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МЕМЛЕКЕТ ЖӘНЕ БИЗНЕС: БАСҚАРУ ТЕОРИЯСЫ МЕН ПРАКТИКАСЫ
ГОСУДАРСТВО И БИЗНЕС: ТЕОРИЯ И ПРАКТИКА УПРАВЛЕНИЯ

ИНВЕСТИЦИЯЛАР, ҚАРЖЫ ЖӘНЕ ЕСЕП
ИНВЕСТИЦИИ, ФИНАНСЫ И УЧЕТ

CONTENT

DESIGN AND IMPLEMENTATION OF AN AUTOMATED BUDGETING SYSTEM AT A MINING ENTERPRISE: THE CASE OF RG GOLD LLP

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ABSTRACT

This article is aimed to investigate the process of designing and implementing an automated budgeting system at a mining enterprise in order to provide an overview of methods, tools and stages of implementation, as well as an analysis of the advantages and practical examples of using this system.

The purpose of the research is to identify the features of the budget process and develop recommendations for the successful implementation of an automated budgeting system to improve financial management and increase the efficiency of a mining enterprise.

Methodology. The following scientific methods were used in the study: comparative analysis; synthesis; methods of systematization and generalization, in-depth interview, SWOT analysis.

Originality / value of the research. The value of this study consists in identifying the key problems of budgeting of industrial enterprises of the Republic of Kazakhstan, developing a methodology for designing and implementing an automated budgeting system for the gold mining company RG Gold LLP. The introduction of an automated budgeting system at the enterprise has made it possible to reduce the time spent on consolidating data when forming budget applications, reduce the risk of the human factor, increase the time for forecasting and modeling the budget for making management decisions and increasing competitiveness in the market.

Findings. Based on diagnostics, SWOT analysis of the current budgeting system in the financial management system of RG Gold LLP and an expert survey to identify its limitations, user needs for the automation process were determined.

A model product for automation of the budgeting system with functional testing of the budget campaign of RG Gold»LLP for 2024 has been designed.

The automated budgeting system of Anaplan RG Gold LLP has been configured and training programs for its users have been developed.

The potential impact of the Anaplan budgeting automation system on accelerating the process of making strategic financial and managerial decisions and increasing labor productivity by saving time, labor and financial resources in RG Gold LLP were estimated.

Keywords: budgeting, financial planning, automated budgeting system, mining industry, gold mining company.

INTRODUCTION

The mining sector of the Republic of Kazakhstan is considered as its economic base. Gold mining in Kazakhstan has determined its position in the world ranking of producers on the 11th place globally.

The contribution of the mining industry to the formation of the country's gross domestic product (GDP) in 2021 amounted to 17 %. The export share of products in the total volume of exports of mining industry products was at the level of 16 %. The industry provides employment for about 273,000 people at 230 mining and metallurgical enterprises [1].

The competitive development of domestic mining enterprises was favored by government support for the industry. The Program for the development of the mining and metallurgical industry in the Republic of Kazakhstan for 2010-2014 was implemented [2].

Legislative and regulatory documents have been adopted, the Code On Subsoil and Subsoil Use (2018), Ecological Code of the Republic of Kazakhstan (2021), the Tax Code (2019), The State Program of Industrial and Innovative Development (2020-2025), The State program «Digital Kazakhstan», the roadmap of industrialization, which together are aimed to diversify the industry in accordance with the modern requirements of the world community.

However, in Kazakhstan, despite the state's focus on digital sector reform, serious problems remain in the industry. In the context of increasing global dependencies, risks and threats to the mining industry of Kazakhstan are increasing.

First of all, there is a depletion of mineral reserves and the lack of investment in exploration.

Secondly, the ability of domestic enterprises to compete in the global market is limited by old technologies that do not correspond to the management approach. Thus, in comparison with foreign companies, the main problems of Kazakhstani mining enterprises remain low operational management efficiency and technological backwardness.

In conditions of constant threats and challenges, the issues of effective enterprise management through the rational use of resources are particularly acute. The adoption of professionally competent management decisions based on innovative technologies and advanced digital achievements contribute to financial and sustainable development, increasing the competitiveness and value of mining enterprises.

Global ubiquitous digitalization, affecting the industrial sphere, literally puts mining sector enterprises in front of the fact of an unambiguous transformation towards digitization of human resource management, budgeting, procurement, transportation, warehousing, logistics and all other business processes of mining enterprises in Kazakhstan.

The specifics of gold mining enterprises, which we noted in the form of the need to search for and constantly invest in intelligence processes, technological innovations, and environmental protection measures, actualizes the problem of simplifying and automating budget processes, implementing information systems and digital aggregators for managing, accounting, planning, and controlling financial resources.

Automation of the budget cycle of gold mining enterprises is an urgent need to improve the efficiency of financial management in the context of digital transformations of the industry.

Thus, automation of budgeting will give gold mining enterprises a flexible management and analytics tool for making strategic financial and managerial decisions to scale and increase business value in uncertain conditions.

The scientific community has conducted quite in-depth studies of the theoretical and methodological foundations of the concept of budgeting, which in its most general form means planning income and expenses both at the state level and at the level of business and households [3; 4; 5].

Budgeting serves as a fundamental instrument in managing a company's finances, enabling not just the management and planning of income and expenses, but also in setting the organization's objectives, strategies, and priorities. By adopting the common budget control, it allows to integrate various elements of an organization's operations into a cohesive plan. This plan is comprehensive, serving multiple purposes, including the planning of efficiency and the comparison of actual outcomes against the planned objectives [6].

The great majority of earlier research in the field of management accounting assumed that budgets play a diagnostic role. Budgets are traditionally used to assess effectiveness and allocate responsibility for outcomes to distinct functions within an organization [7].

According to Govindarajan, «the operational budget typically spans one year and contains information about the income and projected expenses for that period». Budgeting is characterized by several aspects, such as management's allegiance to overall aims, scrutiny and approval by a senior authority, the obligatory and limited essence of the process, along with regular analysis of discrepancies from the budget [8].

Malmi et al. [9] argue that budgeting is one of the primary responsibilities of the company's accountants. Traditional budgets are typically adhere to yearly cycles and embody the translation of strategic plans into financial terms [9]. However recent advancements in budgeting have expanded these budgetary principles. Rolling budgets or forecasts, which companies update monthly or quarterly, represent a shift towards more dynamic and adaptable budgeting methods, differing from the static nature of traditional planning [10]. These rolling forecasts, covering a future period of 12 to 18 months, are continually updated, adding a new month or quarter as each passes, offering benefits like ongoing planning, simplified content, ease of update, forward-thinking, and prompt adaptability in response to changing circumstances [10].

It is important to note that despite the existing developments in the field of conceptual provisions in the field of budgeting, issues related to the study of budgeting as a method of financial planning and enterprise management remain controversial in the scientific world [11]. In this article [11], the authors note that there are various approaches in budgeting processes.

Budget automation issues have mainly been highlighted in recent years due to the growing attention to the possibilities of using modern technologies such as machine and artificial intelligence, data analytics for budget automation. For example, a group of scientists I. M. Hegazy, A.K. Abdelhamid, A.M. Said and others in the article «How to Achieve Operational Excellence through Digital Transformation» [12] write that innovations and digital technologies will contribute to operational excellence in the oil and gas industry.

Thus, a number of researchers have made attempts to study the processes of automating the budget process. The studies of S.N. Nikulina, A.A. Butyugina and E.E. Gorbunova reflects aspects of automation of budgeting in organizations of the agro-industrial complex [13]. Willcocks L., Lacity M. and Craig A. [14] explore the implementation of robotic process automation (RPA) in human resource management (HR) and global business services (GBS).

K. Zavrazhnyi [15] also examines the facets of implementing digital communication processes in Ukrainian business enterprises. Sidorova I.A. highlighted the features of the Ventra Portal cloud software implementation for an outsourcing company [16].

It is worth noting that KPMG, Oracle, EY, IBM and others have expertise in infrastructure solutions using the best IT achievements, cloud technologies in business process automation processes.

In general, general trends in the literature indicate the active use of information technology, the development of software solutions and data analysis methods to automate enterprise budgeting processes in order to improve financial management efficiency. The study showed that despite the available theoretical and methodological developments on the budgetary process, stages of budgeting at enterprises in general, the conceptual methodological foundations of automation of budgeting processes at enterprises, as well as methodological aspects of evaluating the effectiveness of automation of financial resource management of enterprises have not yet been fully disclosed by the scientific community.

In this study, by budgeting, we will understand the method of financial planning of income and expenses of an enterprise's funds, in order to improve the effectiveness of its economic activities.

From a process-focused standpoint, we consider the budgeting procedure as actions for the preparation, review, approval and execution of the budget.

The management team of most mining enterprises, as the business develops, one way or another, will face the vital task of automating the budgeting system, since in the dynamic environment of enterprises there are constant challenges to improve management, strategic management, and innovative transformation.

The solution to automate the budgeting system will reveal numerous issues to the company's team and the financial service. The range of these issues will include how to structure the internal information space, which procedures for regulating the budgeting process need to be improved, and others. An important aspect will be issues related to the methodological aspects of the budget process, the concept of budgeting automation, which software solutions are adequately suitable for business, and the definition of stages of budgeting automation. These issues are of great importance today for enterprises that are focused on sustainable economic growth.

The study of the process of developing and implementing an automated budgeting system for industrial enterprises of the mining sector of the Republic of Kazakhstan was conducted by a team of authors of Narxoz

University within the framework of the scientific project «Development of an automation system for budgeting of the mining enterprise RG Gold LLP».

MAIN BODY

The design of a study on the advancement, design and implementation of an automated budgeting system (ABS) of an industrial enterprise of RG Gold LLP is shown in Figure 1.
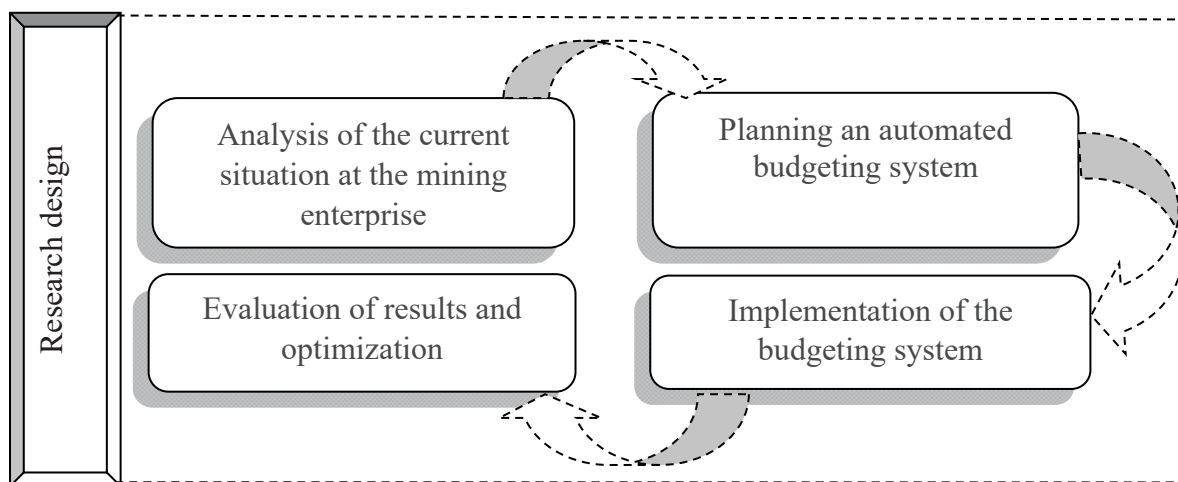
Figure 1 – Research design of an ABS
Note – developed by the authors

The development of this design study made it possible to outline the range of tasks necessary to achieve the project goal and identify methods to achieve it, according to Figure 2.

Thus, the main goal of the project was to design and implement an automated budgeting system for the gold mining company RG Gold LLP based on an assessment of the current budgeting system in the financial management system of the enterprise.

The study of approaches to automation of budgeting in the company's financial management system involves analyzing the available product solutions on the market. To date, the following planning and budgeting modules are presented, which are part of many ERP systems, such as SAP, Oracle, Parus, 1C, Galaktika, Microsoft, BAAN, which are more often implemented in mining and metallurgical companies. When implementing such systems, it is necessary to purchase licenses for all modules being implemented, the cost of which will depend on the number of users.

To consider this type of solution in more detail, the following example of the functional module of the SAP ERP PaB (Planning and Budgeting) can be used. Corporate systems of this class are engaged in enterprise resource planning and are designed to automate many processes, including accounting and management. The PaB functional module is designed specifically for information support of planning and budgeting processes in large companies. With its help, it is possible to collect data on accounting transactions, financial transactions, to create a budget, to make adjustments, to coordinate and build reports. As a result of the implementation of such an IT solution, the amount of manual work is reduced by up to 50 % and the creation of financial reports is accelerated by 40 % [17]. Business intelligence solutions offer new opportunities for automatic data collection and use that support data-driven decision-making. These technological advancements can exceed human efficiency levels and assist businesses in enhancing their decision-making capabilities. Furthermore, earlier research indicates that effectively integrating innovations in information technology (IT) broadly enables companies to realize substantial gains in terms of time efficiency and convenience [18].
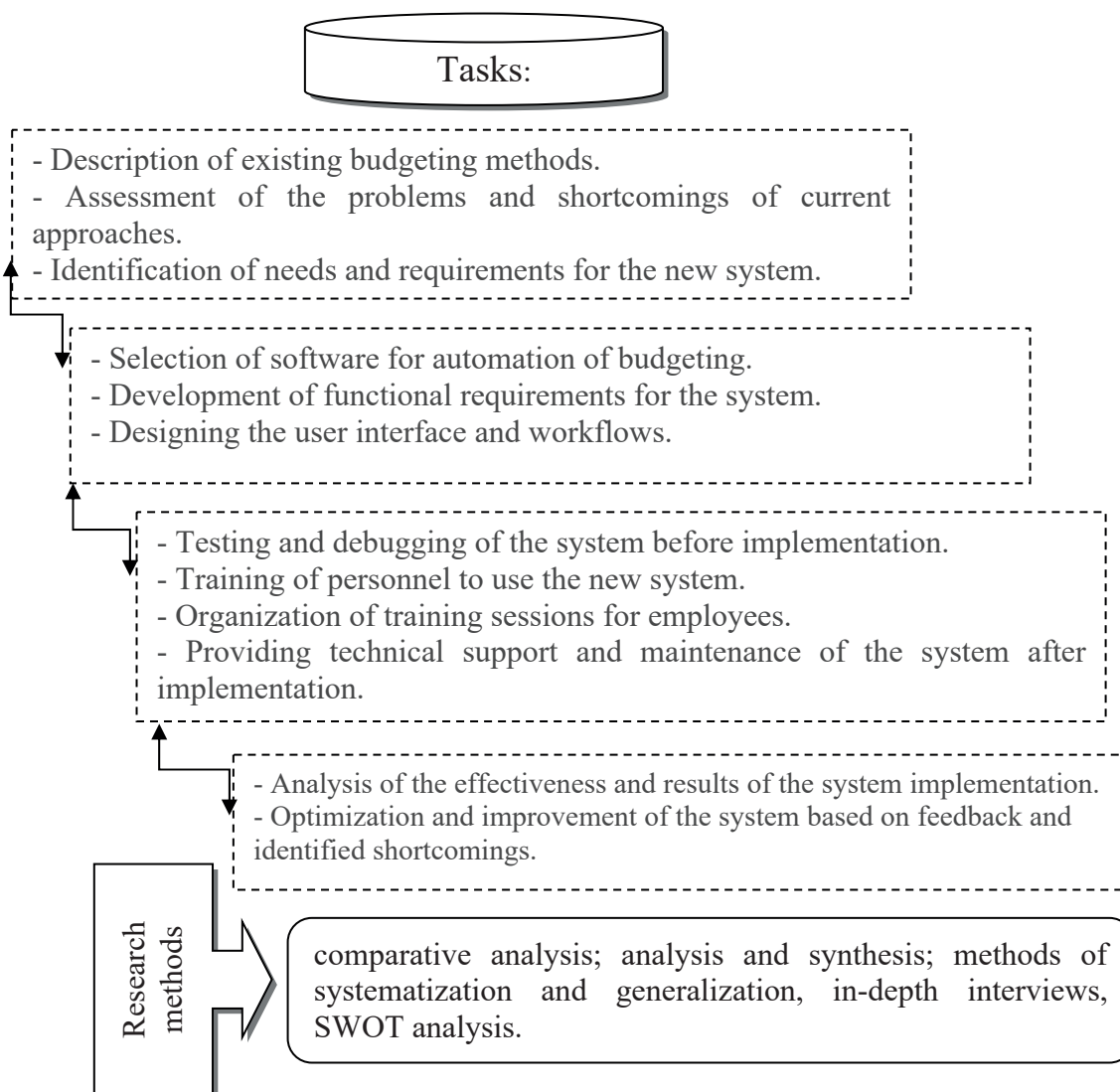
Figure 2 – Tasks and research methods for the development of ABS
Note – developed by the authors.

In recent years, the Robotic Process Automation (RPA) solution has increasingly proven itself [19] for the implementation of automated processes. An RPA can be defined as «a pre-configured instance of software that applies business rules and a combination of actions to independently implement processes, actions, transactions and tasks in one or more unrelated software systems, which is oriented to achieve a result or provide a service, while management is exclusively carried out by a person». RPA refers to the automation of structured scenarios in businesses, either partially or wholly, using software that executes repetitive, rule-based tasks across various functions and applications. Examples of such predefined processes in accounting include tasks like payment processing, account opening, handling invoices, or generating corporate reports [20], these tasks are best suited for standardized processes that are not complex. It is estimated that up to 70 % of routine administrative tasks could be executed through such rule-based and robotic-controlled processes [21]. Prior to adopting an RPA solution, assessing the potential for automation is crucial [22], because establishing a robot involves considerable effort in process modeling, analysis, programming, and testing. In academic and professional literature, the appraisal of these projects typically focuses on process-centric factors like the volume and frequency of the processes, their level of structuring and standardization, and the availability of required data. [23]

Magnitogorsk Iron and Steel Works (MSW) is one of the world's leading steel producers and is a key one in the Russian ferrous metallurgy. The company has created a special unit that is responsible for introducing innovations and improving business efficiency through robotic automation of RPA processes. MSW has robotized a variety of processes, including accounting, logistics, procurement, and HR. Robotization of the scrap metal supply payment process, which includes several divisions, has become one of the most complex and complex projects for the MSW. The scrap metal market is characterized by many suppliers and manufacturers who work on prepayment. Unfortunately, the share of unscrupulous and financially unreliable market participants is high. The development of the robot made it possible to automate key business processes, including making payments, accounting for supplies, accounting, and database maintenance.

The robot carried out most of the work in internal ERP accounting systems based on Oracle, BI, bank clients, etc. In this regard, the company faced the task of integrating the robot into the corporate ERP system and creating individual interaction scenarios for a variety of roles in the corporate system. All information is collected from the RPA system to an Oracle-based web portal, where the data is presented in an accessible form. All robots are centrally controlled here. Employees with the appropriate access give commands to robots and upload the necessary reports. It should also be noted that when implementing RPA solutions, information security became another challenge for MMK [24].

Researchers have pointed out that during 2019-2020, "digital efficiency" emerged as the second-highest risk for the mining industry. For transformation to be both effective and valuable, it's essential that it be undertaken as a collaborative effort across the entire organization, underpinned by a unified business vision and robust commitment from top management. Implementing digital technologies entails a transformative process that extends beyond mere technological change, requiring both organization-wide coordination and an understanding of its impact at the organizational level. As the result of automation of processes and the adoption of new technologies and methods, organizational frameworks will undergo significant transformations. A recent study indicated that technological advancements could potentially alter about 80 % of the existing workforce skills in Chile's mining sector over the medium to long term. Furthermore, there's a significant likelihood, at least 40 %, that these competencies might be supplanted by automated systems. This scenario necessitates a thorough evaluation and proactive planning for new organizational structures. Preparing employees for these emerging technologies is crucial, necessitating the development of new knowledge and skills. Hence, companies should prioritize investing in relevant training programs for digital technology [25].

So, the study of available information systems and automation technologies in the IT solutions market allowed us to identify the advantages of ABS, as well as identify the optimal criteria and requirements for the introductory software product, in accordance with Figure 3.

Based on the above information analysis, the following main advantages of implementing an automated budgeting system can be identified:
- automatic data collection;
- new solutions for business intelligence;
- reducing the amount of manual work;
- accelerate the creation of financial reports;
- centralized data management;
- improving the accuracy of budget calculations.

Therefore, we have formed the following criteria for selecting a digital solution for automating the budgeting system:
- integration with existing IT-programs;
- efficient and automated data management;
- minimized use of MS Excel;
- optimized creation of financial reports;
- practical and advanced business analytics:
- functionality, performance and security.
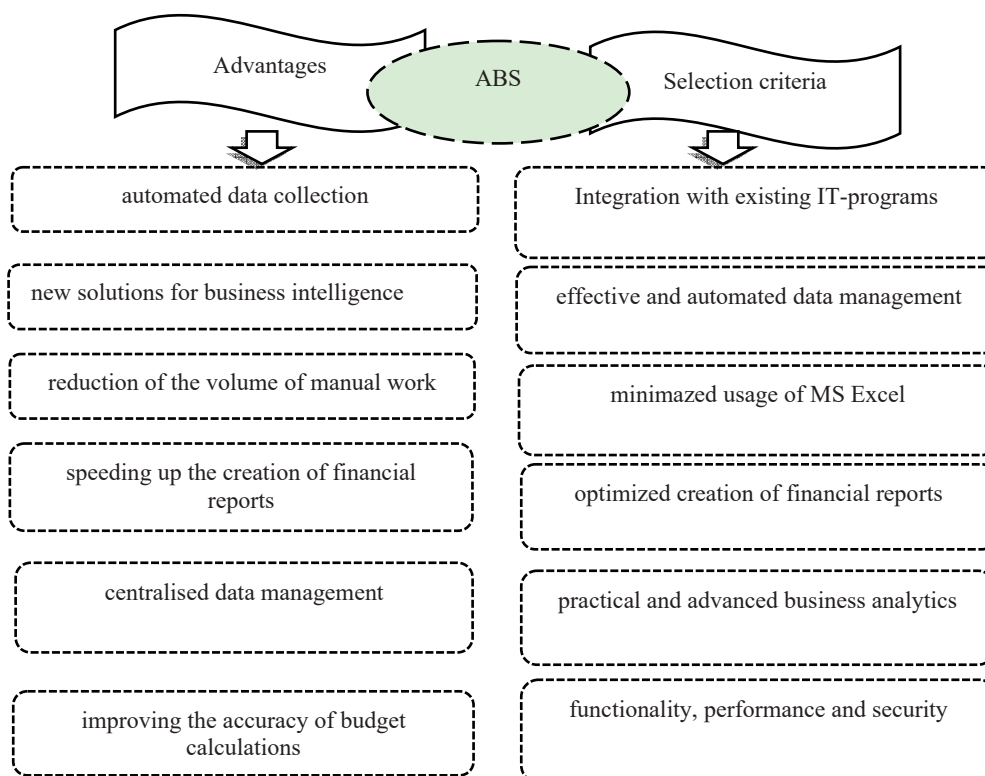
Figure 3 – Advantages and criteria for the implementation of ABS
Note – developed by the authors

The assessment of the organization of financial management and budgeting system of RG Gold LLP made it possible to identify the specifics of the company's activities and identify the needs and requirements for a new automation system from the financial and analytical service (FAS) and the company's management.

The analysis of the current system of formation and procedure for approving the budget of RG Gold LLP made it possible to identify strengths and weaknesses, as well as identify opportunities and threats of the current architecture of the budget model of the enterprise. Due to the confidential data, we are limited in reporting the final results of the SWOT analysis of the current budgeting system of the RG Gold LLP. Figure 4 shows the advantages and disadvantages of the budget model of the enterprise that we have systematized.

Our advantages include the fact that the budgeting procedure is phased and provides a guideline for business development in the future. Regarding the main drawback, in our opinion, it is an insufficient degree of automation of the budget process at the enterprise.

For practical implementation of the project on automation of the budgeting system, a competitive map was developed for RG Gold LLP to select the optimal offer among 3 development companies: KORUS Consulting LLP, Cybernetics.com LLP with software Opti Macro, FOREVALUE LLP with software Anaplan.

The analysis of market offers showed that FOREVALUE LLP has competitive advantages in terms of reliability assessment criteria, positive customer experience and the duration of the company's operation in the market, as well as the presence of strengths.

Anaplan is a cloud-based planning and modeling platform that allows RG Gold LLP to create a budget process model based on operational data, combine data, people and plans in real time, thereby helping management make more effective decisions, according to Figure 5.

To identify the limitations of the current budgeting system of RG Gold LLP and the needs of users for its automation, we conducted an in-depth interview in June 2023.

Diagnostics of the current budgeting system

Advantages

Disadvantages

- coverage of all divisions;
- existence of the clear plan;
- goal setting;
- designation of the time frame.

- prevalence of manual labor;
- human factor of inattention;
- distortion of final budgets;
- lack of business intelligence.
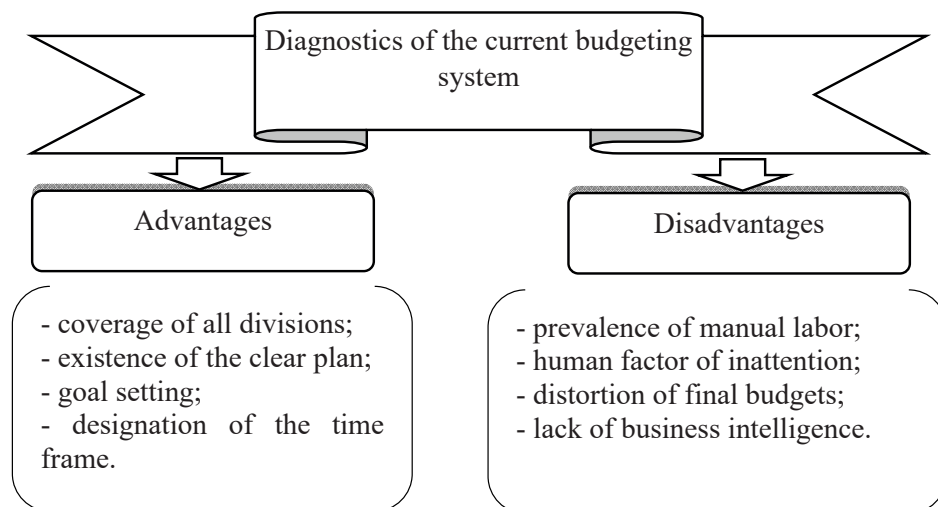
Figure 4 – Diagnostic results of the current budgeting system of RG Gold LLP
Note – compiled by the authors

Anaplan modular software product

Budgeting

Forecasting

Modeling

Business data

Integration of disparate data sources in real time

making informed decisions, improving collaboration and optimizing business processes
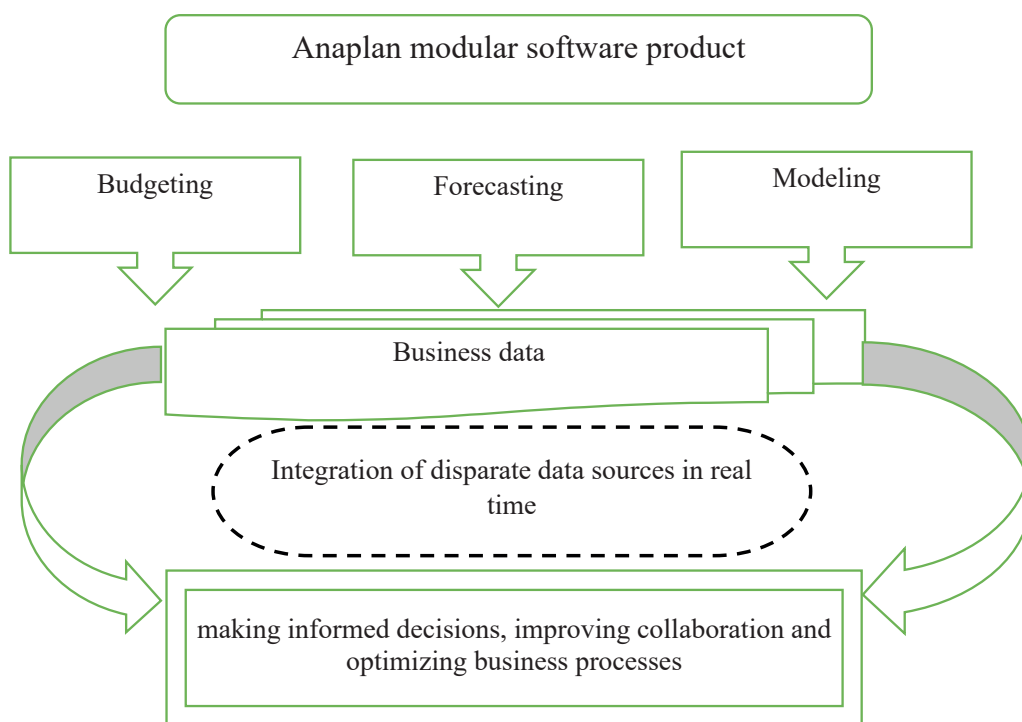
Figure 5 – Features of the Anaplan model software product
Note – developed by the authors according to the source [26]

The purpose of the in-depth interview was to identify users' expectations from the new automated budgeting system of RG Gold LLP and develop recommendations for its development, considering the existing main problems and limitations of the current budgeting system. The object of the study was TOP management, FAS employees and representatives of the structural divisions of RG Gold LLP involved in the formation of the company's budget.

The subject of the study is the needs and preferences of users regarding the new automated budgeting system.

Research objectives:

- to identify the main shortcomings of the current budgeting system in RG Gold LLP through an in-depth interview;

- determine users' expectations from the automated financial budgeting model;

- identify the possibilities of integrating the current budgeting system into an automated one and training employees to work in it.

During the in-depth interview, the complex and time-consuming processes of the company's budget process were revealed. For example, filling out forms with needs and consolidating data required manual labor and time.

The process of developing a model software product for the implementation of budgeting processes of RG Gold LLP assumed a breakdown of work into several phases, table 1.

Table 1 – Stages of design and development of Anaplan ACS by RG Gold LLP

Design phases	Types of work
Phase I – Budgeting	- design of automation of budget application formation (integration of 1C KUFIB systems with Anaplan)
Phase II – Financial statements	- works related to revenue modeling (production plan, volume of finished products and revenue; GOGS, taking into account the production and technological specifics of mining enterprises, taxes, CAPEX, etc.)
Phase III – Consolidation -	- design of a single aggregating form for the consolidation of all budget applications for the analysis and formation of the enterprise budge.
Note – compiled by the authors based on the results of the study	

Thus, the complete process of designing and developing a model software product for the implementation of budgeting processes of RG Gold LLP is quite time-consuming and step-by-step.

It should be noted that the process of operational implementation and testing of the new ABS in RG Gold LLP took place during the budget campaign for 2024-2025. The testing process was accompanied by training of FAS employees to work in the Anaplan system. So, the testing process included successive stages:

Stage I - Collection and accounting of requirements. Before testing, it is extremely important to understand the specific budgetary requirements of the gold mining industry. This includes understanding the types of data that need to be managed, the financial and operational metrics that are critical, as well as the unique challenges and regulatory constraints faced by the industry.

Stage II - Testing planning. Here, first of all, it is necessary to determine the necessary and sufficient amount of data for testing, which should cover all the functionality of Anaplan developed during the automation project. It is necessary to check the correctness and completeness of the uploaded and entered data, which will determine the test set.

Stage III - Testing of data integration. When importing test data, you need to make sure that the data can be imported from various sources, such as production, financial, and operational data.

Stage IV - Testing of modeling and budgeting. Creating a test budget model. To do this, users need to be able to create working budget models that consider factors such as production costs, commodity prices, labor and equipment.

Stage V is User interface testing. At this stage, the user interface is being tested, that is, the convenience of working with the system for the end user. It is necessary to make sure that the user interface is intuitive and convenient for budgeting specialists for companies in the gold mining industry.

Stage VI is Performance testing. It is important to test the performance of Anaplan under various workloads, making sure that it can handle the amount of data and user activity expected in a gold mining company. In this project, this stage was carried out in real time, and additional time, at least 2-3 budget cycles, will be required to fully assess the performance of the implemented ABS.

Stage VII - Safety and compliance testing. The implementation of the Anaplan software system involves the processing of confidential financial and business data. It should be noted that the Anaplan cloud platform has the highest standards of data protection, confirmed by international certificates.

Stage VIII - User Acceptance Testing (User Acceptance Testing UAT). This stage allowed us to check how Anaplan meets the specific requirements and workflows of end users. In the current case, UAT has been integrated along with the design, configuration, and implementation process.

To teach the use of the Anaplan system, RG Gold LLP held a training session in two stages:

- in the first phase of the project, general training for all participants in budgeting;

- in the second phase of the project, training is provided for the newly created competence center of RG Gold LLP and the production department.

In general, the training of end users was aimed at adapting users to the new Anaplan system.

A logical part of the introduction of a new ABS for enterprises in the extractive industry should be an assessment of the effectiveness of the introduction of technological innovations. Considering that RG Gold LLP is still at the stage of implementing automation of the budgeting system, it is premature to identify the overall economic effect. However, to assess the initial changes in work processes after the introduction of the Anaplan system, we conducted a qualitative study - an in-depth interview with FAS employees. The purpose of the in-depth interview was to study budgeting processes after the introduction of automation in RG Gold LLP.

Let's outline the main results of the implementation of the Anaplan system in terms of the efficiency of the budget process for the company:

Firstly, the risk of the human factor in the budget process has been reduced. Thus, there was a decrease in manual work in MS Excel after the introduction of automation. Most of the processes are now carried out in the Anaplan system, in which several people/departments can work at once.

Secondly, the Anaplan system has verification tools that check errors during filling, prevent technical errors, that is, the system has minimized the risks of the technical plan.

Thirdly, the next important advantage of the system is data analytics, since before the implementation, employees of the FAS department spent a lot of time verifying and correctly filling in data. Moreover, FAS employees can create special analytical information panels for top management, which reflect the main financial indicators. Another characteristic of the Anaplan system is the advanced data granularity.

