ВИСШЕ УЧИЛИЩЕ ПО АГРОБИЗНЕС И РАЗВИТИЕ НА РЕГИОНИТЕ

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AUTHOR'S ABSTRACT OF A DISSERTATION

for the award of the educational and scientific degree
"DOCTOR"
Field of Higher Education: 3. Social, Economic, and Legal Sciences
Professional Field: 3.8 Economics
Doctoral Program in the Scientific Specialty: "Finance and Banking"

on the topic:

OPTIMIZING THE FINANCING OF VOCATIONAL ECONOMICS HIGH SCHOOLS

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Plovdiv, 2025

I. GENERAL CHARACTERISTICS OF THE DISSERTATION

The relevance of the topic of secondary education financing is a key component of the educational policy of any country, as its effectiveness directly affects the quality of the learning process and the future realization of students. In this context, the optimization of the financing of vocational economics high schools represents a current and strategically significant issue that requires in-depth research and scientifically grounded solutions.

The dissertation focuses on the development of a model for optimizing the financing of vocational economics high schools in Bulgaria by analyzing the relationship between financial resources and the effectiveness of the educational process. The research aims to contribute to improving the quality of education and rationalizing expenditures by presenting well-founded recommendations for enhancing financing in the sector.

The object of the present research is the delegated budgeting system in the field of secondary education in Bulgaria. The study focuses on vocational economics high schools, analyzing the levels of efficiency and the quality of education achieved in these institutions.

The subject of the research includes the financing mechanisms of economics high schools, the development of the delegated budget system, and its impact on the quality of the educational process. The study emphasizes the improvement of financial instruments as an essential factor for enhancing educational efficiency.

Based on the defined object and subject of the dissertation, the following research thesis is defended:

The optimization of the delegated budgeting system for economics high schools in Bulgaria—considered as a group of schools united under the Association of Economics Schools in Bulgaria—can be achieved by linking their efficiency to their financing. This would significantly contribute to improving the quality of education while also ensuring a smooth transition to higher economic education in the professional field of "Economics," which is among the most preferred in the country.

The main objective of the dissertation is to explore and analyze the possibilities for optimizing the delegated budgeting system in economics high schools in Bulgaria by using real empirical data and establishing criteria related to educational efficiency and quality. The study aims to identify relationships between financing and the outcomes achieved by these schools. By applying approaches such as data analysis and the DEA (Data Envelopment Analysis) methodology, the goal is to develop a model that links financial resources to the educational efficiency of the high schools. In this way, recommendations will be proposed for a more rational allocation of resources.

On this basis, the research tasks are defined as follows:

1. To examine the essence and legal regulation of the delegated budget system in secondary education as a primary financing mechanism, including through the implementation of a survey aimed at studying the system's impact and effectiveness.

2. To analyze modern approaches to education financing with a view to their applicability in economics high schools.

3. To establish criteria for assessing the quality and efficiency of education in economics high schools by categorizing the schools into five main groups based on their efficiency, in order to achieve a better understanding of their outcomes.

4. To develop and apply DEA models for the effective allocation of delegated budgets, taking into account educational results and needs.

5. To propose solutions for optimizing budget allocation through the introduction of efficiency criteria that promote the quality and sustainability of the educational process.

Validation: Parts of the dissertation have been presented and discussed at academic forums and published as reports and articles in specialized scientific journals.

Limitations of the dissertation research: On an empirical level, the dissertation focuses on the financing of secondary vocational education, with economics high schools in Bulgaria as the main object of analysis. The study covers financing mechanisms applicable to this type of school and does not include a detailed examination of general education, private, or specialized schools.

II. VOLUME AND STRUCTURE OF THE DISSERTATION

The dissertation comprises a total of 184 pages, with its content structured in accordance with the defined research thesis, objectives, and tasks, and aligned with the object and subject of the study.

Structurally, the dissertation consists of an introduction, main body, conclusion, findings and recommendations, scientific contributions of the dissertation, bibliography, and appendix (a total of 123 sources, including 100 in Cyrillic and 23 in Latin script), as well as a declaration of authenticity and originality.

The dissertation includes 22 tables, 14 charts, and 10 graphs. The content is presented in the following sequence:

INTRODUCTION

CHAPTER ONE. THEORETICAL CONCEPTS OF THE ORGANIZATION AND FINANCING OF SECONDARY EDUCATION IN BULGARIA

1.1. Organization of Secondary Education in Bulgaria – Legal-Economic Aspects and Stages of Development

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1.2.1. Centralized Management

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1.3. Establishment and Development of the Structure of Economics Education in Bulgaria and Its Social Significance

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1.4.1. Retrospective Analysis of Financing Models in Secondary Education

1.5. Specific Features and Challenges in the Financing of Economics Schools in Bulgaria

Summary of Chapter One

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2.1. Main Sources of Financing for Different Types of Secondary Schools – State, Municipal, Private

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CHAPTER THREE. DEVELOPMENT AND APPLICATION OF DEA MODELS FOR THE ASSESSMENT AND OPTIMIZATION OF THE

FINANCING OF ECONOMICS SCHOOLS
3.1. Concept and Methodology of DEA Models for Assessing the Efficiency of Economics High Schools
3.2. Selection of Input and Output Variables
3.3. Statistical Analysis of Input and Output Variables with Emphasis on Financial Data
3.4. Application of the DEA Model for Efficiency Assessment and Analysis of Results in Economics Schools
3.5. Results Analysis and Interpretation of Efficiency
3.6. Optimization Proposals for Resource Allocation
3.7. Research Limitations and Directions for Future Studies
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III. SYNTHESIZED CONTENT OF THE DISSERTATION

INTRODUCTION

The introductory part substantiates the relevance and importance of the dissertation. It outlines the main challenges associated with financing through delegated budgets.

As stated at the beginning of the abstract, the object of analysis is the economics schools in Bulgaria, with the research focusing on the assessment of the efficiency of their financing and resource allocation. The choice of these institutions is motivated by their significant role in preparing professionals for the economic sector and the need to optimize their financing in order to improve the quality of education.

The focus of the study is placed on the use of DEA (Data Envelopment Analysis) models to evaluate the efficiency of economics schools. This approach makes it possible to identify the schools that utilize their allocated resources most effectively, as well as to highlight potential opportunities for optimization in other institutions. DEA models were chosen due to their capacity to assess the relative efficiency of organizational units.

CHAPTER ONE. THEORETICAL CONCEPTS OF THE ORGANIZATION AND FINANCING OF SECONDARY EDUCATION IN BULGARIA

The first section, titled “Organization of Secondary Education in Bulgaria – Legal and Economic Aspects and Stages of Development,” presents education as a key factor for the economic and social development of any country. It is viewed as a complex system composed of multiple elements such as

subsystems, management structures, and resources, all of which are closely interconnected. Education is seen as an investment in human capital which, when managed properly, leads to increased productivity and economic growth.

As the educational system develops, the complexity of organizing the learning process in a highly effective manner also increases, especially given the large scale of the system. Education can be regarded as an economic good, as it contributes to enhancing productivity and encouraging entrepreneurial activity, which in turn stimulates economic growth.

In the article "The Role of Education Promoting the Economic and Social Vitality of Rural America," Lionel describes the strong connection between education and a robust local economy. High-quality schools produce responsible citizens and skilled workers. A well-educated population plays a vital role in fostering stable local economic activities..[1]

From a socio-economic perspective, the educational system is crucial for the development of the national economy and plays a defining role in shaping the identity of young individuals—students and university learners alike. A stable educational structure contributes to the development of human capital, which serves as the foundation for sustainable economic growth. This stems from the fact that the educational level of the population directly influences not only demographic characteristics (such as birth rates, fertility rates, infant mortality, etc.) but also the overall socio-economic status of the population and its potential for development.[2]

From a legal perspective, the educational system in Bulgaria is closely linked to the country's Constitution. This is because education is established through the Constitution, the Pre-school and School Education Act, the Vocational Education and Training Act, and other regulatory frameworks.

The Constitution of the Republic of Bulgaria states: “The State shall create conditions for the free development of science, education, and the arts, and shall support them.”[3]

The second section, “Educational Governance Systems – Overview, Analysis, and Comparison,” presents the school system as a core element of the educational structure in Bulgaria. The governance of education is described as a "substructure of the educational system," playing a key role in ensuring the organization, regulation, and implementation of educational policies and

[1] Lionel J., The role of education promoting the economic and social vitality of rural America, 2005

[2] Kazakov, B. Educational Structure of the Population and the State of Educational Infrastructure in the Mountainous Regions of Bulgaria, 2016

[3] Article 23 of the Constitution of the Republic of Bulgaria, in force since July 13, 1991, published in State Gazette No. 56 of July 13, 1991, amended in SG No. 85 of September 26, 2003; SG No. 18 of February 25, 2005; SG No. 27 of March 31, 2006; SG No. 78 of September 26, 2006; SG No. 12 of February 6, 2007; and amended and supplemented in SG No. 100 of December 18, 2015.

processes.[4] The educational system of the Republic of Bulgaria is founded on centuries-old traditions and a rich historical background. Despite these traditions, achieving the goals of the system requires effective governance that ensures sustainable development and benefits for all learners.

D. Tsvetkov defines education and upbringing as global concepts: "Education is associated with the acquisition of knowledge, skills, and preparation for a specific professional and social activity, while upbringing refers to the formation of views, beliefs, needs, abilities, and behavior."[5]. In an international context, there are significant differences in the degree of involvement of central authorities in the educational systems of various countries. This has led to the existence of two main models of governance: the centralized and decentralized models. These models form the foundation of the organizational ideology in the field of education and have a substantial impact on how educational systems are structured and managed.

