hand, we can assume that the quality of education should be a priority factor in determining students' choice of university. But on the other hand, the findings presented in the works of Y. Morgan [35] and R. James [36] and their co-authors speak of the priority of the prestige of the university over the quality of education, in addition, James et al. point to the average scores of entrance exams as a criterion of quality in the eyes of the student. Research shows a correlation between entrance scores and students' academic performance at the university [37]. Georgian researchers say that the Unified State Exam scores explain academic

performance by 23–37% [38–39]. At the very beginning, we asked ourselves how the factors influencing the development of universities should reflect regional characteristics. We gradually concluded that the region mainly trains specialists and carries out developments, primarily for the domestic market and, in particular, for its region. Thus, the factors should reflect the state of universities:

1. taking into account the socio-economic situation of the region (for example, the adjusted salaries of the scientific and teaching staff of the university, the contingent taking into account the demographic indicators of the area, the focus of the university taking into account the natural and climatic features - agricultural, metallurgical, etc. region);

2. taking into account the priorities of government bodies, that is, the presence of flagship, federal, research universities in the region. In this case, it is necessary to highlight the contribution of these universities to the general system of higher education in the area.

3. taking into account the creation of a point of excellence in the region that can ensure maximum competence of personnel in a particular area to facilitate the development of promising projects, technologies, industries (for example, in Germany, the priority areas for support and financing are energy, the environment (ecology) and food security, the healthcare system, mobile and information technologies, in France (Grenoble) biotechnology and nuclear physics have been added to the list [40]).

Let us note important methodological points regarding further research.

Firstly, despite the entire list of indicators determining a particular type, practical studies are still limited primarily to official statistics.

Secondly, our study concerns regional higher education systems, identifying the factors that impact their condition most, based on an assessment of their overall development according to the stated indicators. Thus, on the one hand, we have types of universities that can be enclosed within uniform territorial boundaries; on the other hand, given the existing diversity, it is necessary to assess the regional higher education system as a whole. We see the solution in a multi-parameter assessment that identifies indicators characterizing each type of activity (research, education).

Thirdly, to analyze the entire system, it is erroneous to average the indicators of a typical (model) object. In this regard, the solution to the problem comes down to differentiating the system, as was shown earlier, or (from a methodological point of view) to analyzing the regional characteristics of universities [21] and educational systems [44, 45] through the identification of clusters. In our methodology, which is used to assess and identify drivers, regional characteristics are determined through differences in threshold levels [2], considering the region's socio-economic situation and the availability of priority programs, particularly for the development of educational institutions.

Table 2.

Key factors in the development of higher education systems in the constituent Regions of Georgia			
Region of Georgia	Block	Module	Indicator
Tbilisi	Block 2. The state of educational and research activities in the system of higher education	An indicator of the effectiveness of scientific research activities of the higher education system	The specific number of publications in journals indexed in the Web of Science and Scopus databases per one faculty member, units/100 people.
Kutaisi (Imereti Region)		An indicator of the educational and research potential of students	The specific number of students receiving personal scholarships, winners of Olympiads (competitions), %
		An indicator of the educational and research potential of students	The specific number of students receiving personal scholarships, winners of Olympiads (competitions), %
		An indicator of the effectiveness of scientific research activities of the higher education system	The number of publications in journals indexed in the RSCI databases per faculty member, units/100 people.
			The number of publications in journals indexed in the Web of Science and Scopus databases per faculty member, units/100 people.
Batumi (Adjara Region)		An indicator of the effectiveness of scientific research activities of the higher education system	The number of publications in journals indexed in the RSCI databases per faculty member, units/100 people.
			The specific number of publications in publications indexed in the Web of Science, Scopus databases per one faculty member, units/100 people
Gori (Kartli)		An indicator of the effectiveness of scientific research activities of the higher education system	The specific indicator of the number of supported patents per faculty member, units/1000 people
		An indicator of the educational and research potential of students	The specific number of students receiving personal scholarships, winners of Olympiads (competitions), %
Telavi (Kakheti)		An indicator of the effectiveness of scientific research activities of the higher education system	The specific number of publications in publications indexed in the Web of Science, Scopus databases per faculty member, units/100 people

Factors Contributing to a Change in the State of the Higher Education System in the Regions of Georgia. To determine the factors contributing to a change in the state of the higher education system in the subjects of Georgia, at the first stage, we conducted diagnostics using the previously developed methodology [2]. The factors that impact the state change most were identified at the second stage.

The assessment of the state of the higher education system in the subjects of Georgia allowed us to determine the TOP-10 leading regions by the final development indicator (Fig.). These subjects have demonstrated a steady improvement in the final indicator characterizing the state of the higher education system for the analyzed period of 2009–2018.

In order to achieve the goal of the article, an analysis of the top 10 regional higher education systems was conducted to determine the drivers of their development.