In general, the development and implementation of Anaplan made it possible to automate the budgeting process of RG Gold LLP. The results were the automation of the collection of information on budget applications, which was previously the most labor-intensive process in the company. In addition, the process of collecting financial statements, such as profit and loss statements, cash flow statements, and unit cost reports, has been automated.

CONCLUSION

The budget process has difficulties in the mining sector. Thus, the methodological foundations of the budgeting automation system are determined by the specifics of the industry and the activities of gold mining enterprises. Therefore, when designing and developing an ABS, it is necessary to carefully develop approaches to cost formation and rationing, planning a production plan and various budgets (P&L, Cash flow, etc.).

A review of the software development market and digital budgeting aggregators showed that today there is a huge selection of product solutions for automating the financial management unit and budgeting of industrial enterprises. The competitive analysis of the ABS developers allowed us to determine the appropriate software product for RG Gold LLP. Thus, the introduction of an ABS based on Anaplan software at the enterprise will result to an enhance in the quality of the budget process, improve the accuracy of forecasts and make informed financial decisions, as well as optimize time and resources, which will contribute to the effective financial manageability of the enterprise.

Diagnostic procedures were carried out to identify the limitations and barriers of the current budgeting system in the financial management system of RG Gold LLP using SWOT analysis and in-depth interview with experts, which made it possible to clearly identify the needs of users for budget automation and requirements for the future budget model. We consider this stage in the design and implementation of ABS for industrial

enterprises in Kazakhstan to be very important, since it allows us to determine the exact requirements, criteria, and parameters of the future system for a particular enterprise.

The process of designing, developing and implementing ABS takes place in stages. In our case, first, the design of an effective automated budgeting model of the mining enterprise RG Gold LLP with requirements for functionality, performance and safety is defined.

Methodological developments for setting up functionals, classifiers, reference books and regulations for the normalization of cost item metrics are designed. The function of adaptation to changing needs and the possibility of entering additional analytical indicators with the introduction of calculation formulas by the competence center (FAS specialists) has been considered.

A model product for automating the budgeting system in the Anaplan cloud platform was designed, and functional testing of the Budgeting subsystem of RG Gold LLP was carried out in the real Budget 2024 case.

The possible risks of introducing the Anaplan system into the financial management process of RG Gold LLP have been worked out. At the implementation stage, user acceptance testing and double verification testing were conducted, which confirmed that the system is adapted to user needs, functions as intended and meets business goals.

The automated budgeting system of Anaplan RG Gold LLP has been configured and training programs for its users have been developed.

It is recommended to create a competence center based on the Financial and Analytical Service (FAS) RG Gold LLP to maintain and develop the knowledge and skills of employees on the use of the Anaplan cloud platform. Two programs have been developed to master the knowledge and skills of users and the competence center for working in the new system.

An assessment of the initial changes in work processes after the introduction of the Anaplan system was carried out through an expert survey with FAS employees. Automation of the budgeting system ensured the speed of all operations, accuracy, transparency of data, made integrated business planning possible, ensuring its flexibility, rapid adaptation to changing conditions, led to a high level of staff communications, its focus on analysis and business decision-making procedures, thereby improving the quality of management, employee satisfaction with work results.

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ТАУ-КЕН ӨНДІРУ КӘСІПОРНЫНДА АВТОМАТТАНДЫРЫЛҒАН БЮДЖЕТТЕУ ЖҮЙЕСІН ЖОБАЛАУ ЖӘНЕ ЕНГІЗУ: «RG GOLD» ЖШС КЕЙСІ

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АҢДАТПА

Бұл мақала енгізу әдістері, құралдары мен кезеңдеріне шолу жасау, сондай-ақ осы жүйені пайдаланудың артықшылықтары мен практикалық мысалдарын талдау мақсатында тау-кен кәсіпорнында автоматтандырылған бюджеттеу жүйесін жобалау және енгізу процесін зерттеуге бағытталған.

Зерттеудің мақсаты бюджеттік процестің ерекшеліктерін анықтау және қаржылық басқаруды жақсарту және тау-кен кәсіпорнының тиімділігін арттыру үшін автоматтандырылған бюджеттік жүйені сәтті іске асыру бойынша ұсыныстар әзірлеу болып табылады.

Әдіснамасы. Жұмыста келесі ғылыми әдістер қолданылды: салыстырмалы талдау; синтез; жүйелеу және жалпылау әдістері, терең сұхбат, SWOT-талдау.

Зерттеудің бірегейлігі / құндылығы. Бұл зерттеудің құндылығы Қазақстан Республикасының өнеркәсіптік кәсіпорындарын бюджеттеудің негізгі проблемаларын анықтаудан, «RG Gold» ЖШС алтын өндіруші компанияның автоматтандырылған бюджеттеу жүйесін жобалау және енгізу әдіснамасын әзірлеуден тұрады. Кәсіпорында автоматтандырылған бюджеттеу жүйесін енгізу бюджеттік өтінімдерді қалыптастыру кезінде деректерді шоғырландыруға жұмсалатын уақытты қысқартуға, адами фактор тәуекелін азайтуға, басқарушылық шешімдер қабылдау және нарықта бәсекеге қабілеттілікті арттыру үшін бюджетті болжау мен модельдеуге уақытты ұлғайтуға мүмкіндік берді.

Зерттеу нәтижелері. «RG Gold» ЖШС қаржылық басқару жүйесіндегі қолданыстағы бюджеттеу жүйесін диагностикалау, SWOT-талдау және оның шектеулерін анықтау бойынша сараптамалық сауалнама негізінде пайдаланушылардың оны автоматтандыру процесіне қажеттіліктері айқындалды.

2024 жылға арналған «RG Gold» ЖШС бюджеттік науқанының функционалдық тестілеуімен бюджеттеу жүйесін автоматтандыру бойынша модельдік өнім әзірленді.

«RG Gold» ЖШС Anaplan автоматтандырылған бюджеттеу жүйесін баптау жүргізілді және оны пайдаланушыларды оқыту бағдарламалары әзірленді.

Anaplan бюджеттеуді автоматтандыру жүйесінің стратегиялық қаржылық-басқару шешімдерін қабылдау процесін жеделдетуге және «RG Gold» ЖШС-де уақытша, еңбек және қаржы ресурстарын үнемдеу арқылы еңбек өнімділігін арттыруға әлеуетті әсері бағаланды.

Түйін сөздер: бюджеттеу, қаржылық жоспарлау, автоматтандырылған бюджеттеу жүйесі, тау-кен өнеркәсібі, алтын өндіруші компания.

ПРОЕКТИРОВАНИЕ И ВНЕДРЕНИЕ АВТОМАТИЗИРОВАННОЙ СИСТЕМЫ БЮДЖЕТИРОВАНИЯ НА ГОРНОДОБЫВАЮЩЕМ ПРЕДПРИЯТИИ: КЕЙС ТОО «RG GOLD»

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АННОТАЦИЯ

Настоящая статья направлена на исследование процесса проектирования и внедрения автоматизированной системы бюджетирования на горнодобывающем предприятии с целью представления обзора методов, инструментов и этапов внедрения, а также анализа преимуществ и практических примеров использования данной системы.

Целью исследования является выявление особенностей бюджетного процесса и разработка рекомендаций по успешной реализации автоматизированной системы бюджетирования для улучшения финансового управления и повышения эффективности горнодобывающего предприятия.

Методология исследования. В работе использованы следующие научные методы: сравнительный анализ; синтез; методы систематизации и обобщения, глубинного интервью, SWOT-анализа.

Оригинальность / ценность исследования. Ценность данного исследования состоит в выявлении ключевых проблем бюджетирования промышленных предприятий Республики Казахстан, выработке методологии проектирования и внедрения автоматизированной системы бюджетирования золотодобывающей компании ТОО «RG Gold». Внедрение автоматизированной системы бюджетирования на предприятии позволило сократить время, затрачиваемое на консолидацию данных при формировании бюджетных заявок, снизить риск человеческого фактора, увеличить время на прогнозирование и моделирование бюджета для принятия управленческих решений и повышения конкурентоспособности на рынке.

Результаты исследования. На основе диагностики, SWOT-анализа действующей системы бюджетирования в системе финансового управления ТОО «RG Gold» и экспертного опроса по выявлению ее ограничений определены потребности пользователей к процессу ее автоматизации.

Спроектирован модельный продукт по автоматизации системы бюджетирования с функциональным тестированием бюджетной кампании ТОО «RG Gold» на 2024 год.

Проведена настройка автоматизированной системы бюджетирования Anaplan ТОО «RG Gold» и разработана программы обучения его пользователей.

Оценено потенциальное влияние системы автоматизации бюджетирования Anaplan на ускорение процесса принятия стратегических финансово-управленческих решений и повышение производительности труда посредством экономии временных, трудовых и финансовых ресурсов в ТОО «RG Gold».

Ключевые слова: бюджетирование, финансовое планирование, автоматизированная система бюджетирования, горнодобывающая промышленность, золотодобывающая компания.

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ИМПОРТОЗАМЕЩЕНИЕ КАК СТРАТЕГИЯ РАЗВИТИЯ СТРАН С ПЕРЕХОДНОЙ ЭКОНОМИКОЙ: ОПЫТ КАЗАХСТАНА

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АННОТАЦИЯ

Цель исследования – раскрыть роль политики импортозамещения Казахстана в выборе экономической траектории развития экономики с позиции ее декарбонизации и расширения международного сотрудничества.

Методология: теоретико-методологическая основа исследований базируется на методах системного и структурного анализа, позволяющих изучить сущность политики импортозамещения и выявить степень ее влияния на экономику Казахстана Научно-методический аппарат включает ретроспективный, причинно-следственный, текущий и перспективный анализ, сопоставление статистических данных открытого доступа, характеризующих политику импортозамещения.

Оригинальность / ценность исследования заключается в обосновании ускорения адаптации институциональных рамок к новым реалиям, что обеспечит поддержку приоритетных секторов экономики как лидеров нового технологического уклада.

Результаты исследования – определены структурные ограничения экономики, которые необходимо принимать во внимание при реализации политики импортозамещения. Выявлены наиболее проблемные сектора экономики Казахстана с точки зрения зависимости от поставок импорта. Сформулированы приоритетные направления политики импортозамещения в контексте нарастания геополитических рисков и трансформации глобальных цепочек создания стоимости. Выделены ключевые аспекты трансформации реального сектора экономики Казахстана, имеющего потенциальные возможности снижения импортозависимости и роста привлекательности у иностранных инвесторов. Обоснована роль цифровых решений в реализации политики импортозамещения.

Практическая значимость исследования. Казахстан адаптирует накопленный мировой опыт формирования политики импортозамещения. Пример Казахстана может быть полезным странам с переходной экономикой, стремящимся к росту самообеспеченности и конкурентоспособности реального сектора экономики, расширяющим свое присутствие на международных рынках.

Ключевые слова: Казахстан, переходная экономика, государственное регулирование, импортозамещение, обрабатывающая промышленность, предприятие.

ВВЕДЕНИЕ

Казахстан предпринимает действенные шаги для построения новой модели глобализации в контексте достижения устойчивого развития, перехода бизнеса на принципы ESG (Environmental, Social, and Corporate Governance), декарбонизации национальной экономики. Страна готова использовать накопленный углеводородный потенциал для поддержания энергетической безопасности на мировых и европейских рынках.

Геополитические факторы и природные катаклизмы ускоряют перестройку экспортно-импортной модели экономики Казахстана: страна оперативно реагирует на изменения рыночной конъюнктуры для повышения отдачи от ресурсного потенциала. Исходя из важности сохранения интеграции в мирохозяйственную систему, рассматриваются новые траектории репозиционирования в глобальных производственных связях.

Очередным этапом продвижения социально-экономической стратегии роста конкурентоспособности Казахстана должна стать политика импортозамещения, которая является следствием не только внешних факторов, но необходимостью достижения технологической самостоятельности в предстоящий период промышленных инноваций. Импортозамещение в реальном секторе позволит минимизировать проблемы с нехваткой отдельных видов продукции, ускорить разработку отечественных технологий и продуктов.

Об актуальности обозначенного исследования свидетельствуют принимаемые государством меры по поддержке импортозамещения, усилению инвестиционной активности путем создания новой техники и технологий на внутреннем рынке [1-2].

Обзор литературы. Обзор научной литературы подтверждает возрастающий интерес стран с переходной экономикой к различным аспектам политики импортозамещения, изучению исторического опыта его развития [3]. При этом на пути к экономическому росту каждая страна с учетом конкретных условий своего существования, формирует собственный сценарий импортозамещения. Исследование теоретических основ, положенных в основу современной политики импортозамещения, позволяет заключить, что, к примеру, применяемые протекционистские меры могут принести отрицательные последствия. В конечном счете страна столкнется с уменьшением благосостояния граждан, увеличением выпуска неконкурентоспособных товаров, общим снижением эффективности экономики.

Многие авторы в исследованиях импортозамещения как длительного процесса наращивания конкурентных позиций промышленности, затрагивающего ключевые компоненты цепочки создания стоимости, указывают на то, что высокая зависимость от импорта обостряет экономическую отсталость страны [4; 5]. Научно-обоснованные выводы базируются на оценке политики импортозамещения, к примеру Малайзии, где применяется открытая модель с экспортом или африканской закрытой модели, опирающейся на собственные ресурсы.

Ряд авторов [6; 7] подчеркивают значимость промышленной политики в укреплении импортонезависимости и конкурентных позиций государства.

В работах [8; 9; 10] показано, как цифровизация, ускоряющая переход от модели массового потребительского спроса к индивидуальному производству, способствует продвижению высокотехнологичного индустриального производства, укрепляет импортонезависимость страны. Авторы подчеркивают возрастающую роль НИОКР, на которые приходится порядка 25 % добавленной стоимости обрабатывающей промышленности. Согласно исследованиям, эффективность импортозамещения во многом зависит от грамотно выстроенного управления инновациями [11] и инвестиционной политикой [12]. Сегодня, например, в Китае, Индии для замещения импортных товаров активно разрабатываются высокотехнологические продукты.

Особого внимания заслуживают научные работы, показывающие как импортозамещение за счет насыщения внутреннего рынка может повлиять на рыночное позиционирование промышленных предприятий в развивающихся странах [13; 14; 15].

Казахстан перенимает передовую практику различных стран по уменьшению импортозависимости и внедрению стратегии внутристрановой ценности, стремится найти собственный путь к импортозамещению рынка готовой продукцией и наращиванию экспортного потенциала.

Одна из насущных проблем экономики Казахстана связана с созданием высокотехнологичной промышленности, также требующей активизации процессов импортозамещения. В исследовании [16] показана значимость диверсификации реального сектора, ее влияние на инновационное развитие Казахстана. Различные аспекты влияния импортозамещения на устойчивость и самодостаточность национальной экономики обсуждаются авторами [17; 18].

Таким образом, перед экономической наукой стоят сложные задачи совершенствования концепции импортозамещения, как первоосновы формирования практических рекомендаций выбора импортозамещающих и экспортоориентированных производств, обоснованию принципов оценки их конкурентоспособности.

В целом востребованность изучения обозначенной проблемы для Казахстана, недостаток ее освещения в отечественной литературе во многом предопределили необходимость ее углубленного изучения.

ОСНОВНАЯ ЧАСТЬ ИССЛЕДОВАНИЯ

В Казахстане политика импортозамещения рассматривается как процесс роста национального производства, предполагающий применение разнообразных механизмов, временно ограничивающих импорт в импортозамещаемых отраслях. Реализация политики импортозамещения это не просто замена импорта на местный продукт, попытка добиться любыми средствами импортозамещения может уменьшить национальные резервы.

Казахстан решает задачи достижения технологического суверенитета путем создания высокотехнологичного производства, в соответствии с отраслевыми потребностями. С этой целью вносятся принципиальные изменения во внешнюю торговлю касательно отраслей, содействующих импортозамещаемым производствам, в части предоставления им сырья, полуфабрикатов и других производственных ресурсов, что безусловно укрепляет конкурентные позиции государства.

Актуальная модель импортозамещения, механизм его становления и перспективы развития имеют несколько направлений. Выделим главные критерии, предполагающие целесообразность замены импортного продукта благодаря повышению конкурентоспособности местных товаров, или наращивания объемов производства изделий ввиду лимитирования импортного продукта:

– поощрение экономического роста, исходя из имеющихся резервов и осуществления долговременных структурных трансформаций благодаря мобилизации иностранных инвестиций, освоения производственных мощностей;

– импортозамещение за счет протекционистских государственных действий касательно отраслей с потенциалом развития. Это позволит удовлетворить запросы внутреннего рынка и открыть возможности местным производителям осваивать рынки за пределами страны.

Несмотря на то, что за годы реализации стратегии импортозамещения были задействованы различные инструменты промышленной, фискальной и монетарной политики, тем не менее остаются нерешенные проблемы со снижением импортозависимости, что обусловлено сложностями формирования конкурентной среды, монополизацией внутреннего рынка, низким производственно-техническим уровнем (Таблица 1).

Таблица 1 – Динамика импорта Казахстана, млрд. долл.

Показатели	Годы				
	2017	2018	2019	2020	2021
Импорт, всего	29,6	33,6	39,7	38.9	41,2
В том числе:					
- обработанные	27,2	30,4	35,7	36,4	38,3
- сырье	2,4	3,2	4,0	2,5	2,9
Импорт промежуточных товаров	14,9	17,6	19,2	17,2	19,2
Примечание – составлено авторами на основе [19]					

Сложности в реализации политики импортозамещения также обусловлены структурными ограничениям (технологические и логистические риски, риски изменения внешнеторговых путей, что отразилось на товарной структуре экспорта и импорта; слабая товарная разновидность экспорта, географическая концентрация экспортно-импортных коммуникационных связей, уровень предпринимательской активности в цепочках создания стоимости).

Реализуемая политика по стимулированию экспортной диверсификации пока не привели к существенному снижению доли сырьевых товаров в отечественном экспорте, преимущественно формируемом за счет поставок энергетического сырья и металлов на внешние рынки. Несмотря на то, что по количеству и разнообразию ресурсов минерально-сырьевая база Казахстана занимает одно из ведущих мест в мире, страна по-прежнему восприимчива к колебаниям спроса и цен на полезные ископаемые, устанавливаемые на глобальных сырьевых рынках.

О высоком уровне импортозависимости промышленной сферы свидетельствует то, что сырьевые товары в общем объеме импорта составляют всего 10,8 %, импорт промежуточной продукции, направляемой на последующую переработку, объединяет совокупные объемы поставок и потребительских, и инвестиционных товаров [19]. Учитывая место Казахстана в мировых торговых операциях в рамках международного разделения труда, стоимость импорта промежуточных товаров выступает элементом производственных расходов местных предприятий, занимающих более высокие позиции в цепочке создания стоимости.

Не принесли ожидаемого результата меры по насыщению рынка товарами местного содержания с высокой технологической сложностью, предпринятые государством в период новой индустриальной политики. В частности, рост вложений в обрабатывающую промышленность, крайне зависимую от импортного сырья и комплектующих изделий, не производимых в Казахстане и не имеющих перспектив к локализации (Таблица 2).

Таблица 2 – Показатели обрабатывающей промышленности Казахстана

Показатель	Годы									
	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Инвестиции в основной капитал, млрд. тенге	597,0	652,1	722,3	774,2	834,1	981,6	1247,2	994,0	1062,7	1550,0
Затраты на технологические иннова-ции, млн. тенге	151584,4	166605,1	202946,1	424902,0	1197059,4	614873,2	610862,3	247148,9	302933,4	421177,4
Уровень инновационной актив-ности пред-приятий по всем типам инноваций, %	5,7	8,0	8,1	8,1	9,3	9,6	10,6	11,3	11,5	10,5
Примечание – составлено авторами на основе [20]										

Мультипликативный эффект от обрабатывающей промышленности, доля которой в ВВП страны за 2012-2021 гг. возросла всего на 2,3 %, так и не получен. Только в 2021 г. доля импорта промежуточных товаров, не имеющих перспектив к локализации в стране, превышала 50 %, объем импорта продукции обрабатывающей промышленности составил 38,3 млрд. долл.

Даже обширный пакет инструментов государственной поддержки ведущих отраслей промышленности так и не решил проблемы импортной зависимости, остались открытыми вопросы обеспечения внутреннего рынка казахстанскими продуктами с перспективами выхода на новые рынки [21; 22].

Среди отраслей наиболее импортозависимыми являются машиностроение, металлургия и химическая промышленность, где доля импорта промежуточных товаров составляет 23,6; 16,1 и 12,7 % соответственно. Отраслевая неоднородность зависимости от импорта объясняется сложностями перехода промышленности на местные технологии, недостатком самостоятельных новых решений накопившихся производственных задач, низкой инновационной активностью предприятий, высоким физическим износом основных фондов, низкой долей высокотехнологичного экспорта, дефицитом кадров (Таблица 2).

Почти половина предприятий обрабатывающей промышленности импортирует сырье для производства их конечной продукции из стран ЕАЭС и ЕС. Для незначительной части предприятий источником сырья являются местные предприятия и лишь немногие субъекты хозяйствования имеют собственную сырьевую базу. Наибольшую потребность в сырье, импортируемом из стран ЕАЭС, испытывают машиностроители и металлурги. Например, ежегодно металлургические предприятия Казахстана производят 453 тыс. тонн меди, 266 тыс. тонн цинка и 249 тыс. тонн. алюминия, которые экспортируются и перерабатывается внутри страны для выпуска продукции с высокой добавленной стоимостью. Но при этом остается актуальной проблема нехватки металла на внутреннем рынке для местных предприятий. Ключевые причины зависимости от импортного сырья обусловлены, главным образом, отсутствием в Казахстане производства высококачественного сырья и материалов и низким качеством местной продукции.

Подчас производителям проще использовать импортные аналоги, чем инвестировать в обновление производственно-технической базы, устанавливать взаимосвязь с местными поставщиками и потребителями. Отсутствие конкурентов и ставка на замещение импорта негативно отражаются на качестве создаваемого продукта. Ценовая конкурентоспособность отечественного производства определяется, среди прочего, не дорогими импортными промежуточными товарами. Введение ограничений, тормозящих продвижение импорта, увеличивает себестоимость изделий, содержащих в своем составе как минимум один импортный посредствующий товар.

В структуре импорта наибольшая доля приходится на поставку машин, электротехнического оборудования, транспортных средств, причем около 30 % поставляется из дальнего зарубежья, 10 % – из стран СНГ. Ведущие импортеры – Россия, Китай и Германия (Рисунок 1).
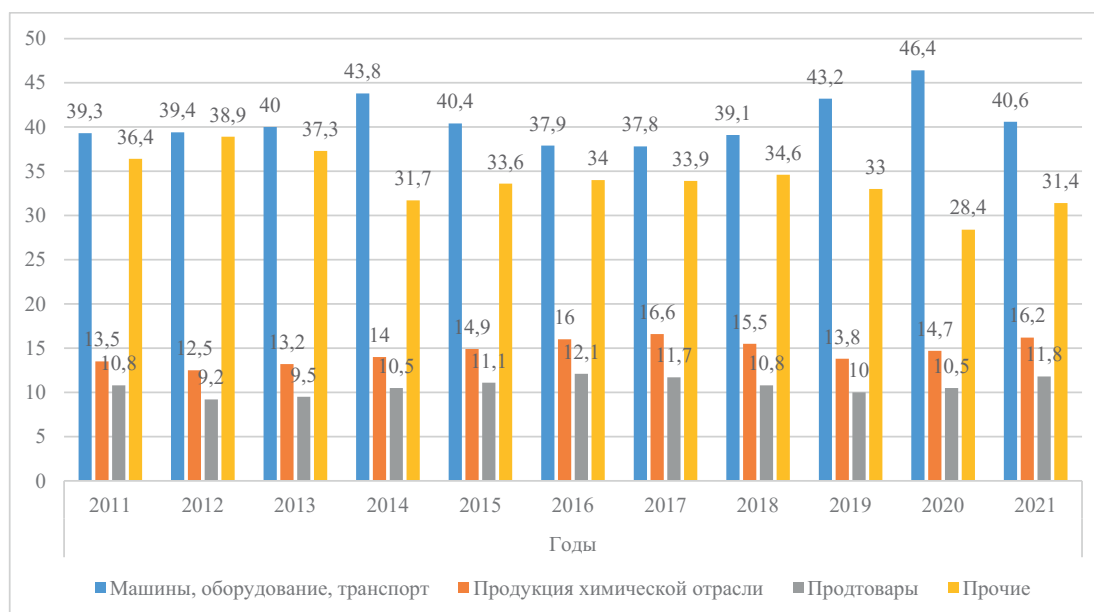
Рисунок 1 – Структура импорта Казахстана, %
Примечание – составлено авторами на основе [20

В машиностроении вопрос замещения импорта собственным производством весьма актуален с позиции стимулирования отрасли и создания благоприятных условий для развития машиностроения внутри страны и выхода на экспорт. На внутреннем рынке машиностроителям невозможно достигнуть конкурентоспособности своей продукции и создать наукоемкие прорывные технологии из-за масштабов производства. Единственным мерилом конкурентоспособности местных производителей может быть только экспорт их продукции, сейчас значительная часть экспорта машиностроения представлена реэкспортом.

К сожалению, примером необоснованной государственной поддержки конкретных секторов обрабатывающей промышленности, защиты их от внешней конкуренции внутри Казахстана, является автомобилестроение, ориентированное на экспорт в соседние страны, получающее непосредственное содействие от государства (например, инвестиционные субсидии, льготное кредитование и предоставление земельных участков, налоговые преференции). Государство защищает внутренний рынок от импорта посредством высокого утилизационного сбора. Благодаря защищенности местных производителей от конкурентов, возросли цены на иностранные автомобили, укомплектованные в стране, отрасль получает большой доход, не боясь падения спроса на товар.

Переход Казахстана на цифровую экономику осуществляется все еще по «догоняющей» модели развития: зависимость от иностранных IT-разработок и специалистов, закуп высокотехнологичного программного обеспечения, услуги сторонних организаций и специалистов. Поэтому принципиально, что развитие отечественных программных средств является важной задачей импортозамещения, обеспечения технологического суверенитета страны.

В условиях незначительного внутреннего рынка государственное финансовое содействие автосборочным предприятиям (налоговые льготы, инвестиционные субсидии, льготное кредитование) наряду с высокими барьерами по защите от внешней конкуренции, тормозит производителей. Пользуясь финансовыми ресурсами государства и потребителей, автосборочные предприятия имеют доход и не заинтересованы в росте конкурентоспособности на внешнем рынке.

На текущий момент, импортная продукция превалирует в сегментах с технологически более сложным оборудованием, где предприятиям предстоит осваивать цифровые двойники, используя технологии информационного моделирования и машинного обучения. Главные поставщики товаров высокого передела в Казахстан: Китай (87 % импорта вычислительных машин, 83 % оборудования для коммуникаций), Турция, Вьетнам, Гонконг [23].

Несмотря на то, что современный уровень комплексной цифровизации на предприятиях пока не получил массового характера, требует упорядоченности и последующей инициализации, остро стоит вопрос о минимизации импортозависимости от инжиниринга и обслуживания техники, необходимости замещения отечественными аналогами продуктов иностранных разработчиков, на базе которых построены критически важные информационные системы (к примеру, АСУТП, MES-системы) предприятий, переходе электроэнергетики на местные информационные программные продукты с развитием электронной компонентной базы.

Использование местного программного обеспечения для автоматизации предприятий позволит на 50 % снизить время реагирования на чрезвычайные ситуации и стоимость сервисной поддержки информационных систем, в 3-4 раза сократить время перепланировки логистических цепочек.

Важнейшее место в развитии импортозамещения занимает химическая промышленность, где объемы импорта втрое превосходят экспорт местной продукции, только за счет импортных поставок покрывается потребность местных предприятий в сложных товарах (Рисунок 2).

Из-за отсутствия производственных мощностей, покрывающих внутренний спрос, рынок продукции химической промышленности полностью импортозависимый, отсутствуют эффективные технологии, необходимые для декарбонизации экономики, позволяющие минимизировать выбросы. Государство содействует росту конкурентоспособности местных производителей и импортозамещающей продукции, поскольку даже при ежегодном росте производства, потребности внутреннего рынка в новых видах экологичной и энергоемкой химической продукции с высокой добавленной стоимостью, не покрываются: например, в 2021 г. при объеме внутреннего рынка 1486,5 млрд. тенге, доля местных товаров незначительна (6,9 %) [24].
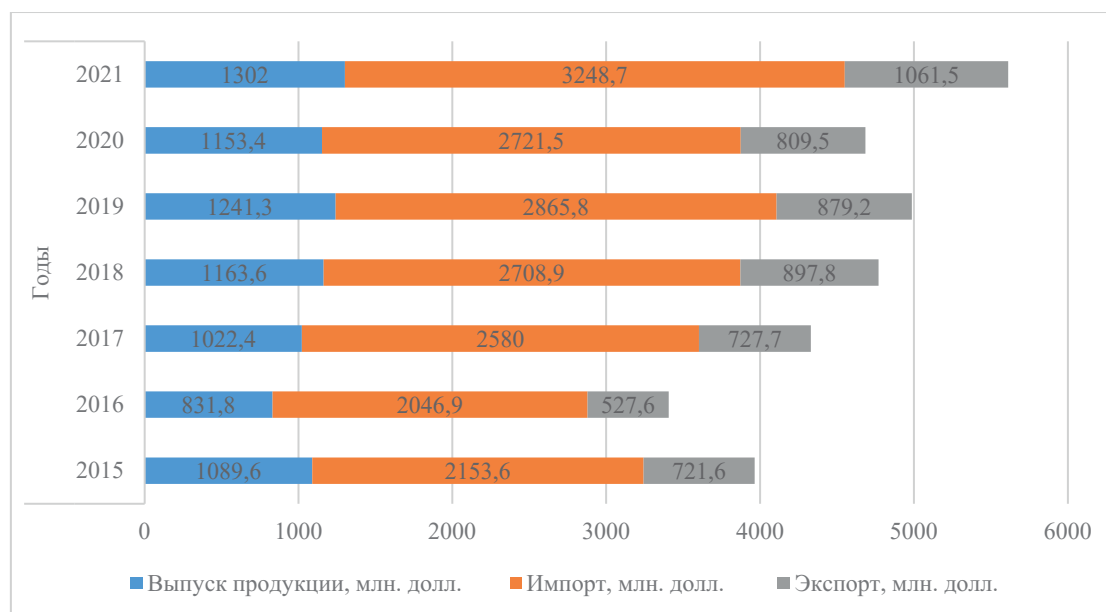
Рисунок 2 – Показатели химической промышленности

Примечание – составлено авторами на основе [20]

Таким образом, рассчитывать на устойчивое импортозамещение и рост технологической независимости страны можно лишь при высокой готовности предприятия к модернизации, активизации собственных исследований и наличии важнейших компонентов. Безусловно, в значительной мере уменьшение импортозависимости зависит от адаптации иностранных технологий к местным условиям, обучения работников их использованию, возможностей реинтеграции в глобальные цепочки на более выгодных условиях, умения предприятия ориентироваться на зарубежных рынках актуальных технологий. Одновременно Казахстан должен использовать импортозамещение для развития собственных технологий, создания высококонкурентоспособных технологичных производств. Невзирая на трудности в принятии цифровых решений (масштабы и сложности производственных процессов, расходы на техническое оснащение, высокозатратный и высокорисковый характер новых технологий), именно цифровизация выступает определяющим фактором, позволяющем предприятиям сохранять конкурентоспособность в обозримом будущем.

Процессы импортозамещения следует рассматривать в контексте перспектив продвижения Казахстана на международных рынках и с учетом меняющегося мирового окружения. Грамотно выстроенная политика импортозамещения нивелирует влияние зарубежных импортеров на экономику Казахстана, противостоит удорожанию импорта, вызванному закрытием границ, санкциями в отношении импортеров, разрушением традиционных транспортно-логистических цепочек.

Среднесрочные перспективы импортозамещения. Для Казахстана с небольшим внутренним рынком политика импортозамещения, ориентированная на защиту местных товаропроизводителей от внешней конкуренции посредством тарифных и нетарифных мер защиты от импорта, предоставления субсидий, льготного кредитования и налогообложения, ускорит создание рабочих мест в краткосрочном периоде. Наращивание конкурентоспособности обрабатывающей промышленности позволит достичь к 2029 г. рост экспорта обработанной продукции до 36 млрд. долл. (Таблица 3).

Однако в обозримой перспективе страна может столкнутся с уменьшением роста ВВП и конкурентных позиций, отставанием в научно-техническом развитии, поскольку обострится зависимость промышленности от иностранных комплектующих оборудования, особенно повлияет удорожание европейских компонентов, используемых добывающими предприятиями.

Таблица 3 – Прогнозные индикаторы обрабатывающей промышленности

Индикатор	Годы					
	2024	2025	2026	2027	2028	2029
Производительность труда, тыс. долл./ чел.	55,7	59,6	64,2	69,2	75,5	82,1
Валовая добавленная стоимость, трлн. тенге	17,8	19,9	22,5	25,1	28,2	31,5
Инвестиций в основной капитал, трлн. тенге	2,4	2,6	2,8	3,1	3,3	3,5
Примечание – составлено авторами на основе [25]						

Принимая во внимание тенденцию смены технологических укладов цивилизации на прогрессивные технологии, в том числе переход на возобновляемые источники энергии, одним из действенных способов укрепления позиций Казахстана в международных производственно-сбытовых цепочках является реализация проактивной стратегии по декарбонизации промышленных секторов.

Поэтому для реализации стратегии самодостаточности национальной экономики, обеспечения технологического суверенитета и достижению до 2025 г. шестидесятипроцентной доли казахстанского содержания, принимаются меры системного характера. Предстоит преодолеть зависимость национальной экономики от импорта сырья и комплектующих за счет снабжения сырьем и насыщения рынка местными продуктами, разработки индивидуально для каждой отрасли политики импортозамещения. Для перехода на новый качественный уровень, производства продукции с высокой добавленной стоимостью предприятиям предстоит привлекать стратегических инвесторов.