This section analyzes the existing educational governance systems, with a focus on the two primary models—centralized and decentralized.

Centralized governance is based on bureaucratic principles and the application of an administrative model. This model assumes the existence of various management levels, where key decision-making is concentrated in the hands of a small group of people, typically from the top leadership. These decisions are passed down through the hierarchical chain, where lower levels carry out the directives without being directly involved in the decision-making process.

According to Louis A. Allen, "centralization" is the systematic and consistent retention of authority at the central points within an organization.[6]

Centralization is a widely adopted model in the governance of educational systems, including in Bulgaria. This model assumes that the Ministry of Education and Science (MES) plays a central role in making key decisions that affect the entire system.

Henri Fayol notes that "everything that increases the importance of the role of subordinates is decentralization, and everything that reduces it is centralization."[7] The centralized governance of education in Bulgaria is concentrated specifically in the hands of the Ministry of Education and Science, and respectively, in the authority of the Minister of Education and Science[8], This becomes evident through the hierarchical structure of the Ministry of Education and Science (MES), where decisions made at the national level are implemented in all schools across the country.

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[4] Gyurova, V. Issues of Educational Management. Sofia, 2009

[5] Tsvetkov, D. General Pedagogy as a Science and Academic Subject. Sofia: Narodna Prosveta, 1988

[6] Louis A. Allen, Management and Organization, 2013

[7] Fayol, H. Principles of Management

[8] Bulgaria: Review of Education Reforms Related to School Autonomy (World Bank Report)

Decentralization is defined as the process of transferring powers and resources from the central to the local level of governance. While closely related to centralization, decentralization is its direct counterpart. At the same time, when discussing the essence of decentralization and the mechanisms through which it is implemented, it is important to recognize that it is not an alternative to centralization. Both are necessary and complementary components of an effective governance system.[9] According to Henri Fayol, "Everything that increases the importance of the role of the subordinate is decentralization; everything that reduces it is centralization."[10]. Decentralization in education is perceived as a means to increase governance efficiency and improve the quality of educational services. It enables the reduction of bureaucracy and centralized control by transferring more responsibilities to the local level, where decisions are more responsive to specific community needs.

Emiliya Kandeva points out that decentralization is seen as one of the opportunities for the modern state to reconsider key institutional and functional characteristics of public administration in order to successfully fulfill its role in ensuring and safeguarding economic and social well-being.[11]

It is also noted that decentralization represents "a process of transferring decision-making powers, delegating responsibilities, resources, and funding from a higher level of public administration to a lower one."[12]

Decentralization is closely linked to a high degree of modernization in the governance of educational systems. Various functions, rights, and responsibilities are delegated to lower levels of administration, such as municipalities or schools, while the central governing body—the Ministry of Education and Science—retains specific functions and powers.

The main goal of decentralization is "to increase the overall efficiency and effectiveness of the public sector by enhancing the responsiveness and accountability of local authorities."[13].

The third section, "Establishment and Development of the Structure of Economics Education in Bulgaria and Its Social Significance," examines vocational economics high schools in Bulgaria, which play a key role in developing financial literacy and preparing professionals for the national economy.

The development of economics education in Bulgaria during the 20th

[9] UNDP & Government of Germany. Decentralization: a sampling of definitions. Working paper, 1999

[10] Fayol, H. Principles of Management

[11] Kandeva, E. Decentralization and Modernization of Public Administration. Sofia: St. Kliment Ohridski University Press, 2007

[12] Ivanov, S. (Ed.). Monitoring of the Delegated Budget System. Author Collective. Published by the Ministry of Education and Science, 2007

[13] Kandeva, E. Decentralization and Modernization of Public Administration. Sofia: St. Kliment Ohridski University Press, 2007

century was based on the concept that economic literacy is an integral part of effective economic governance.

With the growth of industrialization and globalization, economics education has become increasingly important for achieving economic stability and competitiveness on the international stage.

The establishment of vocational economics high schools provides young people with the knowledge and skills necessary to make well-informed decisions and to actively contribute to the development of the national economy. The chambers of commerce and industry in Bulgaria began their activities in 1894 with the adoption of a special law. "The law laid the foundations for the organizational development and outlined the directions for the forthcoming activities of the chambers of commerce and industry in Bulgaria—those in Sofia, Plovdiv, Ruse, and Varna. A few years later, the Burgas chamber also joined them."[14] The chambers of commerce and industry play an important role not only in the economic development of the country but also in education, by promoting vocational training.

In 2015, following a national conference involving the principals of economics high schools in Bulgaria, the leadership of the University of National and World Economy (UNWE), and representatives from the Ministry of Education and Science, the Association of Economics Schools in Bulgaria (AESB) was established. The association is chaired by a representative of UNWE, who holds the position by right.

The main goal of AESB is to enhance the quality of education in secondary economics schools across the country, ensuring a smooth transition to higher education in the field of economics.

The fourth section, "Main Sources of Financing for Secondary Education," examines the primary sources and forms of funding for secondary education in Bulgaria. It analyzes the mechanisms used to ensure the necessary resources for the functioning and development of the educational system.
The goal is to outline the structure of educational financing, identify the key stakeholders involved in the process, and analyze the advantages and disadvantages of the various funding models.

The financing of the educational system involves securing sources of monetary resources, their management, and effective structuring. "Cash flows in education are formed by financial inflows (revenues) and financial outflows (expenditures). They constitute the essence of public finances in education and are characterized by the non-equivalent and non-refundable movement of monetary resources within the system. From an economic perspective, the relatively autonomous cash flows and the restructured financial relations accompanying them represent the financial system of education."

[14] Veleva, L. The Chambers of Commerce and Industry in Bulgaria 1894–1919: Organization and Activities. Sofia: Avangard Prima.2005

The financing of secondary education in Bulgaria has traditionally been based on public funds provided through the state and local budgets. The state budget is the main source of funding. It covers expenditures related to the educational process, teachers' and administrative staff salaries, school infrastructure maintenance, and various student-focused social programs. Funds are allocated based on predetermined criteria such as the number of students, the type of school, and the specific needs of the educational institutions.

Local budgets also play a significant role in the financing process, especially in the case of municipal schools. Municipalities contribute to the maintenance of school infrastructure, the provision of additional resources, and the implementation of projects aimed at improving the learning environment. This co-financing model allows local authorities to take an active role in the management of educational institutions.

In addition to public funding, supplementary sources of financing also play a significant role. These include:

- European funds and programs aimed at the development of education, digitalization of the learning process, teacher training, and improvement of educational infrastructure.

- Donations and sponsorships from individuals and legal entities, which are used for purchasing learning materials, renovations, and funding extracurricular activities.

- Fees and services collected by some schools for extracurricular programs, courses, or additional services such as after-school care or interest-based clubs.

The fifth section, "Specific Features and Challenges in the Financing of Economics Schools in Bulgaria" explores the key characteristics and challenges related to the financing of economics schools in the country.

Financing economics schools, as part of the vocational education system, is a complex process with significant implications for student development and future career realization.

Economics high schools, which represent a relatively small portion of the total number of vocational schools in Bulgaria, offer a suitable platform for piloting financing reforms. In this context, the gradual introduction of new financial models—initially applied to a limited number of schools—would allow for the evaluation of their effects before scaling them up nationally, as was done with the delegated budget system.

The financing of economics high schools in Bulgaria is a crucial factor for their operation and development. Vocational schools require more specific funding that accounts for the complexity of teaching professional disciplines, the need for additional resources, and technological modernization. A phased implementation of reforms in a limited number of schools would enable result assessment and adjustment before applying the changes on a broader scale.

Summary of Chapter One.

The educational system in Bulgaria plays a central role in the country's socio-economic development. High-quality and systematic education contributes significantly to the enhancement of human capital, which is a key driver of economic growth and social stability.

The legislative and institutional framework of secondary education in Bulgaria is well developed and encompasses a wide range of regulatory acts aimed at ensuring equal access to education and maintaining high teaching standards. Despite the solid legal foundation, challenges remain in the areas of governance and financing.

Educational governance in Bulgaria is primarily carried out through centralized mechanisms, which allow for the unification of policies and standards at the national level. This model offers advantages such as easier coordination and oversight but also limits the ability of local educational institutions to adapt to the specific needs of their students and communities. In response to these challenges, recent years have seen a trend toward partial decentralization, granting more autonomy to schools and encouraging flexible management approaches.

School financing in Bulgaria is largely based on the delegated budget system, which provides educational institutions with a certain level of financial autonomy.

Economics high schools hold an important position within the Bulgarian educational system, playing a key role in preparing young professionals for the economic sector. These schools contribute significantly to the development of human capital in the country by offering specialized training aimed at students' professional realization.

A historical analysis of economics education in Bulgaria reveals that it has undergone various stages of development while consistently maintaining a significant place in the national education system. Over the years, the focus has remained on the preparation of qualified specialists to meet the demands of the economy.

Despite reforms in the education sector, the modern Bulgarian education system continues to face serious challenges. These challenges require targeted efforts to improve the governance and financing of the system in order to achieve sustainable development and raise the quality of education in the country.

