

**ЕКОНОМІКА ТА УПРАВЛІННЯ НАЦІОНАЛЬНИМ ГОСПОДАРСТВОМ**

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**BALANCED SCORECARD: FORMATION WITH PERSPECTIVE TO ENSURE ECONOMIC SECURITY OF HIGHER EDUCATIONAL INSTITUTIONS**

**ЗБАЛАНСОВАНА СИСТЕМА ПОКАЗНИКІВ: ФОРМУВАННЯ З ПЕРСПЕКТИВОЮ ЗАБЕЗПЕЧЕННЯ ЕКОНОМІЧНОЇ БЕЗПЕКИ ВИЩИХ НАВЧАЛЬНИХ ЗАКЛАДІВ**

**Urgency of the research.** The lack of widespread introduction of BSC in work of higher educational institutions creates the basis for research of peculiarities of its use at the level of higher education.

**Target setting.** The most acceptable in terms of domestic educational services is the strategy of "reducing overall costs" as such, which will increase the efficiency of higher educational institutions functioning and, as a result, increase their level of economic security, state and national security in general.

**Actual scientific researches and issues analysis.** The aspects of BSC formation within the strategic management of economic entities have been considered in the works of R. Kaplan, D. Norton and many others, and peculiarities for state institutions have been determined by P. Niven.

**Uninvestigated parts of general matters defining.** There is no comprehensive research in the context of ensuring the economic security of higher educational institutions, using the basic approaches to the development of BSC.

**The research objective.** There is feasibility study of using BSC at the university level with the perspective to ensure the economic security.

**The statement of basic materials.** There have been considered methodical approaches to use BSC at the university level. There have been conducted an ABC (ABCD) analysis – the time expenditures of academic staff for certain work types and further regression analysis taking into account the perspective to ensure the economic security of higher educational institutions.

**Conclusions.** The practical use of BSC at the university level will, in the future, contribute to their economic security and, as a result, state and national security in general.

**Keywords:** higher educational institutions (HEIs); balanced scorecard; financial and customer components of the strategy of higher education; the effectiveness of internal processes; economic security of higher educational institutions.

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**Актуальність теми дослідження.** Відсутність поширеного впровадження BSC в діяльності ВНЗ створює підстави для досліджень особливостей її використання на рівні вишів.

**Постановка проблеми.** Найбільш прийнятною в умовах вітчизняного ринку освітніх послуг є стратегія "за зниженням загальних витрат" як така, що сприятиме підвищенню ефективності функціонування ВНЗ, а у результаті, підвищенню рівня їх економічної безпеки, держави та національної безпеки в цілому.

**Аналіз останніх досліджень і публікацій.** Аспекти формування BSC в межах стратегічного управління суб'єктами господарювання розглянуті в працях Р. Каплана, Д. Нортон та багатьох інших, а особливості для державних установ – П. Нівена.

**Виділення недосліджених частин загальної проблеми.** Відсутні комплексні дослідження у контексті забезпечення економічної безпеки ВНЗ з використанням при цьому основних підходів до розробки BSC.

**Постановка завдання.** Дослідження можливостей використання BSC на рівні ВНЗ з перспективою забезпечення їх економічної безпеки.

**Виклад основного матеріалу.** Розглянуто методичні підходи до використання BSC на рівні ВНЗ. Проведений ABC (ABCD) – аналіз витрат часу НПП на окремі види робіт та подальший регресійний аналіз з урахуванням перспективи забезпечення економічної безпеки ВНЗ.

**Висновки.** Практичне використання BSC на рівні ВНЗ сприятиме у перспективі забезпеченню їх економічної безпеки та, як результат, держави й національної безпеки загалом.

**Ключові слова:** ВНЗ; збалансована система показників; фінансова та клієнтська складові стратегії діяльності вишів; результативність внутрішніх процесів; економічна безпека ВНЗ.

**Urgency of the research.** In current development environment of Ukraine there is no widespread use of the balanced scorecard (Balanced Scorecard – BSC) in the work of state institutions (even in developed countries). When its efficiency is proven, it creates a basis for research of BSC features at the level of higher education institutions (HEIs).

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**Target setting.** BSC as a tool for strategic management involves establishing coherence (phase-balancing) performance of all components of business strategy (financial, customer, internal processes of the organization, staff development and training).

Among the known variants of balancing financial performance and customer components at higher educational institutions the most appropriate in terms of domestic market of educational services are those that are formed on a "reducing overall costs". This offer of educational services with the best correlation "quality-price" is associated with high level of price competition and widespread nature of the demand for educational services, which, in its turn, is important in the growing competition between universities for students, employers and graduates in the domestic and international labor markets.