Для содействия местным производителям, стимулирования приобретения у них готового продукта, ужесточения ответственности за непрозрачную систему закупок недропользователей, внесены изменения в систему закупок [26]. Недропользователи, за которыми будут закреплены обязательств по обеспечению сырьем предприятий, будут разрабатывать собственные программы развития импортозамещения на срок не менее 5 лет с обязательным условием заключения с местными предприятиями долгосрочных договоров гарантированного закупа и оффтейк-контрактов, позволяющими отечественным товаропроизводителям выпускать новую продукцию под гарантированный сбыт

Рассматривается возможность внести в Налоговый кодекс коррективы, затрагивающие создание равноправных условий работы для иностранных и казахстанских предприятий, рассчитанные на товары с высокой, средней и низкой готовностью импортозамещения [27]. Именно с обозначенными тремя группами товарных позиций связывают прогресс в импортозамещении. Прежде всего, это касается изделий с высокой готовностью импортозамещения, где налажено производство и требуется содействие в сырьевом, финансовом и кадровом обеспечении, заключении долговременных связей.

Из 700 инвестиционных проектов, планируемых к реализации в отраслях обрабатывающей промышленности до 2025 г., которым будет оказано содействие со стороны государства, 286 импортозамещающих проектов и 414 проектов нацелены на экспорт готовой продукции. Местные органы власти окажут содействие в вопросах выделения земли или аренды зданий предприятиям, реализующим новые проекты, требующие кастомизированный подход.

Вокруг 50 системообразующих предприятий, ориентированных на работу в новом формате путем встраивания в глобальные цепочки, планируется создание производственного пояса МСБ. В рамках совершенствования подходов к техническому регулированию вопросов относительно качества продукции и уровня конкурентоспособности отечественных товаров, планируется внедрение механизмов, обеспечивающих равный доступ предприятий к инженерно-коммуникационной инфраструктуре.

Законодательно планируется закрепить обязательства крупных предприятий обрабатывающей промышленности по поэтапной переработке сырья, концентрата и первичного металла внутри страны. При этом государственное содействие получат только производители продукции средних и высоких переделов. Для обеспеченности требуемым сырьем местных переработчиков, действующий добровольный механизм заключения соглашений с добывающими предприятиями будет носить обязательный характер.

Предприятиям, разрабатывающим программы развития внутристрановой ценности, учитывающие заключение долгосрочных договоров и офтейк-контрактов с местными производителями, будут предложены новые механизмы финансирования:

- совместно с банками второго уровня под 8 % для конечного получателя;

- кредитование малого и среднего бизнеса через Фонд развития промышленности и местные исполнительные органы (МИО) под 3 %;

- кредитование проектов от 3 % до 7 % через Фонд развития промышленности.

Проекты определены по 6 направлениям и разделены на 4 категории: вводимые в текущем году, реализуемые, прорабатываемые и перспективные. На текущий момент по 155 проектам, ориентированным на уже производимую местными предприятиями продукцию, планируется дальнейшее наращивание объемов продукции для последующего полного их импортозамещения. Запуск перспективных 95 проектов по товарам со средней готовностью импортозамещения, уже имеющих инициаторов, задерживается из-за поиска инвесторов. По 36 нишевым проектам, предполагающим выпуск высокотехнологичных перспективных товаров с незначительной готовностью импортозамещения, наряду с государственным финансовым содействием, также требуется участие инвесторов. Уже в 2023 г. начнется строительство трех металлургических предприятий в Карагандинской области. Вложения в высокотехнологичные проекты, продукция которых ориентирована на импортозамещение и экспорт, составят порядка 230 млрд. тенге [28].

В машиностроении по импортозамещению, запланирован 21 проект. При этом, 130 млрд. тенге выделено на проекты, располагающие потенциалом замещения импорта и 622 млн. долл. – на экспортоориентированные проекты.

С учетом небольших объемов внутреннего рынка среднесрочное планирование машиностроительной продукции должно предусматривать наращивание экспортных объемов. Действенные шаги по частичной компенсации расходов, связанных с транспортировкой готовых товаров по территории Казахстана и сертификации товара на экспортных рынках, облегчат доступ казахстанским предприятиям на внешние рынки.

Планируется обеспечить машиностроение отечественным сырьем, доступным финансированием для создания новых и модернизации действующих производств, оффтэйк-контрактами с местными товаропроизводителями, что позволит увеличить производственные объемы и внутристрановую ценность [29], создать импортозамещающие производства с зарубежными транснациональными компаниями.

Принимая во внимание предстоящую диверсификацию модельных рядов по ценовым признакам и целевому направлению, автопроизводители активизируют поиск стратегических партнеров, что расширит каналы сбыта на новых рынках, ускорит освоение новых технологий. С целью насыщения рынка Казахстана высококачественным продуктом, роста локализации и технологических операций с применением отечественных материалов и полуфабрикатов уже введены соглашения об изготовлении транспортных средств как встречные бизнес – обязательства на предоставленные стимулирующие меры.

В среднесрочной перспективе важнейшими ориентирами для автомобильной отрасли, как драйвера индустриализации в условиях цифровизации, должны стать: кардинальное уменьшение расхода горючего путем за счет применения новых видов топлива, использование новых композитных материалов, рост комфортности, ввод сервисов мобильности.

Ключевые направления поддержки машиностроения:

- углубление локализации на основе принятия изготовителями встречных обязательств;

- оптимизация системы государственных закупок продукции за счет внедрения методов долговременных контрактов;

- наращивание масштабов финансирования программы льготного кредитования и лизинга;

- содействие экспорту продукции путем наращивания доли расходов, компенсируемых государством при увеличении экспорта готовых изделий на 80 %.

В обозримой перспективе в мировой экономике будут преобладать ключевые тенденции, от которых окажется зависимой промышленность: автоматизация и цифровизация; перемещение мирового промышленного производства в азиатском направлении и обострение экологических проблем. С учетом предполагаемого сокращения цепочки создания стоимости с последующего смещением в сторону конечного потребителя, будут формироваться новые бизнес-модели с упором на сырьевые базы, конечную продукцию, диверсификацию поставщиков сырья и материалов во избежание зависимости от одного источника. Мировые тренды затронут и Центральную Азию, которая перестает быть периферией для крупных экономических игроков на евразийском пространстве и располагает реальными возможностями стать Евразийским транспортно-логистическим перекрестком.

Так, в транзитно-транспортной сфере Казахстан активизирует сотрудничество с Грузией, поскольку через эти государства проходят трансконтинентальные транспортные коридоры, связывающие Европу с Китаем и Юго-Восточной Азией. Для расширения выхода на Иран, Афганистан, Пакистан и Индию начато строительство новой железнодорожной линии «Дарбазам-Мактаарал» между Казахстаном и Узбекистаном. Для Казахстана перспективным направлением является коридор Север-Юг, соединяющий Россию с Ираном, странами Персидского залива и Индией [30].

Трансформации экспортной структуры за пределами сырьевых товаров будут способствовать трансграничные или региональные экономические коридоры «Алматы-Бишкек», «Шымкент-Ташкент-Худжанд», преимуществами которых являются не только укрепление позиций на внутреннем рынке и рост трансграничных торгово-инвестиционных потоков, но и обширные торговые связи Казахстана со странами Европы, Ближнего Востока и Восточной Азии (Таблица 4). Это позволит диверсифицировать экспорт, уменьшить уязвимость Казахстана перед волатильностью мировых цен на сырьевые товары, повысить надежность транспортных маршрутов за счет гармонизации стандартов и таможенных процедур. Для развития экономического коридора Шымкент – Ташкент - Худжанд странами-участницами (Казахстан, Узбекистан, Таджикистан) Азиатский банк развития, поддерживающий инициативы энергетического сотрудничества Казахстана в рамках перехода к низкоуглеродной экономике, оказал техническое содействие (800 тыс. долл.) в рамках Дорожной карты.

Таблица 4 - Прогнозируемый удельный вес отдельных секторов в валовом региональном продукте г. Шымкент и Туркестанской области, %

	Факт	Прогноз по годам	
	2018 г.	2025 г.	2030 г.
г. Шымкент			
- производство	22,6	24	25
-услуги	61,0	60	60
Туркестанская область			
- производство	9,9	12	14
-услуги	48,5	50	50
Примечание – составлено авторами на основе [31]			

Решая проблемы импортозамещения, Казахстан продолжит укреплять международные позиции, как ключевой транзитной страны между Азией и Европой, довести к 2030 г. объемы транзитных перевозок через Казахстан до 35 млн. тонн.

Вышесказанное приобретает особую актуальность в геополитическом контексте, создающем стимулирующие механизмы для формирования новых транзитных маршрутов для содействия диверсификации торговли, укрепления энергетической безопасности особенно для стран евразийского региона. Для достижения бесперебойности функционирования глобальной производственно-сбытовой цепочки

необходимо укреплять взаимодействие между странами-поставщиками, транзитными странами и странами-потребителями для достижения устойчивости международных каналов транспортировки энергоресурсов.

В ближайшие годы потребуется значительная координация интересов государственной и энергетической безопасности, повысится зависимость каждой страны от институциональных возможностей для трансформации энергосистем в контексте проводимой промышленной политики, способствующей реализации конкурентных преимуществ в сфере экологически чистых энергетических технологий.

Подводя итоги, подчеркнем следующее:

Концепция импортозамещения рассматривается нами как политика индустриально- инновационного реформирования промышленного сектора, нацеленного на внутрипроизводственный рост, насыщения отечественного рынка высококачественным и конкурентоспособным товаром, замещающим импорт. При обосновании импортозамещающей политики исходить следует из отраслевых особенностей, накопленных каждой отраслью конкурентных преимуществах. Драйверами по потенциалу импортозамещения могут стать отрасли, связанные с производством машин и электрооборудования, химических продуктов, автомобилестроением.

Импортозависимость экономики по целому ряду товарных позиций отчасти вызвана слабыми коммуникационно-кооперационными связями внутри Казахстана, недостатками в стимулировании роста продаж. Государство должно стимулировать локальных производителей в повышении технологической сложности производства. С учетом передовых международных практик внедрения политики импортозамещения, государству следует таргетировать поддержку высокотехнологичных отраслей экономики, способствующих росту ее технологической сложности [32]. Продвижение наиболее приоритетных проектов в высокотехнологичных отраслях, разработка новых инструментов мотивации, активизация транснациональных компаний позволят раскрыть потенциал импортозамещения.

Предстоит мобилизовать ресурсы, привлечь к взаимовыгодному партнерству частный сектор, что позволит генерировать проекты в базовых и прорывных направлениях экономики с высокой добавленной стоимостью. Наибольшее внимание следует сконцентрировать на налоговые стимулы, субсидированные кредиты, экспортную поддержку и рост предпринимательской инициативы. Экспортоориентированное импортозамещение должно не просто ориентировать на создание национальных производств, обеспечивающих только внутреннее потребление, они должны быть конкурентоспособны на внешних рынках.

ЗАКЛЮЧЕНИЕ

Масштабные геополитические изменения существенно трансформировали слабо диверсифицированную экономику Казахстана, одного из лидеров Центральноазиатского региона.

Импортозамещение, позволяющее нарастить внутристрановые ценности, должно стать стимулом для качественного управления внутренним спросом, нахождения способа вписаться в глобальную цепочку добавленной стоимости, что повысит экспортоориентированность экономики Казахстана. В среднесрочном периоде Казахстан планирует расширить источники финансирования инвестиционных проектов, упор будет сделан на повышении сложности экспорта и освоении новой продукции более высокого передела в экспортоориентированной обрабатывающей промышленности, кооперацию в научно-технической и инновационно-производственной сферах [33]. Предстоит развивать региональную инфраструктуру и комплементарные конкурентные преимущества, поддерживать трансграничное движения товаров, развивать новые страновые партнерства.

Авторы надеются, что полученные результаты расширят представление об экономике Казахстана, вызовут дискуссию и продолжат исследования, углубляющие представление о политике импортозамещения в мировой экономике. Направления дальнейших исследований авторы видят в изучении импортозамещения в контексте стимулирования ресурсосберегающей модели поведения, усиления роли возобновляемых источников энергии.

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IMPORT SUBSTITUTION AS A DEVELOPMENT STRATEGY FOR COUNTRIES IN TRANSITION: THE EXPERIENCE OF KAZAKHSTAN

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ABSTRACT

The purpose of the research is to reveal the role of Kazakhstan's import substitution policy in choosing the economic trajectory of economic development from the standpoint of its decarbonization and expansion of international cooperation.

Methodology: the theoretical and methodological basis of the research is based on the methods of systemic and structural analysis, which allow studying the essence of the import substitution policy and identifying the degree of its impact on the economy of Kazakhstan. characterizing the policy of import substitution.

The originality / value of the research lies in the rationale for accelerating the adaptation of the institutional framework to new realities, which will provide support for priority sectors of the economy as leaders of the new technological order.

Findings – the structural constraints of the economy are identified, which must be taken into account when implementing the import substitution policy. The most problematic sectors of the economy of Kazakhstan are identified in terms of dependence on import supplies. The priority directions of the import substitution policy are formulated in the context of growing geopolitical risks and the transformation of global value chains. The key aspects of the transformation of the real sector of the economy of Kazakhstan, which has the potential to reduce import dependence and increase the attractiveness of foreign investors, are highlighted. The role of digital solutions in the implementation of the import substitution policy is substantiated.

The practical significance of the study. Kazakhstan adapts the accumulated world experience in the formation of import substitution policy. The example of Kazakhstan can be useful for countries with economies in transition, seeking to increase self-sufficiency and competitiveness of the real sector of the economy, expanding their presence in international markets.

Keywords: Kazakhstan, transitional economy, state regulation, import substitution, manufacturing industry, enterprise.

ИМПОРТТЫ АЛМАСТЫРУ ӨТПЕЛІ ЭКОНОМИКАСЫ БАР ЕЛДЕРДІҢ ДАМУ СТРАТЕГИЯСЫ РЕТІНДЕ: ҚАЗАҚСТАН ТӘЖІРИБЕСІ

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АНДАТПА

Зерттеудің мақсаты – Қазақстанның импортты алмастыру саясатының экономиканы дамытудың экономикалық траекториясын оны декарбонизациялау және халықаралық ынтымақтастықты кеңейту тұрғысынан таңдаудағы рөлін ашу.

Әдістеме: зерттеудің теориялық-әдіснамалық негізі импортты алмастыру саясатының мәнін зерде-леуге және оның Қазақстан экономикасына әсер ету дәрежесін анықтауға мүмкіндік беретін жүйелік және құрылымдық талдау әдістеріне негізделеді ғылыми-әдістемелік аппарат ретроспективті, себеп-салдарлық, ағымдағы және перспективалық талдауды, импортты алмастыру саясатын сипаттайтын ашық қолжетімділік статистикасын салыстыруды қамтиды.

Зерттеудің бірегейлігі / құндылығы жаңа технологиялық құрылымның көшбасшылары ретінде экономиканың басым секторларын қолдауды қамтамасыз ететін институционалдық шеңберлердің жаңа шындықтарға бейімделуін жеделдетуді негіздеу болып табылады.

Зерттеу нәтижелері – импортты алмастыру саясатын іске асыру кезінде ескеру қажет экономиканың құрылымдық шектеулері анықталды. Импорт жеткізілімдеріне тәуелділік тұрғысынан Қазақстан экономикасының неғұрлым проблемалық секторлары анықталды. Импортты алмасты-ру саясатының басым бағыттары геосаяси тәуекелдердің өсуі және жаһандық құн тізбектерін транс-формациялау контекстінде тұжырымдалған. Импортқа тәуелділікті төмендету және шетелдік инвесторлардың тартымдылығын арттыру мүмкіндіктері бар Қазақстан экономикасының нақты сек-торын трансформациялаудың негізгі аспектілері айқындалды. Импортты алмастыру саясатын іске асырудағы цифрлық шешімдердің рөлі негізделген.

Зерттеудің практикалық маңыздылығы. Қазақстан импортты алмастыру саясатын қалыптастырудың жинақталған әлемдік тәжірибесін бейімдейді. Қазақстанның мысалы өтпелі экономикасы бар, экономиканың нақты секторының өзін-өзі қамтамасыз етуі мен бәсекеге қабілеттілігін арттыруға ұмтылатын, халықаралық нарықтарда өзінің қатысуын кеңейтетін елдерге пайдалы болуы мүмкін.

Түйін сөздер: Қазақстан, өтпелі экономика, мемлекеттік реттеу, импортты алмастыру, өңдеу өнеркәсібі, кәсіпорын.

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STATE REGULATION OF RAILWAY FREIGHT TRANSPORTATION IN THE REPUBLIC OF KAZAKHSTAN: ANALYSIS OF THE CURRENT STATE AND DEVELOPMENT PROSPECTS

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ABSTRACT

The purpose of the article is to develop theoretical and practical recommendations on improving the use of the development potential of the railway sector of the Republic of Kazakhstan, studying regulatory measures by the country and determining their development prospects.

The methodology of this article was theoretical and empirical research methods: analysis of the state of the country's railway complex, its problems and ways to solve them, as well as the study of the railway transportation process and its regulation. Analysis of literature on the research problem, comparison and systematization of empirical and theoretical data, systemic approach to the studied problems of the article, method of qualitative comparison, statistical method.

Originality/value of the research: Railway transport is one of the basic sectors of the economy of Kazakhstan, providing its internal and external transport and economic relations, and the transportation needs of the population, therefore it is important to improve the development strategy of the country's railway transport at the Government level. The state will be able to optimize the railway transport sector by obtaining useful information as a result of this article.

Conclusion: In order to successfully develop the railway transport market in Kazakhstan, the state must play a more active role as a strategic consultant, which will take on issues of long-term planning, forecasting, analysis and preparation of recommendations to market participants. In this regard, we believe that Kazakhstan needs a separate program for the development of railway transport.

Keywords: regulation, railway transportation, railway tariff, freight turnover, investment, economy.

INTRODUCTION

Transportation is often referred to as the "lifeblood" of the economy, significantly influencing the speed of a country's economic progress. The transportation sector of Kazakhstan has consistently been a focal point, as evidenced by its prominent mention in government program documents.

Railways play a vital role in promoting economic prosperity and enhancing societal well-being. Rail freight services typically manage the substantial transportation requirements of national economies, granting producers in key industries access to high-capacity transportation at a more economical cost compared to road transport. Furthermore, passenger railways serve important economic and social roles within densely populated inter-city corridors and well-integrated regional passenger transport systems.

Ensuring that railway infrastructure remains in good condition is of utmost importance for the safe operation of trains. It establishes an effective, accurate, and reflective decision support system for management and evaluation, addressing the challenges and issues at hand [1].

Therefore, the purpose of this article is to determine the current balanced development and operation of the railway transport system of the Republic of Kazakhstan, as well as to develop proposals for effective state regulation of railway transport. The study aims to offer a comprehensive and nuanced analysis of the current state of railway freight transportation in the Republic of Kazakhstan.

In summary, the purpose of the article seems to be a thorough exploration of the current state of railway freight transportation regulation in Kazakhstan, with a focus on identifying challenges and proposing prospects

for development. This type of analysis is crucial for policymakers, industry professionals, and researchers interested in the efficient functioning and growth of the railway freight transportation sector in the Republic of Kazakhstan.

The article explores potential areas for improvement and development in the regulation of railway freight transportation. This could involve proposing policy recommendations or infrastructure investments that could enhance the efficiency and effectiveness of the sector.

In undertaking, an analysis of the state regulation of railway freight transportation in the Republic of Kazakhstan, several problems or challenges might be identified. These issues could encompass a range of factors affecting the efficiency, safety, and overall effectiveness of the railway freight transportation system. Here are some potential problems that the study might explore: the railway infrastructure outdated, leading to issues such as track deterioration, which can affect the safety and efficiency of freight transportation; inadequate capacity might lead to congestion and delays in freight transportation; competition from other modes of transportation, such as road or air, could impact the market share of railway freight.

Addressing these problems would likely be a crucial aspect of the study, allowing for a more nuanced understanding of the challenges that the state regulation of railway freight transportation faces in Kazakhstan and providing a foundation for proposed solutions and recommendations.

Literature review. The railway industry is a highly regulated sector around the world. Historically, railroads are a good example of a natural monopoly due to their (infrastructure-based) high-cost structure, the presence of indivisibility in their services, and economies of scale. Therefore, public control or ownership of railway infrastructure and public management of railways have become the most common approach [4].

Scholarly research interest in public policy issues in the rail freight industry has increased in line with the growing uncertainty in the economic environment in the process of globalization.

The provision of the railway transportation process with a carriage component and tariff policy are an integral part of an effective freight transportation process, which is a prerequisite for studying this topic [5].

Therefore, tariff policy and tariffs for railway freight transportation are important in the formation of national and regional markets for goods and services [6], therefore the system of railway freight tariffs is a relevant topic for study by many modern researchers [7].

Grigorieva O.A. highlights that railway transport infrastructure represents a production system characterized by a systematic structure akin to a technological complex. This complex is utilized by natural monopoly entities and is subject to regulation through state tariff policies. The infrastructure is considered a multifaceted entity within Civil Law, indivisible and non-consumable. It is intricately linked to the land plot, making it irreplaceable and underlining its direct association with state property [8].

Stepanov C.A. provides the perspective that objects within the material world, including railway infrastructure, are viewed in terms of property rights and associated obligations, which are subject to regulation by the state. In this framework, established property rights and legal obligations that are defined and enforced by the state govern the ownership and management of railway infrastructure. This underscores the role of regulatory frameworks and legal structures in managing and administering ownership and usage rights related to railway infrastructure. He noted that the meaning of railway infrastructure is not a uniform concept, but rather a broad and multifaceted concept [9].

Yakovlev A. S. [10] considered property as something that could be owned by someone, giving the example of railway infrastructure as property with a specific owner. In the work of Murzin D.V. [11], Stepanov C.A., the concept of railway infrastructure is likened to the legal understanding of a "thing" [12, 13]. This implies that within the legal context, railway infrastructure is regarded as a tangible entity, asset, or object that holds significance and is subject to legal considerations and regulations. It aligns with the legal framework that governs how railway infrastructure is defined, owned, managed, and utilized within the realm of law and associated practices.

Aydarova N.A. delineates three levels within the concept of state-regulated railway infrastructure: infrastructure networks, operations (operation or other infrastructure network service), and infrastructure markets, the latter being contingent on network capacity [14]. In the legislation of Kazakhstan, the main railway system is categorized as infrastructure.

From the provided definitions, it is evident that railway transport stands as a fundamental and crucial sector of Kazakhstan's economy. It operates under government regulation and serves vital roles in both domestic and international transport, economic relations, and the transportation needs of the populace. The functioning of railway transport, as an integral part of the unified transport system of the country, significantly contributes to the smooth operation of all social production sectors, fosters socioeconomic development, strengthens the state's defense capability, and promotes international cooperation for Kazakhstan.

MAIN PART

The oversight of railway transport in Kazakhstan falls under the jurisdiction of the Transport Committee within the Ministry of Industry and Infrastructure Development (MIID) of the Republic of Kazakhstan. This committee holds the responsibility for technical control and supervision of transportation safety, including the development and enforcement of standards. On the other hand, the Committee for Technical Regulation and Metrology, also under MIID, ensures adherence to technical standards and regulations. In addition to railway transport oversight, regulatory functions concerning natural monopolies, regulated markets, and the promotion of competition are managed by the Committee for the Regulation of Natural Monopolies (CRNM), operating under the Ministry of National Economy (MNE) of the Republic of Kazakhstan. Their shareholders or founders through general meetings, boards of directors or supervisory boards govern companies. Thus, the shareholder of the group of companies NC "Kazakhstan Temir Zholy" JSC, which encompasses the main railway system, freight and passenger carriers, transport and logistics companies, the port of Kuryk, and financial organizations, is indeed "Samruk-Kazyna" JSC, holding 100% ownership. "Samruk-Kazyna" JSC is a key sovereign wealth fund in Kazakhstan and has complete ownership of "Kazakhstan Temir Zholy" JSC, making it the sole shareholder of the entire group of companies.

Paragraph 1 of Article 5 of the Law of the Republic of Kazakhstan "On Railway Transport" clearly states that the main railway system is not eligible for privatization. Instead, it is designated to be transferred to the national managing holding and subsequently to the National Railway Company, based on conditions specified by the Government of the Republic of Kazakhstan. This legislative stipulation underscores the strategic significance and public ownership of the main railway system in Kazakhstan's transportation infrastructure. The national infrastructure operator is a legal entity whose controlling stake belongs to the national managing holding or the National Railway Company, which operates, maintains, modernizes, builds and provides services to the main railway system [2].

Currently, the National Infrastructure Operator in the form of a private legal entity is not separated, the main railway line is on the balance sheet of NC «Kazakhstan temir zholy» JSC (the managing branch of JSC "KTZ NC" is the Main Line Directorate).

Despite all the difficulties in foreign policy, the domestic political situation in the country is very stable. The composition of the Government and the Parliament has been stable for a long time and there are no trends for structural changes. In general, this is a positive factor for the external environment, because any political uncertainty can create risks for all sectors of the economy, which is not happening now. In addition, as a 100% state-owned company, a stable political environment is directly important for of NC «Kazakhstan temir zholy» JSC.

By 2025, the objective for NC "Kazakhstan Temir Zholy" JSC is to transform into a comprehensive transport and logistics enterprise. Its role will encompass executing the state strategy for orchestrating transit transport and logistics services, while concurrently prioritizing the augmentation of shareholder value.

Railway infrastructure spans a vast area and poses challenges in maintenance due to its intricate nature, involvement of numerous stakeholders, susceptibility to weather fluctuations, and the need to adapt physical components designed for earlier traffic and track conditions. This infrastructure is subdivided into distinct components, encompassing administration, traffic management, maintenance, and new investments [3].

Considering that passenger transport (both suburban and intercity) in the Republic of Kazakhstan is subsidized by the state due to its societal importance, the government's influence on transport companies is substantial. Primarily, the state exercises regulation over tariffs. As per legislation, NC "Kazakhstan Temir Zholy" JSC is classified as a natural monopoly entity, subjecting its operations to tariff regulation by the state.

The Committee for the Regulation of Natural Monopolies under the Ministry of National Economy of the Republic of Kazakhstan approves the service fees for the main railway system. Consequently, the success of the primary operations is contingent on political factors. Factors such as the "excessive reduction of tariffs for passenger transportation" and the "reduction in the volume of allocated subsidies" can significantly impact operations.

Secondly, the organization of regular passenger transport is partly the responsibility of the state. Here, the factor will be "strategy of development of the route system for the implementation of passenger transport". If the state is unwilling to develop and subsidize this or that direction, the company will not be able to carry out its activities even if there is a demand for this direction.

It is also worth mentioning the strategy of creating a system of highways. As Kazakhstan's rail passenger transport cannot move fast enough, road transport can compete with its autobahn development strategy.

In this case, economic factors are more standardized. First, it is the dynamics of the exchange rate, which affects the cost of tickets and the degree of profitability of the population.

High inflation and rising supplier prices. In this case, with an increase in consumer prices, the state "holds" tariffs at one level, in which case the company loses a significant percentage of its income.

Income inequality and low living standards reduce the demand for travel. This can also lead to a decrease in the level of population migration, and many citizens use rail transport precisely for "seasonal migration", for example, on a rotational basis, students or workers.

Since the freight industry is mainly a B2B industry, its development is indirectly affected by social factors. Nevertheless, it's important to note that the social situation in the country is relatively stable. Despite the influence of political and economic factors on the regulation and subsidization of passenger transport, the overall societal conditions in the Republic of Kazakhstan remain relatively consistent and stable. Despite the long-lasting economic crisis, the people of Kazakhstan do not show any negative activity now, thereby not increasing the political tension.

Methodology. The article was built upon a foundation of various theoretical and empirical research methods. These encompassed an analysis of the country's transport and logistics complex, focusing on its current state, existing challenges, and potential solutions. Additionally, the study delved into the railway transportation process and conducted a comprehensive review of relevant literature pertaining to the research problem. Comparative and systematic analyses of both empirical and theoretical data were employed, utilizing a systematic approach to address the discussed issues. The method of qualitative comparison and statistical analysis were also instrumental in conducting a thorough investigation.

To ensure accuracy and credibility, the article utilized official statistical data sourced from the Bureau of National Statistics of the Agency for Strategic Planning and Reform of the Republic of Kazakhstan. Furthermore, the results of international studies were incorporated, enabling a detailed examination of Kazakhstan's innovative, scientific, and technological development and facilitating a comparative analysis between domestic and foreign data. This methodological approach underpins the robustness and reliability of the findings and conclusions presented in the article.

Results and discussion. Railroad transport, like pipeline transport, provides intercity and international connections in Kazakhstan. Railways have virtually no competition when carrying out large volumes of transportation over long distances.

As of the beginning of 2022, the operational length of railway lines in the Republic of Kazakhstan stood at 16,062.7 km. Within this total length, approximately 26.4% of the lines were electrified, indicating the portion of the railway network that utilized electrification for power. Additionally, double-track lines constituted about 31.4% of the operational railway lines, signifying the proportion of the network with two parallel tracks for bidirectional travel and increased capacity. These statistics provide an overview of the key metrics related to the railway infrastructure in Kazakhstan at that specific time. The density of the railway network is 5.9 km/1000 km.

In 2022, based on data presented in Table 1 from the Bureau of National Statistics of the Agency for Strategic Planning and Reforms of the Republic of Kazakhstan, the total freight turnover for all modes of transport reached 602,962.5 million tonne-kilometers (t-km). This figure represents a 1% increase compared

to the level observed in 2021. Specifically, the freight turnover attributed to railway transport, constituting half of the country's total freight turnover, witnessed a growth of 4.3%. By the end of 2022, the freight turnover for railway transport amounted to 311,927.0 million tonne-kilometers. These statistics provide insights into the trends and performance of the freight transport sector in Kazakhstan during the specified year. The largest increase in cargo turnover was observed in inland water transport - 54.5%, maritime transport - by 23.4%. The growth in cargo turnover of pipeline transport amounted to 3.6%. In the reporting year, air transport cargo turnover decreased by 33.4%, road transport – by 7.6% [15].

Table 1 – Freight turnover of Kazakhstan in 2022 by mode of transport, million t-km

Kind of transport	Freight turnover, million t-km				Share in total cargo turnover, %	
	2020	2021	2022	Changes 2022/2021, %	2021	2022
All transport	588 679,4	597 196,2	602 962,5	0,97	100	100
Pipeline transport	125 088,5	139 012,6	143 969,6	3,57	23,28	23,88
Air Transport	56,2	81,7	54,4	-33,41	0,01	0,01
Water transport	62,1	66,4	102,6	54,52	0,01	0,02
Railway transport	302 156,1	299 170,8	311 927,0	4,26	50,10	51,73
Automotive and urban electric transport	160 685,5	158 311,9	146 227,1	-7,63	26,51	24,25
Sea transport	631,0	552,8	681,9	23,35	0,09	0,11
Note – compiled by the author based on source [16]						

The stability and effectiveness of the railway industry in Kazakhstan are significantly attributed to its well-structured organization, primarily centered around a vertically integrated transport holding company, JSC NC KTZ. This holding company oversees a unified mainline railway network and comprises key business units essential for the integrated transportation process.

Joint Stock Company "National Company Kazakhstan Temir Zholy" (referred to as "NC KTZ" JSC, KTZ, or the Company) serves as the national railway company, established through the decision of the Government of the Republic of Kazakhstan as a joint stock company. The controlling stake of this company is owned by the national management holding company, JSC "National Welfare Fund Samruk-Kazyna." Notably, Samruk-Kazyna is the founder and sole shareholder, and it is ultimately owned by the Government of the Republic of Kazakhstan.

The efficient functioning of railway transport is directly contingent on the cohesive and efficient operations of this railway company. The integrated structure and management facilitated by NC KTZ play a crucial role in ensuring the smooth operation, development, and growth of the railway sector, further supporting the overall transportation and economic landscape of Kazakhstan.

As noted, the carriage component and tariff policy are important for the railway industry. A significant number of wagon owners, low market concentration, imperfect management principles for small fleets worsen the efficiency of using rolling stock in general and increase the load on the railway system. Which creates additional difficulties in organizing operational work in the field of freight transportation and reduces the level of satisfaction of the needs of the economy of Kazakhstan in transport services. In such conditions, to balance supply and demand in the market for rail freight transportation, the efficient use of the rolling stock becomes key. In the face of increasing competition within the transport services market, the key determinant for a railcar operator's success is the enhancement of business processes, targeting improved efficiency and heightened customer focus.

The utilization of rolling stock poses a challenge due to high wear and tear, amounting to approximately 70%. This issue, coupled with potential delays in adopting new technologies and upgrading railway technical conditions, poses a significant risk of reduced freight and passenger transportation volumes.

Asset depreciation within the railway sector significantly impacts industry development, incurring substantial costs. The first image illustrates the wear and tear levels of main resources in the transport sector of the Republic of Kazakhstan. Railway transport faces a wear and tear rate of 27%, while car types experience a 25.8% wear and tear. Storage and additional economy have a wear and tear rate of 35.7%, and inland water transport experiences a wear and tear rate of 34.3%. Addressing asset depreciation is crucial for the sustainable growth and efficiency of the railway industry.
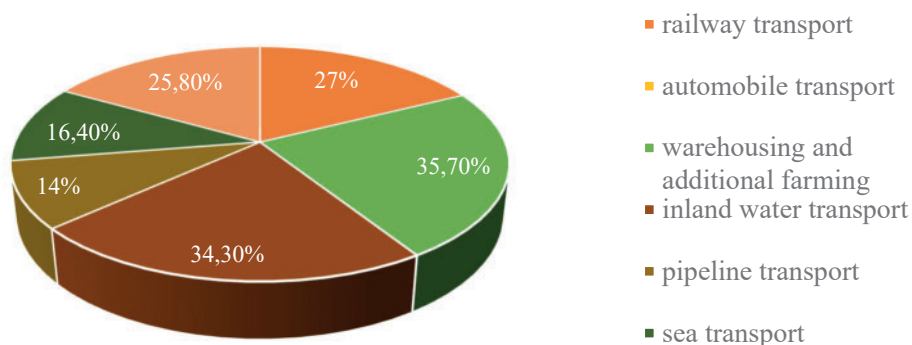
Figure 1 – The degree of depreciation of fixed assets in transport of the Republic of Kazakhstan
Note – compiled by the author based on sources [16]

The substantial moral and physical degradation of fixed assets, along with extensive wear and tear in the infrastructure, especially the prolonged single-track and non-electrified sections, impose severe limitations on the speed and capacity of the primary railway network. These challenges contribute to the formation of numerous "narrow crossings," further restricting capacity. Consequently, these constraints impede progress in enhancing population mobility and diminish the competitive edge of rail transport for both passengers and freight. Moreover, these factors also impact the competitiveness of transit corridors.