CHAPTER TWO. SOURCES OF FINANCING FOR SECONDARY SCHOOLS IN BULGARIA – FEATURES AND CHALLENGES

The first section, "Main Sources of Financing for Different Types of Secondary Schools – State, Municipal, Private" examines the Bulgarian educational system, which includes a variety of school types, each with a specific financing model. Funding is a key factor in ensuring the quality of education and the sustainability of the system. The structure of school education, regulated by the Pre-school and School Education Act, defines the main educational priorities and forms of organization.

Secondary schools in Bulgaria face a number of challenges related to the changing needs of students and society. In the context of increasing competition to attract students, school funding often depends on the number of enrolled students. This places schools in different positions depending on their type and funding sources.

Between 2018 and 2023, there was a significant increase in education expenditures in Bulgaria. Reported funding rose from BGN 3,989.6 million in 2018 to BGN 7,501.5 million in 2023—nearly doubling in six years. This positive trend reflects the state's growing commitment to the education sector and its efforts to finance it as part of national priorities.

In Bulgaria, schools can be divided into four main categories: state, municipal, private, and religious. Each of these types relies on different sources of funding, including the state budget, municipal transfers, student fees, donations, and European funds.

State schools are educational institutions that perform an important public function by providing access to quality education for all citizens. "State schools are of national significance and are funded through the state budget via the Ministry of Education, Youth and Science, as well as through other ministries and public institutions." These include a variety of schools such as vocational high schools (which include economics schools), schools for students with special educational needs (SEN), schools for incarcerated individuals, and Bulgarian schools abroad.

Municipal schools in Bulgaria are institutions of local importance. "Municipal schools are established upon the proposal of the municipal council and are subsidized by the municipality. They are opened by order of the Minister of Education, Youth and Science and are geographically distributed across the entire territory of Bulgaria, in various municipalities, taking into account the number of students and the needs of the respective schools."

Municipal schools include the majority of primary, lower secondary, general education, and upper secondary general education institutions. This type of school is the most widespread in the country.[15]

[15] European Commission/EACEA/Eurydice. National Education Systems: Bulgaria – Organisation of the Single Structure.<https://eurydice.eacea.ec.europa.eu/bg/national-

In line with global trends in education, the private education sector in Bulgaria—much like in many other European countries—has been steadily developing. Private schools offer a meaningful alternative to state and municipal educational institutions by providing opportunities for more flexible educational approaches and individualized curricula. These institutions, operating as legal entities, are bound by specific legal requirements that prohibit them from engaging in activities unrelated to pre-school and school education.

Religious schools in Bulgaria are specialized educational institutions that provide religious education and upbringing, preparing individuals for service within their respective denominations.

The second section, "Delegated Budget System – A Core Method of Financing Secondary Schools," explores the implementation and role of the delegated budgeting model in Bulgarian education.

The main goal behind the introduction of the delegated budget system is the creation and development of decentralized financial management in education, aimed at enhancing autonomy and decision-making capacity at the municipal and school levels. Schools are the most numerous beneficiaries of this financial instrument, and it is believed that it reinforces the financial independence of educational institutions.

The Delegated Budget System (DBS) was launched as a means of optimizing the model for allocating financial resources. As stated in the literature: "A delegated school budget is an autonomously constructed budget based on a pre-established formula."[16]

The initiative for introducing this system came from the Ministry of Education and Science (MES), which secured funding for the project "Financial Management of Secondary Education" under the PHARE program of the European Union.

In 2007, the MES developed a national strategy for implementing the delegated budget system across the country. This was made possible through amendments to the legal framework.

The introduction of the delegated budget system aimed to achieve better overall results in school education, improve the efficiency of resource utilization, and enhance the quality of educational services provided. According to Denitsa Zagorcheva, "The purpose of introducing delegated budgets in the pre-school and school education system is decentralization and the increase of decision-making freedom at the delegated level. However, a delegated budget also implies an increase in the responsibility of the managers who administer it."[17]

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education-systems/bulgaria/bulgaria-bgorganizaciya-na-edinniya-etap>

[16] Pitekova, R. Fundamentals of Financial Management in Secondary Education. Gabrovo: EX-PRESS Publishing., 2007

[17] Zagorcheva-Koycheva, D. P. Financial Accountability and Control in Education. Shumen:

After reviewing the essence, objectives, and stages of implementing the Delegated Budget System (DBS), this section analyzes its advantages and disadvantages. Using empirical data and visual elements, the actual impact of the DBS on schools' financial autonomy, the efficiency of resource utilization, and the quality of educational services is assessed.

To provide a deeper understanding of the real benefits and challenges faced by stakeholders, an empirical study was conducted.

Research Methodology

The present study aims to identify the key aspects of the delegated budget system by incorporating the perspectives of school principals, teachers, accountants, and other relevant stakeholders.

The research objectives are directly linked to the questions in the conducted survey, which seeks to identify both the positive and negative aspects of the delegated budget system. These objectives include:

- Highlighting the main advantages of the system, such as increased financial autonomy of schools and more efficient resource management.
- Identifying key challenges, including lack of financial competencies, uneven distribution of funds, and constraints imposed by the regulatory framework.

The object of the study consists of schools from various regions in Bulgaria that provide secondary education and apply the delegated budgeting system. The research incorporates the views of key stakeholders. A standardized questionnaire was used for data collection, serving as the main survey instrument.

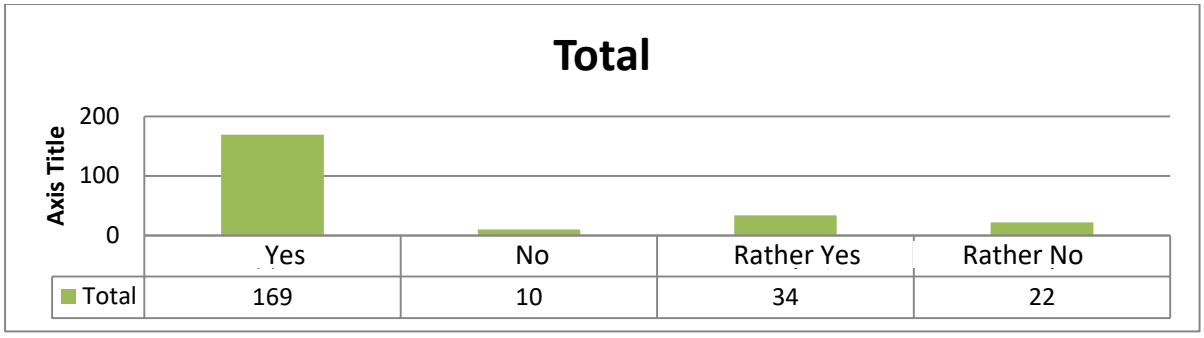
As a result of the survey, the responses were grouped and systematized to reflect the main opinions regarding the advantages and disadvantages of the delegated budget system.

Analysis of Survey Results

Based on the data collected through the survey, a visual and interpretive analysis of the responses was conducted to highlight the key strengths and weaknesses of the delegated budget system.

Question 1: Do you believe the delegated budget system contributes to the development of financial autonomy in schools?

Diagram No. 1 presents the distribution of responses to the question regarding the impact of delegated budgets on the financial autonomy of schools.



The data show that out of a total of 235 participants, a significant portion—169 respondents (72%)—answered definitively with "Yes," indicating a clearly positive perception of the system's impact on the autonomy of educational institutions.

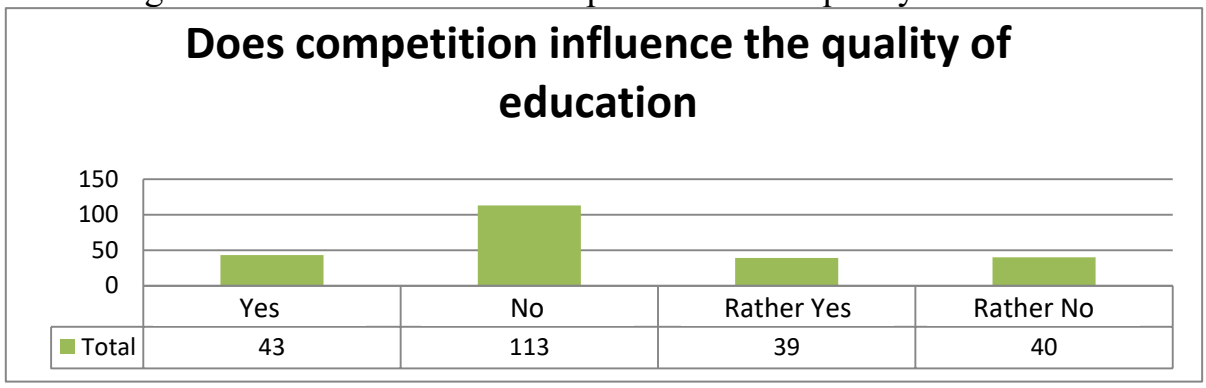
Additionally, 34 participants (14%) responded with "Rather yes," suggesting some reservations, although the overall assessment remains positive. At the same time, 22 respondents (9%) answered "Rather no," and 10 participants (4%) firmly rejected the contribution of delegated budgets to the development of financial autonomy.

The collected data reveal a distinctly positive assessment by the majority of respondents regarding the role of delegated budgets in enhancing schools' financial autonomy.

Question 2: Do you think that the system stimulates competition among schools, leading to improvements in the quality of education?

Diagram No. 2 presents the distribution of responses regarding whether the delegated budget system stimulates competition between schools and contributes to the improvement of education quality.