**Actual scientific researches and issue analysis.** The issues considered in the formation of BSC are mentioned in works of Robert Kaplan and David Norton [1; 2] and other sources [3; 4], including government organizations – in the work [5]. Robert Kaplan and David Norton noted logic linking between indicators of strategic and operational plans to enhance the efficiency of implementation of strategic tasks [2]. The authors in papers [3; 4] cover the general nature of this connection with the example of HEIs. The scientific literature [6; 7] considers the basic aspects of the HEIs specific to their activities and studies (which mainly concern institutions as entities) that result in the assessment of economic security.

**Uninvestigated parts of general matters defining.** Acknowledging the achievements of scientists [1-7], it should be noted that in current economic environment of Ukraine there is no comprehensive theoretical and practical research on economic security of higher educational institutions. It should be taken into account the possibility of cooperation with the government and employers in the labor market and the use of the main approaches to BSC development that makes allowance for the possibility of its implementation at the level of HEIs.

**The research objective.** There is feasibility study of using balanced scorecard at the university level with the perspective to ensure the economic security of HEIs.

**The statement of basic materials.** Taking into account the nature of national security (the Law of Ukraine "On National Security" [8] it is treated as "protection of vital interests of man and citizen, society and the state, which ensured the sustainable development of the society, early detection, prevention and neutralization of real and potential threats towards national interests ..."), economic security (is a major component of national security<sup>1</sup>) and the role of higher educational institution in sustainable economic growth, it is advisable to pay attention to the development of measures to promote improving their financial and economic indicators. One way to achieve this is to use BSC at universities, in particular to implement the strategy for "reducing overall costs".

The analysis of the actual time expenditures (for certain work types) of academic staff is made using ABC analysis (modified version that provides the distribution of indicators into 4 groups – ABSD) (Tab. 1).

The calculations show that only 18 of 96 work types that can be performed by academic staff should have a share higher than 1% each and together account 87,2% of total time expenditures of academic staff in the university as a whole. However, only the first five work types listed in Table 1, are characterized by proportion of at least 6% each, as a result, their share is 57,5%. So in fact 18.8% of the academic staff hours are spent to prepare for the teaching process, which is important in the implementation of the strategy of "reducing overall costs". To implement the strategy of "reducing overall costs", there have been performed a regression analysis based on multiple regression model by constructing efficiency of internal processes depending on the time expenditures for certain work types of academic staff (Tab. 2).

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<sup>1</sup> According to the methodological recommendations as for calculations of economic security of Ukraine, approved by the Ministry of Economic Development and Trade of Ukraine from 29.10.13 number 1277 [9], it is a "state of national economy, which allows to store resistance towards internal and external threats, to ensure high competitiveness in global economic environment and describes the ability of national economy towards sustainable and balanced growth".

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Table 1

**Results of the analysis of the actual time expenditures for certain work types of academic staff, which were taken into account when forming the regression model of internal processes at higher educational institution**

Work types of academic staff (Xi – factors included in the model)	Internal processes	Share
Preparation for lectures, practical classes, seminars (X2)	methodological	18,8
Conducting practical classes	educational	17,9
Conducting consultations on disciplines	educational	7,9
Conducting lectures (X5)	educational	6,6
Conducting laboratory lessons	educational	6,3
Theses (projects) management	educational	5,4
Preparation of a teaching-methodical complex on discipline	methodological	3,7
Conducting semester control	educational	3,1
Guidance of curricular practical training (X7)	educational	2,5
Articles publication in domestic editions (including professional ones)	scientific	2,4
Checking of independent types of students' work (calculations, abstracts, reviews)	educational	2,1
Management and acceptance of term papers, projects	educational	1,9
Publishing: monographs; dictionaries, reference books	scientific	1,8
Preparing and publishing a textbook (manual) (X12)	scientific	1,7
Scientific research work under international and state programs, on contractual topics; receiving grants from international programs	scientific	1,4
Leadership of students' scientific work	scientific	1,4
Article publication in foreign scientific journals. Conducting scientific and methodological seminars with participation of representatives of enterprises and foreign firms (X17)	scientific	1,2
Thesis defense	scientific	1,1
Accumulated share in the total time expenditures of academic staff		87,2

Table 2

**Multiple regression results**

	BETA	Standard error BETA	B	Standard error B	t (1) Student index	p-level
Intercept			0,0	0,000342	0,0	1,0
X 2	0,810847	0,001617	0,810847	0,001617	501,4723	0,001269
X 7	0,160941	0,001012	0,160941	0,001012	159,0674	0,004002
X 17	0,114316	0,001104	0,114316	0,001104	103,5665	0,006147
X 12	0,056014	0,001035	0,056014	0,001035	54,1274	0,011760
X 5	-0,065677	0,002323	-0,065677	0,002323	-28,2731	0,022507

The column B in Tab. 2 shows the coefficients of the regression equation at each variable and intercept in the regression model, which would look like this (Formula 1).

$$Y_i = 0,810847 \times X_2 + 0,160941 \times X_7 + 0,114316 \times X_{17} + 0,056014 \times X_{12} - 0,065677 \times X_5, (1)$$

where  $Y_i$  – total academic staff hours.