Addressing this issue requires a comprehensive approach. It involves strategic investments in infrastructure modernization, electrification of tracks, and the expansion of double-track sections to alleviate limitations. Enhancing the railway network's capacity is crucial for facilitating the efficient movement of people and goods, ultimately contributing to the development of the transportation sector and the nation's economy as a whole. It's vital to focus on sustainable practices and advanced maintenance strategies to ensure the longevity and effectiveness of the railway infrastructure, fostering enhanced mobility and competitiveness.

In Kazakhstan, $1.6 billion must be invested in upgrading mainline and shunting locomotives by 2032. Seven out of ten locomotives available at the beginning of this year were considered worn out. This is reported in the concept of transport and logistics potential of Kazakhstan until 2030, developed by the Ministry of Industry and Infrastructure Development, presented for public discussion.

1,846 locomotives were registered in the republic, including 1,228 diesel locomotives and 618 electric locomotives, as well as 2,577 passenger railway carriage, 139,073 freight railway carriage in 2022.

Also, the problems of railway transport include the poor condition of most of the infrastructure, the lack of electrification on 70% of railways, only about 26.4% of Kazakhstan's railways are electrified as shown in Figure 2 [17].

Addressing the issue of wagon scarcity and the decline of the wagon fleet necessitates either investments or optimizing the tariff policy to ensure sufficient revenue. As noted, the state participates in regulating tariffs in the railway industry. In recent years, Kazakh railway workers have been busy improving the tariff policy for freight transportation. This is a long and painstaking task, but necessary. Due to insufficient clarity and transparency in the tariff policy, NC KTZ JSC does not receive a large portion of its income. They, in turn, are needed for the development of infrastructure and renewal of the locomotive fleet.
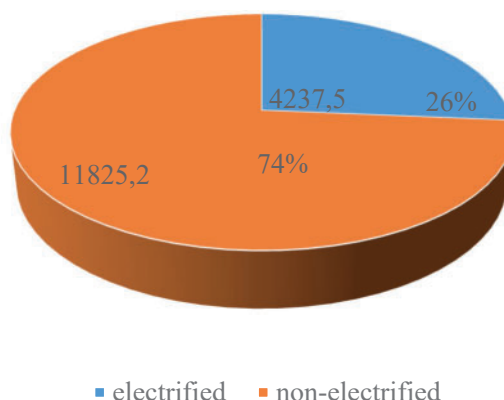
Figure 2 – Indicators of electrification of railways in Kazakhstan
Note – compiled by the author based on source [17]

In Kazakhstan, the four components of the railway tariff are formed as follows [18]:

- infrastructural component – the tariffs for services provided by the main railway networks (MRN) are regulated due to the nature of these services falling within the domain of natural monopolies.

- locomotive component (LC);

- the cost of the locomotive traction service is capped or restricted, because services belong to the sphere of socially significant markets;

- wagon component;

- services for the provision of wagons and containers are provided on the competitive market by the owners of the rolling stock, or operators of wagons, containers, respectively, state price regulation does not apply to them. The final 27 fee varies and depends on the transportation distance, type of rolling stock, wagon ownership, type of cargo, wagon load and other parameters;

- Evaluation and analysis of quality, implementation of methodological bases for determining compliance of services with standards, analysis of customer feedback. By analyzing customer feedback, it is possible to timely eliminate problems that may affect the efficiency of the service, the reputation and competitiveness of the organization;

- Implementation of a system of monitoring and evaluation of the activities of organizations providing railway transport services, creation of an accessible information base for all subjects where organization data is evaluated by consumers and expert analysis is carried out. It provides more information about transport organizations serving the rail sector;

- Conducting policy according to the information system of the railway industry, conducting market research and ensuring transparency of information. Marketing research provides a complete picture of the development of rail transport. Marketing research provides managers with information to determine further tactics. Failure to enact suitable policies in the information provision system of the industry results in a decline in the reliable collection of industry-related data and delays in the timely dissemination of information to national or regional centers. Consequently, this curtails the capacity to effectively compare information pertaining to each sector of the industry. All of these negative situations reduce the effectiveness of the information obtained and lead to the unintended use of resources in the field.

- Hence, drawing from global experience, efforts should be directed towards innovating new categories of trains, railway tracks, and rolling stock. Leveraging existing road industry programs, improvements should be made to railway vehicles and road condition monitoring devices within the railway sector. For this, domestic factories in the field should work together with foreign companies and firms to create a new era of road machinery. In the near future, general renovation of roads is the main task.

- In light of the increasing transportation volumes, establishment of new transport pathways, and ambitious transit potential development plans, a significant challenge faced by Kazakhstan's railway industry is the inadequate supply and substantial export of rolling stock. The issue of insufficient freight rolling stock has persisted for numerous years, emphasizing the need to enhance the performance of the country's machinery manufacturing sector. To address this, the following steps are imperative:

- In order to successfully develop the railway engineering market in Kazakhstan, the state should play a more active role as a strategic consultant, which will take on the long-term planning, forecasting, analysis and preparation of recommendations for market participants. Given these circumstances, we hold the view that Kazakhstan requires a dedicated program for the advancement of railway engineering.

- The government should undertake the development of long-term strategic plans, in which machine builders are given relevant forecasts and plans, recommendations for the release of the optimal production line by year and its nomenclature. Such plans can be announced at regular strategic sessions at the site of the National Chamber of Entrepreneurs of the Republic of Kazakhstan "Atameken".

- The state should also more actively support the development of innovations in the railway-engineering sector, in particular, initiate research in the field of efficiency of using innovative wagons, and to this end actively use the potential of domestic transport science.

It is necessary to further improve and harmonize the development of the regulatory legal framework, which regulates the process of planning and organization of railway cargo transportation, as well as the improvement of the tariff policy, which should be a direct reflection of the chosen model of reforming the industry. Considering the strategic significance of railway transportation for Kazakhstan and the potential inflationary impact resulting from increased transportation tariffs, it is prudent to advocate for continued regulation of freight transportation tariffs and locomotive traction services. Furthermore, there is a need for ongoing enhancement of the industry financing system and tariff policies.

It is plausible to assert that the financing system and tariff policies within the industry require further refinement. It is likely necessary to implement a systematic state support mechanism for JSC NC KTZ, serving as the national operational infrastructure. This support should encompass, in our perspective, a clearly defined commitment from the state to shoulder the primary costs of maintaining and advancing the primary railway network, along with expenses associated with fulfilling its social obligations.

In an ideal market structure, tariffs should be set in a way that allows a company to generate sufficient income, without relying on state subsidies and investments, to cover all its expenses and ensure a reasonable profit margin. Additionally, these tariffs should be designed to incentivize companies to adopt the most efficient operational strategies, fostering healthy competition within the market.

Railway transport is a foundational sector of Kazakhstan's economy, playing a vital role in both domestic and international transport and economic linkages, as well as meeting the transportation needs of the population. Therefore, it is crucial to enhance the country's strategy for the development of railway transport at the government level.

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ҚАЗАҚСТАН РЕСПУБЛИКАСЫНДАҒЫ ТЕМІР ЖОЛ ЖҮК ТАСЫМАЛЫН МЕМЛЕКЕТТІК РЕТТЕУ: ҚАЗІРГІ ЖАҒДАЙЫН ТАЛДАУ ЖӘНЕ ОНЫҢ ДАМУ БОЛАШАҒЫ.

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АҢДАТПА

Мақаланың мақсаты – Қазақстан Республикасы теміржол саласының даму әлеуетін пайдалануды жақсарту бойынша теориялық және практикалық ұсыныстар әзірлеу, елдің реттеу шараларын зерделеу және олардың даму перспективаларын анықтау.

Әдістемесі теориялық және эмпирикалық зерттеу әдістеріне негізделді: елдің теміржол кешенінің жай-күйін талдау, оның проблемалары мен оларды шешу жолдары, сондай-ақ теміржол тасымалы мен оны реттеу үдерісін зерттеу. Зерттеу мәселесі бойынша әдебиеттерді талдау, эмпирикалық және теориялық деректерді салыстыру және жүйелеу, мақалада зерттелетін мәселелерге жүйелі көзқарас, сапалық салыстыру әдісі, статистикалық әдіс қолданылды.

Зерттеудің бірегейлігі/құндылығы: теміржол көлігі Қазақстан экономикасының ішкі және сыртқы көліктік-экономикалық байланыстарын, сондай-ақ халықтың көліктік қажеттіліктерін қамтамасыз ететін негізгі салаларының бірі болып табылады, сондықтан еліміздің теміржол стратегиясын мемлекеттік деңгейде жетілдіру маңызды. Мемлекет осы мақаланың нәтижесінде пайдалы ақпарат алу арқылы теміржол көлігі саласын оңтайландыра алады.

Түйін сөздер: реттеу, темір жол тасымалы, темір жол тарифі, жүк айналымы, инвестиция, экономика.

ГОСУДАРСТВЕННОЕ РЕГУЛИРОВАНИЕ ЖЕЛЕЗНОДОРОЖНЫХ ГРУЗОВЫХ ПЕРЕВОЗОК В РЕСПУБЛИКЕ КАЗАХСТАН: АНАЛИЗ СОВРЕМЕННОГО СОСТОЯНИЯ И ПЕРСПЕКТИВЫ РАЗВИТИЯ

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АННОТАЦИЯ

Цель статьи – разработка теоретических и практических рекомендаций по совершенствованию использования потенциала развития железнодорожного сектора Республики Казахстан, изучение мер регулирования страны и определение перспектив их развития.

Методологией данной статьи послужили теоретические и эмпирические методы исследования: анализ состояния железнодорожного комплекса страны, его проблем и путей их решения, а также изучение процесса железнодорожных перевозок и его регулирования. Анализ литературы по проблеме исследования, сравнение и систематизация эмпирических и теоретических данных, системный подход к изучаемым проблемам статьи, метод качественного сравнения, статистический метод.

Оригинальность / ценность исследования: железнодорожный сектор является одним из основных компонентов экономики Казахстана, обеспечивающим внутренние и внешние транспортно-экономические связи, а также удовлетворяющим потребности населения в транспортных услугах. Поэтому существенно разработать и усовершенствовать стратегию развития железнодорожного транспорта на уровне государства. Государство сможет оптимизировать сектор железнодорожного транспорта получив полезную информацию в результате данной статьи.

Результаты исследования: для успешного развития рынка железнодорожных перевозок в Казахстане государство должно играть более активную роль стратегического консультанта, который возьмет

на себя вопросы долгосрочного планирования, прогнозирования, анализа и подготовки рекомендаций участникам рынка. В связи с этим мы считаем, что Казахстану необходима отдельная программа развития железнодорожного транспорта.

Ключевые слова: регулирование, железнодорожные перевозки, железнодорожный тариф, грузооборот, инвестиции, экономика.

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ҚАЗАҚСТАН РЕСПУБЛИКАСЫНЫҢ ТЕЛЕКОММУНИКАЦИЯЛЫҚ ҚЫЗМЕТТЕР НАРЫҒЫН МОДЕЛЬДЕУ ЖӘНЕ БОЛЖАУ

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АҢДАТПА

Зерттеудің мақсаты: Қазақстан Республикасындағы телекоммуникацияның дамуын және оның дамуына әсер ететін факторларды зерттей отырып, телекоммуникациялық қызметтер нарығын модельдеу және болжау.

Әдіснамасы: Телекоммуникация нарығының соңғы 2017-2022 жылдар аралығындағы даму көрсеткіштеріне және аймақтар бойынша статистикалық талдаулар мен болжамдар жасалды. Статистикалық, гипотезаларды тексеру, корреляциялық, регрессиялық әдістері қолданылды. Есептеулер деректерді талдауға арналған R бағдарламау тілінде жүргізілді.

Зерттеудің бірегейлігі/құндылығы: Мақалада Қазақстан Республикасындағы телекоммуникация саласы қызметтерінің ерекшеліктері қарастырылған. Телекоммуникацияның салалары бойынша қызметтер нарығын талдаулар жасалды. Сондай-ақ, оны жақсартуға ықпал ететін оң факторларды және оның дамуына кедергі келтіретін негізгі себептер анықталды. Анықталған факторлар негізінде болжамдар жасалып, модель құрастырылды.

Өзектілігі: Телекоммуникация саласының даму тенденцияларын зерттеу әлемдік экономиканы дамытудың жалпы стратегиясының шеңберінде ерекше өзекті болып табылады.

Зерттеу нәтижелері: Талдау нәтижелеріне қарап байланыс қызметі бойынша кіріс алып келіп отырған негізгі ішкі салалар сымсыз және сымды желілер бойынша Интернет қызметтері екені анықталды. Аймақтар бойынша Алматы және Астана қалаларында түсім көбейген. Зерттеулер негізінде авторлар Қазақстан Республикасындағы телекоммуникация қызметтерінің даму жағдайы туралы қорытындыларды қалыптастырды.

Түйін сөздер: цифрландыру, телекоммуникация, статистикалық талдау, корреляция, регрессия, R программалау тілі.

КІРІСПЕ

Қазіргі уақытта ақпараттық технологиялардың дамуы телекоммуникация қызметтері нарығының экономиканың маңызды құрамдас бөлігіне айналып, халықтың өмір сүру сапасын да, деңгейін де арттыруға ықпал етті. Экономикалық қызметтің жалғасып жатқан жаһандануы, ақпараттандыру және технологияландыру жағдайында деректер көлемі әрбір 1,5-2 жыл сайын артып отырады, демек, компания деңгейінде де, жалпы әлемдік экономикада да телекоммуникациялық қызметтердің маңыздылығын арттырады.

Зерттеудің өзектілігі: Қазіргі уақытта бүкіл әлемде телекоммуникация нарығының тұрақты өсуі байқалады. Өсу факторларын зерттеу және инфрақұрылымдық компонент ретінде телекоммуникациялық ресурстардың дамуын модельдеу өзекті болып табылады.

Зерттеудің мақсаты: Қазақстан Республикасы бойынша телекоммуникациялық қызметтер нарығын талдау, өсу мен жақсартуға ықпал ететін оң факторларды және оның дамуына кедергі келтіретін негізгі себептерді анықтау. Анықталған факторлар негізінде болжам жасап, модель құру.

Зерттеу міндеттері:

− Ғылыми әдебиеттерде, заманауи журналдарда, интернетте ұсынылған әртүрлі ақпаратты қарастыру.

− Алынған деректерді зерттеу және классификациялау.

− Статистикалық мәліметтерді талдау және болжау.

− Телекоммуникация нарығының даму тенденцияларын зерттеу.

Зерттеудің теориялық және әдістемелік негізіне экономикалық-математикалық әдістер, сондай-ақ ақпараттық қоғамды дамытудың заңнамалық және нормативтік құжаттары, тұжырымдамалары мен бағдарламалары саласындағы отандық және шетелдік информатика ғалымдары мен экономистерінің еңбектері алынды. Ақпаратты өңдеу және оны талдау нәтижелері R-бағдарламалау тілі арқылы жүзеге асырылды.

Зерттеудің ақпараттық-эмпирикалық базасы. Эмпирикалық ақпараттың бастапқы көздері ретінде мемлекеттік статистика ұйымдарының жылдық есептері пайдаланылды. Жұмыста қойылған міндеттерді шешу үшін компьютерлік технологияны қолдану арқылы экономикалық-математикалық модельдеудің заманауи әдістері қолданылды.

Зерттеудің әдістемесі: Статистика, гипотезаларды тексеру, корреляциялық, регрессиялық, кластерлік талдау әдістері болып табылады. Есептеулер деректерді талдауға арналған R бағдарламау тілінде жүргізілді.

Зерттеудің ғылыми жаңалығы. Телекоммуникациялық технологиялардың жылдам дамуы үшін оның ішкі салаларының қаншалықты дамып, кіріс алып келіп отырғанын үнемі талдап, тексеріп отыру керек. Телекоммуникация қызметінің сала және аумақ бойынша өсу тенденциясының моделін құрып, болжам жасау.

Зерттеудің практикалық маңыздылығы ондағы әзірленген ережелер Қазақстан Республикасында телекоммуникациялық ресурстарды тиімді пайдаланудың теориялық және практикалық негізін құруында. Келесі әзірлемелердің тікелей практикалық маңызы бар: телекоммуникациялық қызметтен түсетін табыстың математикалық үлгілері, телекоммуникациялық ресурстарды пайдалану бойынша ұсыныстар.

Зерттеу барысында соңғы жылдардағы Қазақстан Республикасының телекоммуникация қызметінің көрсеткіштеріне қатысты мәліметтер алынды.

Телекоммуникация қызметтері нарығын дамытудың негізгі тенденциялары анықталды, телекоммуникация қызметтері нарығының дамуы мен көрсеткіштеріне талдау жасалды. Телекоммуникация секторының дамуын тежейтін факторларға келесі тәуекелдер жатады:

− телекоммуникациялық инфрақұрылымды жақсартуға жұмсалатын шығындардың жоғары деңгейі;

− телекоммуникация кәсіпорындарының экономикалық көрсеткіштерін төмендететін белсенді емес абоненттердің көптігімен байланысты абоненттер санын есептеуде дәлсіздіктердің болуы; әртүрлі елдердегі телекоммуникация нарығы сегменттерінің даму әлеуетіндегі елеулі айырмашылықтар;

− тұтынушыларға қажет емес қызметтердің белгілі бір түрлерін ұсыну.

Зерттеу нәтижесінде қолайсыз макроэкономикалық жағдайларға байланысты жаһандық өсу қарқынының бәсеңдеу тенденциясы байқалғанына қарамастан, телекоммуникация қызметтері нарығы әлі де жоғары даму әлеуетін сақтайды, оны одан әрі ілгерілетеді деген қорытынды жасауға болады.

Әдебиетке шолу. Телекоммуникация саласының стратегиялық дамуы мен бәсекеге қабілеттілікті арттыру мәселелерін зерттеуде отандық бірнеше авторлардың еңбектері бар.

С. С. Дарибеков, Е. Т. Акбаев, Т. А. Мукашев, С. К. Ержанова «Қазақстан Республикасының телекоммуникация саласының қазіргі жағдайын бағалау» атты еңбектерінде Қазақстанның телекоммуникация саласының даму көрсеткіштері сипатталған. Қызмет түрлерінің орташа динамикасы, байланыс саласындағы кірістер құрылымы атап өтілген [1].

Д. И. Разакова және С. Ш. Оралова «Қазақстанның телекоммуникациялық нарығын талдау және оның тиімділігін анықтайтын факторлар» атты мақаласында телекоммуникация нарығының дамуын және оған әсер етуші факторларды атап көрсеткен. Өткен жылдардың мәліметтерін 2021 жылмен салыстыра отырып зерттеген [2].

ЗЕРТТЕУДІҢ НЕГІЗГІ БӨЛІМІ

Телекоммуникация – мәліметтерді үлкен қашықтыққа тасымалдау. Телекоммуникациялық құралдар – мәліметтерді ұзақ қашықтыққа тасымалдауға арналған техникалық, бағдарламалық және ұйымдастырушылық құралдардың жиынтығы.

Қазіргі уақытта Қазақстанда ұсынылған байланыс түрлері бойынша телефонды пайдаланатын 2,5 млн. абоненттері тіркелген. Бұл ретте, жыл сайын телекоммуникация нарығының жалпы көлеміндегі бекітілген байланыс үлесі ұялы байланысқа орнын бере отырып, төмендеуде. Ұялы байланысқа келетін болсақ, бекітілген абоненттер саны 25,8 млн асты [3].

2011 жылы елімізде 3G стандартының байланысы енгізілген кезде сала ұялы байланыстың дамуына айтарлықтай серпін алды. Байланыс операторлары 2014 жылдан бастап 4G/LTE стандартында байланыс қызметтерін ұсына бастады. 2019 жылдан бастап Қазақстандағы Шымкент, Алматы, Астана қалалары бойынша 5G байланысы бойынша тестілеу жобалары жүзеге асырыла бастады. Тестілеудің алғашқы нәтижелері оң болды және сарапшылар Қазақстан аумағында 5G технологиясын енгізуге дайын екендіктерін хабарлады.

Қазіргі уақытта радио, теледидар, телефон және компьютерлік желілер нарығында спутниктік жылжымалы байланыс, Интернетке қол жеткізу, халықаралық және қала аралық байланыстар, сонымен қатар байланыстың негізгі қызметтерін ұсынатын басқа да байланыс операторлары жұмыс жасайды.

Халықты Интернет желісіне жаппай қол жеткізумен қамтамасыз ету – байланыс саласын, сондай-ақ «Цифрлық Қазақстан» мемлекеттік бағдарламасын дамыту жөніндегі негізгі міндеттердің бірі. Қазақстандықтардың сапалы интернетте қажеттілігін қанағаттандыру үшін бүгінгі күні көптеген сымсыз және сымды технологиялар қолданылуда. Жалпы жоғары жылдамдықтағы интернет қолданушы абоненттерінің саны 2,5 млн. адамды құрайды.

Бірақ Интернеттің негізгі тұтынуы ұялы байланыс желісі арқылы жүзеге асырылатынын атап өту керек. Ауылдық жерлерді жоғары жылдамдықты Интернетпен қамтамасыз ету үшін екі жоба іске қосылуда. Оның нәтижесінде Интернетке қосылуға адам саны 250 және одан да көп адам тұратын елді мекендер ие болады. 250 ден аз тұратын аймақтарда 3G/UMTS, спутниктік және радиожелілік байланыс сияқты технологияларды пайдаланып жылдамдығы 2 Мбит/с кем емес Интернет желісін 2023 жылдың аяғына дейін қосу жоспарлануда [4].

Қазақстан Республикасының Ұлттық статистика бюросының деректері бойынша, 2022 жылдың 12 айында Қазақстанның Телекоммуникациялар нарығының көлемі 1,106 трлн теңгені құрады, бұл 2021 жылдың қаңтар-желтоқсан айларында байланыс қызметтерінің көлемінен 8%-ға артық (2021 жылдың қаңтар-желтоқсан айларындағы жағдай бойынша өсім 14,4% құрады). Жергілікті телефон байланысы қызметтерінің көлемі өткен жылдың қаңтар-желтоқсан айларында бюроның деректері бойынша 29,1 млрд теңгені құрады, бұл 2021 жылдың көлемінен 16,6% -ға аз; интернет желісінің қызметтері – 474,1 млрд теңге (15,4%-ға артық) және ұялы байланыс қызметтері – 250,6 млрд теңге, ол 2,2%-ға аз (1-сурет).

Бұрынғыдай интернет қызметтері, ұялы байланыс қызметтері және басқа да телекоммуникациялық қызметтер нарықтың флагманы болып табылады [2].

Нарық компоненттерін қарастырайық. 2022 жылғы желтоқсанда қалааралық және халықаралық телефон байланысы қызметтерінен түскен түсім бір жыл бұрынғы 1,47 млрд (+3%) қарсы 1,51 млрд құрады. Жергілікті телефон байланысы секторындағы кірістер – 2,33 млрд теңге (-19%). Интернет қызметтерінен операторлар 45,25 млрд теңге (+19%); кабельдік инфрақұрылым бойынша, сымсыз желілер арқылы және жерсерік арқылы бағдарламаларды тарату бойынша қызметтерден – 3,9 млрд теңге, бір жыл бұрынғы 3,81 млрд теңгеге (+2%); ұялы байланыс қызметтерінен – 22,2 млрд (+2%); басқа әр түрлі телекоммуникациялық қызметтер – 23,5 млрд теңгені (20% - ға артық) құрап отыр [4].
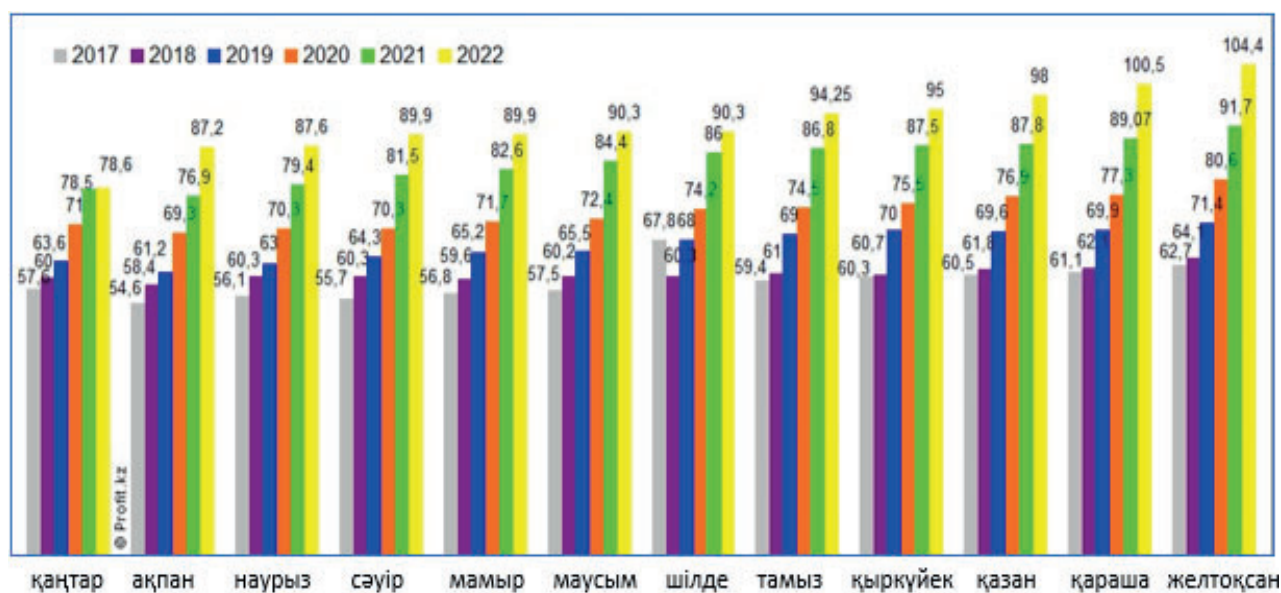
Сурет 1 – Қазақстандағы телекоммуникация секторларларының кірісі,
ай бойынша 2017-2022 жж., млрд.теңге
Ескерту – [4] дерек көзден алынды

Телекоммуникациялық қызметтердің ену деңгейі. Өткен 2022 жылғы желтоқсанда тіркелген теле-фон желілерінің саны 2,835 млн (-35 мың) құрады, ұялы байланыс абоненттерінің саны – 25,12 млн бірлік (+120 мың), оның 17,4 млн-ға жуығы Интернетке қол жеткізе алады (бейтарап). Осылайша, ұялы байланыс абоненттері арасында Интернеттің ену деңгейі 69,3% құрады (2021 жылдың желтоқсан айының қорытындысы бойынша 68%). Соңында, тіркелген Интернет абоненттерінің саны 2,89 млн құрады (1-сурет).

Байланыс қызметінің көлеміне (млн.теңге) талдау жасау (2017-2022 жылдар аралығы бойын-ша). Қазақстан Республикасының 2017-2022 жылдар аралығындағы байланыс қызметінің көлеміне (млн.теңге) талдау жүргізілді. Қазақстан Республикасының ұлттық статистика бюросынан байланыс қызметінің көлемін көрсететін мәліметтер алынды [5].

Негізгі факторлар 1-кестеде көрсетілген:

У – Байланыс қызметінің көлемі (млн.теңге);

X1 – Халықаралық және қала аралық телефон байланысының қызметі (млн.теңге);

X2 – Жергілікті жердегі телефон байланысының қызметі (млн.теңге);

X3 – Сымсыз және сымды телекоммуникациялық желі арқылы деректерді беру қызметі (млн.теңге);

X4 – Сымсыз және сымды телекоммуникация желілері бойынша интернет қызметтері (млн,теңге);

X5 – Сымсыз желілер, кабельдік инфрақұрылым және жерсерік арқылы интернет тарату қызметтері (млн,теңге);

X6 – Ұтқыр байланыс қызметтері (млн.теңге);

X7 – Өзге де телекоммуникациялық қызметтер (млн.теңге) [5].

Кесте 1 – Байланыс қызметі көлемін көрсететін корсеткіштер кестесі

Жыл	У (млн. теңге)	X1 (млн. теңге)	X2 (млн. теңге)	X3 (млн. теңге)	X4 (млн. теңге)	X5 (млн. теңге)	X6 (млн. теңге)	X7 (млн. теңге)
2017	645641	30076	40949	26962	228607	27185	163872	127990
2018	727533	28832	39365	35570	244568	35445	215650	128103
2019	798539	25997	36730	46877	285106	36062	220597	147170
2020	884471	20534	35756	52897	331801	39805	231980	171698
2021	1012063	18780	34931	50264	405497	43917	252923	205751
2022	1074039	18855	29132	53161	442131	44760	252207	233793
Ескерту – [3] дерек көзі негізінде авторлармен құрастырылған								

Мәліметтерді статистикалық талдау және модель құру. Мәліметтерге статистикалық талдауды мынадай қадамдарға бөлу арқылы жүргізсек болады [6]:

Бірінші қадам – Негізгі статистикалық сипаттамаларды алу.

Екінші қадам – Статистиканың классикалық талдау әдісі: корреляция коэффициенті.

Үшінші қадам – Регрессиялық модельдеу және болжам жасау.

Жалпы байланыс қызметінің дамуына әсер етуші факторларды анықтау үшін статистикалық талда-малы жүйе құрастырылды.

Қазақстан Республикасының ұлттық статистика бюросынан байланыс қызметінің көлемін көрсететін мәліметтер жүктеліп, R бағдарламасына импортталды (Сурет 2).

	Y	X1	X2	X3	X4	X5	X6	X7
1	728657	28832	39365	35570	244568	35445	215650	128103
2	800090	25997	36730	46877	285106	36062	220597	147170
3	884475	20534	35756	52897	331801	39805	231980	171698
4	1012068	18780	34931	50264	405497	43917	252923	205751
5	1106027	18855	29132	53161	442131	44760	252207	233793

Сурет 2 – R бағдарламасына импортталған мәліметтер кестесі
Ескерту – 1-кестедегі деректер негізінде авторлармен құрастырылған

Байланыс қызметі көлемінің жыл бойынша өсімін көру үшін шашырау диаграммасы құрастырылды. Диаграмма құру әдісі:

plot(tele$год, tele$Y, cex = 2,pch=18,col="blue", main = "Диаграмма рассеяния") [7].

Диаграмма нәтижесіне қарап байланыс қызметінің жыл сайын өсіп келе жатқаны көрінеді (Сурет 3).
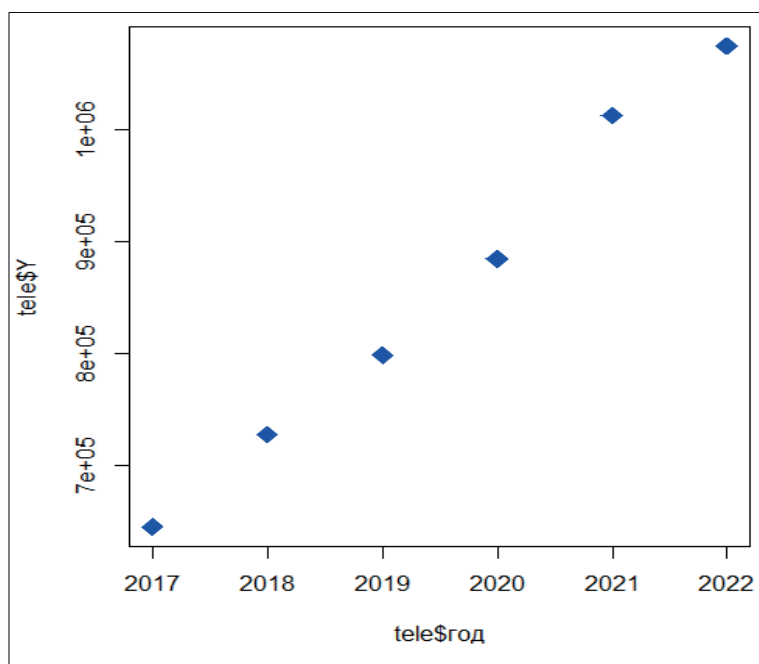
Сурет 3 – Байланыс қызметінің көлемін көрсететін диаграмма
Ескерту – [2] дерек көзі негізінде авторлармен құрастырылған

Негізгі статистикалық сипаттамаларды алу. Негізгі статистикалық сипаттамаларды алу үшін аталған деректерге summary() функциясы қолданылды (Сурет 4).

Сандық айнымалылар үшін бұл функция ең төменгі және ең үлкен мәнді, арифметикалық ортаны, медиананы, төменгі (1-ші кв.) және жоғарғы (3-ші кв.) квартилдерді шығарады. Төменгі квартиль – таңдамадағы мәндердің 25% аспайтын мән, ал жоғарғы квартиль – іріктеудегі мәндердің 75% аспайтын мәнді анықтайды [8].

```
> summary(tele)
      Y                 X1              X2              X3              X4              X5
 Min.   : 645641   Min.   :18780   Min.   :29132   Min.   :26962   Min.   :228607   Min.   :27185
 1st Qu.: 745285   1st Qu.:19275   1st Qu.:35137   1st Qu.:38397   1st Qu.:254703   1st Qu.:35599
 Median : 841505   Median :23266   Median :36243   Median :48571   Median :308454   Median :37934
 Mean   : 857048   Mean   :23846   Mean   :36144   Mean   :44289   Mean   :322952   Mean   :37862
 3rd Qu.: 980165   3rd Qu.:28123   3rd Qu.:38706   3rd Qu.:52239   3rd Qu.:387073   3rd Qu.:42889
 Max.   :1074039   Max.   :30076   Max.   :40949   Max.   :53161   Max.   :442131   Max.   :44760
      X6                X7
 Min.   :163872   Min.   :127990
 1st Qu.:216887   1st Qu.:132870
 Median :226289   Median :159434
 Mean   :222872   Mean   :169084
 3rd Qu.:247150   3rd Qu.:197238
 Max.   :252923   Max.   :233793
```

Сурет 4 – Негізгі статистикалық сипаттамалар
Ескерту – 1-кестедегі деректер негізінде авторлармен құрастырылған

Статистиканың классикалық талдау әдісі: корреляция коэффициенті

Корреляция коэффициенті (rr) – екі айнымалы арасындағы байланыс дәрежесінің өте ыңғайлы көрсеткіші. Ол −1-ден +1-ге дейін өзгеретін өлшемсіз шаманы білдіреді.