Diagram No. 2. Influence of competition on the quality of education**.**



The results indicate a predominantly negative or neutral perception regarding the ability of the delegated budget system to stimulate competition for the purpose of improving the quality of education. Nearly half of the respondents (48%) do not see a connection between competition and quality, which could be attributed to insufficiently developed incentives or the lack of

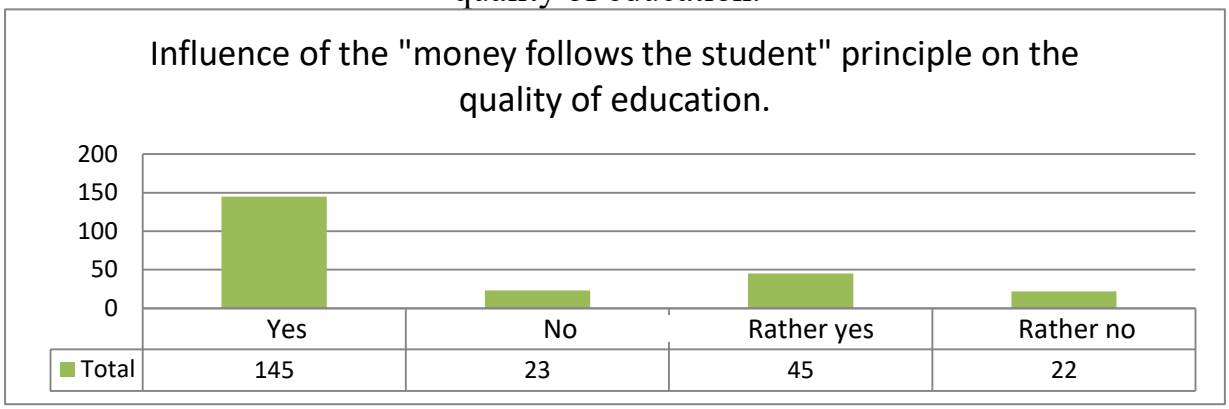
real mechanisms for measuring and promoting quality.

However, the relatively significant share of positive responses ("Yes" and "Rather yes" – 35% in total) suggests that the system still has the potential to encourage competitiveness among schools.

Question 3: Do you think that the "money follows the student" principle creates challenges for the quality of education?

Diagram No. 3 presents the distribution of responses regarding whether the "money follows the student" principle creates challenges for the quality of education.

Diagram No. 3. Influence of the "money follows the student" principle on the quality of education.



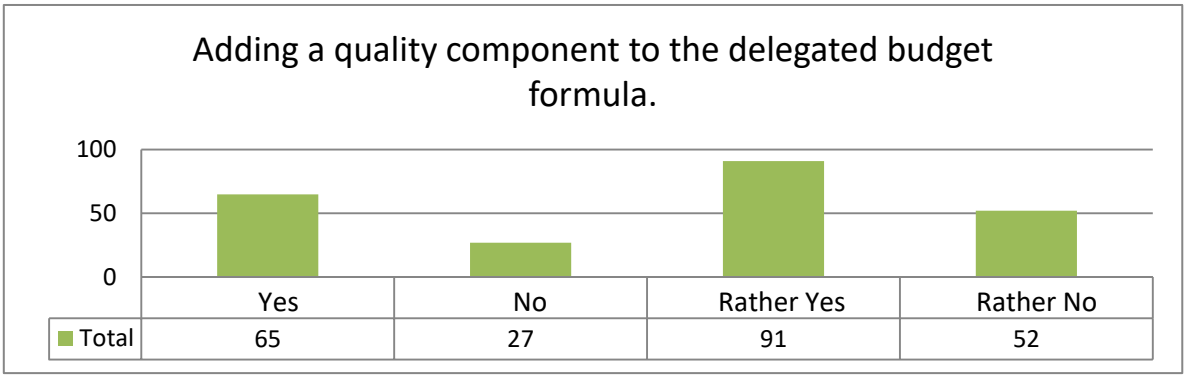
The data shows that a significant majority of respondents – 145 participants (62%) – believe that the "money follows the student" principle creates challenges for the quality of education. Additionally, 45 participants (19%) express moderate agreement with the statement, indicating "Rather yes." This strongly emphasizes the prevailing opinion that the current funding model poses potential difficulties and risks to the quality of the educational process.

At the same time, 22 respondents (9%) selected "Rather no," and 23 participants (10%) strongly disagree with this opinion. These responses indicate that there is a smaller group that does not perceive the model as a source of challenges, likely due to its better implementation in specific schools or regions.

Question 4: Do you think that the calculation formula for the delegated budget should include a component related to the quality of education?

Diagram No. 4 presents the distribution of responses regarding the necessity of adding a component related to the quality of education to the calculation formula for the delegated budget.

Diagram No. 4. Addition of a quality component to the delegated budget formula.



The data shows that a significant portion of respondents support the addition of a component related to the quality of education in the calculation formula for the delegated budget. 91 participants (38%) answered "Rather yes," and 65 participants (27%) strongly support the proposal with the answer "Yes." In total, 65% of respondents believe that the quality of education should be part of the financing methodology. At the same time, 52 respondents (22%) expressed moderate disagreement with the answer "Rather no," while 27 participants (11%) categorically rejected the idea with the answer "No." This indicates that some respondents either do not see a connection between education quality and funding or believe that the existing formula is sufficient.

Based on the results of the entire survey, which covers 14 key questions, the advantages and disadvantages of the delegated budget system, as perceived by the stakeholders, can be identified.

Advantages of the Delegated Budget System:

- Financial Autonomy: The overwhelming majority of respondents believe that the system provides financial autonomy to schools by granting them freedom in the allocation and management of resources. This aligns with the concept of “optimal distribution of authority and resources across different levels of governance for the delivery of higher-quality services to citizens.”

- Transparency of Expenditures: A significant share of participants view the system as a means of enhancing accountability and transparency in spending. According to Denitsa Petkova Zagorcheva-Koycheva, “delegated budgets encourage independent planning and transparent allocation of funds.”[18].

- Encouragement of Efficient Resource Use: More than half of the respondents believe that the system encourages schools to optimize expenditures and use their resources more effectively. This reflects the view that the system “provides freedom in setting priorities” and “flexibility in

[18] Zagorcheva-Koycheva, Denitsa Petkova. Financial Accountability and Control in Education. Shumen: University Publishing House "Episkop Konstantin Preslavski".2022

reallocating available funds."[19].

- Flexibility and Security: Delegated budgets are perceived as providing both flexibility and security for schools. "The implementation of delegated budgets can be viewed positively from the perspective of the decentralization process, as financial powers and responsibilities are genuinely delegated down the management hierarchy."[20].

Disadvantages and Challenges of the Delegated Budget System:

- Lack of Link to Educational Quality: Over 65% of respondents believe that the system lacks a component related to the quality of education, indicating an absence of incentives to achieve better outcomes. "The current system lacks incentives for improving the quality of education, as evidenced by the absence of significant progress in student performance in international comparative assessments."[21].

- Burdensome Regulatory Framework: 89% of respondents indicated that the large number of regulatory acts complicates the management of delegated budgets and creates administrative burdens. "The system requires specific financial knowledge and administrative capacity, which are not always available within schools"[22].

- Conflicts Between School Management and Municipal Administration: More than half of the participants (67%) see a potential for conflicts arising from mismatched priorities and lack of coordination. This concern is also highlighted in other studies, which point out that "the system creates potential for conflicts between different institutions."[23].

- Lack of strategy for monitoring and auditing: About 56% of respondents believe that the absence of regular checks and audits creates a risk of inefficient management and accountability. As noted in an analysis by the "Education" Syndicate, "the lack of effective control mechanisms hinders the transparency of expenditures.".[24]

The delegated budget system is perceived as a tool that ensures financial autonomy, transparency, and efficient resource utilization in schools. However, the identified challenges—such as administrative burden, lack of connection to

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[19] Zagorcheva-Koycheva, Denitsa Petkova. Financial Accountability and Control in Education. Shumen: University Publishing House "Episkop Konstantin Preslavski".2022

[20] Ministry of Regional Development and Public Works, Decentralization Strategy 2016–2025

[21] Nikolov, A. School Financing: Effects on Budgeting, Salaries, and Quality of Education. Institute for Market Economics, Sofia, 2017.

[22] Zagorcheva-Koycheva, Denitsa Petkova. Financial Accountability and Control in Education. Shumen: University Publishing House "Episkop Konstantin Preslavski"., 2022

[23] Zagorcheva-Koycheva, Denitsa Petkova. Financial Accountability and Control in Education. Shumen: University Publishing House "Episkop Konstantin Preslavski", 2022

[24] Education Trade Union, "From Delegated Budgets to Priority", available at: https://www.podkrepa-obrazovanie.com

educational quality, and risks for small schools—require attention and targeted improvements. Optimizing the system by introducing mechanisms for fairer funding and enhanced accountability could make it more effective and sustainable.

The third section, "Application of Unified Cost Standards as a Mechanism for Financing Secondary Schools in Bulgaria," introduces the Unified Cost Standards (UCS) as a key tool for determining the financing of secondary schools in the country.

The funding of activities related to the upbringing, preparation, and education of children and students in state and municipal educational institutions, as well as in auxiliary units, is carried out through the allocation of budgetary funds determined by the state budget. The main resources are granted to primary budget holders based on unified cost standards, established per child or student and approved by the Council of Ministers. These primary budget holders then distribute the funds among various institutions (schools, kindergartens, and auxiliary units) using specific formulas tailored to each activity.