The data in Tab. 2 show that among all work types, the most important to ensure the effectiveness (quality) of internal processes are factors that are characterized by the highest proportion (funding

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amount) in total time expenditures and have relatively high regression coefficients (influence level on performance of internal processes), including X2 with regression coefficient 0.81. In contrast, all other work types are characterized by low impact, so it is advisable to browse planning allowances or vary the time of execution for these work types. For further formation of a balanced scorecard taking into account the requirements of internal processes there have been singled out works related to academic staff development and training (Tab. 3).

Table 3

### Results of the analysis of the actual time expenditures for certain work types of academic staff, which were taken into account when forming the regression model of learning development of higher educational institution

Work types of academic staff (Xi – factors included in the model)	Internal processes	Share
Preparation for lectures, practical classes, seminars (X1)	methodological	18,8
Preparation of a teaching-methodical complex on discipline	methodological	3,7
Articles publication in professional editions in foreign languages; publishing and republishing of monographs; dictionaries, reference books	scientific	2,4
Preparing and publishing a textbook (manual)	methodological	1,7
Leadership of students' research papers; preparation of scientific articles; applications for the issuance of security documents for objects of intellectual property; work on a competition / exhibition; reports to the conference. Guidance of a scientific club	scientific	1,6
Implementation of the scientific research work under the state program of research work on the subject of negotiation, scientific research work under the international program. Receiving grants from international programs (X5)	scientific	1,4
Articles publication in foreign scientific editions (X7)	scientific	1,2
Thesis defense (candidate's, doctorate's)	scientific	1,1
Scientific reports at conferences, seminars, abstract publication	scientific	0,5
Obtaining security documents for objects of intellectual property	scientific	0,3
Obtaining the academic title: associate Professor, professor	scientific	0,2
Creating a scientific laboratory, its certification and certification. Manufacturing a new educational laboratory stand	scientific	0,2
Obtaining awards of Ukraine for outstanding scientific achievements (State Prize of Ukraine in the field of science and technology, other academic prizes for scientific achievements)	scientific	0,1
Receiving by young scientists state awards, scholarships and grants of the President of Ukraine, the Verkhovna Rada of Ukraine, the Cabinet of Ministers of Ukraine, National and Branch Academy of Sciences of Ukraine	scientific	0,1
Preparation and publication (re-publication) of methodical materials on educational disciplines in a foreign language (X14)	methodological	0,1
Implementation of information technologies in the educational process	methodological	0,1
Results of commercialization and introduction of scientific developments in production: sales of licenses in Ukraine and abroad	scientific	0,1
Accumulated share in the total time expenditures of academic staff		33,6

According to the time expenditures to perform the above work types there has been done a regression analysis based on multiple regression with determination of significant regressors (Tab. 4) and formed the model of academic staff development and training (Formula 2).

$$Y_i = 1,113464 \times X1 + 0,246725 \times X7 - 0,200039 \times X5 - 0,198496 \times X14 \quad (2)$$

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Table 4

Multiple regression results						
	BETA	Standard error BETA	B	Standard error B	t (2) Student index	p-level
Intercept			0,0	0,007531	0,0	1,0
X 1	1,113464	0,080367	1,113464	0,080367	13,85466	0,005169
X 7	0,246725	0,023060	0,246725	0,023060	10,69935	0,008623
X 5	-0,200039	0,028049	-0,200039	0,028049	-7,13183	0,019099
X 14	-0,198496	0,080524	-0,198496	0,080524	-2,46505	0,132609

In the regression model (Formula 2) the index-number X1 also has the largest regression coefficient (1.11), indicating the importance of quality control and planning complexity of this type of strategy for the implementation of educational activities. Regression coefficients for all other factors (work types) are no more than 0.24, indicating that these factors (work types) which are selected as important for strategy implementation of educational activities "reducing overall costs", according to the results of regression analysis have little (or negative) impact on staff development and training. For such work type planning it is advisory to develop and implement measures to revise the rules of time on their performance or improve academic staff productivity, which generally can be used in the formation of development strategies of both universities in general and entities of different ownership; and in the methodological recommendations development to evaluate economic security of higher educational institutions.

**Conclusions.** Taking into account all the above it should be noted that the practical use of the balanced scorecard at the level of HEI can promote the rational use of different types of resources, including labor (intellectual). It can be done through balancing labor costs and results of its use; spreading autonomy and improving HEIs functioning, strengthening their position in national and international rankings and as a result, preventing or at least eliminating the threat activity, and thus improving their economic security and, in total, state and national security.

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