Айнымалылардың тәуелсіз өзгеруімен, олардың арасында байланыс болмаған кезде, r=0. Байланыс қаншалықты күштірек болса, корреляция коэффеценті де үлкенірек болады. Бұл жағдайда оң r мәндері оң (= тікелей) байланысты көрсетеді (яғни, бір айнымалының мәндері көбейген кезде, орташа алғанда, басқа айнымалы мәндер артады), ал теріс (= кері) байланысты (бір айнымалы өскен кезде, екіншісі төмендейді) [9].

```
> round(cor(tele),4)
        Y       x1       x2       x3       x4       x5       x6       x7
Y   1.0000  -0.9606  -0.9371   0.8742   0.9934   0.9611   0.9144   0.9789
x1 -0.9606   1.0000   0.8557  -0.9138  -0.9518  -0.9300  -0.8817  -0.9283
x2 -0.9371   0.8557   1.0000  -0.8306  -0.9351  -0.8726  -0.8205  -0.9443
x3  0.8742  -0.9138  -0.8306   1.0000   0.8302   0.9084   0.9107   0.7894
x4  0.9934  -0.9518  -0.9351   0.8302   1.0000   0.9246   0.8630   0.9947
x5  0.9611  -0.9300  -0.8726   0.9084   0.9246   1.0000   0.9881   0.8885
x6  0.9144  -0.8817  -0.8205   0.9107   0.8630   0.9881   1.0000   0.8150
x7  0.9789  -0.9283  -0.9443   0.7894   0.9947   0.8885   0.8150   1.0000
```

Сурет 5 – корреляциялық талдау нәтижелері
Ескерту – 1-кестедегі деректер негізінде авторлармен құрастырылған

Біз осы корреляциялық матрица арқылы факторлардың арасындағы байланыстың бар жоғын біле аламыз.

Корреляциялық матрицаны талдай отырып, тәуелді айнымалының x1 және x2 қатынасы кері (-0,9606 және -0,9371), ал x3 - x7 регрессорларымен байланысы тікелей екенін көреміз. Барлық болжаушылардың Чедок шкаласы бойынша тәуелді айнымалымен тығыз байланысы бар.

Алынған соңғы модельді интерпретациялау кезінде кері байланыс x1 және x2 регрессорларының көбеюімен тәуелді айнымалының азаятынын білдіреді.

Регрессиялық модельдеу және болжам жасау. Кейбір деректер жүйесінде тәуелділіктің бар болуын және түрін анықтау (1).

Қарапайым сызықтық регрессия сызығын бағалайтын математикалық теңдеу:

$$Y = a + b * x \tag{1}$$

мұндағы, x – тәуелсіз айнымалы немесе болжаушы;

Y – тәуелді айнымалы. Егер біз x шамасын білсек, бұл y–тің мәні (орташа), яғни бұл «болжамды y мәні»

a – бағалау сызығының еркін мүшесі (қиылысы), бұл x = 0 болған кезде Y мәні;

b – бағаланған сызықтың бұрыштық коэффициенті немесе градиенті, егер біз x-ты бір бірлікке көбейтсек, бұл Y орташа есеппен өсетін шаманы білдіреді.

a және b бағаланған сызықтың регрессия коэффициенттері деп аталады, Дегенмен бұл термин көбінесе тек в үшін қолданылады [10].

Сызықтық регрессия оның параметрлерінің нақты экономикалық түсіндірілуіне байланысты эконометрикада кеңінен қолданылады. Қарапайым сызықтық регрессия сызығын бағалайтын математикалық теңдеуді қолдана отырып байланыс қызметінің көлемінің тәуелділігі анықталды (2):

$$\textit{Байланыс қызметінің көлемі} = a + b \times \textit{қалааралық байланыс} \qquad (2)$$

R-да регрессиялық модельге арналған негізгі функция - lm() функциясы (6-сурет).

Оның қолдану формасы: myreg<-lm(formula, data), мұндағы formula – модель түрін сипаттайды, ал data – модель жасау үшін пайдаланылатын деректер кестесі [6].

Сурет 6 – Регрессиялық талдау нәтижесінің көрсеткіштері
Ескерту – 1-кестедегі деректер негізінде авторлармен құрастырылған

Модельді жетілдіреміз және *summary* функциясының көмегімен сапаны бағалаймыз (5-сурет). Алынған нәтижелердің ішінен болжауға арналған теңдеу мынадай түрге ие болады:

Байланыс қызметінің көлемі = 2.450e+05 + 1.895 × Интернет желісінің қызметтері

Pr(>|t|) бағанынан регрессия коэффициенті (1.895) статистикалық тұрғыдан нөлден (p < 0.001) ерекшеленеді және интернет желісінің қызметтерінің 1.895 млн. теңгеге өсуі күтілуде. Көптеген детерминация коэффициенті (0.9869) модель байланыс қызметінің көлеміне интернет желісінің қызметтерінің дисперсиясын анықтайды.

Бұл коэффициент нақты және болжамды мәндердің арасындағы корреляция коэффициентінің квадраты болып табылады. Басқаша айтқанда, осы шағын статистикаға сәйкес байланыс қызметінің көлемінің негізгі бөлігі интернет желісінің қызметтерінен тұратыны анықталады.

Болжам жасау. Яғни, интернет желісі қызметінің көлемі 600 000 млн тг. өсетін болса алдағы уақытта байланыс қызметінің көлемі қаншаға өсетініне болжам жасалды. Ол үшін *predict* функциясы арқылы регрессиялық талдау жүргізілген мәліметтер қолданылды [12].

```
> reg<-lm(Y~X4,data=tele)
> summary(reg)

Call:
lm(formula = Y ~ X4, data = tele)

Residuals:
     1      2      3      4      5      6
-32599  19043  13219  10652  -1430  -8885

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept) 2.450e+05  3.633e+04   6.742  0.00252 **
X4          1.895e+00  1.093e-01  17.345 6.49e-05 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 21180 on 4 degrees of freedom
Multiple R-squared:  0.9869,    Adjusted R-squared:  0.9836
F-statistic: 300.8 on 1 and 4 DF,  p-value: 6.485e-05
```

Сурет 7 – Predict функциясы арқылы болжам жасау
Ескерту – 1-кестедегі деректер негізінде авторлармен құрастырылған

Болжау нәтижесі бойынша интернет желісі қызметінің көлемі 600 000 млн тг. өсетін болса, онда байланыс қызметі 1 382 127 млн.тг өседі деп күтілуде (Сурет 7).

Есептік кезеңдегі кәсіпорындар түсімі 523,5 млрд. теңге құрады, бұл 2021 жылдың аталмыш кезеңімен салыстырғанда 40,3 млрд. теңгеге артық, яғни операторлардың көрсеткен қызметі 7% өскен. Түсімнің өсуінің негізгі себебі – интернет қызметтері. Аймақтар арасында ең көп пайда әкелген Алматы мен Астана қалалары, олар өсу көрсеткішінің 95%-ын қамтамасыз етті.

Жергілікті телефон байланысының қызметі белгілі уақыт бойы аутсайдер болуда (-17,3 %, 14,6 млрд теңгеге дейін). Сонымен қатар мобильдік байланыс қызметі жарты жыл бойы теріс көрсеткіш беруде, яғни минус 2,5 % немесе 122,8 млрд теңге.

Аймақтарды алып қарасақ, Алматы және Астана қалаларында түсім көбейіп, шоғырланған. Көрсетілген қызметтер көлемі жарты жыл ішінде жылдық көрсеткішке жеткен, яғни +7,9 % және 16 %. Номиналдық өсім көрсеткіші сәйкесінше +22,4 млрд және +16,4 млрд теңге, бұл саланың барлық кірісі 96,4% өсім берді. Төмен көрсеткіштер Жамбыл және Түркістан облыстары, Шымкент қаласында тіркелді.

ҚОРЫТЫНДЫ

Қорытындылай келе, телекоммуникациялық технологиялардың жылдам дамуы үшін оның ішкі салаларының қаншалықты дамып, кіріс алып келіп отырғанын үнемі талдап, тексеріп отыру керек.

Жиналған мәліметтер негізінде коррелляциялық және регрессиялық талдаулар мен болжаулар жасалды. Талдау нәтижелеріне қарап байланыс қызметі бойынша кіріс алып келіп отырған негізгі ішкі салалар сымсыз және сымды желілер арқылы Интернет қызметтері анықталды. Аймақтар бойынша Алматы және Астана қалаларында түсім көбейген [15].

Ақпараттық коммуникациялық технология қызметтерінің көлемі біздің еліміз негізінен байланыс жағынан қарастыру қажет нәрселер бар:

1. АКТ қызметінің көлеміне байланысты тауарлар санын арттыру;

2. Халықтың экономикалық мүмкіндіктерін кеңейту, АКТ қызметі сапасын жақсарту және елдегі байланыс немесе интернет желісінің мүмкіншіліктерін көбейту;

3. Халықтың мүмкіншіліктерін жоғарылату. Байланыс, интернет жүйесі дамымай немесе әлі жетпеген аймақтарды дамыту.

Осыған сәйкес Қазақстан Республикасының ақпараттық және коммуникациялық технологияларын дамыту үшін қойылған мақсаттарға қол жеткізу кешенді әдісті қажет етеді. Соңғы жылдары қарастырылған барлық көрсеткіштер бойынша халықаралық ұйымдардың бағалауларымен дәлелденген өңірлік және халықаралық деңгейде Ақпараттық коммуникациялық технология қызметтерінің тұрақты дамуын көрсете отырып, оның дамуының оң динамикасын көрсетіп отыр.

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MODELING AND FORECASTING OF THE TELECOMMUNICATION SERVICES MARKET OF THE REPUBLIC OF KAZAKHSTAN

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ABSTRACT

The purpose of the study: modeling and forecasting the telecommunications services market with the study of the development of telecommunications in the Republic of Kazakhstan and the factors affecting its development.

Methodology: statistical analysis and forecasts of the development indicators of the telecommunications market for the last 2017-2022 and by region were made. Methods of statistical, hypothesis testing, correlation, regression, cluster analysis were used. Calculations were carried out in statistical packages R, Gretl, as well as in Microsoft Excel.

Originality / value of the study: the article discusses the features of telecommunications services in the Republic of Kazakhstan. Analysis of the market of services in the areas of Telecommunications was carried out. It also identified positive factors that contribute to its improvement, and the main reasons that hinder its development. Based on the identified factors, forecasts were made and a model was compiled.

Relevance: the study of trends in the development of the telecommunications industry is particularly relevant within the framework of the general strategy for the development of the world for the development of the world economy.

Findings: based on the results of the analysis, it was found that the main sub-sectors that generate revenue for communication services are internet services for wired and wireless telecommunications networks. According to the regions, revenues increased in Almaty and Astana. Based on the reserch, the authors formed, conclusions about the state of telecommunications services in the Republic of Kazakhstan.

Keywords: digitalization, telecommunications, statistical analysis, correlation, regression, R programming language.

МОДЕЛИРОВАНИЕ И ПРОГНОЗИРОВАНИЕ РЫНКА ТЕЛЕКОММУНИКАЦИОННЫХ УСЛУГ РЕСПУБЛИКИ КАЗАХСТАН

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АННОТАЦИЯ

Цели исследования: моделирование и прогнозирование рынка телекоммуникационных услуг с изучением развития телекоммуникаций в Республике Казахстан и факторов, влияющих на их развитие.

Методология: проведен статистический анализ и прогнозы показателей развития телекоммуникационного рынка за последние 2017-2022 годы и по регионам. Применялись методы статистического, проверки гипотез, корреляционного, регрессионного. Расчеты проводились в статистических пакетах R.

Оригинальность/ценность исследования. В статье рассмотрены особенности деятельности отрасли телекоммуникаций в Республике Казахстан. Проведен анализ рынка услуг по отраслям телекоммуникаций. Также были выявлены положительные факторы, способствующие его улучшению, и основные причины, препятствующие его развитию. На основе выявленных факторов были сделаны прогнозы и составлена модель.

Актуальность: изучение тенденций развития телекоммуникационной отрасли является особенно актуальным в рамках общей стратегии развития мировой экономики.

Результаты исследования: по результатам анализа установлено, что основными подотраслями, приносящими доход по услуге связи, являются услуги сети Интернет по проводным и беспроводным телекоммуникационным сетям. По регионам выручка увеличилась в городах Алматы и Астана. На основе исследований авторами сформированы выводы о состоянии развития телекоммуникационных услуг в Республике Казахстан.

Ключевые слова: оцифровка, Телекоммуникации, статистический анализ, корреляция, регрессия, язык программирования R.

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HUMAN CAPITAL OF THE REPUBLIC OF KAZAKHSTAN: FEATURES OF FORMATION AND OPPORTUNITIES FOR GROWTH OF COMPETITIVENESS

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ABSTRACT

Purpose of the research. The article substantiates the need to form competitive human capital on the example of advanced countries, the purpose of which is to determine the sources of formation of effective human capital.

Methodology: In the course of the study the methods of analysis and synthesis, statistical and comparative analysis were applied. The authors conducted a literature review of scientific works in the field of human capital formation of both domestic and foreign economists, studied the best practices of countries, and the possibility of its application in the Kazakhstani realities. For a more in-depth study of the issues were considered strategic programs and analyzed statistical compilations.

Originality / value. The main indicators of the health care system, providing the formation of health capital as a component of human capital, have been analyzed. The main problems of education and health care spheres are defined. The comparison of labor remuneration indicators with advanced countries both in the average value and by sectors of the economy as a whole is carried out, the degree of its influence on the development of human capital is determined.

Findings: A mechanism for the development of national human capital in the conditions of building an innovative economy is proposed. Recommendations have been developed to ensure the effectiveness of investments in the development and realization of the country's human capital.

Keywords: human capital, national competitiveness, competitive advantage, investments.

INTRODUCTION

The first place in the economic and social sciences has always been occupied by human capital, i.e. its creative qualities, abilities, forces with which it improved itself and the world around it. This is due to the accelerated development of the material and technical base in production, which is associated with the industrial revolution - all this has obscured the problems in the development of man and his productive abilities. As a result, for many years the productive abilities of a person were regarded as one of the quantitative factors of production.

For the first time, the term «human capital» appeared in the works of T. Schultz, who interpreted it as «valuable qualities acquired by a person that can be enhanced by appropriate investments» [1].

M. Cretsky characterizes human capital as a special form of human life activity, assimilating two specific forms: consumer and production [2].

According to G. Becker «human capital is a set of human skills» [3].

At the same time, human capital is considered both in a narrow and in a broad sense. If we consider it in a narrow sense, then one of the forms of human capital is education. It was called human because this form

becomes a part of a person, and it is capital because it represents a source for future earnings and satisfaction, or all taken together. In a broad sense, human capital is formed with the help of investments (long-term investments) in one particular person in the form of expenses for the education and training of an employee for an enterprise, for health protection, migration, as well as for the search for information about prices and incomes [4].

Being a part of the total capital, human capital can be represented as a combination of its elements, that is, it has its own internal structure. I. V. Ilyinsky distinguished the following components: the capital of health, culture and education [5]. F. Neumann he attributed cultural and ethnic characteristics, qualifications and professional education to human capital [6].

The American economist (Nobel Prize winner in 1971) in his work «Capital and the American economy» (1961) presented the accumulated national human capital as the main factor of stable growth of the country's economy. The scientist investigated the relationship between the growth of the quality of human capital and the increase in labor productivity, the impact on the formation of new technological patterns. One of the alternative concepts of human capital development is considered to be the concept of permanent income. According to the theory, human capital is an asset that provides income (like bonds, stocks, money, durable consumer goods).

The essence of human capital is the purposeful action of acquired knowledge, practical skills and incentives to labor in the production process. The theory served as a basis for the development of an alternative concept of human capital development. First of all, in the definition of the category of «human capital» the scientist saw innate abilities and talent, and then the acquisition of education and qualifications. He also emphasized the ability of a person to work, his cultural and social qualities, psychological features [7]. The first studies of human capital are summarized. According to his definition, human capital embodies gifts, knowledge, productive abilities. He expanded the interpretation of this category, including such a characteristic as "respect for political and social stability". A special contribution of the American scientist was the recognition that human capital includes any improvements that rely on the increase of mental and physical abilities of the individual.

In the conditions of tougher competition in the world markets, the human resource was recognized as the main resource with the greatest reserves for improving the efficiency of the organization. Competitiveness should be understood as the compliance of the labor force with the requirements of the market, which opens up the opportunity for employees to enter into competitive relations in the labor market. Consequently, work on the presented elements increases the competitiveness of human capital.

THE MAIN PART OF THE RESEARCH

The development of the leading countries of the world led to the formation of a post-industrial, and then a new economy - the economy of knowledge, innovation, global information systems, the economy of intellectual labor, science, the latest technologies and technological venture business. The basis of this economy is accumulated human capital, which is the main dominant of the socio-economic development of modern society. Within the framework of the new paradigm of the development of the world community, human capital has taken a leading place in the national wealth and in the total productive capital.

Thus, on the basis of the theory and practice of human capital, a successful development concept of the United States and leading European countries is being formed and improved. Sweden, once lagging behind other countries, thanks to the theory of human capital, modernized its economy and in the 2000s regained its leadership position in the world economy. It is obvious that the success of developed countries in conquering world markets and producing competitive high-tech products is primarily due to the availability of high-quality human capital.

One of the urgent problems of the economy of the Republic of Kazakhstan is the formation and provision of a high level of its competitiveness through the formation of competitive human capital. National competitiveness is a tool in the struggle for a place in the global economic system. The issue of increasing the competitiveness of the republic's economy is a key one in the development of the Strategy «Kazakhstan-2050» [8] and other programs aimed at modernizing the economy. The successful modernization of the republic's economy is predetermined by achievements in the formation of human capital as the main factor in increasing the competitiveness of the national economy.

One of the main indicators determining the place and image of a country in the world table of ranks is the Global Competitiveness Index. The indicators of the leading countries of this rating can serve as thresholds for determining the country's place in the world market. In recent years, Switzerland, the USA, Singapore, Hong Kong and the Netherlands have consistently held leading positions. Among the CIS countries, Kazakhstan was inferior to Russia and Azerbaijan [9]. In the latest study of the competitiveness rating of countries conducted in 2019, Kazakhstan ranked 53rd out of 141 countries, among the countries of the post-Soviet space, letting Russia, Lithuania and Latvia go ahead, but ahead of Azerbaijan [10]. The Center for the Study of Global Competitiveness of the International Institute for Management Development (IMD, Switzerland) conducted a comprehensive study in 2023, in which 64 countries participated. In the course of the study, factors such as economic activity, government efficiency, business efficiency, infrastructure were evaluated. According to this rating, Denmark, Switzerland, Singapore, Ireland and the Netherlands occupy the leading positions. Kazakhstan ranks 37th, ahead of Kuwait, Portugal, and India. However, according to the «economic activity» factor, the indicators for the «employment» sub-factor worsened by 13 points; according to the «business efficiency» factor, the positions for the indicators «labor market», «management practice», «attitudes and values» decreased; according to the «infrastructure» factor, the indicators for technological and scientific infrastructure became worse [11]. These indicators are somehow related to human resources.

It should be noted that the industrial and innovative development of the country implies high quality parameters of employees. At the moment, the level of professionalism of Kazakhstani workers is not always adequate to modern scientific and technical achievements, which significantly complicates the recovery of the economy, slows down innovation processes. The low quality of training of specialists is due to the low level of funding for education and science, as well as a narrow range of its sources, a shortage of qualified personnel, separation of the training system from real practice, limited motivation of teachers and teaching staff of higher educational institutions, low level of integration of science, production and education, insufficient participation of employers in the formation of the content educational programs, inefficient use of existing scientific potential. One of the demotivating factors is the remuneration of labor, which sharply differs by spheres of economic activity, industries and professions.

Table 1 – Average monthly salary by type of economic activity, tenge

№	Type of economic activity	Year				Deviation 2022 from 2010.	
		2010	2014	2017	2022	(+,-)	%
1	2	3	4	5	6	7	8
1	Industry	93119	159839	214189	418811	325692	4,5 times
2	Construction	104434	140321	194227	416940	312506	4 times
3	Trading	74014	117186	145698	268469	194455	3,6 times
4	Financial activities	158121	220803	298725	560459	402338	3,5 times
5	Public administration and defense	70437	106000	125247	263843	193406	3,7 times
6	Education	49216	74756	96612	248575	199359	5,1 times
7	Healthcare	54650	88779	108714	249834	195184	4,6 times
Note – Compiled by the authors based on [12-14]							

According to the data in table 1, during 2010-2022 there has been an increase in the size of the average monthly nominal salary for all types of economic activity. At the same time, in 2010, the highest wages were paid to employees of the financial sector, construction workers were slightly lower, and the lowest wages were typical for education and healthcare systems. In subsequent years, the situation with wages in various sectors

of the economy began to change, and therefore in 2014, as before, higher wages were observed in the financial sector, and industry was in second place in terms of wages. The current trend continues to the present time. At the same time, despite the fact that over the past 12 years, wages in the education system have increased 5.1 times, and in healthcare – 4.6 times, the level of remuneration in these areas remains the lowest. In 2010, the salary of financial sector employees exceeded the remuneration of education workers by 3.2 times, healthcare workers – by 2.9 times. Over the past time, the existing wage imbalances have been eliminated. Nevertheless, in 2022, the salaries of financial sector employees exceeded the level of remuneration of employees of the education and health systems by 2.3 times and 2.2 times, respectively.

If we compare it with wages in advanced countries, the situation will look even worse. Thus, in the ranking of average wages in the countries of the world for 2022 out of 165 countries, Kazakhstan is on the 114th place (378 US dollars). The average wage level in the country is lower than, for example, in the USA – by 8.8 times, in Japan - by 7 times, in Germany – by 6.8 times, in South Korea – by 6 times [14]. Luxembourg (5850 US dollars), Germany (4390), Japan (3990), the USA (3900) are the leaders in the ranking of countries in terms of remuneration of employees of the education system. In Kazakhstan, this figure is US$ 545, which is 10.7 times lower than in Luxembourg, 8.1 times lower in Germany, 7.3 times lower in Japan, and 7.2 times lower in the USA. In terms of the average salary of health care workers, the TOP 5 includes the Netherlands, Australia, the USA, Belgium and Canada. The remuneration of healthcare workers in the Netherlands (US$ 9750) exceeds the remuneration of Kazakhstani doctors (US$ 548) by 17.8 times, in Australia (7583) – by 13,8 times.

It is obvious that the quality of human capital determines the level of development of the healthcare system. Healthcare expenditures in Kazakhstan were in the range of 2.3–2.6 % of GDP, but by 2020 the figure increased to 2.8 %. While, for example, expenditures on the healthcare system in Austria account for 10.2 % of GDP, in Belarus – 6.3 %, in Germany – 11.3 %.

According to Table 2, in recent years the number of doctors of all specializations has increased by 13.4 thousand people or by 20.3 %, and the number of secondary medical personnel has increased by 21.7 thousand people or by 12.8 %. This is explained, first of all, by the increase in educational grants for medical specialties. So, in recent years, 2,700 grants have been allocated annually for undergraduate studies alone. In addition, 20 grants are allocated within the framework of international agreements, and 325 grants are allocated for master's degree. However, in the total number of educational grants for the training of specialists with higher education, medical specialties account for only 5 %, which is not so much, given the country's need for specialists in the field of medicine. Despite the 20 % increase in the number of medical workers, it is clearly not enough for the normal provision of medical services to the population of Kazakhstan, since their increase remains insignificant per 10 thousand people of the population.

Table 2 – Key indicators of the healthcare system

№	Indicators	Year			Deviation 2022 from 2014.	
		2014	2017	2022	(+,-)	%
1	2	3	4	5	6	7
1	The number of doctors of all specialties, thousand people.	66,0	74,6	79,4	13,4	120,3
2	The number of secondary medical personnel, thousand people.	169,6	170,8	191,3	21,7	112,8
3	Number of hospitals, units	995	877	818	-177	82,2
4	Number of hospital beds, thousand units.	107,5	100,1	105,2	-2,3	97,9
5	Number of beds for pregnant women and women in labor, thousand units.	9,4	8,5	9,8	0,4	104,3
6	Number of beds for sick children, thousand units.	18,3	18,4	22,2	3,9	121,3
Note – Compiled by the authors on the basis of [12; 13; 15; 16]						

The same situation is observed with regard to nursing staff. It is clear that the high workload of medical personnel does not contribute to the growth of the quality of medical services. Consequently, the problem of providing the healthcare system with personnel is still unresolved and relevant.

At the same time, medical ambulance services are not carried out at the proper quality level, which is manifested in untimely arrival to patients, unskilled service, lack of availability of drugs. It is not for nothing that ambulance workers have been called "free taxis" in medical circles, because when they come on call, they are often unable to make a correct diagnosis and prefer to bring all patients to hospitals. While the task of ambulance workers is to provide primary medical care to patients who do not need hospitalization. The long queues of patients in polyclinics have not become a thing of the past either; insufficient hospital beds, as a result of which patients lie in hospital corridors or are simply denied hospitalization. The current situation indicates that the problems of the healthcare system are systemic in nature.

Of course, the growing processes of globalization are intensifying competition in the fields of education and healthcare. With the growth of people's well-being, their effective demand for high-quality educational and medical services is growing. In this connection, the number of people applying for medical services to clinics in other countries and for the provision of educational services to foreign universities is increasing. For example, every year more than 20 thousand Kazakhstani students study abroad for a fee, and more than 10 thousand people have received state scholarships under the Bolashak presidential program over the past 20 years. While the share of exports of educational services provided by Kazakh universities and other educational institutions remains insignificant.

The development of the theory of human capital is a process of accumulation of scientific views and theoretical and methodological concepts regarding the role and place of human beings in the economy on the basis of combination and synthesis of various scientific schools, currents, accumulation of ideas of scientists of different times. The analysis of scientists' research allows us to present the structure of investment in human capital, which covers the following types of investment: expenditures on education – in general and special education, formal and informal, training at work and the like; expenditures on human upbringing; expenditures on health care – investment in medical care, disease prevention, improvement of living conditions; search for economically relevant information; mobility costs, which facilitates the migration of human capital to places of higher labor productivity; motivation of economic activity; R&D, intellectual innovations; ecology and healthy lifestyle; culture, spirituality, leisure, etc.

It is clear that the formation of human capital is influenced by the state policy in the field of health, education and vocational training. In the current conditions, there is a need to develop a mechanism for managing human capital, taking into account its structure, the interdependence of the processes of formation and use, which allows to increase the innovative activity of employees.

In accordance with Figure 1, when implementing the proposed mechanism for the development of national human capital, it is necessary to take into account different levels of formation of conditions for the development of human resources potential. This process should be carried out as a result of complex interaction of all economic entities, but with the leading role of the state.

As the experience of countries with a high level of development shows, investing in people, even in small amounts, brings much higher returns in the long run than investing in enterprise development. There is no consensus among academic economists as to whether conventional investments can be compared with investments in human capital development. But all agree that investment in human capital is the main source of economic development of a country. Investments in human capital are characterized by certain features different from ordinary investments, namely:

- formation of human capital requires significant expenditures not only of an individual, family, but also of the state, enterprise as a whole;

- the investment period is much longer than that of physical capital - approximately 12 - 20 years;

- the expected results from investing in a person depend on the period of active labor of a person. The earlier investments in a person and his/her development were made, the more return on investment can be expected;

- investments in human capital are considered by scientists to be the most beneficial both for the individual and for society as a whole in comparison with expenditures in other types of capital;
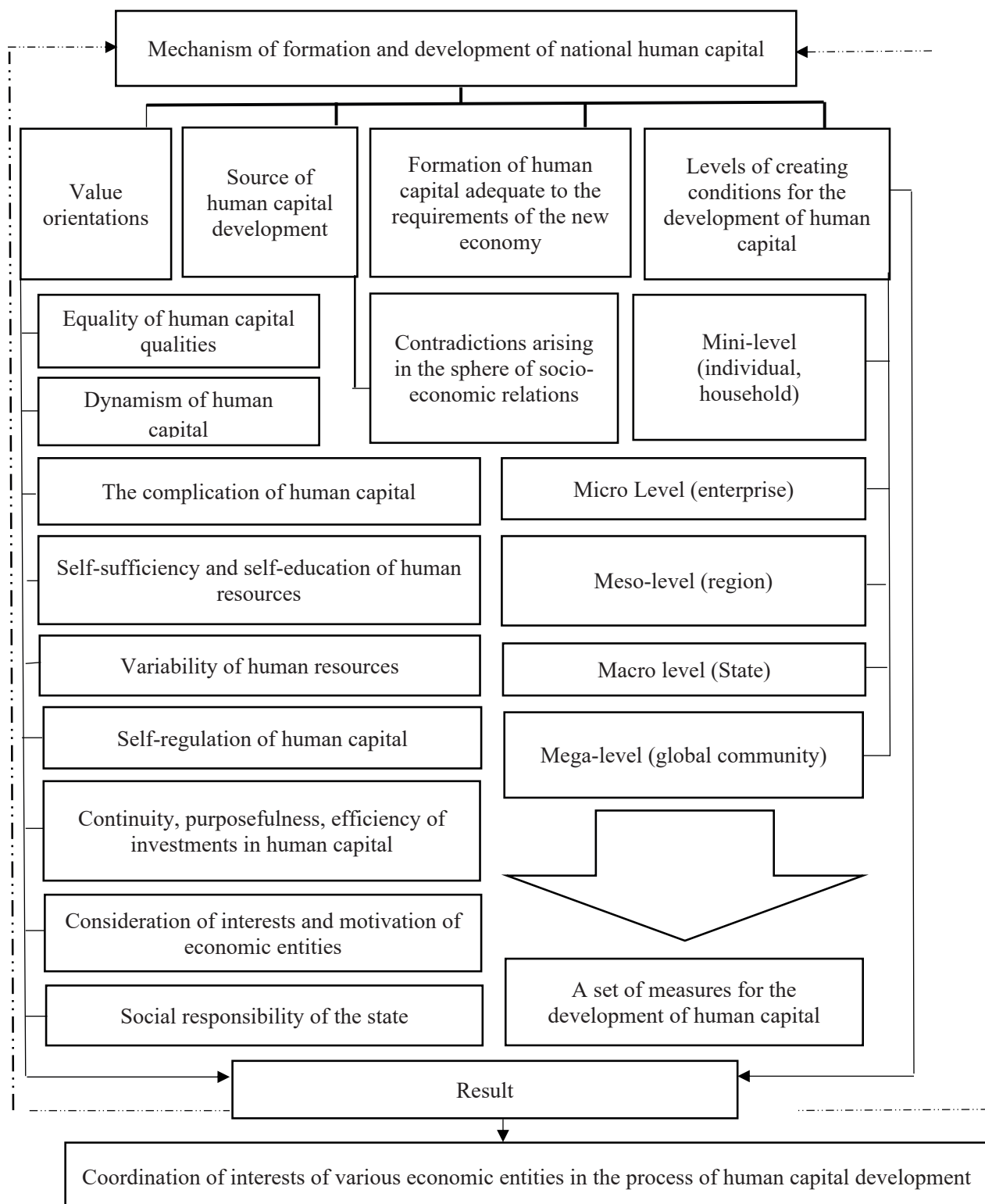
Figure 1 – Mechanism of national human capital development
Note – compiled by the authors based on the source [6]

- as a result of the use of human capital, it is used up both physically and morally. But if additional investments in a person are made during the period of use (continuous education, professional skills and experience, health, mobility, etc.), human capital is able to accumulate, improving its quantitative and qualitative characteristics;

- investments in human beings are significant in terms of volume, long in time, but give integral economic and social effects in the future (increased economic activity of each individual contributes to the revitalization of human capital mobility, improvement of citizens' well-being, development of society as a whole, which is the consequence of an increase in the level of education of human capital and growth of social consciousness of the population);

- not all feasible expenditures in a person are considered investments, but only those that contribute to human development, are economically feasible and benefit society;

- investments in the formation and development of human capital are associated with risk, as the period after which they begin to pay off can be twenty or more years;

- despite the fact that various subjects (state, enterprise, public organizations, family, individual) can be investors in human beings, but the direct control over the use of human capital and the receipt of income is exercised by an individual who is the owner of this type of capital;

- types of investments in human development, their nature and scale are conditioned by national, historical, cultural peculiarities and traditions of the society, mentality of the nation.

The main areas of investment in human capital at different levels are:

1) Personal level (individual and family expenditures):

- Expenses related to the birth and upbringing of children;

- expenditures on health, physical education and sports;

- expenditures on searching for important information;

- investment in education, professional knowledge and experience;

- migration costs;

- expenditures on culture and leisure.

2) micro level (corporation level):

- Expenditures on professional education;

- expenditures on professional development of employees;

- expenditures on labor protection and health of human capital;

- investments of adaptation (for effective involvement of a worker in production activities);

- investments of internal mobility of the employee, obtaining additional competencies (professional career development and the like).

3) meso-level (industry and regional level):

- expenditures on the economic and social development of human capital of a certain territory, which contributes to the growth of returns from it and the development of this region;

- expenditures on the creation of regional human capital development programs.

4) macro-level (state level):

- Expenditures from the state budget on education (general and higher education);

- expenditures on vocational training

- expenditures on health care;

- contributions to educational and medical programs;

- expenditures on science and innovative development;

- expenditures on physical and spiritual development of a person;

- social transfers.

5) globalization level (transnational corporations):

- TNCs' expenditures on increasing corporate social responsibility and employee's competence level;

- expenditures on the development of creative activity and professionalism of a person;

- expenditures on increasing the role of motivation for innovative labor.

Investments in the formation and development of human capital depend on the scale and profitability of the organization, but they are always quite costly. Taking into account the fact that the creation of innovations and

high labor productivity require, as one of the factors of production, high capitalization of human resources, which subsequently increases its income and competitiveness, it can be concluded that investments in human capital are direct investments in the innovative development of the enterprise.

THE RESULTS OBTAINED

Current trends in economic development dictate certain conditions for the system of formation and development of human capital of enterprises. Industry 4.0, digitalization, globalization, as well as transformational processes within enterprises and organizations cause an objective need for the formation of innovation centers within themselves. All organizational changes, short- and long-term strategies should be aimed at creating and retaining long-term competitive advantages.