The primary budget holder is obliged to approve the allocation formulas after consultations with the heads of the respective educational institutions. These formulas are applied from the beginning of the budget year and remain unchanged throughout its duration. The main factors incorporated into each formula include the unified cost standard and the number of children and students in the respective institutions, following the principle that "funding follows the student."

State budget funding for activities related to student upbringing and education is calculated using the following formula:

CF = (BCF + ACF) * RF,

where:

CF – funding calculated by the formula,

BCF – basic component of the formula,

ACF – additional components of the formula,

RF – regional coefficient.

Key Components of the Formulas Include:

1. Number of children and students, number of groups and classes, and type and number of educational institutions, based on data from the National Electronic Information System for Pre-school and School Education (NEISPUE) as of January 1, 2023, including natural indicators for schools of arts and culture as of the same date.

2. Unified cost standards per child and student, per group and class, and per educational institution, in accordance with a decision by the Council of Ministers adopting the standards for state-delegated activities.

It is of particular importance to take into account regional and municipal differences. The funding allocated to schools is multiplied by a regional coefficient, as specified in Article 3, Paragraph 3 of the Ordinance on the Financing of Institutions in the Pre-school and School Education System. This coefficient is presented in Table 7 below, and its value is defined in Appendix No. 1a to Article 3a, Paragraph 1 of the same ordinance.

Table No. 7. Value of the Regional Coefficient According to the Combined Effect of the Factors "Population in the Municipal Center" and "Distance of the Municipal Center from a Regional City and a Settlement with Over 100,000 Inhabitants"

Regional Group	First Group	Second Group	Third Group	Fourth Group	Fifth Group	Sixth Group	Seventh Group	Eighth Group
Regional Coefficient	0	0,017	0,034	0,051	0,068	0,085	0,102	0,12

Source: Pre-school and School Education Act, Appendix No. 1a to Article 3a, Paragraph 1.

The formula:

CF = (BCF + ACF) * RF

is used to distribute funds between schools for activity 326 "Vocational High Schools and Classes for Vocational Training" from the EBK for 2023.[25]

Although the formula for financing activities related to “Vocational High Schools and Classes for Vocational Training” demonstrates effectiveness and transparency in the allocation of budgetary funds, it primarily focuses on quantitative indicators such as the number of students, groups, and institutions. The lack of a component related to the evaluation of education quality is a significant drawback. For educational institutions, the quality of the education provided is a key factor for long-term success, which cannot be overlooked.

The fourth section, “Analysis of the Delegated Budget System in Vocational Economics High Schools,” examines the implementation of the delegated budget system in vocational economics high schools, focusing on the specific characteristics, challenges, and effects of its functioning on financial sustainability and the quality of the educational process.

This analysis aims to explore the financial parameters of the delegated budget system in economics high schools in Bulgaria. Statistical methods will be used to analyze key indicators such as average values, budget distribution, and student numbers, as well as regional differences in funding.

The study will focus on 32 economics high schools, which are part of the Association of Economics Schools in Bulgaria and receive funding from the Ministry of Education and Science (MES), excluding municipal schools due to

[25] Formulas for the Distribution of Funds Received Through Unified Cost Standards Between Schools and Auxiliary Units, Secondary Budget Holders of the Ministry of Education and Science for 2023, Appendix to the Order № РД 09-2052 / 29.08.2023 г.

differences in funding data. This methodology aligns with best practices in similar studies, which exclude specific cases due to incomparable parameters.

The goal of the analysis is to provide empirical data on the economics high schools that shed light on the current state of the delegated budget system, serving as an informative basis for understanding the funding and management of these schools.

Based on the data provided by the Ministry of Education and Science (MES), the average number of students is 510.72, which is approximately 511 students per school. The average amount of delegated budgets is BGN 2,174,583.13. These values provide an important starting point for subsequent analyses, allowing the identification of central tendencies in the distribution of resources and students in the studied schools.

The coefficient of variation and standard deviation are key statistical indicators that allow for the analysis of differences and the degree of deviation in the data distribution. In this study, these indicators were calculated for the number of students and the budgets of vocational economics high schools.

In this analysis, the relationships between regional coefficients and key indicators such as the number of students and total budget were calculated and visualized. The following was observed:

- Significant differences in the amount of additional funding between regional groups.

- A clear relationship between higher regional coefficient values and smaller-sized educational institutions, highlighting the system's goal of supporting schools in smaller and more remote areas.

Despite the positive aspects of the system, the analysis also reveals some weaknesses. First, schools in large cities, which fall into the first group, do not receive any additional funding, as their regional coefficient is 0. This puts these schools at a disadvantage, even though they often serve a large number of students and rely on more extensive infrastructure.

Conclusions from Chapter Two

The delegated budget system is a well-established core mechanism for financing schools in Bulgaria, providing school principals with greater financial autonomy and the ability to manage resources independently. Despite the positive aspects of this model, its effective implementation requires a high level of administrative capacity, which poses a significant challenge for smaller schools, particularly in municipalities with limited resources.

From 2018 to 2023, there was a significant increase in education expenditures, nearly doubling compared to previous years. This growth reflects the government's commitment to the sector and efforts to improve conditions in educational institutions. However, the share of education expenditures relative to the Gross Domestic Product remains relatively stable, suggesting that the increase in funding is primarily linked to the overall rise in budget expenditures,

rather than prioritizing the sector. The analysis shows that most of the increased funds are directed toward current expenditures, such as staff salaries and administrative needs.

The focus on current expenses limits the opportunities for the strategic development of the educational system. A significant portion of school budgets is spent on salaries, leaving little room for investments in improving infrastructure, introducing innovative technologies, and developing school facilities.

Particular attention should be paid to the financing of vocational education, which plays a key role in preparing skilled workers for the labor market. Vocational schools have higher requirements for technical equipment, teaching materials, and practical training, leading to significantly higher costs compared to general education schools.

Despite the increase in education funding, the system continues to suffer from a lack of effective mechanisms for assessing the quality of the educational process.

Chapter Three emphasizes the importance of sustainable and effective financing for secondary education in Bulgaria. While the increase in budgetary funds is a positive step, the system requires better management and precise allocation of resources to address inequalities and promote the long-term development of the education sector.

CHAPTER THREE. CONSTRUCTION AND APPLICATION OF DEA MODELS FOR ASSESSMENT AND OPTIMIZATION OF FINANCING FOR ECONOMICS SCHOOLS

The first section, "Concept and Methodology of DEA Models for Assessing the Efficiency of Economics High Schools," introduces Data Envelopment Analysis (DEA), an innovative approach for efficiency analysis that allows for the comparison of organizations based on their resources and achieved outcomes. "DEA is a widely used method for measuring the efficiency of organizations or decision-making units (DMUs) by comparing multiple input and output parameters."[26] This approach has become an established key tool for analyzing and comparing efficiency in the context of organizations with different goals and structures. "The main objective of this method is to identify the efficient units—those that produce the highest output using the least amount of input resources."[27]

[26] Nenovski, N., & Mihaylova-Borisova, G. Effectiveness of Bulgarian Banks at the Beginning of the 20th Century: A Historical Reconstruction Using Unconventional Methods, 2017

[27] LOTFI, F.H., SHIROUYEHZAD, H. (2010) Analyzing Efficiency of Human ResourcePerformance Using Data Envelopment Analysis. 1.st Conference on executive MBA, 2010

DEA assesses the efficiency of a DMU by identifying those units that achieve optimal results relative to the resources invested. “Efficiency is expressed as the ratio between output and input parameters, with the result ranging from 0 to 1, where 1 represents full efficiency.”[28] This makes it an especially useful tool for comparing units that operate under different conditions and scales.

The second section, “Selection of Input and Output Variables,” presents the choice of input and output variables for analysis through the Data Envelopment Analysis (DEA) model, which is crucial for ensuring adequacy and precision in evaluating the efficiency of economics high schools. The main criteria for selecting the variables include their objectivity, measurability, and logical connection between the resources used and the results achieved.

Input Variables:

- Main Component of the Formula (MCF). The primary component in the financing formula (part of the budget). This variable reflects the main funding for high schools, which depends on the number of students.

- Additional Components (AC). Includes additional funding for specific activities or needs of the schools, such as support for students with special educational needs, which supplements the main funding.

- Regional Coefficient (RC). A coefficient used to adjust funding based on regional factors. This variable takes into account specific regional conditions that influence funding, such as distance, population size, and other regional factors.

- Total Resources Adjusted by Regional Coefficient (TRRC). The total budget represents the sum of all funding components provided to the school. These are the total resources, adjusted by the regional coefficient, representing the sum of all funding components adapted to regional conditions.

- Number of Students (NS). The total number of students enrolled in the school, which is a key factor in the distribution of resources.

Output Variables:

Average Bulgarian Language and Literature State Matriculation Exam Score (ABLSMES). The average score from the state matriculation exam in Bulgarian Language and Literature is a key indicator for evaluating students' proficiency in the Bulgarian language and their analytical abilities.

- Average Bulgarian Language and Literature National External Evaluation Score (ABLNES). The average score from the National External Evaluation (NEE) in Bulgarian Language and Literature in 10th grade is a key indicator for assessing students' language and literature competencies in

[28] Фатима, С., & Махмуда, У. Двустепенен DEA анализ за измерване на ефективността на началните училища в Индонезия. Международно списание за екологично и научно образование, 2017

secondary education.