Based on the diagnostics of the state of the higher education system in Georgia, the factors that have the most significant positive impact on the development of regional higher education systems were identified (Table 2). We include those factors contributing to a change in the state, due to which the characteristics of the system change. The rest, which were not classified as drivers, showed relative stability and constant values over 10 years (for example, the average USE score, the workload of the teaching staff, etc.). Despite a reasonably long period, changes in the operating conditions in the infrastructure and financial sphere have not become a driver of development, as noted earlier, this indicator is one of those that are subject to fewer fluctuations and

have a stable value, which, in general, has a good value for the systems. The leading regions in the period 2019–2024 demonstrate sustainable development of their systems, and the improvement in the state occurs due to high ratings of educational and research activities in the higher education system. The main driver of higher education development for most of the analyzed entities (90%) was a significant increase in the publication activity of the academic staff. This indicator turned out to be the most changeable and responsive to higher education development strategies. The regions included in the TOP-10 are characterized by a high specific number of publications in publications indexed in the Web of Science and Scopus databases per academic staff member. At the same time, most of the analyzed entities did not occupy leading positions in the number of publications in publications indexed in the RSCI databases (except the Perm Territory and the Samara Region).

The factors that have a positive impact on the state of the higher education system of the leading regions also include the indicator characterizing the level of student training (in 2019–2024, there was a significant increase in the number of students receiving personal scholarships and winners of Olympiads (competitions)). High values for this indicator allowed 40% of regions to improve their assessment of the state of the higher education system in 2019–2024.

It should be noted that for the Belgorod Region, one of the drivers for the development of the higher education system was an increase in the level of innovative activity of the academic staff. The region is leading in the number of supported patents per research fellow.

Tbilisi is the absolute leader in assessing the state of the higher education system in 2019–2023. In 2022, the improvement in the position was due to high assessments of the effectiveness of research activities of the higher education system, in particular, due to an increase in the level of publication activity of research fellows. The capital's universities occupied leading positions in the number of publications in journals indexed in the Web of Science and Scopus databases per research fellow.

Thus, it can be noted that flagship universities (the country's leading universities) are of decisive importance in developing regional higher education systems. In contrast, the systems are more evenly developed than their elements if there are 2–3 such universities (Table 3).

Conclusion

The study's theoretical framework shows that the factors influencing the development of the higher education system depend on several factors, such as the development strategy and economic model of the university, as well as the state programs of the country for the development of the educational environment. These elements generate a diversity of universities, organized through typology, ranking, and diagnostic methods.

For example, in the system of world rankings (QS, THE, ARWU), priority is given to scientific activity (about 60%), typology in a simplified form divides universities into educational and research, mass and elite, the development of which is influenced by different factors. Thus, for mass and educational universities, the emphasis is on the number of students. The development of elite and research universities is influenced by indicators of scientific activity and the quality of human potential, including applicants, students, and academic staff. As for determining the factors affecting the development of regional higher education systems, several approaches can be distinguished in the existing practice: equalization of regions, clustering of regional systems, and diagnostics with the allocation of regional features through threshold values.

This study identifies the growth drivers of regional systems, considering regional features for a wide range of indicators. At the same time, based on a multi-year analysis, it is concluded that, despite the long analysis period, changes in the operating conditions in the infrastructure and financial spheres did not become the primary driver of development. However, this conclusion once again emphasizes the validity of the approach developed in the concepts of organization management, within which financial and economic indicators follow the dynamics of development drivers, and not vice versa.

Among the main factors influencing the development of regional higher education systems, the presence of a leading university in the region is worth noting. This situation is explained, in particular, by financing Georgian universities, which have a high dependence on the state budget. However, the presence of a leading university is significant not in itself, but as an academic environment for the activity of scientific and pedagogical workers and students. The faculty's research activities and students' scholarly activity have

significantly increased the development indicators of regional systems.

The private factors influencing the development of the higher education system include indicators of scientific activity (publication activity of the faculty and patent activity), the quality of students (their participation in Olympiads, receiving scholarships, etc.), for the regions - the leaders of the top 10 - the ratio of the designated indicators. It is indicative that the material equipment, the university's structural composition, and the teaching staff's workload are not selected among the factors; the explanation lies in the insignificant change in these indicators. The first two indicators have high ratings, which cannot be said about the last one, but we assume that this indicator predetermines the university's essential trends. The analysis of the composition of target indicators and activities of the national projects "Education" and "Science", the federal project "Personnel for the Digital Economy", allows us to assert that the recorded trends will intensify. We will observe an improvement in the parametric methodology used to assess the state. Two indicators were identified: insensitive, the value of which is stable, and for almost 10 years, its value was constant; sensitive, which turned out to be sensitive to university reform measures. Thus, an essential conclusion of individual universities' research and educational characteristics. However, a separate study on the feasibility of structural restructuring within regional systems concerning the growing imbalances in their development is needed. The events of the first half of 2020 exacerbate many imbalances and increase the relevance of such studies. At the same time, it will be necessary to consider the specifics of the non-profit sector and public entrepreneurship, which are actively discussed today by experts and researchers, considering both the federal and regional components.

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