In order to increase labor productivity indicators and, as a result, the economic indicators of the enterprise as a whole, a planned and verified strategy for the development of the organization's human capital is necessary, since human capital is a key factor in production, allowing to obtain a cumulative positive effect. Effective reproduction of human capital requires a planned long-term impact on its system-forming components, which allow purposefully changing the level of activation of human capital. The focus should be on finding ways in which companies maximize the potential of human resources in the midst of organizational change.

In our opinion, it is possible to ensure the effectiveness of investments in the development and realization of human capital if the following conditions are met:
- the efficiency of the economy as a system;
- minimal administrative regulation of the economy;
- formation of competitive domestic markets;
- raising capital;
- ensuring the ownership of investors;
- increasing the share of expenditures on financing the social sphere, science, education, healthcare, culture to a level corresponding to the indicators of developed countries;
- increasing the remuneration of public sector employees, in particular, doctors, teachers to the average salary level in non-governmental organizations;
- implementation of state targeted investment programs in the field of healthcare, education, science, culture, development of information technologies with strengthening of the monitoring and control system.

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ҚАЗАҚСТАН РЕСПУБЛИКАСЫНЫҢ АДАМИ КАПИТАЛЫ: БӘСЕКЕГЕ ҚАБІЛЕТТІЛІКТІҢ ҚАЛЫПТАСУ ЕРЕКШЕЛІКТЕРІ МЕН ӨСУ МҮМКІНДІКТЕРІ

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АҢДАТПА

Зерттеудің мақсаты. Мақалада озық елдер мысалында бәсекеге қабілетті адами капиталды қалыптастыру қажеттілігі негізделген, оның мақсаты тиімді адами капиталды қалыптастыру көздерін анықтау болып табылады.

Әдіснамасы. Зерттеу барысында талдау және синтез, статистикалық және салыстырмалы талдау әдістері қолданылды. Авторлар отандық және шетелдік экономистердің адами капиталын қалыптастыру саласындағы ғылыми еңбектеріне әдеби шолу жүргізді, елдердің озық тәжірибесі және оны қазақстандық шындықта қолдану мүмкіндігі зерделенді. Мәселелерді тереңірек зерттеу үшін стратегиялық бағдарламалар қарастырылып, статистикалық жинақтар талданды.

Зерттеудің бірегейлігі/құндылығы. Адами капиталдың құрамдас бөлігі ретінде денсаулық капиталын қалыптастыруды қамтамасыз ететін денсаулық сақтау жүйесінің негізгі көрсеткіштері талданды. Білім беру және денсаулық сақтау салаларының негізгі мәселелері анықталды. Еңбекақы төлеу көрсеткіштерін алдыңғы қатарлы елдермен салыстыру жүргізілді, орташа алғанда да, жалпы экономика салалары бойынша да оның адами капиталдың дамуына әсер ету дәрежесі анықталды.

Зерттеу нәтижелері. Инновациялық экономиканы құру жағдайында ұлттық адами капиталды дамыту тетігі ұсынылды. Еліміздің адами капиталын дамыту мен іске асыруға инвестициялардың тиімділігін қамтамасыз ету бойынша ұсынымдар әзірленді.

Түйін сөздер: адами капитал, ұлттық бәсекеге қабілеттілік, бәсекелестік артықшылықтар, инвестициялар.

ЧЕЛОВЕЧЕСКИЙ КАПИТАЛ РЕСПУБЛИКИ КАЗАХСТАН: ОСОБЕННОСТИ ФОРМИРОВАНИЯ И ВОЗМОЖНОСТИ РОСТА КОНКУРЕНТОСПОСОБНОСТИ

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АННОТАЦИЯ

Цель исследования. В статье на примере передовых стран обоснована необходимость формирования конкурентоспособного человеческого капитала, целью которой является определение источников формирования эффективного человеческого капитала.

Методология исследования. В ходе исследования были применены методы анализа и синтеза, статистического и сравнительного анализа. Авторами был проведен литературный обзор научных трудов в области формирования человеческого капитала как отечественных, так и зарубежных экономистов, был изучен передовой опыт стран, и возможность применения его в казахстанских реалиях. Для более глубокого изучения вопросов были рассмотрены стратегические программы и проанализированы статистические сборники.

Оригинальность / ценность исследования. Проанализированы основные показатели системы здравоохранения, обеспечивающей формирование капитала здоровья как составной части человеческого капитала. Определены основные проблемы сфер образования и здравоохранения. Проведено сравнение показателей оплаты труда с передовыми странами как в среднем значение, так и по отраслям экономики в целом, определен степень ее влияния на развитие человеческого капитала.

Результаты исследования. Предложен механизм развития национального человеческого капитала в условиях построения инновационной экономики. Разработаны рекомендации по обеспечению эффективности инвестиций в развитие и реализацию человеческого капитала страны.

Ключевые слова: человеческий капитал, национальная конкурентоспособность, конкурентные преимущества, инвестиции.

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ОЦЕНКА КОМПЕТЕНТНОСТНОГО ПОДХОДА В ПОДГОТОВКЕ ГОСУДАРСТВЕННЫХ СЛУЖАЩИХ: ОПЫТ АКАДЕМИИ ГОСУДАРСТВЕННОГО УПРАВЛЕНИЯ КАЗАХСТАНА

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АННОТАЦИЯ

Цель исследования: Исследование направлено на оценку того, как компетентностный подход, внедренный в систему подготовки кадров в Академии Государственного Управления, способствует эффективности и адаптации будущих государственных служащих к современным вызовам и требованиям службы в условиях неопределенности.

Методология: Методология включает анализ образовательных программ и практик, реализованных Академией, с фокусом на компетентностном подходе. Оценка включает в себя изучение применения подхода в отборе, обучении, и развитии кадров, с учетом требований государственной службы.

Оригинальность / ценность исследования: Статья представляет собой первичное исследование, посвященное анализу опыта Академии Государственного Управления в контексте применения компетентностного подхода в процессе подготовки кадров для государственной службы. Результаты исследования могут служить основой для дальнейших усовершенствований системы подготовки государственных служащих.

Результаты: Исследование подчеркивает, что компетентностный подход и управление компетенциями в Казахстане направлены на стратегическое планирование человеческих ресурсов и улучшение государственной службы. Однако, несмотря на улучшения, наблюдается недостаточное использование компетенций, что требует более широкого внедрения информации о компетенциях в государственные органы и образовательные учреждения для привлечения молодых талантов.

Ключевые слова: Государственная служба, Кадровое обеспечение, Компетентностный подход, Ассессмент-центр, Подготовка государственных служащих, оценка компетенции.

ВВЕДЕНИЕ

В настоящее время постепенный переход современных государств к модели «сервисной организации» является общемировой тенденцией, основной задачей которых является удовлетворение потребностей личности и общества. За последние два десятилетия реформы государственного сектора были сосредоточены на повышении эффективности, что является результатом трансформации традиционных бюрократических систем государственного управления в рыночные, ориентированные на результат деятельности государственных органов.

Продолжающийся процесс реформирования государственного управления и сдвиг парадигмы от бюрократических традиций и подходов, ориентированных на государство к новым управленческим методам, направленных на потребности гражданина оказывают значительное влияние на качество и темпы предоставления государственных услуг. Таким образом, государство вынуждено проводить

реформы и предоставлять более качественные услуги. В этом плане обязанности государственного служащего многогранны, и очень сложны. Поэтому требует уникального сочетания умений и компетенций, профессионализма, мотивацию, а также готовность государственных служащих к новым вызовам. Соответственно, эффективность изменений в сфере государственного управления зависит от квалификации государственных служащих и их профессиональных компетенций.

Обзор литературы. М. Вебер определял компетенцию как объективное разграничение должностных обязанностей, расстановку начальства и распределение средств принуждения [1; 2]. Он также выделял чиновников как высококвалифицированных специалистов, подчеркивая необходимость формирования определенных знаний и навыков. Р. Мертон расширил понятие, подчеркивая роль нормативных аспектов в бюрократии и выявив дисфункции, такие как формализация, обезличенность и «дух корпоративности», вносящие социальные конфликты и снижение эффективности деятельности. Вопрос об их врожденности или связи с отбором личностных качеств остается открытым [3].

«Компетентностный» подход к управлению человеческими ресурсами стал неотъемлемой частью системы государственного управления в последние годы. «Компетентность» охватывает знания, навыки, способности, модели поведения, которые позволяют человеку выполнять задачу в рамках конкретной функции или деятельности [4]. Термин «компетенция», с 1970-х годов упоминается в психологической литературе, в работах Дэвидом Макклелланда [5]. В своей работе «Тестирование компетентности, а не интеллекта» автор утверждает, что традиционные тесты академических способностей и содержания знаний на самом деле не предсказывают ни эффективность работы, ни успех в жизни [5]. Понятие «компетенция» также стало широко использоваться применительно к теории языка Н. Хомским в 70-е гг. ХХ века в США [6]. Это дало толчок на исследования в области компетенций, оценки и развития навыков персонала. В 1982 году Бояцис впервые обобщил исследуемые данные, собранные в США с помощью метода «оценки профессиональных компетенций» [7]. С тех пор компетентность стала важным фактором в практике развития профессионализма человеческих ресурсов.

В этом контексте, Закон «О государственной службе Республики Казахстан» 2015 года можно считать началом нового этапа качественного развития государственного управления в Казахстане. С того времени, с учетом лучших зарубежных практик были модернизированы механизмы и процедуры поступления на государственную службу и дальнейшего карьерного роста [4].

В 2017 году впервые была разработана и апробирована Единая рамка компетенций, позволяющая осуществлять отбор и продвижение кадров с учетом оценки личных компетенций (профессиональных и иных качеств кандидата).

Впервые в сфере государственной службы начали внедрять современные технологии управления человеческими ресурсами. С 2017 года инициирован мониторинг и анализ HR-процессов, происходящих в государственных органах. Впервые был подготовлен и опубликован Отчет ОЭСР, в котором содержится сравнительный анализ управления человеческими ресурсами государственной службы в Казахстане и странах-участницах этой организации. Академией в процессе обучения стали применяться стандарты ОЭСР – была внедрена «единая рамка компетенций» государственных служащих [8].

Одним из новых ключевых принципов комплексной аттестации административных государственных служащих корпуса «Б» в 2017 года была использование компетентностного подхода. При этом важно было не только определить уровень знаний специалиста, но и то, каким образом он эти знания использует в своей повседневной деятельности и обладает ли для этого соответствующими навыками и умениями. То есть, одних теоретических знаний недостаточно для того, чтобы быть эффективным работником. К примеру, эксперт по дисциплине «лидерство», не всегда оказывается способным эффективно управлять организацией. Ведь для этого он должен не только знать, что такое лидерство, но и уметь быть лидером на практике, а это предполагает наличие соответствующих компетенций. Таким образом, под компетенциями понимается совокупность знаний, умений и навыков, необходимых для осуществления эффективной профессиональной деятельности на конкретной должности [9].

С тех пор, перечень оцениваемых компетенций был составлен с учетом ключевых требований, предъявляемых к современному профессиональному государственному аппарату. Это – эффективность, служение народу, прозрачность и подотчетность.

Агентством по делам государственной службы совместно с учеными Академии государственного управления, специалистами зарубежных и государственных компаний, имеющими опыт внедрения компетентностного подхода, были организованы и проведены специальные семинары для членов аттестационных комиссий. Обучение было направлено на то, как правильно формулировать вопросы, на что обращать внимание и как оценивать ответы. В целях соблюдения единых требований к процессу собеседования члены аттестационных комиссий использовали специальные методические рекомендации, разработанные Агентством совместно с указанными партнерами.

Академией были приняты меры по соблюдению принципов объективности и прозрачности и в ходе тестирования на выявление компетенций. Недавний анализ, проведенный Академией, показал, что меньше половины государственных служащих наиболее необходимыми для государственных служащих выделили наличие следующих компетенций: следование этическим нормам и принципам, оперативность, управление деятельностью, сотрудничество, самостоятельность и навыки принятия решений, и управление командой.

В соответствии с Концепцией развития государственного управления в Республике Казахстан до 2030 года акцент в кадровой работе будет смещен на профессиональные и личностные компетенции кандидатов, в том числе за счет внедрения передовых методов оценки кандидатов с привлечением общественности и экспертов [10].

Новая модель государственного управления, основанная на принципах «слышащего», эффективного, подотчетного, профессионального и прагматичного государства, может быть успешно реализована лишь при условии кардинального изменения подходов к развитию профессиональных компетенций и личностных качеств государственных служащих.

На нынешнем этапе развития Казахстана расширение сотрудничества общества и государства является ключевой модернизационной парадигмой. В первых, реализация принципа «Слышащего государства» с учетом новой Концепции развития государственного управления имеет центральное и принципиально важное значение в формировании коммуникационных навыков и компетенций государственных служащих. Поэтому, обучение государственных служащих по вопросам эффективных коммуникаций с населением, ориентации деятельности на потребителя услуг является одним из приоритетных направлений в образовательной деятельности Академии. Данная необходимость подтверждается практическими исследованиями, которые регулярно проводятся учеными Академии: «Эффективные коммуникации», «Стратегии лидерства и эффективного взаимодействия с населением», «Слышащее государство: практические инструменты взаимодействия с населением и гражданским обществом», «Лидерство и стратегия эффективного взаимодействия с населением» и др.

Модернизация государственной службы является важной государственной задачей для европейских стран. Разработанные стратегии государств-членов ЕС тщательно рассматриваются с точки зрения совместимости с европейскими нормами, реализации общей политики и соответствия европейскому законодательству. В Германии был разработан и внедрен артефакт консультативной информации *(advisory information artifact).* Данный инструмент оказывает всестороннюю поддержку государственным служащим на рабочем месте, позволяя им предоставлять консультационные услуги, ориентированные на граждан. Артефакт консультативной информации состоит из трех основных компонентов: интегрированная база знаний (*Integrated knowledge base*), консультирование (*counseling affordances*) и сервисы thinkLet (*thinkLet предоставляет сотрудникам рекомендации по социальному поведению, информируют сотрудников о лучших примерах решения проблем*). Таким образом, данная система оказания услуги помогает государственным служащим совершенствовать свои навыки, исключает необходимость в длительных и дорогостоящих тренингах для сотрудников [11].

Французская модель государственной службы построена на таких принципах, как *непрерывность* (конституционный принцип, основанный на обязательстве постоянно удовлетворять потребности граждан), *равенство доступа к государственным услугам*, из чего вытекает обязанность государственных служащих сохранять нейтралитет при оказании государственных услуг; а также *приспосабливаемость* (*согласно которому государственные услуги должны удовлетворять потребности граждан и успевать за техническим развитием*) [12].

Из ближнего зарубежья можно привести пример Литвы, в которой одной из наиболее важных комплексных мер, направленных на введение административной реформы, является модель компетенций государственной службы (далее – CSCM), направленная на то, чтобы сделать государственную службу эффективной, открытой и действенной [13; 14; 15]. CSCM был создан за счет разумного использования средств ЕС и изучения опыта других государств (*Бельгии, Нидерландов, Финляндии и др.*). Литва успешно переняла инновации в государственном управлении и опыт стран Западной Европы, что можно определить, как шаг к модернизации государственного управления. Литовская оценка общих компетенций охватывает оценку трех групп компетенций:

– *Общие компетенции – применимы в любой сфере деятельности;*

– *Управленческие и лидерские компетенции – необходимые для управления учреждением или отделом;*

– *Конкретные профессиональные компетенции – необходимые для осуществления профессиональной деятельности* [13].

Разработчики нового CSCM проанализировали процедуры отбора государственных служащих в европейских странах (*Великобритания, Швеция, Бельгия, Нидерланды*), их системы компетенций государственных служащих и модели оценки деятельности [10]. В Модели компетенций государственной службы следующие общие компетенции были определены как обязательные:

– *Способность создавать добавленную социальную ценность (added value)* – цель государственной службы состоит в содействии созданию социальной ценности;

– *Организационная компетенция*– способность планировать деятельность и время, определять приоритеты, предпринимать немедленные действие;

– *Надежность и ответственность*: способность выполнять обязательства, брать на себя ответственность за деятельность и результаты, постоянно совершенствоваться;

– *Аналитическое и логическое мышление* – способность проводить анализ ситуации;

– *Коммуникативность* – способность эффективно доносить информацию, общаться лицом к лицу и с общественностью, как в письменной, так и в устной форме, посредством электронной почты, писем, отчетов, телефонных звонков и т. д. [10; 11; 12].

По исследованиям авторов, муниципальные власти Литвы довольно критично отнеслись к централизованной оценке общих компетенций, отметив, что они имеют большое влияние на качество работы и результаты ее деятельности. Схема состоит из трех групп компетенций: *общих компетенций* (требуются в любой сфере деятельности), *управленческо-лидерских* (требуются для руководства учреждением или подразделением) и *специальных и профессиональных компетенций* (необходимых при выполнении профессиональных функций) [13; 14; 15].

Следует отметить, что европейские страны в основном придерживаются модели компетенции Европейского союза и внедряют опыт, который успешно практикуется в странах ЕС. Авторы также обращают внимание на повышение квалификации посредством улучшения базовых и функциональных компетенции для руководящих, как *личная эффективность, эффективность межличностных отношений, социальная ответственность, а также управленческие способности и лидерство.*

Опыт Академии государственного управления в применении компетентностного подхода в обучении. На первоначальном этапе перехода к применению компетентностного подхода в обучении была разработана модель компетенций, которая соответствует профилю эффективного государственного служащего в соответствии с текущими и будущими потребностями системы государственного управления Казахстана. Данная модель разрабатывалась Академией совместно с основными стейкхолдерами, а именно Администрацией Президента Республики Казахстан и Агентства по делам государственной службы Республики Казахстан для отбора в Президентский молодежный кадровый резерв 2019 года. Академия посчитала, что данная модель универсальна для эффективного государственного служащего и применима для использования в обучении, так как отвечает современным вызовам, стоящим перед государственной службой Казахстана. В результате были определены пять компетенций эффективного казахстанского государственного служащего (Рисунок 1).
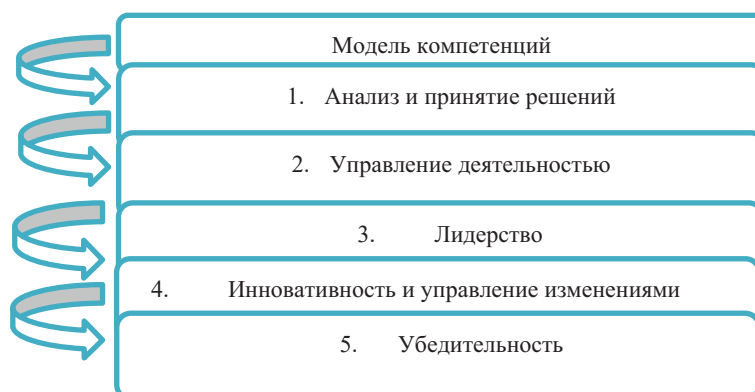
Рисунок 1 – Модель компетенций профиля эффективного государственного служащего
Источник – Разработка Академии государственного управления при Президенте Республики Казахстан.

Наличие данных компетенций у государственного служащего позволяет ему принимать обоснованные качественные решения на основе анализа имеющихся данных, эффективно управлять собой и своими сотрудниками, генерировать новые идеи, совершенствовать имеющиеся решения, мыслить критично, быть убедительным при продвижении своих идей и решений.

Для эффективного применения компетентностного подхода Академия проводит измерение компетенций каждого поступившего студента перед началом учебного процесса методом Ассессмент – центра, а затем в конце обучения этим же методом. Данный метод предполагает погружение участника в определенную рабочую ситуацию, в которой он может проявить все названные компетенции в полной мере.

В ходе оценки использовались инструменты Ассессмент Центра. Ассессмент Центр — это инструмент оценки, основанный на упражнениях, который включает в себя *аналитические упражнения и групповые дискуссии.*

Групповая дискуссия — это метод оценки, имитирующий ситуацию совещания или иного группового обсуждения в организации. Данный метод используется для того, чтобы выявить, как кандидаты взаимодействуют между собой во время групповой работы, принимают коллегиальные решения и отстаивают свою позицию.

Аналитическая презентация — это метод оценки, имитирующий презентацию участником решения конкретной производственной задачи. Презентационные упражнения являются мощным средством оценки аналитических и стратегических навыков наряду с навыками коммуникативными, которые обеспечивают ясность и убедительность изложения своей точки зрения.

Шкала оценки состоит из пяти пунктов, где оценка «3» показывает достаточный уровень компетенций для решения типичных задач государственной службы, но требующий небольшие целенаправленные усилия по развитию отдельных поведенческих характеристик (Таблица 1).

Академия подготовила пул профессиональных ассессоров, обладающих международной сертификацией SHL, ведущей глобальной консалтинговой компании, специализирующейся на оценке персонала и тестировании, с более чем 10 000 клиентами в 150 странах. [16]. Данные ассессоры наблюдают за участниками, анализируют их поведение, описывают это поведение в соответствии с моделью компетенций и делают выводы относительно степени проявления каждой компетенции. Для объективности выводов за одним участником наблюдают два ассессора в двух разных упражнениях. Затем ассессор составляет отчет по каждому участнику с подробным описанием проявления каждой компетенции, сильных сторон и зон роста. Завершающим этапом ассессмента является предоставление участнику обратной связи. На данном этапе ассессор в личной беседе разъясняет выводы, показанные в отчете, и дает рекомендации по построению траектории развития студента.

Таблица 1 – Описание шкалы оценки компетенций

Оценка	Описание
1,0	Компетенция не продемонстрирована/ могут быть отдельные негативные проявления, сдерживающий фактор общей эффективности; развитие требует интенсивных усилий и высокой мотивации.
2,0	Компетенция проявлена ниже среднего уровня, продемонстрированы отдельные элементы компетенции, имеется базовый потенциал для дальнейшего развития.
3,0	Компетенция проявлена на среднем уровне, достаточном для решения типичных задач, требуются небольшие целенаправленные усилия по развитию отдельных поведенческих характеристик.
4,0	Компетенция проявлена в полной мере в соответствии с требуемым уровнем, помогает в достижении результата; не требует дополнительных мероприятий по развитию
5,0	Компетенция проявлена ярко; область конкурентного преимущества, уровень мастерства
Примечание – Разработка Академии государственного управления при Президенте Республики Казахстан	
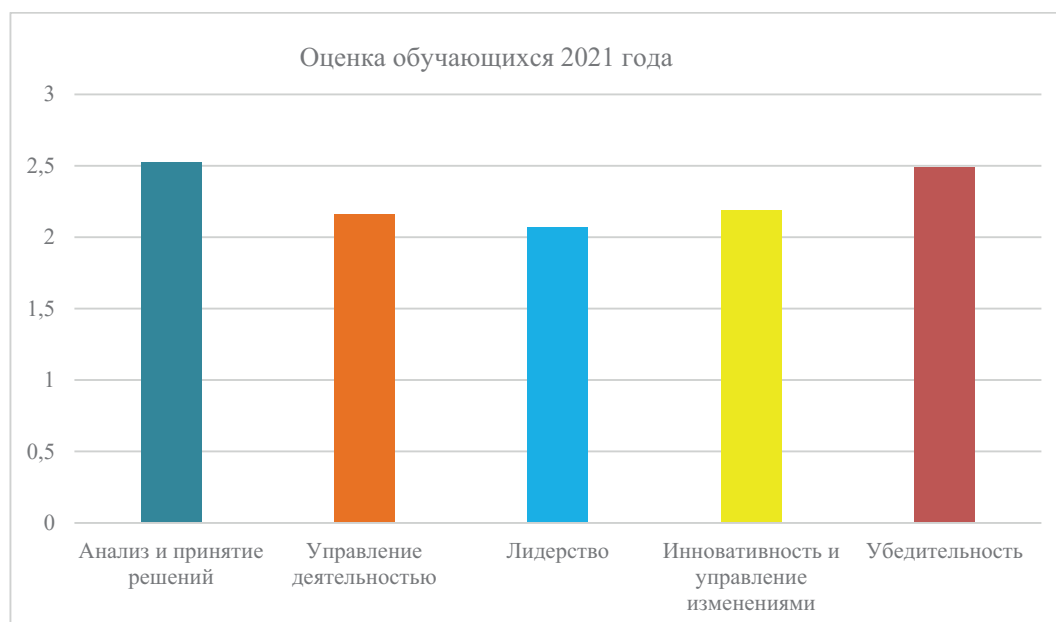
Рисунок 2 – Результаты оценки обучающихся Академии 2021 академического года
Примечание – Результаты оценки проведенного в Академии государственного управления при
Президенте Республики Казахстан

По результатам ассессмента строится траектория обучения каждого студента совместно с кураторами, эдвайзерами и прочими лицами, вовлеченными в организацию учебного процесса. Кроме того, преподаватели вносят изменения в силлабус, а именно в тематику и характер заданий. Так же преподаватель и другие лица, вовлеченные в образовательный процесс, организацию общественных мероприятий и пр. дифференцируют работу с каждым студентом исходя из его потребностей развития. По окончании обучения проводится еще один замер, для понимания степени развития студента за время обучения. Такая оценка и выводы по ее результатам предоставляют уникальную возможность построения траектории развития и определения самостоятельных шагов развития каждому выпускнику Академии. Кроме того, оценка по результатам обучения так же предоставляет данные для анализа эффективности работы всего образовательного блока академии, основания для корректировки его деятельности для повышения качества обучения.

В рамках реализации компетентностного подхода к обучению в феврале 2021 года Академией была проведена оценка компетенций 99 магистрантов и докторантов методом Ассессмент – центра, из них 94 человека являются государственными служащими с опытом работы в центральных и местных государственных органах.

К сожалению, условия локдауна позволили провести оценку лишь один раз, что стало скорее промежуточной оценкой результатов обучения, учитывая, что обучение в Академии начинается в сентябре. Тем не менее обучающимся и образовательному блоку были даны рекомендации по развитию компетенций и корректировки силлабусов по результатам проведенной оценки.
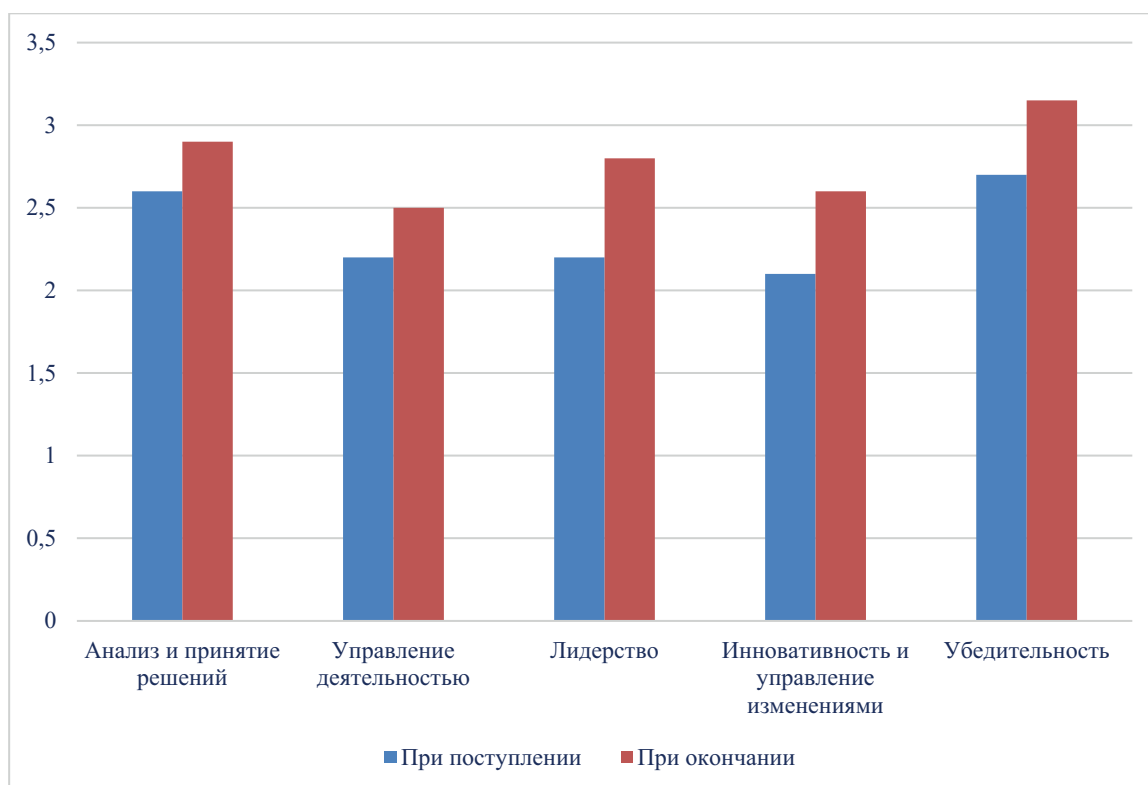
Рисунок 3 – Результаты оценки обучающихся Академии 2022–2023 академического года
Примечание – Результаты оценки проведденного в Академии государственного управления при
Президенте Республики Казахстан

На данной диаграмме показаны средние результаты оценки студентов, поступивших в 2022 году и окончивших Академию в 2023 году. Всего обеим оценкам подверглись 62 магистранта и докторанта. Как видно из результатов, за год обучения уровень компетенций вырос по всем пяти компетенциям, что говорит об эффективности данного подхода. Например, обучающиеся по программе «Государственное управление» показали высокий прирост по четырем компетенциям, развив компетенции «Анализа и принятия решений», «Убедительности», «Управления деятельностью» и «Инновативностью и управления изменениями» на уровень выше достаточного. Данный уровень не требует серьезных дополнительных мероприятий по развитию. Наиболее высокий прирост с 2 до 3,3 наблюдается по компетенции «Инновативность и управление изменениями», что является важным показателем, так как Академия готовит будущих лидеров изменений, а специальность «Государственное управление» в свою очередь готовит руководителей высшего и среднего звена.

Рисунок 4 – Результаты оценки обучающихся по специальности «Государственное управление»
Примечание – Результаты оценки проведденного в Академии государственного управления при Президенте Республики Казахстан

Анализируя всю оцениваемую группу обучающихся, отмечается развитие компетенций у всех обучающихся, прошедших Ассессмент-центр. Необходимо понимать, что все оцениваемые имели разный уровень развития компетенций при поступлении, что напрямую зависит от требований для поступления в Академию по тем или иным специальностям.

Важным моментом оценки является обновление и поддержание актуальности модели оценки компетенций, изменения по различным индикаторам при необходимости, в соответствии с глобальными изменениями, а также на основе результатов анализа потребностей страны.

В это связи, Стратегия развития компетенций ОЭСР 2019 определяет широкий спектр компетенций, которые имеют значение для достижения экономических и социальных результатов [8]. Спектр в себе включает такие компетенции как, *навыки счёта и цифровую грамотность; трансверсальные когнитивные и метакогнитивные навыки, включая критическое мышление, комплексное решение задач, творческое мышление; а также социальные и эмоциональные компетенции, включая добросовестность, ответственность, сочувствие, эффективность и сотрудничество, ит.д.*, необходимые для развития и выполнения конкретных поставленных задач.

Учитывая индивидуальный подход каждого государства в формировании и оценке профессиональных компетенций государственных служащих, эмпирические исследования того, как результаты оценивания используются в образовании, а также государственными органами, представляются необходимыми для дальнейшего развития компетенции.

ЗАКЛЮЧЕНИЕ

В целом компетентностный подход и система управления компетенциями направлены на переход от традиционного управления персоналом к стратегическому планированию человеческих ресурсов страны для обеспечения профессиональных кадров и менеджеров, а также включение всех слоев населения в развитие государства. Подход к оценке и развитию, основанный на компетенциях, необходим для оценки уровня реагирования на меняющиеся потребности государственных услуг, глобальные экономические и политические условия, а также быстрые темпы глобальных изменений.

Построение «человекоориентированной» модели государственной службы в Казахстане может быть достигнуто за счет необходимого обучения и развития компетенций, а также внедрения комплексной оценки компетенций, соответствующих политике, принятой государством, и основанной на исследование лучших мировых практик.

В плане развития Агентства Республики Казахстан по делам государственной службы на 2023-2027 годы, стратегическими целями определяются следующие важные направления: *улучшение качества человеческих ресурсов и профессионализация государственного аппарата; автоматизация кадровых процессов; развитие клиентоориентированности на государственной службе; проактивная оценка, минимизация и профилактика нарушений среди государственных служащих* [17].

Согласно показателям ОЭСР, несмотря на некоторые признаки улучшения, компетенции в Казахстане не используются интенсивно на работе и в повседневной жизни [8]. Исходя из этого, рекомендуется расширить использование информации о компетенциях государственными органами и заинтересованными сторонами.

Также для привлечения молодых талантов в государственное управление необходимо образовательным учреждениям, готовящим государственных служащих, рассмотреть возможность предоставления информации о необходимых компетенциях, возможностях образования и обучения. Информированность может в дальнейшем помочь молодым талантам при принятии карьерных решений на государственной службе, а также на рынке труда Казахстана.

В заключение следует отметить необходимость проведения комплексного исследования и создания эффективного диалога между образовательными учреждениями, осуществляющими подготовку государственных служащих, и соответствующими государственными органами, что позволит сократить расхождения в компетенциях государственных служащих, а также спрогнозировать будущие потребности государства в развитии необходимых компетенций.

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ASSESSMENT OF THE COMPETENCE APPROACH IN THE TRAINING OF CIVIL SERVANTS: THE EXPERIENCE OF THE ACADEMY OF PUBLIC ADMINISTRATION OF KAZAKHSTAN

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ABSTRACT

The purpose of the study: The study is aimed at assessing how the competence-based approach implemented in the personnel training system at the Academy of Public Administration contributes to the effectiveness and adaptation of future civil servants to modern challenges and requirements of the service in conditions of uncertainty.

Methodology: The methodology includes an analysis of educational programs and practices implemented by the Academy, with a focus on the competence approach. The assessment includes the study of the application of the approach in the selection, training, and development of personnel, taking into account the requirements of the civil service.

Originality / value of the research: The article is a primary study devoted to the analysis of the experience of the Academy of Public Administration in the context of the application of a competence-based approach in the process of training personnel for public service. The results of the study can serve as a basis for further improvements in the system of training civil servants.

Findings: The study emphasizes that the competence approach and competence management in Kazakhstan are aimed at strategic planning of human resources and improvement of public service. However, despite the improvements, there is insufficient use of competencies, which requires a wider introduction of information about competencies in government agencies and educational institutions to attract young talents.