- Average Mathematics National External Evaluation Score (AMNES). The average score from the National External Evaluation (NEE) in Mathematics in 10th grade is an essential indicator for evaluating students' mathematical competencies in secondary education.

In the analysis of potential output variables, the possibility of including qualitative evaluations provided in reports from the National Education Inspectorate, such as "Educational Process," "Management," and "Institutional Environment," was also considered. However, due to the fact that such data is only available for a limited number of schools, their inclusion in the model is not possible at this stage. The lack of sufficient information for all schools limits the applicability of these indicators as output variables in the current study.

The third section, "Statistical Analysis of Input and Output Variables with a Focus on Financial Data," involves a statistical analysis of the input and output variables, which includes processing data on budgets, the number of students, and academic results. The analysis has a strong financial focus as it examines the effectiveness of resource allocation and usage in economics high schools.

After a detailed presentation of the statistical indicators for all input and output variables, the next step in the study is the analysis of the stochastic dependencies between them. The goal of this analysis is to identify significant factors that influence students' academic performance, while simultaneously assessing the effectiveness of resource allocation and usage in economics high schools.

By calculating correlation coefficients and visualizing the results through correlograms, the direction and strength of the relationships between the input and output variables will be analyzed.

The analysis of the correlation relationships between the input and output variables reveals the significance of certain dependencies, which may be key to the effectiveness of economics high schools. The established moderate and weak relationships between the variables highlight the complexity of the factors influencing students' academic achievements.

In the fourth section, "Application of the DEA Model for Efficiency Assessment and Analysis of Results in Economics Schools," the Data Envelopment Analysis (DEA) model is used to assess the technical efficiency of the schools based on multiple input and output variables.

For the DEA analysis in this study, MAXDEA 12.2 software was used, which is a well-established tool for evaluating the efficiency of decision-making units (DMUs). MAXDEA provides a wide range of calculation options, including support for both CCR and BCC models, and allows for both input-oriented and output-oriented analyses.

In the study, the BCC model (Banker, Charnes, and Cooper) with Variable Returns to Scale (VRS) is applied. This model is particularly suitable for evaluating educational institutions as it takes into account the impact of scale on their efficiency. Returns to scale describes how changes in the resources used (inputs) affect the achieved results (outputs).

MAXDEA 12.2 was chosen for this study due to its flexibility, reliability, and accuracy in calculations. This software is widely used in scientific research and is especially suitable for analyzing educational systems, as it provides an objective method for evaluating efficiency based on multiple input and output variables.

Fifth Section: "Analysis of Results and Interpretation of Efficiency". This section presents the analysis of the results from applying the Data Envelopment Analysis (DEA) model, with a focus on the interpretation of the efficiency of vocational economics high schools. The schools are defined as DMUs (Decision-Making Units). The presented data includes the efficiency score, which measures the degree of optimal resource utilization, as well as the ranking (Rank) of each school in relation to others in the sampled group.

Table № 18: Key Indicators for Efficiency and Returns to Scale of Economics High Schools

№	DMU (Name of the School)	Score	Rank
1	DTG "D. Hadzhivasilev"	1	1
2	PGM "P.R. Slaveykov"	1	1
3	PGI "Georgi S. Rakovski"	1	1
4	Vocational High School of Mechanoelectrotechnics	0,753	27
5	PGLPI "Atanas Burov"	1	1
6	Vocational High School of Light Industry and Tourism	0,7785	22
7	Vocational Technical High School "Nikola Y. Vaptsarov"	0,9737	11
8	Staroprestolna Vocational High School of Economics	0,9262	13
9	PGSUAU "Atanas Burov"	0,9887	10
10	PGI "Aleko Konstantinov"	0,7656	25
11	PGIU "Elias Canetti"	1	1
12	FSG "Vasil Levski"	0,9956	9
13	PGIT "Aleko Konstantinov"	0,7911	21
14	PG "Prof. Dr. Asen Zlatarov"	0,8363	17
15	PGI "Robert Schuman"	0,7406	28
16	PGT "Pencho Semov"	0,7394	29
17	PG in Transport and Transport Management	0,6125	32
18	PGIM "Yordan Zahariev"	0,8031	19
19	Vocational High School of Economics	0,7743	24

20	PG in Tourism "Alexander Pascalev"	0,7355	30
21	PGI "Ivan Iliev"	0,8886	14
22	PGIT "Prof. Dr. Asen Zlatarov"	0,7106	31
23	PG of Economics	0,8384	16
24	PGI "Prof. Dr. D. Tabakov"	0,8562	15
25	FSG "Atanas Burov"	0,7595	26
26	Varna Trade High School "G.S. Rakovski"	1	1
27	PG of Economics and Management	0,8317	18
28	PG "Gen. Vladimir Zaimov"	0,778	23
29	Nevrokop Vocational High School "Dimitar Talev"	0,7937	20
30	National Financial and Economic High School	0,9591	12
31	National Trade High School	1	1
32	National Trade and Banking High School	1	1

The results presented in the table reveal significant differences between the effective and ineffective economics high schools. The effective institutions, which achieved an efficiency score of 1, demonstrate optimal use of available resources. Their average rank is 1, placing them at the top of the ranking.

On the other hand, the ineffective schools have an average efficiency score of 0.82, indicating a significant deviation from the efficiency frontier. Their average rank is 20.5, reflecting their weaker performance compared to the effective schools. The analysis of the proportional movement variables, such as the average score from the state matriculation exam (ABLSMES) and the average score from the national external evaluation (ABLNES), shows that these indicators have higher values in comparison to the effective schools. This suggests that ineffective DMUs have significant potential for improvement through optimization of academic achievements and better resource management.

The sixth section, "Optimization Proposals for Resource Allocation," presents optimization suggestions for improving the distribution of resources in vocational economics high schools, based on the results from the efficiency analysis using the DEA model.

Table No. 20 provides a more comprehensive perspective by including the total budget, adjusted by the regional coefficient (TRRC). This indicator reflects the influence of regional conditions on the distribution and utilization of resources. TRRC accounts for demographic, socio-economic, and geographical differences, offering a deeper insight into the efficiency of budgetary spending. The presented analysis aims to identify portions of the total budget that have not been optimally used.

Table №. 20. Inefficiently Used Funds Based on TRRC

№	DMU (Name of the School)	Score	**TRRC**	Adjusted Amount Based on TRRC	Correction of the Provided Amount Based on TRRC
1	DTG "D. Hadzhivasilev"	1	864 665 bgn.	864 665 bgn.	0 bgn.
2	PGM "P.R. Slaveykov"	1	942 204 bgn.	942 204 bgn.	0 bgn.
3	PGI "Georgi S. Rakovski"	1	972 433 bgn.	972 433 bgn.	0 bgn.
4	Vocational High School of Mechanoelectrotechnics	0,753	1 053 395 bgn.	793 206 bgn.	260 189 bgn.
5	PGLPI "Atanas Burov"	1	1 297 422 bgn.	1 297 422 bgn.	0 bgn.
6	Vocational High School of Light Industry and Tourism	0,7785	1 592 094 bgn.	1 239 445 bgn.	352 649 bgn.
7	Vocational Technical High School "Nikola Y. Vaptsarov"	0,9737	1 628 793 bgn.	1 585 956 bgn.	42 837 bgn.
8	Staroprestolna Vocational High School of Economics	0,9262	1 657 928 bgn.	1 535 573 bgn.	122 355 bgn.
9	PGSUAU "Atanas Burov"	0,9887	1 658 407 bgn.	1 639 667 bgn.	18 740 bgn.
10	PGI "Aleko Konstantinov"	0,7656	1 718 556 bgn.	1 315 726 bgn.	402 830 bgn.
11	PGIU "Elias Canetti"	1	1 777 398 bgn.	1 777 398 bgn.	0 bgn.
12	FSG "Vasil Levski"	0,9956	1 812 203 bgn.	1 804 229 bgn.	7 974 bgn.
13	PGIT "Aleko Konstantinov"	0,7911	1 903 811 bgn.	1 506 105 bgn.	397 706 bgn.
14	PG "Prof. Dr. Asen Zlatarov"	0,8363	1 933 197 bgn.	1 616 733 bgn.	316 464 bgn.
15	PGI "Robert Schuman"	0,7406	1 845 105 bgn.	1 366 485 bgn.	478 620 bgn.
16	PGT "Pencho Semov"	0,7394	1 893 032 bgn.	1 399 708 bgn.	493 324 bgn.
17	PG in Transport and Transport Management	0,6125	1 914 877 bgn.	1 172 862 bgn.	742 015 bgn.
18	PGIM "Yordan Zahariev"	0,8031	2 028 373 bgn.	1 628 986 bgn.	399 387 bgn.
19	Vocational High School of Economics	0,7743	2 013 005 bgn.	1 558 670 bgn.	454 335 bgn.
20	PG in Tourism "Alexander Pascalev"	0,7355	2 065 919 bgn.	1 519 483 bgn.	546 436 bgn.
21	PGI "Ivan Iliev"	0,8886	2 082 017 bgn.	1 850 080 bgn.	231 937 bgn.
22	PGIT "Prof. Dr. Asen Zlatarov"	0,7106	2 184 981 bgn.	1 552 647 bgn.	632 334 bgn.
23	PG of Economics	0,8384	2 258 908 bgn.	1 893 868 bgn.	365 040 bgn.
24	PGI "Prof. Dr. D. Tabakov"	0,8562	2 556 232 bgn.	2 188 646 bgn.	367 586 bgn.