Keywords: Civil service, Staffing, Competence approach, Assessment center, Training of civil servants, competence assessment.

МЕМЛЕКЕТТІК ҚЫЗМЕТШІЛЕРДІ ДАЯРЛАУДАҒЫ ҚҰЗЫРЕТТІЛІК ТӘСІЛДІ БАҒАЛАУ: ҚАЗАҚСТАННЫҢ МЕМЛЕКЕТТІК БАСҚАРУ АКАДЕМИЯСЫНЫҢ ТӘЖІРИБЕСІ

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АҢДАТПА

Зерттеу мақсаты: зерттеу Мемлекеттік басқару академиясында кадрларды даярлау жүйесіне енгізілген құзыреттілік тәсілдің болашақ мемлекеттік қызметшілердің тиімділігіне және белгісіздік жағдайында қызметтің заманауи сын-қатерлері мен талаптарына бейімделуіне қалай ықпал ететінін бағалауға бағытталған.

Әдістеме: әдістеме құзыреттілік тәсілге назар аудара отырып, Академия жүзеге асыратын білім беру бағдарламалары мен тәжірибелерін талдауды қамтиды. Бағалау мемлекеттік қызмет талаптарын ескере отырып, кадрларды іріктеуде, оқытуда және дамытуда тәсілді қолдануды зерделеуді қамтиды.

Зерттеудің бірегейлігі / құндылығы: мақала Мемлекеттік қызметке кадрларды даярлау процесінде құзыреттілік тәсілді қолдану контекстінде мемлекеттік басқару академиясының тәжірибесін талдауға арналған бастапқы зерттеу болып табылады. Зерттеу нәтижелері мемлекеттік қызметшілерді даярлау жүйесін одан әрі жетілдіруге негіз бола алады.

Зерттеу нәтижелері: зерттеу Қазақстандағы құзыреттілік тәсіл мен құзыреттерді басқару адами ресурстарды стратегиялық жоспарлауға және мемлекеттік қызметті жақсартуға бағытталғанын атап көрсетеді. Алайда, жақсартуларға қарамастан, құзыреттердің жеткіліксіз пайдаланылуы байқалады, бұл жас таланттарды тарту үшін мемлекеттік органдар мен білім беру мекемелеріне құзыреттер туралы ақпаратты кеңінен енгізуді талап етеді.

Түйін сөздер: Мемлекеттік қызмет, кадрлық қамтамасыз ету, құзыреттілік тәсіл, Ассессмент-орталық, мемлекеттік қызметшілерді даярлау, құзыреттілікті бағалау.

ОБ АВТОРЕ

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ASSESSMENT OF REGIONAL DEVELOPMENT OF WOMEN'S ENTREPRENEURSHIP: CASE-STUDY OF KAZAKHSTAN

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ABSTRACT

Research on the development and support of women's business in the context of developing countries requires special attention.

The purpose of this study is to analyze the features of the regional development of women entrepreneurs in Kazakhstan, a country with a developing economy and a leader among Central Asian countries, as well as the policy of state support for women's entrepreneurship in the post-pandemic period.

The methodology of the study as a basis covers statistical methods of statistical data analysis, cluster analysis.

Originality of the research. The study focuses on identifying the causes of uneven development of women's entrepreneurship in the regions of the republic and the implementation of state support.

Findings. The authors conclude that the socio-economic development of the regions directly affects the entrepreneurial activity of women in the regions. The economic unevenness of regional development is reflected in the social aspect of the level of development. The use of the economic potential of rural women is associated with the development of single-industry towns and infrastructure, as well as the development of programs that take into account the specifics of the regions. However, despite the existence of existing state programs to support entrepreneurship, there are not enough programs aimed at broad involvement of women in business and a number of measures should be taken to improve the country's entrepreneurial ecosystem.

Keywords: women's entrepreneurship, regions, Kazakhstan, public policy, gender economy.

INTRODUCTION

As it is known, the development of women's entrepreneurship in many countries is very different and diverse. This depends on many factors, including the development level of the country, the mentality, established traditions, and the implemented policy in the state which is based on the principles of ensuring gender equality, empowerment of women in general.

Indeed, a World Bank study showed that the increased role of women in the labor market played a significant role in reducing poverty by 30 % and reducing gender inequality over a ten-year period in Latin American countries [1].

Every year, in Kazakhstan's President K. Tokayev's message to the nation [2], the priority role of small and medium-sized businesses in the development of cities and the countryside is emphasized. Kazakhstan demonstrates a commitment to women's empowerment and support for women's entrepreneurship; however, several issues remain to be addressed.

The purpose of the study is to study the regional characteristics and differentiation of women's business development in Kazakhstan and to analyze state support for women's entrepreneurship. The study focuses more on identifying the causes of the uneven advancement of women's entrepreneurship in the country's administrative regions and the implementation of state support, with the help of which the government of many countries, as the most vulnerable entrepreneurs, tried to encourage women's business.

Literature review. The study of women's entrepreneurship helps to identify the problems faced by women in business. This is important to create conditions under which women can develop their business and be competitive. In addition, women's participation in business creates an economically diverse and sustainable environment, including in the social sphere.

Studies emphasized that women's entrepreneurship is of interest worldwide, thanks to a rapidly growing group of entrepreneurs and its distinctive features including household responsibilities and raising children, which contribute to the growth of the GDP of their countries through the creation of jobs, innovation, and involvement in various activities [3-5]. The well-known research group 'Diana' said that women's entrepreneurship is a new form of entrepreneurship [6].

Women's entrepreneurship has several characteristics and distinctive features. The following features of women's entrepreneurship are distinguished:

1) Industry peculiarity. Women entrepreneurs are mostly concentrated in socially oriented industries: education, services, healthcare, traditional handcraft and food, trade, etc. Accordingly, they are underrepresented in typically 'male' sectors such as industry, transport, and production. Conventionally, industries can be distinguished into 3 groups: industries with pronounced gender asymmetry (small trade, services, education, etc.); industries with a low proportion of women's participation (industry, transport, etc.) and industries with no significant difference (wholesale trade, agriculture, financial sector). For example, in Russia, an explicit 'women's business' is typical for retail, agriculture, catering, science, healthcare, and least of all for construction, transport, and industry [7].

2) Dimension of enterprises run by women. In connection with the focus of women on the family and business at the same time, in the non-capital-intensive service sector, which is a flexible organizational and legal form of organization (for example, an individual entrepreneur), due to the psychological characteristics of the social status, and, in addition, due to the presence of gender discrimination, associated with difficult career advancement, distrust of a woman leader, and other reasons, women are less represented in large business.

In addition, the dynamics of growth in the number of small enterprises in women's business is higher than the number of small enterprises in men's. So Barsukova S.Yu. [7] associates this trend to three factors. Women entrepreneurs are concentrated in those industries that do not require a large number of workers. Women are more concerned about the time distribution than paying all attention to the profits growth. Also, the small size of enterprises is conditioned by the insignificant 'age' of businesses led by women.

3) Such characteristics as turnover and the number of employees in the firm also have their differences. Women prefer to work with a small number of employees, however, due to the growth of women-led enterprises in the SMEs, they provide a significant share of jobs (for example, in Kazakhstan, the share of employment in the SMEs in women-led enterprises is about 30 % of the total number of jobs).

4) Informal shadow business. Some of the women who are forced to engage in entrepreneurship in micro and small businesses are often employed in unofficial businesses. This is due to the complexity of registration procedures, tax payments, the emerging demand in a market economy, but also the possibility of obtaining additional low income, characterized by instability and informal activities.

5) The image of a female entrepreneur is made up of personal characteristics, such as age, education, opportunities, and so on. In this regard, the image of a typical female entrepreneur will differ depending on the economic level of the country and the inducements that motivate her to run business.

6) The features of the relationship with partners and the peculiarities of doing business by women. Unlike male entrepreneurs, female entrepreneurs are less likely to encounter non-obligatory partners, are less involved in negative practices and are less prone to negative lifestyles. Their behavior with regular partners is situational. In addition, the specifics of the sectoral affiliation of women's business are typical for low added value industries, and, accordingly, low entrepreneurial risks, which leads to a low probability of obligation violations by partners.

The authors of this study support the view that women are more conservative, less prone to risk, and need support that will help minimize the risks associated with entrepreneurial activity [8].

7) Some scientists distinguish features at each stage of the entrepreneurial process. Different scientists differentiate these stages in various way, however, 4 main stages can be distinguished: idea generation stage; the stage of implementing the idea and assessing resources and capabilities; the stage of direct activity; and the stage of development, control and management. Barriers [9] for women at each stage are dissimilar and vary in countries with different levels of economic development.

One of the problems in the first phase is that women are not always able to search for opportunities due to cultural and national limitations. The gender component manifests itself as a restrictive belief [10].

According to Minniti [11], the level of the gender gap in start-up activities is much higher in countries with an average income per capita than in developing countries, where women start a business out of necessity, and they have more determination in their strengths, skills, and less fear of failure.

The authors agree that despite the fact that entrepreneurial abilities, experience and capital are important in the second stage and are needed everywhere, it should be borne in mind that in developing countries, due to gender discrimination, women do not have sufficient experience, as well as due to lack of knowledge and education, they may not have sufficient confidence in their ability to create a company[12].

An important role is played by the national government, which should pursue an effective policy to support women's entrepreneurship. Microcredit programs for women's businesses increase women's decision-making autonomy, as well as the overall well-being and consumption of households. Legislative regulation and 'ease of doing business' are also important at this stage. And at the last stage of maturity, the authors note slower growth in both sales and employment. This is owing to a number of factors such as women's lower entrepreneurial ability, employment in informal businesses, family networks, and constraining cultural institutions.

Now many global processes in the economy and other industries can be assessed both before and after the outbreak of the pandemic. The governments of the countries provide national support to entrepreneurs and the mechanism of state support for business continues to function actively and adapt to changing conditions.

The impact of the crisis on women's entrepreneurship can be viewed from different perspectives. Female entrepreneurs face a decrease in sales and loss of income by a third more often than men [13].

The authors A.Salamzadeh, Leo Paul Dana [14] identified financial issues, support mechanisms, human resource management, market mechanisms and anti-crisis management as problems faced by startups in Iran.

There are four problems faced by women entrepreneurs in Pakistan during the crisis - a decrease in sales, family income, a deterioration in the lifestyle and psychological state of women [15]. At the same time, the following strategies for business survival are proposed: 1) following the requirements of the market; 2) maintaining and improving effective communications with customers, building trust; 3) improving business management skills. There, the support provided by the government plays an important role.

Most often, men raise capital in the form of venture financing, loans or business-angels, while women mainly rely on government funding and support [16].

Along with negative consequences, some authors also note positive aspects. So, [17] note that during this time, women startups in Hungary went through a kind of filtering of viable projects that received further funding and at the same time rethought and improved their products and services.

The level of development of individual countries is different, so the measures of state support provided also differ. It is known that financial support is very important for supporting women. Financial instruments include subsidies, crowdfunding, investments, grants, leasing, social entrepreneurship.

Small grants are used as one of the tools of state policy to support women entrepreneurs in Croatia [18], aimed primarily at micro and small enterprises, not for the purpose of direct impact, but to cover the costs of

consultations, child care, training documents for obtaining external financing. Despite the small amount of grants, this government support tool has shown to be effective, the benefits of which exceed the costs, to a greater extent for more experienced women entrepreneurs.

Non-financial support is equally important. Through the acquisition of new skills in the digital space and knowledge in a changing environment, women were retrained in order to ensure the survival of the business [19].

For Kazakhstan, the problem of developing women's entrepreneurship is also relevant, including in the context of gender inequality.

Shedenova N.U. considered the priority areas of women's employment during the transitional economy, which was characterized by the structural nature of supply and demand, and participation in entrepreneurial activities is considered as an option for expanding women's employment [20].

The specifics of women's entrepreneurship in each country, including Kazakhstan, is associated with the conditions of its formation, with the patterns of economic transformation of the 90s and the emergence of the first merchants and entrepreneurs in various fields and industries [21] .

So, Satpayeva Z. [22] considers the general state of women's entrepreneurship in Kazakhstan within the framework of the 5Ms concept proposed by Brush [23] Micro Environment, Mezo Environment, Money, Motherhood and Management.

In order to analyze the current state, Seilbekova S.D. and Nurbekova Zh.A. through a questionnaire and online survey, conducted a study on the topic 'Peculiarities of women's entrepreneurship in the Republic of Kazakhstan'[24]. More than 50 % of women spontaneously decide to become an entrepreneur. At the same time, the Western trend continues, in which the number of women's enterprises is growing, with small turnover and employed workers. Basically, the desire for independence determines the social expectations of women in business.

At the present stage Temirbekova Zh.A. pays attention in her work to the motivation of women, which encourages them to do business [25]. Nevertheless, the proportion of women focused on self-realization as individuals, social success and income generation is increasing [26].

The main obstacles faced by the business during the pandemic are financial losses, loan repayment arrears, lack of sales, low purchasing power of the population. At the same time, women's entrepreneurial activity was also affected by an increase in time for family and housekeeping, a lack of knowledge and skills in doing business in crisis conditions, including in working with information technology, participation in online marketplaces [27] and lack of awareness of state support measures [28].

In Kazakhstan, the heightened role of social and family relationships during the pandemic has placed an even greater burden on self-employed women as they tried to maintain a 'family-work balance' while acting as an entrepreneur. At the same time, during the pandemic, women increase their entrepreneurial aspirations by applying various strategies of role obligations, finding support in the family [29].

The importance of family support, especially parents [30], has been noted by many authors, and organizational endorsement for the family is also important, especially within the socio-cultural characteristics of regions or countries, including for informal sectors of women's business development [31]. Not only economic, but also social factors influence the self-employment of both men and women [32].

Women participation in labour force in Kazakhstan. Before the discus multivariate statistical results, to provide a brief information about institutional environment and policies with respect to women entrepreneurship in the country can be helpful to better understand and interpret the results.

The development of women's entrepreneurship, as one of the forms of women's employment, is initially regulated by a number of international and state programs and documents for the implementation of gender policy. The Republic of Kazakhstan has adopted a number of documents that promote the development of women's entrepreneurship.

In 1998, the main Convention on the elimination of all forms of discrimination against women (CEDAW) was ratified [33]. In 2016, the concept of family and gender policy until 2030 was approved, which is a long-term strategic document with specific indicators. Prior to this period, from 2006 to 2016, the gender equality strategy was in force. A number of gender-oriented laws were adopted, including the law of the Republic of

Kazakhstan 'On state guarantees of equal rights and equal opportunities for men and women' [34], the law 'on the prevention of domestic violence' [35].

Women's involvement in the political and economic development of the state stands out as the most crucial direction of the institutional mechanism of the national commission for women, family and demographic policy, a consultative and advisory body under the President of the Republic of Kazakhstan.

To develop women's entrepreneurship, the state programs 'employment roadmap 2020', 'business roadmap 2020', program 'damu' of the entrepreneurship development fund and programs of international organizations such as the European Bank for Reconstruction and Development, which implements the program 'women in business'. The program uses three main support tools: project financing, providing access to training, and reducing credit risks by covering the risk of first losses [36].

In Kazakhstan, women make up about 52 % of the population. At the same time, about 42 % of the total number of entrepreneurs are women entrepreneurs. Even though there is an annual increase (about 4 % on average) in the number of entrepreneurs, the gap between registered and operating entrepreneurs is on average about 15 %, both in general and for women entrepreneurs. It should be noted that the number of operating enterprises is also growing, however in 2018 the share of operating enterprises among registered was 76 % on average, but it increased to already 85 % in 2021. This means that entrepreneurs, starting their activities, face several problems, such as bureaucratic procedures, the complexity of doing business, lack of funding, uncertainty in the chosen field, lack of relevant knowledge and so one. The impact of the pandemic is also felt, since the increase in registered enterprises has been small over the past year. However, the average annual growth among registered enterprises was 101.5 % and among operating enterprises it was 105 % on average (Table 1).

Table 1 – Dynamics of registered and operating enterprises of SMEs

	on 01.01.2018		on 01.01.2019		on 01.01.2020		on 01.01.2021	
	units	%	units	%	units	%	units	%
Registered enterprises, total	1540592	100	1577747	100	1603839	100	1610496	100
Including those headed by women	648 128	42,1	665 973	42,2	677 390	42,2	680 897	42,3
Operating enterprises, total	1145994	76,4*	1241328	80,6*	1330244	84,3*	135711	84,6*
Including those headed by women	492 166	42,9	536 270	43,2	575 524	43,3	587 284	43,3
*-calculated as a share of the previous year's indicator								
Source: Elaborated by Authors based on data from women and men of Kazakhstan / statistical collection/ in Russian, www.stat.gov.kz								

For Kazakhstan, small and medium-sized women's businesses are concentrated in wholesale and retail trade, services, agriculture, education, and real estate transactions. Such concentration in the service sector is due to low costs, high demand due to periodic or household needs, lack of borrowed capital, the ability to self-study and apply skills and abilities in business. About 78 % of women entrepreneurs are individual entrepreneurs, the rest is occupied by legal entities and peasant farms.

METHODOLOGY AND RESULTS

In this research, secondary data from the Bureau of National Statistics of the Republic of Kazakhstan were used, in particular, indicators of gender statistics. We considered demographic indicators for the number of men and women, the number of employed and directly indicators characterizing the development of small and medium-sized businesses in the context of women/men. Indicators were used for cluster analysis - the number of small and medium-sized enterprises run by women, the number of people employed in small and medium-sized businesses headed by women, gross regional product per capita and average amount of credit granted to

women. It should be noted that there are insufficient indicators of gender statistics and the further expansion of the list of these indicators will make it possible to better identify problems and stimulate changes to achieve gender equality.

In addition, the choice of variables for analysis is determined by a different combination of economic activity, financial stability and gender characteristics in the regions. As the authors show [22-24], these factors have a significant impact on the level of development of women's business in the country.

In the study, a comparative static analysis, and statistical methods, including cluster analysis as a grouping method is employed, correlation analysis.

To select the number of clusters from the available data, the Elbow method ('elbow method') was used. He considers the nature of the variation in the spread with an increase in the number of groups. For the analysis, a hierarchical type of clustering was used based on the Ward method, which uses methods of analysis of variance and minimizes the sum of squares for any two clusters that can be formed at each stage. As a visualization of hierarchical clustering, we built a dendrogram.

In preliminary analysis, an adjusted indicator is used. Since there was a scatter of values in the dataset across indicators, standardization was done based on the mean value and standard deviation using the formula:

$$z = \frac{x_i - \mu}{\sigma} \qquad (1)$$

where z is the value of the indicator after standardization, x_i is the actual value of the indicator, μ is the mean value, σ is the standard deviation. Cluster analysis was carried out using the 'R' software, designed for statistical processing and data visualization.

The regions of the republic differ in terms of population, territory, and socioeconomic context in the country. To analyze regional characteristics and identify the relationship between the level of development of regions and the state of women's entrepreneurship, the regions of the Republic of Kazakhstan were clustered according to individual factors that characterize the ecosystem of women's entrepreneurship:

a) the number of small and medium-sized businesses run by women per 1,000 employable women, is an indicator of the aspect of decent employment, that characterizes the position of women in business. At the same time, small business entities are understood as individual entrepreneurs, without forming a legal entity with an average annual number of no more than fifty employees as well as legal entities engaged in private entrepreneurship with an average annual number of no more than fifty employees and an average annual value of assets for the year not more than sixty thousand times the monthly settlement indicator established by the law on the republican budget for the corresponding financial year. Medium-sized businesses include individual entrepreneurs and legal entities engaged in private business, regardless to small and large businesses [37]. For a more correct comparison in the territorial context, relative indicators per 1,000 employable women were used.

b) the number of people employed in small and medium-sized businesses led by women is the number of people working in operating SMEs led by women, per 1000 employed people.

c) gross regional product value per capita is an indicator that characterizes the economic performance of the region.

the average size of a loan issued to women is an indicator that characterizes the micro-crediting of women entrepreneurs and is calculated as the ratio of the amount of loans issued to women to their number by region according to the data of Joint-Stock Company the 'Damu Entrepreneurship Development Fund' (Bureau , Women and men of Kazakhstan / Statistical collection/).

In the optimal number k is three is selected since after three the curve begins to show diminishing returns.

A result of hierarchical type of clustering based on the Ward method is presented with a dendrogram below (Figure 1).
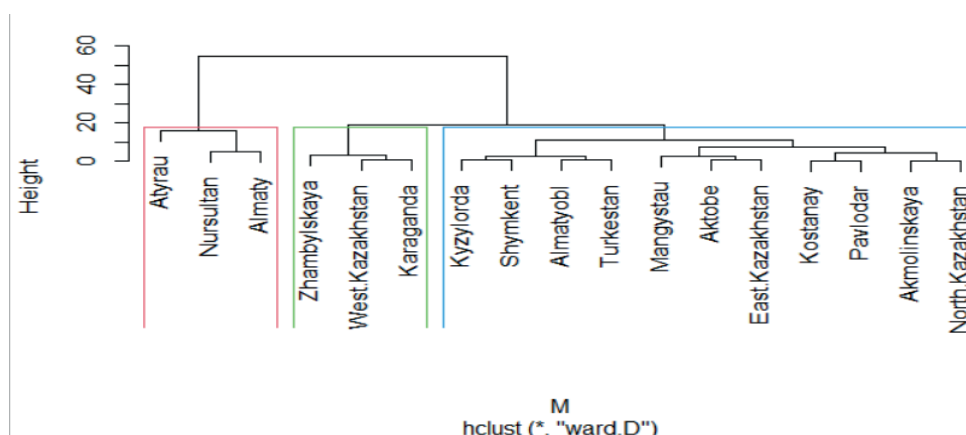
Figure 1 – Dendrogram of the distribution of regions by clusters

Note – compiled by the authors

The analysis results show that three clusters are formed. The first cluster includes the cities of Almaty, Astana and Atyrau. The second cluster included three regions: Zhambyl, West Kazakhstan and Karaganda. The third cluster is represented by the city of Shymkent, as well as Almaty, Kyzylorda, Turkestan, East Kazakhstan, North Kazakhstan, Kostanay, Akmola, Pavlodar, Aktobe and Mangystau regions.

Descriptive statistics show variation across regions in the number of businesses run by women. The smallest number is observed in the North Kazakhstan region (12.3 thousand units), and the largest number is expected in Almaty (85.3 thousand units, which is 7 times more). Accordingly, the number of employed in these regions is proportionally located.

Table 2 – Grouping of regions by the main indicators of cluster analysis as of January 1, 2021

№	Region	WH-SMEs*	EWH-SMEs	GRP per capita	NoB	LW	ALW	NIoA
1	Atyrau	23 973	37 453	11883.2	37	625	16.8	215076
	Nursultan	65 064	116 564	6873.6	209	1 550	7.4	174396
	Almaty	85 363	258 394	6913	23	223	9.6	164721
	on average	58133.3	137470	8556.6	90	799.3	11.3	184731.0
2	West Kazakhstan	19 568	30 681	4151.2	141	3 115	22.1	112319
	Zhambylskaya	27 267	37 945	1675.8	142	4 339	30.6	80516
	Karaganda	42 245	70 455	4431.7	78	1 887	24.2	130552
	on average	29693.3	46360.3	3419.6	120	3113.7	25.6	107795.7
3	Akmolinskaya	20 674	34 949	3102.5	56	872	15.6	107224
	Aktobe	28 427	44 582	3329.8	91	775	8.5	98360
	Almatyobl	50 839	71 391	1805.2	953	1 105	1.2	86606
	Kostanay	24 054	52 517	3314.5	337	1 374	4.1	105856
	Kyzylorda	23 221	27 869	2033.3	1025	1 631	1.6	85142
	Mangystau	24 639	44 054	4335.1	48	623	12.9	141506
	Pavlodar	20 330	46 464	4151.4	117	891	7.6	119334
	North Kazakhstan	12 326	24 574	2877.7	87	1 553	17.8	103292
	Turkestan	45 344	57 370	1174.2	697	1 843	2.6	63443
	East Kazakhstan	42 394	75 130	3369.8	28	455	16.3	111632
	Shymkent	31 556	47 921	2360.3	1547	4 088	2.7	75725
	on average	29436.7	47892.8	2895.8	453	1382.7	8.3	99829.1
	Total	587284	1078313	-	5616	26949	-	-
Note – calculated by the authors (based on (Bureau, Regions of Kazakhstan in 2020 / Statistical yearbook / in Kazakh and Russian)							
*note: WH-SMEs – number of SMEs headed by women, units; EWH-SMEs – the number of employees in SMEs headed; GRP per capita – GRP per capita, for 2020, thousand tenge; NoB – the number of borrowers; LW – the amount of loans granted to women, million tenge; ALW – the average size of the loan issued to women, million tenge; NIoA – nominal cash income on average for 2020, tenge.							

Discussion. Consider each cluster separately. The first cluster includes Almaty, a large, economically developed, financial center with a population of more than 2 million people [38]; Astana is the capital and political center of the republic with a developed social and economic infrastructure, the functioning of small and medium-sized businesses, as well as the Atyrau region with rich oil and gas fields.

About a third of active women entrepreneurs are concentrated in this cluster, only 25 % of which are in two cities. More than 400,000 people or about 38 % of the total number of employees in enterprises headed by women are employed in these small and medium-sized enterprises. On average, almost 200 out of 1,000 employed people employ women, and there are about 175 women's enterprises per 1,000 able-bodied women, most of whom are self-employed.

This cluster forms more than 40 % of the country's gross domestic product, respectively, characterized by a high level of gross regional product per capita, exceeding other clusters by 2-2.5 times. At the same time, the largest share of the gross value added of SMEs in the formation of the GRP of the regions is in Astana and Almaty (56 % and 49 %, respectively). This is primarily due to the high volumes of industrial production (oil, gas, etc.) for the Atyrau region, the share of the business sector, the production of goods and services, and the volume of investments in the fixed capital of the two cities.

A correlation analysis of the relationship was carried out between the individual indicators. The higher the level of development of the region, the higher the nominal cash income per capita ($r = 0.966$), the greater the number of SMEs per 1000 people ($r = 0.642$). In regions where the income of the population is higher, there are more opportunities for the development of entrepreneurship, including the same dependence is observed both for all enterprises and for enterprises headed by women ($r = 0.6209$). At the same time, the lower the level of gross regional product per capita, the greater the proportion of the population with incomes below the subsistence level ($r = -0.518$).

For the first group of regions, the smallest number of women debtors is observed, while in Almaty the smallest number of loans issued to women with the smallest amount among other regions of Kazakhstan, less than 1 %. Compared to other regions, the proportion of women, especially in two cities, who resort to lending is relatively lower. The smallest share of the gross value added of SMEs in the GRP of the region is in the Karaganda region (17.9 %), and the largest is in the West Kazakhstan region (34.1 %), but more than 80 % is small business.

The second cluster is represented by Zhambyl, West Kazakhstan and Karaganda regions, which geographically represent the southern, western, and central parts of the republic. The manufacturing industry, retail trade and agriculture form a large part of the gross regional product of the Zhambyl region, the industrial orientation is typical for the West Kazakhstan region, the manufacturing and mining industry - for the Karaganda region.

These regions collectively account for about 20 % of all female entrepreneurs in the country (or 120 female-led entities per 1,000 able-bodied women) and 13 % of women employed in SMEs (on average, about 94 people per 1,000 employed people).

A characteristic feature is the high level of average lending to women entrepreneurs, on average about 25 million tenge, which is 2-3 times higher than the regions of other groups.

In the Zhambyl region, the low contribution of the gross regional product to the country's economy is correlated with a low level of income per capita, a high share of the self-employed population in comparison with other regions. Nevertheless, there are resources for the development of agriculture, trade, and the possibility of realizing the export potential.

The predominance of the mining sector of industry, typically 'male' industries is typical for the economy of the West Kazakhstan region. There is also a low level of vocational education, lack of awareness about the services of conducting and supporting entrepreneurial activities of women in the West Kazakhstan region [39].

The downward trend in the population associated with migration and the problem of the development of single-industry towns, dependence on large industrial enterprises can be identified as weaknesses for the Karaganda region [40]. These problems affect the quality of the labor market and the creation of new jobs. In this term, the expansion of the business sector by providing funding / subsidizing for women entrepreneurs through the implementation of the state programs 'Business Road Map – 2025, 'Economy of Simple Things' will contribute to the development of employment in single-industry towns.

The third cluster includes 11 regions. A characteristic feature of the economy of the northern and eastern regions is the development of industry, the manufacturing sector and agriculture. Given that many of them are industrial-agricultural regions, state support for the agricultural sector is relevant for them. The southern regions, whose economy is represented by mining, manufacturing, and agricultural development, are characterized by a high population density, active state support through the implementation of state programs to support the business activity of the small and medium business sector. The economy of the city of Shymkent is represented by the manufacturing industry and a developed trade sector, considering the needs of the population and business opportunities. A high demographic potential has been formed here due to natural as well as migration growth.

Pavlodar and Kyzylorda regions have the smallest share of gross value added of small and medium-sized businesses in the GRP of their regions (18.8 % and 17.6 %, respectively), the largest in Almaty region (32.4 %). The southern and northern regions have low rates of gross regional product per capita. For the Turkestan region, where a high proportion of the population with incomes below the subsistence minimum observed a low proportion of female entrepreneurs in the total number of entrepreneurs (r = - 0.7277).

In terms of the number of women entrepreneurs, the third cluster includes more than 55 % of the total number, and half of those employed in women's enterprises. For Almaty and Turkestan regions, a significant proportion of women entrepreneurs, in addition to individual entrepreneurs, are peasant (farm) enterprises (25 % and 35 %, respectively).

It should be noted that for this group of regions, the average amount of a loan issued to a woman is 8.3 million tenge, but they represent almost 90 % of women borrowers from the total number. The fact that in the southern regions there are more women entrepreneurs, they often receive loans for amounts significantly less than representatives of other regions.

CONCLUSION

The analysis of women's entrepreneurship in the regions shows differences in the level of entrepreneurial activity of women in Kazakhstan. In addition, the analysis allows us to identify key aspects affecting women's entrepreneurship, which can become the basis for the development of individual support programs in each region. It is necessary to take into account the peculiarities of each region in order to effectively stimulate and develop women's business.

a) In Kazakhstan, there is differentiation by regions in terms of economic and social indicators. The economic uneven development of regions is reflected in the social aspect at the level of development. Almost all regions are characterized by problems of the self-employed population, spontaneous trade, high unemployment, poor IT infrastructure in rural areas [41]. The socio-economic development of the regions directly affects the entrepreneurial activity of women in the regions. The higher the standard of living of the population in the region, the more encouraged lending for large amounts, the larger the size of the loan. This is because of the opportunities for collateral, and the larger the enterprise in terms of the number of employees, the greater the level of the loan issued.

b) Women from rural areas require special attention. Insufficiency of financial resources, limited access to public resources and services, low collateral opportunities hinder the realization of women's economic potential. Emphasis should be placed on the development of single-industry towns and villages, and the development of the non-primary sector. To narrow the gap, it is necessary to develop special programs to improve indicators that consider the specifics of the regions, to revise regional programs in order to increase efficiency for small farms and women's micro-businesses.

c) Women's business is not focused on innovation and is more focused on meeting the needs of the local and local market, the share of women in large businesses is insignificant, which indicates a small participation of women entrepreneurs in the export of products. For bordering regions, it is necessary to use export opportunities, increasing the competitiveness of products.

d) In general, the proportion of women entrepreneurs needs to be increased, in this regard, the lack of funding and administrative barriers is one of the main problems in the regional aspect. Despite the existence of existing government programs to support entrepreneurship, there are not enough programs aimed at the broad involvement of women in business.

e) As the most demanded measure of state support, women used deferred payments [28], preferential loans, subvention of rent for premises owned by the state and the quasi-sector, exemption from pension and social contributions from the wage fund. Regional centers for the development of women's entrepreneurship were opened and began their work [42]. However, Kazakhstan still has to overcome a number of obstacles to improve the country's entrepreneurial ecosystem, such as unfavorable conditions for business, distrust of the current financial system in the republic and, accordingly, the passivity of entrepreneurs, which leads to a decrease in trust in the state and its structures [43].

Many countries are characterized by a developed network of entrepreneurial ecosystems [16], in this regard, Kazakhstan should also expand the development of the entrepreneurial ecosystem.

Women are still underrepresented in large business. In this term, there are stereotypes that some activities are purely male, and women can work in certain ones. However, the state is taking measures to train girls and women in technical specialties and in the STEM in general. To equalize the chances of men and women to build a career in the STEM industries, employment policy [44] should begin with the period of school vocational guidance.

It is necessary to take into account the socio-economic context of the region when forming strategies and programs to support women entrepreneurs. Given that government programs have an impact, it is necessary to consider the possibility of adapting such programs to single-industry towns, taking into account migration trends and labor market problems.

Changing and analyzing regional social and economic processes, such as migration, will make it possible to anticipate possible problems and respond to them in order to create conditions for the development of women's entrepreneurship.

Awareness should be raised and educational programs should be introduced that create equal opportunities for women in STEM professions.

Recommendations. The study provides to the empirical evince of women's entrepreneurship through the analysis of various scientific studies on the regional characteristics of women's entrepreneurship on the example of the Central Asian Republic of Kazakhstan, as well as on the resolution of the problems faced by women entrepreneurs in Kazakhstan. The results of the study can be used in the development of appropriate policies and programs to support women's business, and as shown the calculations, the role of women's business is significant both in the economy of many countries and in Kazakhstan.

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ӘЙЕЛДЕР КӘСІПКЕРЛІГІНІҢ ӨҢІРЛІК ДАМУЫН БАҒАЛАУ: ҚАЗАҚСТАННЫҢ ЖАҒДАЙЛЫҚ ЗЕРТТЕУІ

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АНДАТПА

Дамушы елдер контекстінде әйелдер бизнесін дамытуға және қолдауға бағытталған зерттеулер ерекше назар аударуды қажет етеді. Бұл *талдаудың мақсаты* Қазақстандағы, экономикасы дамушы елдегі және Орталық Азия елдері арасындағы көшбасшы әйел кәсіпкерлердің өңірлік даму ерекшеліктерін, сондай-ақ пандемиядан кейінгі кезеңде әйелдер кәсіпкерлігін мемлекеттік қолдау саясатын талдау болып табылады.

Зерттеу әдістемесі негіз ретінде статистикалық деректерді талдаудың статистикалық әдістерін, кластерлік талдауды қамтиды.