25	FSG "Atanas Burov"	0,7595	2 617 672 bgn.	1 988 122 bgn.	629 550 bgn.
26	Varna Trade High School "G.S. Rakovski"	1	2 636 586 bgn.	2 636 586 bgn.	0 bgn.
27	PG of Economics and Management	0,8317	3 031 973 bgn.	2 521 692 bgn.	510 281 bgn.
28	PG "Gen. Vladimir Zaimov"	0,778	3 596 624 bgn.	2 798 173 bgn.	798 451 bgn.
29	Nevrokop Vocational High School "Dimitar Talev"	0,7937	3 572 073 bgn.	2 835 154 bgn.	736 919 bgn.
30	National Financial and Economic High School	0,9591	3 589 343 bgn.	3 442 539 bgn.	146 804 bgn.
31	National Trade High School	1	3 607 119 bgn.	3 607 119 bgn.	0 bgn.
32	National Trade and Banking High School	1	5 280 315 bgn.	5 280 315 bgn.	0 bgn.
	Amount	27,6299	69 586 660 bgn.	60 131 900 bgn.	9 454 760 bgn.

Based on the calculations, the inefficiently used funds amount to 8,897,330 BGN when the analysis is carried out using the main funding component (MCF). When the regional coefficient (TRRC) is included, this amount increases to 9,454,760 BGN. The difference of 557,430 BGN reflects inefficiently spent funds associated with the additional components of funding, which include regional conditions and specific expenditure needs.

To ensure a more precise and equitable distribution of resources, a system for categorizing schools based on their DEA results could be introduced. Such a system would allow for directing additional funding to the most efficient schools, while also motivating the remaining institutions to improve their effectiveness. This approach would provide a fairer distribution of resources, taking into account both the achieved results and the potential for optimization in different educational institutions.

Schools could be classified into five categories based on their DEA results. The categorization would provide a clear distinction between schools according to their efficiency in managing resources.

Table № 21 below presents part of the proposed categorization of schools based on the results of the DEA analysis. This table includes clearly defined categories, covering ranges of efficiency and corresponding adjustments in funding.

Table № 21. School Efficiency Categories Based on DEA Analysis

Category	**Efficiency Score (DEA)**	**Correction in Funding (CF)**	**Description**
Category 1	0.95 – 1.00	+10% (CF = 1.1)	Most efficient schools, which use resources optimally. They receive the

			highest incentive.
Category 2	0.90 – 0.949	+5% (CF = 1.05)	High-efficiency schools, which are close to the optimal level. They receive a moderate incentive.
Category 3	0.85 – 0.899	+2% (CF = 1.02)	Medium-efficiency schools. They receive a minimal incentive to encourage improvements.
Category 4	0.80 – 0.849	0% (CF = 1)	Low-efficiency schools. They do not receive additional funding but maintain their budget.
Category 5	under 0.80	0% (CF = 1)	Least efficient schools. They do not receive additional funding but maintain their budget.

In the context of limited public funds, adding a component that encourages schools to optimize their resource usage could contribute to improving the overall efficiency of the system. This could be achieved by introducing an Efficiency Coefficient (EC), which would be based on the results of the efficiency analysis through the DEA model.

A proposal for a new funding formula, based on the current funding formula:

SF = (MCF + ACF) × RC,

could be modified to include the Efficiency Coefficient (EC):

SF = (MCF + ACF) × RC × EC,

where:

SF – Funding Amount;

MCF – Main Component of Funding (e.g., number of students × Unified Cost Standard);

ACF – Additional Component of Funding (includes specific needs);

RC – Regional Coefficient (adjusts funding based on geographical and demographic characteristics);

EC – Efficiency Coefficient, based on results from the DEA analysis.

The Efficiency Coefficient (EC) serves as an incentive for schools to improve their efficiency. It allows for a more equitable distribution of funds, taking into account not only quantitative indicators but also the quality of resource management. Schools that demonstrate high efficiency will receive greater financial incentives, while those with lower efficiency will maintain

their basic funding without additional incentives. This ensures a balance between maintaining minimum resources for each school and promoting best practices.

The potential benefits of categorization can include:

- Stimulating high efficiency: The most efficient schools will be rewarded, which will serve as motivation for others to improve their performance.

- Targeted resource management: Funding will be more precisely directed towards schools that demonstrate high efficiency and achieve better results.

- Fairness: Introducing categories ensures a fairer distribution of funds, taking into account the individual characteristics and achievements of schools.

In the current model, schools with low efficiency (categories 4 and 5) do not receive additional funding but retain their basic funding, which guarantees minimal resources for carrying out core educational activities. This measure aims to motivate these schools to improve while ensuring stability in their operations.

Table № 22 presents the procedure for the calculation and categorization of schools, as well as how the calculation is performed for each school based on its efficiency.

Table № 22. Procedure for Calculating the Optimized Resource Distribution

№	DMU (Name of the School)	Score	Efficiency Category	Efficiency Coefficient (EC)	**TRRC**	Adjusted Amount Based on TRRC	Adjusted Amount with EC
1	DTG "D. Hadzhivasilev"	1	Category 1	1,1	864 665 bgn.	864 665 bgn.	951 132 bgn.
2	PGM "P.R. Slaveykov"	1	Category 1	1,1	942 204 bgn.	942 204 bgn.	1 036 424 bgn.
3	PGI "Georgi S. Rakovski"	1	Category 1	1,1	972 433 bgn.	972 433 bgn.	1 069 676 bgn.
4	Vocational High School of Mechanoelectrotechnics	0,753	Category 5	1	1 053 395 bgn.	793 206 bgn.	793 206 bgn.
5	PGLPI "Atanas Burov"	1	Category 1	1,1	1 297 422 bgn.	1 297 422 bgn.	1 427 164 bgn.
6	Vocational High School of Light Industry and Tourism	0,7785	Category 5	1	1 592 094 bgn.	1 239 445 bgn.	1 239 445 bgn.
7	Vocational Technical High School "Nikola Y. Vaptsarov"	0,9737	Category 1	1,1	1 628 793 bgn.	1 585 956 bgn.	1 744 551 bgn.
8	Staroprestolna Vocational High School of Economics	0,9262	Category 2	1,05	1 657 928 bgn.	1 535 573 bgn.	1 612 352 bgn.
9	PGSUAU "Atanas Burov"	0,9887	Category 1	1,1	1 658 407 bgn.	1 639 667 bgn.	1 803 634 bgn.

10	PGI "Aleko Konstantinov"	0,7656	Category 5	1	1 718 556 bgn.	1 315 726 bgn.	1 315 726 bgn.
11	PGIU "Elias Canetti"	1	Category 1	1,1	1 777 398 bgn.	1 777 398 bgn.	1 955 138 bgn.
12	FSG "Vasil Levski"	0,9956	Category 1	1,1	1 812 203 bgn.	1 804 229 bgn.	1 984 652 bgn.
13	PGIT "Aleko Konstantinov"	0,7911	Category 5	1	1 903 811 bgn.	1 506 105 bgn.	1 506 105 bgn.
14	PG "Prof. Dr. Asen Zlatarov"	0,8363	Category 4	1	1 933 197 bgn.	1 616 733 bgn.	1 616 733 bgn.
15	PGI "Robert Schuman"	0,7406	Category 5	1	1 845 105 bgn.	1 366 485 bgn.	1 366 485 bgn.
16	PGT "Pencho Semov"	0,7394	Category 5	1	1 893 032 bgn.	1 399 708 bgn.	1 399 708 bgn.
17	PG in Transport and Transport Management	0,6125	Category 5	1	1 914 877 bgn.	1 172 862 bgn.	1 172 862 bgn.
18	PGIM "Yordan Zahariev"	0,8031	Category 4	1	2 028 373 bgn.	1 628 986 bgn.	1 628 986 bgn.
19	Vocational High School of Economics	0,7743	Category 5	1	2 013 005 bgn.	1 558 670 bgn.	1 558 670 bgn.
20	PG in Tourism "Alexander Pascalev"	0,7355	Category 5	1	2 065 919 bgn.	1 519 483 bgn.	1 519 483 bgn.
21	PGI "Ivan Iliev"	0,8886	Category 3	1,02	2 082 017 bgn.	1 850 080 bgn.	1 887 082 bgn.
22	PGIT "Prof. Dr. Asen Zlatarov"	0,7106	Category 5	1	2 184 981 bgn.	1 552 647 bgn.	1 552 647 bgn.
23	PG of Economics	0,8384	Category 4	1	2 258 908 bgn.	1 893 868 bgn.	1 893 868 bgn.
24	PGI "Prof. Dr. D. Tabakov"	0,8562	Category 3	1,02	2 556 232 bgn.	2 188 646 bgn.	2 232 419 bgn.
25	FSG "Atanas Burov"	0,7595	Category 5	1	2 617 672 bgn.	1 988 122 bgn.	1 988 122 bgn.
26	Varna Trade High School "G.S. Rakovski"	1	Category 1	1,1	2 636 586 bgn.	2 636 586 bgn.	2 900 245 bgn.
27	PG of Economics and Management	0,8317	Category 4	1	3 031 973 bgn.	2 521 692 bgn.	2 521 692 bgn.
28	PG "Gen. Vladimir Zaimov"	0,778	Category 5	1	3 596 624 bgn.	2 798 173 bgn.	2 798 173 bgn.
29	Nevrokop Vocational High School "Dimitar Talev"	0,7937	Category 5	1	3 572 073 bgn.	2 835 154 bgn.	2 835 154 bgn.
30	National Financial and Economic High School	0,9591	Category 1	1,1	3 589 343 bgn.	3 442 539 bgn.	3 786 793 bgn.
31	National Trade High School	1	Category 1	1,1	3 607 119 bgn.	3 607 119 bgn.	3 967 831 bgn.
32	National Trade and Banking High School	1	Category 1	1,1	5 280 315 bgn.	5 280 315 bgn.	5 808 347 bgn.
	Amount	27,6299	-	-	69 586 660 bgn.	60 131 900 bgn.	62 874 506 bgn.

The optimization model is based on the results of the DEA analysis, which classifies schools into five categories according to their efficiency. For each category, a coefficient is assigned that reflects the degree of efficiency of the schools:

- The most efficient schools receive a coefficient of +10%, stimulating further improvements.
- Schools with medium efficiency receive moderate adjustments, while the least efficient schools maintain their budget without additional funding.

As a result of the proposed optimization:

- 2,742,606 BGN from the total amount are redistributed to schools according to their efficiency.
- The remaining 6,712,154 BGN is kept available for additional activities in the education sector.

The proposed model demonstrates how, through balanced and transparent distribution of resources, higher efficiency in financing can be achieved while simultaneously motivating schools to achieve better results.

Optimizing the funding of vocational economics high schools represents a significant challenge but also an opportunity for greatly improving the efficiency of public resource distribution. These schools, united through the Association of Economics Schools in Bulgaria, operate as an integrated group of educational institutions, providing a favorable foundation for implementing innovative models of management and financing.

The proposed optimization model offers a structured approach to resource allocation, based on efficiency analysis (DEA) and categorization of schools according to objective indicators. The pilot application of the model within the vocational economics high schools offers an opportunity to test its applicability and sustainability in a real-world environment. If its effectiveness is proven, the model can be adapted and expanded to other groups of schools—both at the national level (state schools) and at the regional level (within individual municipalities).

The seventh section, "Limitations of the Study and Directions for Future Research," outlines the key limitations of the current study and proposes directions for future research in the area of financing effectiveness for vocational economics high schools.

One of the primary limitations of this study is the lack of comprehensive data for all vocational economics high schools. This limits the ability to use a broader set of indicators that would allow for a more in-depth and objective analysis. For example, the lack of output data, such as student success after graduation or their employment outcomes in the labor market, makes it difficult to incorporate these important metrics into the model.

An additional issue is that many schools do not have available or up-to-

date reports from the National Education Inspectorate (NEI), which contain evaluations for three key areas:

- Educational Process (qualitative assessment in percentages),
- Management (qualitative assessment in percentages),
- Institutional Environment (qualitative assessment in percentages).

These assessments could be extremely useful for the DEA analysis, as they offer standardized indicators for the quality and effectiveness of activities within schools. The lack of standardized and accessible data from such reports hampers comparability between institutions and limits the ability to create a more comprehensive model.

One of the key directions for future research is the development of a unified database for all schools, which would consolidate information on both funding and other key areas. Such a database could follow the model used by the Ministry of Education and Science (MES), which already has a centralized system for the financing of state schools. This database should include all components of the funding. Including such a database at the municipal level would allow each municipality to maintain up-to-date information about its schools. The publicity and transparency of this information would facilitate comparisons between different municipalities and assist in the development of effective policies for managing educational expenditures.

V. CONCLUSION

This dissertation comprehensively examines the funding of economics high schools in Bulgaria through the system of delegated budgets, focusing on the evaluation of efficiency and the development of optimization approaches. The theoretical framework of the study outlines the legal and economic aspects of financing in secondary education, emphasizing the socio-economic importance of economics high schools in developing financial literacy and ensuring a smooth transition to higher education. The analysis of current funding mechanisms reveals existing imbalances and inefficiencies in the delegated budget system, including insufficient linkage between financial resources and the quality outcomes of the educational process.

In the empirical part of the research, DEA models are applied to assess the efficiency of economics high schools, allowing for a detailed analysis of the relationship between resources and achieved results. Based on the obtained data, a categorization of schools according to their efficiency is proposed, along with recommendations for differentiated funding tailored to their individual characteristics and needs.

The primary goal of the research—optimizing the delegated budget system for economics high schools—has been achieved through:

- A theoretical analysis of the legal and economic framework of financing in secondary education.
- Identifying weaknesses in existing resource distribution mechanisms

and their impact on the quality of education.

- Developing DEA models that demonstrate how linking financial resources to achieved results can improve the efficiency and quality of the educational process.

The research questions related to the possibilities for optimizing the delegated budget system and improving the quality of education were analyzed in depth, with practical, applicable solutions proposed.

Based on the findings and conclusions of the study, several directions for future research are identified:

- Expanding the analysis: Investigating the effectiveness of the delegated budget system in other types of vocational schools, as well as schools with different organizational structures.

- Tracking long-term effects: Evaluating the impact of the proposed models and criteria on the quality of education and student outcomes in the long term.

- International comparisons: A comparative analysis of funding systems in other European countries to identify best practices and adapt successful models to the Bulgarian context.

- Integration of technologies: Developing digital platforms for automated assessment of school efficiency based on the proposed criteria and models.

VI. CONCLUSIONS AND RECOMMENDATIONS

Based on the conducted research, the analyses performed, and the results obtained, the following key conclusions can be formulated:

1. Need for Improvement of the Delegated Budget System: Despite the autonomy provided to schools, the current model does not sufficiently account for the efficiency of vocational economics high schools, limiting the potential for strategic management of financial resources.

2. DEA Analysis Confirms Inefficiencies in Resource Allocation: This method of analysis demonstrates that some schools achieve significantly better results with similar or even fewer resources compared to other institutions. This reveals the lack of a unified methodological framework for assessing efficiency.

3. Absence of a Clear Mechanism for Linking Funding to the Quality of Education: The current system primarily emphasizes quantitative criteria such as the number of students, without considering the real qualitative dimensions of the educational process. This results in insufficient encouragement for schools to improve teaching quality.

4. Need for Reforms in the Existing Funding Model: The results of the study suggest that although delegated budgets are conceptually an effective mechanism, there is a need for additional regulatory mechanisms to ensure more precise allocation of resources based on objective efficiency criteria.

Based on the identified conclusions and the issues observed, the

following recommendations are made for improving the financing system of vocational economics high schools:

- Optimizing the Delegated Budget System by Introducing Corrective Mechanisms: To enhance the effectiveness of this model, it is necessary to create corrective tools that account for the performance of different schools, including vocational economics high schools. Introducing flexible mechanisms for reallocating funds based on achievements and educational specifics would contribute to better resource management.

- Development and Implementation of a School Performance Evaluation System Based on Comprehensive Indicators: Including both quantitative and qualitative indicators in the assessment of schools will allow for more precise measurement of the return on public investments in education. The system should take into account factors such as educational outcomes.

- Application of DEA Models as a Tool for Monitoring and Analyzing Efficiency: Based on the empirical analyses, the use of DEA models as a means to measure the efficiency of vocational economics high schools is recommended. This would provide a basis for comparison between schools and assist in identifying good practices and areas in need of improvement.

- Development of Quality Evaluation Criteria to Be Integrated into Future Educational Policies: These criteria should be used when developing funding policies, so that budgetary resources are strategically directed towards areas with the greatest impact on the quality of education.

VII. SCIENTIFIC CONTRIBUTIONS OF THE DISSERTATION

In theoretical terms, the scientific contributions of the dissertation can be summarized as follows:

1. Expansion of Knowledge on the Delegated Budget System: The study contributes to the development of financial and economic models in education by identifying specific challenges and opportunities for improving the delegated budget system. It systematically organizes the factors that affect the effectiveness of public resource allocation in the educational sector.

2. Introduction of Theoretical Concepts on the Relationship Between Educational Quality and Financial Resource Allocation: By analyzing existing financial mechanisms, the dissertation introduces a new model that lays the foundation for future research in the field of secondary education funding, emphasizing the role of school efficiency.

3. Methodological Contribution: The dissertation makes a methodological contribution by adapting and applying DEA models to evaluate the effectiveness of economics high schools. The developed methodology integrates both quantitative and qualitative indicators, allowing for more precise measurement of educational productivity. This approach provides a new analytical tool for assessing school efficiency, accounting for both input resources and achieved

output results, with the potential for application in future studies and educational policies.

In terms of applied scientific contributions, the dissertation is summarized as follows:

1. Development of New Criteria for Assessing the Efficiency of Economics High Schools: By using DEA models, new criteria are developed to evaluate school performance. The inclusion of specific input and output variables enables objective comparisons between schools, providing a basis for informed decision-making in educational management.

2. Introduction of a School Categorization Approach Based on Efficiency: This approach creates opportunities for differentiated funding strategies. It facilitates a more equitable distribution of resources and encourages the improvement of educational quality by targeting resources based on the efficiency of schools.

3. Formulation of Specific Recommendations for Optimizing the Delegated Budget System: The proposed mechanisms can be applied in national educational policy to ensure better allocation of resources, improving the efficiency of the system.

4. Providing Practical Guidelines for Reforming the Financing System of Economics High Schools: The recommendations consider both quantitative and qualitative indicators, allowing for the sustainable development of educational institutions and creating conditions for more effective use of public funds.