Зерттеудің құндылығы. Зерттеу республика өңірлерінде әйелдер кәсіпкерлігінің біркелкі емес даму себептерін анықтауға және мемлекеттік қолдауды жүзеге асыруға бағытталған.

Зерттеу нәтижелері. Авторлар өңірлердің әлеуметтік-экономикалық дамуы өңірлердегі әйелдердің кәсіпкерлік белсенділігіне тікелей әсер етеді деген қорытындыға келеді. Өңірлік дамудың экономикалық біркелкіностьстігі даму деңгейінің әлеуметтік аспектісінде көрініс табады. Ауыл әйелдерінің экономикалық әлеуетін пайдалану моноқалалар мен инфрақұрылымды дамытумен, сондай-ақ өңірлердің ерекшеліктерін ескеретін бағдарламаларды әзірлеумен байланысты. Алайда, кәсіпкерлікті қолдаудың қолданыстағы мемлекеттік бағдарламаларының болуына қарамастан, әйелдерді бизнеске кеңінен тартуға бағытталған бағдарламалар жеткіліксіз және елдің кәсіпкерлік экожүйесін жақсарту үшін бірқатар шаралар қабылдау қажет.

Түйін сөздер: әйелдер кәсіпкерлігі, өңірлер, Қазақстан, мемлекеттік саясат, гендерлік экономика.

ОЦЕНКА РЕГИОНАЛЬНОГО РАЗВИТИЯ ЖЕНСКОГО ПРЕДПРИНИМАТЕЛЬСТВА: КЕЙС КАЗАХСТАНА

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АННОТАЦИЯ

Исследования, посвященные развитию и поддержке женского бизнеса в контексте развивающихся стран, требуют особого внимания.

Целью исследования является анализ особенностей регионального развития женщин-предпринимателей в Казахстане, стране с развивающейся экономикой и лидере среди стран Центральной Азии, а также политики государственной поддержки женского предпринимательства в постпандемический период.

Методология исследования в качестве основы охватывает статистические методы анализа статистических данных, кластерный анализ.

Оригинальность / ценность исследования. Исследование направлено на выявление причин неравномерного развития женского предпринимательства в регионах республики и осуществление государственной поддержки.

Результаты исследования. Авторы приходят к выводу, что социально-экономическое развитие регионов напрямую влияет на предпринимательскую активность женщин в регионах. Экономическая неравномерность регионального развития отражается на социальном аспекте уровня развития. Использование экономического потенциала сельских женщин связано с развитием моногородов и инфраструктуры, а также разработкой программ, учитывающих специфику регионов. Однако, несмотря на наличие действующих государственных программ поддержки предпринимательства, программ, направленных на широкое вовлечение женщин в бизнес, недостаточно, и необходимо принять ряд мер для улучшения предпринимательской экосистемы страны.

Ключевые слова: женское предпринимательство, регионы, Казахстан, государственная политика, гендерная экономика.

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EARNINGS QUALITY DURING COVID-19: CENTRAL ASIAN CASE

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ABSTRACT

The purpose of this research. In 2021 Gong & Choi investigated the effect of State ownership on Accounting quality. Positive relationship between State ownership and Earnings management has weakened in recent years, which is the result of the effective mixed-ownership reform [1]. Our research is an event study to assess the impact of COVID-19 on the National IPO/SPO Program results in terms of Earnings quality changes in partial state-owned enterprises.

Methodology. We analyze 572 unbalanced panel firm-year observations during 2009-2021period. Sample data is extracted from KASE Stock Exchange population across different industries excluding financial institutions and investment holdings. To estimate Earnings quality, we combine Kasznik cash flow model for accrual-based Earnings management and Roychowdhury aggregate model for real activity Earnings management [2; 3].

Findings. We found that COVID-19 positively affected Earnings quality in partially state-owned companies and its effect was stronger compared to Earnings quality in 100 % owned private and state enterprises. Despite such the immediate and positive reaction, in post COVID-19 2021 year, Earnings quality deteriorated in partial state-owned companies (with 50-99 % Government ownership) up to the level of 100 % private/state companies.

Originality / value of the research. Our study is among the first attempts to analyze Earnings quality dynamics over 2009-2021 horizon in Kazakhstan with the assessment of COVID-19 impact. As a practical recommendation, our research findings could be integrated into the National IPO/SPO Program as a red flag to impact Earnings quality trend in partial state-owned enterprises.

Keywords: Earnings quality, Ownership structure, Republic of Kazakhstan, National IPO/SPO Program, COVID-19.

INTRODUCTION

In 2021 Gong & Choi investigated the effect of State ownership on Accounting quality, measured by earnings management. They found out that positive relationship between State ownership and Earnings management has weakened in recent years, implying the mixed-ownership reform to be effective [1]. Proper functioning of capital markets highly depends on transparency and quality of financial information. Investors assess companies not only by profitability and cash generation but also by risk of earnings information quality that affect future sustainability.

The National IPO/SPO Program (or ownership reform) in Kazakhstan started more than 10 years ago. The program was developed in pursuance of the Instructions of ex-President Nazarbayev during the XIII Congress of the Nur-Otan, People's Democratic Party, on February 11, 2011. The National IPO/SPO Program is expected to be effective, especially during shock periods like COVID-19 when it's vital to keep potential investors interested in investing into partial state-owned enterprises attracting not only by cash and profits but by transparent high-quality financial corporate data.

Here is an excerpt from the President of the Republic of Kazakhstan K. K. Tokayev's speech delivered to the representatives of international investment companies on December 3, 2021:

«A large-scale campaign is now underway on privatization of more than 700 state-owned enterprises in

various sectors of the economy of Kazakhstan, including oil and gas, energy, infrastructure. We consider it preferable to place shares of the largest companies on national stock exchanges».

KazTransOil joint-stock company (hereinafter JSC) was the first state company to go public in 2012. As part of The National IPO Program, citizens of Kazakhstan and local pension funds, were offered to purchase 38 million ordinary shares of the company at 725 tenge per share by subscription. On December 18, 2014, the initial offering of ordinary shares of KEGOC JSC on the KASE stock market was carried out through subscription. In November 2018, Samruk-Kazyna JSC put over the National IPO of NC Kazatomprom JSC in the amount of 14.92 % or 38 million shares and global depositary receipts with a double listing on the London Stock Exchange and the Astana International Exchange. In 2019 and 2020, Samruk-Kazyna JSC conducted Secondary Public Offering of NC Kazatomprom JSC through the accelerated book building. As a result of the IPO/SPO, 25 % of the issued shares was placed in free circulation. Later in 2022, Samruk-Kazyna JSC announced Secondary Public Offering of KazMunaiGaz JSC shares on the AIX and KASE Stock Exchanges. Government adopted a new Comprehensive Privatization Plan for 2021-2025 approved by Decree of the Government of the Republic of Kazakhstan as of December 29, 2020, No.908) to reduce the presence of the state in the economy.

Problem, objective and questions: Lack of the research regarding the effects of the National IPO/SPO on Earnings quality during COVID-19 pandemic inspires us to investigate this research problem and provide results to the investor community and all stakeholders involved in the National IPO/SPO program.

Many researchers use Earnings management as a measure of Earnings quality: higher/lower EM imply lower/higher EQ. Recent study by Brennan analyze various definitions of EM and reviewed the frequently used items in the academic literature such as «Accounting choice», «Income smoothing», «Earnings management» and «Earnings manipulation» [4]. We emphasize on the opportunistic use of the financial reporting strategy that usually leads to the accounting manipulations, mainly referring to the Healy & Wahlen definition:

«Earnings management occurs when managers use judgment in financial reporting and in structuring transactions to alter financial reports to either mislead some stakeholders about the underlying economic performance of the company or to influence contractual outcomes that depend on reported accounting numbers» [5].

Research objective is to assess the impact of COVID-19 on the National IPO/SPO Program results in terms of Earnings quality changes in partial state-owned enterprises.

RQ1: Did COVID-19 improve Earnings quality in partially state-owned companies?

RQ2: Was COVID-19 effect relatively stronger in partially state-owned companies?

Contributions: Our study is among the first attempts to analyze Earnings quality dynamics over 2009-2021 horizon in Kazakhstan with the assessment of COVID-19 impact. In addition to literature gap reduction, our research findings could be practically integrated into the National IPO/SPO Program as a red flag to adjust further Earnings quality trend in partial state-owned enterprises.

The rest of the paper is organized as follows. In the literature review we develop the research hypothesis. In the methodology section we explain data sampling approach and measure Earnings quality variable applying earnings management models. Then, we discuss our empirical results in Results & Discussion and conclude.

Literature review. *Papers on Earnings management strategies.* Roychowdhury believe that managers manipulate not only the abnormal accruals (or «AEM»), but also engage into the operational activities (or «REM»). One issue left behind the scope of her findings is the trade-off between AEM and REM conditioned that managers are flexible in their choice [3]. In 2008 Cohen proved that the analysis of only AEM doesn't provide a full picture without REM study. Moreover, both should be treated as substitutes to achieve earnings benchmarks in the post-SOX world [6]. In 2012 Zang documented that managers do switch AEM and REM based on the relative costs, and REM goes first with AEM serving as an adjustment [7].

Papers on Earnings management and ownership structure relation. In classic paper Ding et al. investigated the role played by a firm's ownership structure in EM, with reference to the Chinese capital market and found that the relationship between EM measures and ownership concentration exhibits a statistically significant non-linear, inverted U-shape pattern known as the "entrenchment versus alignment" effect [8].

Among contemporaneous studies Lu et al. using A-share listed Chinese firms on both the Shanghai and Shenzhen Stock Exchanges, investigated impacts of State ownership on management's decision to select REM

or AEM earnings management strategies. Authors found that state-owned enterprises tend to favor REM over AEM earnings management strategies more than private [9]. In 2021 Gong & Choi investigated the effect of State ownership on Accounting quality, measured by earnings management. Using the samples of state-owned enterprises listed in the A-share market in China during 2009-2017, authors found that there is a significantly positive relationship between State ownership and Earnings management. Furthermore, the results indicate that higher industry competition effectively inhibit the negative effect of State ownership on Accounting quality. It also turned out that positive relationship between State ownership and Earnings management has weakened in recent years, implying the mixed-ownership reform to be effective [1].

Hypotheses. In 2020 Orazalin measured Earnings management in Kazakhstan and concluded that companies with larger boards apply a more restrained approach to EM practices. We continue and extend local EM measurement combining AEM and REM to get a proxy for Earnings quality [10]. Based on the literature review, we hypothesize relation between ownership structure and Earnings quality in Kazakhstan. We expect positive association of State ownership with EM implying state-owned companies prefer increase-increasing EM strategies whereas insignificant association with absolute value of EM should indicate potential U-shaped relation.

H1.1: State ownership is correlated with Earnings quality.

Once direction and strength of association in H1 are determined, we are ready to answer our research questions whether COVID-19 event affected Earnings quality dynamics. Based on the literature review we expect the National IPO/SPO Program to be effective in Kazakhstan, especially during shock periods like COVID-19 when it's vital to keep potential investors interested in investing into partial state-owned enterprises attracting not only by cash and profits but by transparent high-quality financial corporate data. SOE stands for 100 % public state-owned enterprises; POE means public privately-owned enterprises.

H2: COVID-19 positively affected Earnings quality in partially state-owned companies and its effect was stronger compared to those in SOE/POE.

H3: post COVID-19 period positively affected Earnings quality in partially state-owned companies and its effect was stronger compared to those in SOE/POE.

In the next section, we describe KASE population, Earnings quality variable and EM models.

MAIN RESEARCH BODY

Methodology. Data collection and sampling: Data is manually collected from annual audited financial reports of the companies listed on KASE Stock Exchange. As a four-eyes review procedure, we (co-authors) separately extracted and compared data to minimize errors. KASE Stock Exchange sample population is 52 local companies, 26 state and 26 private, (out of 235 eminents) across different industries excluding banks, insurance companies, leasing companies, pension funds and other investment holdings. Time horizon is 13 years during 2009-2021 totaling 572 unbalanced panel firm-year observations.

Table 1 – Descriptive statistics

variable	mean	sd	iqr	max	p50	min
state	.4667832	.4993321	1	1	0	0
state_share	.2929699	.4078172	.5440000	1	0	0
AGG	.0012825	.1922879	.2267061	.608434	.0183802	-.547961
Abs(AGG)	.1471139	.1236611	.1582190	.608434	.1152467	.0001515
roa	.1047998	.2618265	.1437082	4.457944	.0605795	-1.05379
cfota	.1300129	.2074945	.1531988	1.063830	.1035490	-1.52381
lev	.6000122	.4197225	.3579337	3.268509	.5120107	.0586207
growth	.3578330	3.0916830	.3104409	71.727270	.1166663	-1
liq	1.8774750	1.9339820	1.474174	14.454550	1.3202750	.0144605
size	4.3441270	1.8607110	2.486751	9.592420	4.0943390	.1823216
Source: authors' calculation using Stata15.1 tool						

Stata software offers variety of tests for unit roots in panel data including Fisher-type test for unbalanced panel data. Unit root test is required for all variables except dummy variables. Test combines p-values using the inverse chi-squared, inverse-normal, and inverse-logit transformations. Non-stationary panel data produce unreliable results in panel data models and need to be transformed. For calculation of AEM and REM, variables don't contain unit root (p-values = 0 at 1 % significance level.

Testing for normality using Jarque-Bera and Skewness / Kurtosis tests (omitted) in panel data and plotting histogram identified high kurtosis due to potential outlier presence. We apply the approach of winsorising outliers to deal with high kurtosis. A value of skewness for the response variables and associated residuals is between -0.5 and 0.5 indicating that the distribution is fairly symmetrical. Winsorising at 5 % reached kurtosis around 3-3.5 which is within the acceptable range.

Operationalization of variables. To measure overall Earnings quality, we combine the effects of both AEM plus REM earnings management measures.

$$Abs(AGG) = AEM + REM, \tag{1}$$

where AGG – determines direction of earnings management strategies, abs(AGG) – absolute value of AGG and determines aggregate level of Earnings quality, AEM – accrual-based EM, and REM – real activity EM.

To measure AEM, we follow Kasznik cash flow (variation of Jones1991 model) model [2; 11]:

$$TA_i, / A_i, t\text{-}1 = \alpha 0 / A_i, t\text{-}1 + \alpha 1 (\Delta Rev_i, t) / A_i, t\text{-}1 + \\ + \alpha 2 (PPE_i,) / A_i,\text{-}1 + \alpha 3 (\Delta CFO_i, t) / A_i, t\text{-}1 + \mu, \tag{2}$$

where TA – EBIX-CFO (cash flow approach), EBIX – earnings before extraordinary items and discontinued operations, A – total assets, Rev – sales, CFO – net operating cash flow, PPE – gross fixed assets, μ - AEM.

Kasznik model exhibits relatively higher ranking based on F-statistics, adjusted R^2, individual model variable significance, separate period 2009-2021 and 4 industries regression significance (O&G, Manufacturing, Mining and Services). Based on the results of Hausman test (F-test, LM-test) and the presence of Autocorrelation, Heteroskedasticity, Cross-sectional dependence issues, we applied Random-effects GLS Regression with Driscoll-Kraay standard errors.

To measure REM, we follow Roychowdhury aggregate model of 3 models, cash flow model, production model and discretionary expenses model [3]:

$$CFO_i, / A_i, t\text{-}1 = \beta 0 / A_i, t\text{-}1 + \beta 1 (Rev_i, t) / A_i, t\text{-}1 + \\ + \beta 2 (\Delta Rev_i,) / A_i,\text{-}1 + \text{€}, \tag{3}$$

$$PROD_i, / A_i, t\text{-}1 = \pi 0 / A_i, t\text{-}1 + \pi 1 (Rev_i, t) / A_i, t\text{-}1 + \\ + \pi 2 (\Delta Rev_i,) / A_i,\text{-}1 + \pi 3 (\Delta Rev_i, t\text{-}1) / A_i, t\text{-}1 + \text{£}, \tag{4}$$

$$DISX_i, / A_i, t\text{-}1 = \Omega 0 / A_i, t\text{-}1 + \Omega 1 (Rev_i, t\text{-}1) / A_i, t\text{-}1 + \text{¥}, \tag{5}$$

where A – total assets, Rev – sales, CFO – net operating cash flow, PROD – Inventory + COGS, DISX – S G&A expenses, β π Ω - constant variables, SUM ((-€) + £ + (- ¥)) – aggregate REM.

Based on the results of Hausman test (F-test, LM-test) and the presence of Autocorrelation, Heteroskedasticity, Cross-sectional dependence issues, we applied: 1) Random-effects GLS Regression with robust standard errors to cash flow model, 2) Fixed-effects (within companies) Regression with robust standard errors to production model, and 3) Random-effects GLS Regression with Driscoll-Kraay standard errors discretionary expenses model.

State ownership has two measures: 1) state dummy; and 2) state shares variable is measured as % of total shares owned by State. For further analysis, we split state-owned companies into sub-groups: 1) 0-49 % partial SOE, 2) 50-99 % partial SOE, and 3) 100 % SOE.

Results and Discussion. Using Stata 15.1 application and Earning quality model discussed in Methodology section, in Table 2 we present dynamics of EQ during 2010-2021, year-wise and by ownership structure.

Table 2 – Dynamics of Earnings quality (by mean values of abs(AGG) variable)

YEAR/EQ	POE+SOE	POE	SOE (ALL)	SOE (0-49 %)	SOE (50-99 %)	SOE (100 %)
	(1)	(2)	(3)	(4)	(5)	(6)
2010	.1251898	.0929009	.1861800	n/a	.2061028	.1702418
2011	.1728404	.1486017	.2074671	.2095962	.1519161	.2347103
2012	.1824038	.1897452	.1737670	.1571375	.2031036	.1681194
2013	.1656531	.1682971	.1628623	.1386692	.1514307	.1813836
2014	.1726620	.1931144	.1522096	.1442915	.1357993	.1693943
2015	.1016811	.1356040	.0734119	.0862590	.0416771	.0767680
2016	.1341990	.1317927	.1362203	.1553800	.1009660	.1323887
2017	.1307015	.1657560	.0956471	.0621830	.1257465	.1198259
2018	.1481170	.1518126	.1441259	.1128874	.1356699	.1934207
2019	.1527137	.1484179	.1577255	.1506067	.0929602	.2151981
2020	.1500812	.1727228	.1246093	.0960342	.0743895	.1952875
2021	.1392865	.1489499	.1275223	.0974174	.1546033	.1554866
AVG	**.1471139**	**.1548477**	**.1386318**	**.1170183**	**.1273776**	**.1660832**
Source: authors' calculation using Stata15.1 tool						

For the comparison purpose, we call year 2020 - COVID-19 time point, year 2019 – pre COVID-19, year 2021 – post COVID-19, and year 2014-2015 – local currency (Kazakhstani tenge) Devaluation or free flow period.

Column (1) POE+SOE refers to total sample population of KASE-listed companies, where Column (2) POE are firms owned by non-government public shareholders and Column (3) SOE – enterprises with full or partial state engagement. Columns (4) – (6) present state companies according to the degree of Government ownership.

Variable abs(AGG) or EM increase/decrease implies EQ decrease/increase.

Total sample population. Earnings quality in our total sample population is equal 0.14 with the lowest value of abs(AGG) in Devaluation period and below-average values (0.13) during post Devaluation 2016-2017. EQ drastically improved in 2015 (from 0.17 to 0.10 mean value) when tenge was freed to flow and started deteriorating right after up to COVID-19. In 2020 when COVID-19 took place, EQ level didn't react quickly and only 1 year after we see improvement by 0.1 point (from 0.15 to 0.139 mean value). Overall, looking at total sample population, we conclude that COVID-19 event, though with 1-year lag, did impact positively on Earnings quality in 2021.

POE vs SOE. Next, we'd like to estimate COVID-19 effect separately according to ownership structure. Statistically, abs(AGG) measure is lower in SOE and significantly different from that in POE. (refer to Table 3 below) So year-wise, Earnings quality is better in state-owned enterprises except for 2010 (sig T-stat), 2011, and 2019. (refer to Table 2, Column (2) vs Column (3)) In 2013 and 2016 EQ is at the relatively same level, 0.16 and 0.13 respectively. EQ in SOE began to increase after Devaluation of tenge and outperform EQ in POE during 7 years, significantly in 2015, 2017 and 2020.

Table 3 – T-test: Earnings quality in SOE vs POE

. ttest absAGG, by(state) unequal	
Two-sample t test with unequal variances	
Group Obs Mean Std. Err. Std. Dev.	[95 % Conf. Interval]
0 272 .1548477 .0076316 .1258638	.1398229 .1698725
1 248 .1386318 .0076761 .1208836	.1235128 .1537508
combined 520 .1471139 .0054229 .1236611	.1364604 .1577675
diff .0162159 .0108242	-.0050491 .0374809
diff = mean(0) - mean(1)	t = 1.4981
Ho: diff = 0 Satterthwaite's degrees	of freedom = 516.592
Ha: diff < 0 Ha: diff != 0	Ha: diff > 0
Pr(T < t) = 0.9326 Pr(T > t) = 0.1347	Pr(T > t) = 0.0674
Source: authors' calculation using Stata15.1 tool	

To remind, EQ in total sample population remained the same (0.15) in 2019 and 2020. This happened because EQ in SOE and POE moved in different directions and compensated each other. EQ POE deteriorated from 0.14 in 2019 to 0.17 in 2020 whereas EQ SOE improved from 0.15 to 0.12 respectively. In post COVID-19 period, EQ POE improved to 0.14 while EQ SOE remained the same (0.12). That explains how and why COVID-19 affected EQ in the total sample only after 1 year. Looking at COVID-19 impact through ownership structure, we get a better picture. EQ SOE positively and immediately reacted to COVID-19. In turn, EQ POE first had a negative right away impact, but returned the pre COVID-19 EQ level back in 2021.

POE vs SOE vs partial SOE. Once we evaluated the effects of COVID-19 on EQ in SOE and POE, next step is to analyze EQ dynamics in partial SOE, number of which increases due to the National IPO/SPO Program. (refer to Table 2, Columns (2), (4)-(6))

Ranking analysis. Since we have 4 groups, ranking analysis is applied to conclude who is the winner in terms of EQ year-wise. For that, number 1 is assigned to the lowest value of abs(AGG) or highest EQ, and number 4 is given to the highest value of abs(AGG) or lowest EQ. In table 2 we highlighted cells of winners. As a result of totaling year-wise numbers, the highest EQ ranking (21 scores) is assigned to partial SOE (50-99 %), following by partial SOE (0-49 %) (22 scores), then POE (31 scores) and finally SOE (100 %) (36 scores).

To remind, EQ in SOE improved from (0.15) in 2019 to (0.12) in 2020. We observe that all 3 SOE Groups have EQ increased, with largest raise in SOE (0-49 %) from (0.15) to (0.09). In post COVID-19, EQ SOE remained unchanged which occurred mainly due to compensating effect of EQ SOE (50-99 %) decrease and EQ SOE (100 %) increase. EQ SOE (0-49 %) stayed the same (0.09). To sum, EQ in all SOE positively reacted to COVID-19 though EQ SOE (50-99 %) significantly deteriorated a year later.

Correlation analysis. A Spearman rank correlation describes the monotonic relationship between 2 variables. It is useful for nonnormally distributed continuous data, can be used for ordinal data, and is relatively robust to outliers. While the Pearson product-moment correlation coefficient is a measure of the strength and direction of association and requires data to be continuous, normal, linear without significant outliers. Since we failed to meet normality assumption based on Doornik-Hansen multivariate normality test, the Spearman rank correlation is preferred. The Spearman approach can often be useful for nonnormal data, as it can increase power while maintaining a low Type I error rate [12; 13].

Table 4 – Pearson correlation (rows) vs Spearman rank (columns)

	AGG	Abs(AGG)	state	state_shares
AGG	1.0000	0.0045	0.2043*	0.2154*
abs(AGG)	-0.0950*	1.0000	-0.0693	-0.0267
state	0.1853*	-0.0656	1.0000	0.9382*
state_shares	0.1941*	0.0091	0.7685*	1.0000
*at 10 % significance level Red-colored numbers are differences between correlation methods Source: authors' calculation using Stata15.1 tool				

There is no relation between Earnings quality (abs(AGG)) and State ownership which is explained by U-shaped nonlinear association with higher Earnings quality in partial SOE. (refer to Table 4 above) To remind Ranking analysis, the highest EQ ranking is assigned to partial SOEs, then to POE and finally SOE (100 %), which re-confirms U-shaped relation year-wise with exception in 2011, 2012, and 2016 where zigzag behavior is observed. For example, in 2016 as we move from POE to SOE (100 %) through partial SOEs, EQ (0.13) first deteriorates to (0.15), then improves to (0.10), and finally again increase to (0.13).

Based on the results of correlation and ranking analysis, we accept/reject H1 hypothesis set before.

H1: We accept hypothesis (State ownership is associated/correlated with Earnings quality). Both ownership measures (+state and +state_shares) are positively related to Earnings quality measure (AGG) whereas these measures seem to have no relation with abs(AGG) measure. This implies different income strategies used by different ownership structures and also U-shaped association between ownership and Earnings quality. To remind Ranking analysis, the highest EQ ranking is assigned to partial SOEs, then to POE and finally SOE (100 %), which re-confirms U-shaped relation.

Referring back to Table 2 above and study event analysis, we accept/reject hypotheses H2-H3 set in the literature review.

H2: We accept hypothesis in full (COVID-19 positively affected Earnings quality in partially state-owned companies and its effect was stronger compared to those in SOE/POE). We observe that all 3 SOE Groups have EQ increased, with largest raise in partial SOE (0-49 %) from (0.15) to (0.09). Partial SOE (50-99 %) also improved EQ from (0.09) in 2019 to (0.07) in 2020.

H3: We reject hypothesis (post COVID-19 period positively affected Earnings quality in partially state-owned companies and its effect was stronger compared to those in SOE/POE). EQ in all SOE positively reacted to COVID-19 though EQ SOE (50-99 %) significantly deteriorated a year later whereas POE/SOE (100 %) EQ increased. In 2021 EQ partial SOE (0-49 %) remained at (0.09). In turn, abs(AGG) measure in POE/SOE decreased from (0.17) and (0.19) in 2020 to (0.14) and (0.15) in 2021 respectively.

CONCLUSION

Highlights: We found that COVID-19 positively affected Earnings quality in partially state-owned companies and its effect was stronger compared to Earnings quality effect in private/state enterprises. Despite such quick and positive reaction, a year later in post COVID-19, Earnings quality deteriorated in partial state-owned companies (particularly with 50-99 % Government ownership) up to the level of private/state companies.

Contributions and limitations: Despite limitations such as the manual data collection and the scarce local literature, our study is among the first attempts to analyze Earnings quality dynamics over 2009-2021 horizon in Kazakhstan with the assessment of COVID-19 impact. In addition to literature gap reduction, our research findings could be practically integrated into the National IPO/SPO Program as a red flag to adjust further Earnings quality trend in partial state-owned enterprises.

Future research: Ding et al. already found that the relationship between EM measures and ownership structures exhibits a statistically significant non-linear, inverted U-shape pattern known as the «entrenchment versus alignment» effect [8]. Ranking and Correlation analyses in our research indicate potential U-shaped cause-effect relationship and could be interested to researchers to dig deeper using regression analysis.

Earlier in 2005 Graham et al. found the evidence of managers' preference of REM over AEM to meet earnings targets in the post-SOX world, though economic costs appear to be higher [14]. Gunny empirically prove that consequences of REM are higher compared to AEM and reflected in the negative future performance as a result of managers' sacrifice of future cash flows for current earnings [15]. Our next research is to compare different EM strategies in terms of the impact on key investment indicators, particularly compensating strategies when REM is positive and at the year-end negative AEM is used as an instrument to balance overall level of EM resulting in less volatility and high-quality corporate data.

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COVID-19 КЕЗІНДЕГІ ҚАРЖЫЛЫҚ ДЕРЕКТЕРДІҢ САПАСЫ: ОРТАЛЫҚ АЗИЯЛЫҚ КЕЙС

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АҢДАТПА

Зерттеу мақсаты. 2021 жылы Gong & Choi мемлекеттік меншік құрылымының қаржылық деректердің сапасына әсерін зерттеді. Меншік құрылымы мен қаржылық деректердің сапасы арасындағы оң байланысы соңғы жылдары әлсіреді, бұл аралас меншікті тиімді реформалаудың нәтижесі [1]. Біздің зерттеуіміз COVID-19-дың халықтық IPO/SPO бағдарламасының нәтижелеріне аралас мемлекет қатысатын кәсіпорындардағы деректер сапасының өзгеруі тұрғысынан әсерін бағалауға бағытталған оқиғаларды талдау болып табылады.

Әдіснамасы. Біз 2009-2021 жылдар кезеңінде 572 теңгерімсіз панельдік зерттеулерді талдадық. Бұл үлгілер қаржы институттары мен инвестициялық холдингтерді қоспағанда, экономиканың әр түрлі салаларындағы кәсіпорындар бойынша KASE қор биржасының сайтынан алынған. Деректер сапасын бағалау үшін біз 1) Нақты қызмет әдісі негізінде деректер манипуляциясын есептеу үшін 2) жиынтық модельмен бірлесіп есептеу әдісі негізінде деректер манипуляциясын есептеу үшін ақша ағындарының моделін ұстанамыз [2; 3].

Зерттеу нәтижелері. Біз COVID-19-дың аралас мемлекеттік қатысуы бар кәсіпорындардағы деректер сапасына оң әсер еткенін және оның әсері 100 % мемлекеттік қатысуы бар жеке компаниялар мен кәсіпорындардағы деректер сапасына әсерімен салыстырғанда күштірек екенін анықтадық. Осындай жедел және оң реакцияға қарамастан, 2021 жылы аралас (50-99 %) мемлекеттік қатысуы бар кәсіпорындардағы деректер сапасы нашарлап, жеке және Мемлекеттік (100 % қатысуымен) компаниялар деңгейіне дейін төмендеді.

Зерттеудің бірегейлігі / құндылығы. Біздің зерттеуіміз COVID-19 әсерін бағалай отырып, 2009-2021 жылдар ішінде Қазақстандағы қаржылық деректер сапасының өзгеру динамикасын талдаудың алғашқы әрекеттерінің бірі болып табылады. Практикалық ұсыныс ретінде біздің зерттеу нәтижелеріміз аралас мемлекет қатысатын кәсіпорындардағы деректер сапасының кейінгі өзгерістеріне әсер ететін ескерту индикаторы ретінде Халықтық IPO/SPO бағдарламасына біріктірілуі мүмкін..

Түйін сөздер: Қаржы деректерінің сапасы, меншік құрылымы, Қазақстан Республикасы, Халықтық IPO / SPO, COVID-19.

КАЧЕСТВО ФИНАНСОВЫХ ДАННЫХ В ПЕРИОД COVID-19: КЕЙС ЦЕНТРАЛЬНОЙ АЗИИ

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АННОТАЦИЯ

Цель исследования. 2021 году Gong & Choi исследовали влияние государственной структуры собственности на качество финансовых данных. Положительная связь между структурой собственности и качеством финансовых данных в последние годы ослабла, что является результатом эффективной реформы смешанной собственности [1]. Наше исследование представляет собой анализ событий, направленный на оценку влияния COVID-19 на результаты Народной программы IPO/SPO с точки зрения изменения качества данных на предприятиях со смешанным государственным участием.

Методология. Мы проанализировали 572 несбалансированных панельных наблюдения за период 2009-2021 гг. Данные выборки выгружены с сайта фондовой биржи KASE по предприятиям в различных отраслях экономики, за исключением финансовых учреждений и инвестиционных холдингов. Для оценки качества данных мы следуем 1) модели денежных потоков для расчета манипуляций данных на основе метода начислений, совместно с 2) совокупной моделью для расчета манипуляций данных на основе метода реальной деятельности [2; 3].

Результаты исследования. Мы обнаружили, что COVID-19 положительно повлиял на качество данных на предприятиях со смешанным государственным участием, и его эффект был сильнее по сравнению с влиянием на качество данных в частных компаниях и предприятиях со 100 % государственным участием. Несмотря на такую немедленную и положительную реакцию, в 2021 году качество данных на предприятиях со смешанным (50-99 %) государственным участием ухудшилось и опустилось до уровня частных и государственных (со 100 % участием) компаний.

Оригинальность / ценность исследования. Наше исследование является одной из первых попыток проанализировать динамику изменений качества финансовых данных в Казахстане в течение 2009-2021 гг., с оценкой влияния COVID-19. В качестве практической рекомендации, результаты

нашего исследования могут быть интегрированы в Народную программу IPO/SPO в качестве предупреждающего индикатора, который повлияет на последующие изменения качества данных на предприятиях со смешанным государственным участием.

Ключевые слова: Качество финансовых данных, Структура собственности, Республика Казахстан, Народное IPO/SPO, COVID-19

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KAZAKHSTAN EXPERIENCE OF VENTURE CAPITAL FINANCING OF TECHNOLOGY ENTREPRENEURS

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ABSTRACT

The economy cannot function without a high-quality technology production sector. To do this, a connection between science and business must be established. Supporting technology entrepreneurship is the first step in building communication amongst them. Technological entrepreneurship is a high level of commercialization of high-tech technologies with high added value.

Technology-based entrepreneurship needs an effective ecosystem where venture capital investment is developing, as it is a high-risk investment tool. The following indicators demonstrate the relevance of the study: R&D expenditures in the country's GDP have significantly decreased over the past 10 years; the rating of the Republic of Kazakhstan in GEM, according to the indicator «Access to entrepreneurial finance» – 38th place out of 45 countries; the rating in the Venture Capital & Private Equity Country Attractiveness Index – 54th place.

The purpose of the study is an analytical and empirical review of venture investment in technological entrepreneurship in the Republic of Kazakhstan.

The research methodology is based on the methods of basic statistics, logical analysis, correlation and regression analysis, questionnaires, and content analysis.

The originality of the work lies in the study of a phenomenon of gaining momentum in the country as venture financing of technological entrepreneurship, through a survey of technological entrepreneurs of the Republic of Kazakhstan.

The results of the study show that venture financing significantly affects the development of technological entrepreneurship. However, this method of financing is mainly available only to large enterprises. The authors come to the conclusion that techno-trainers find access to venture financing moderately difficult and mainly rely on personal finances.

Keywords: technological entrepreneurship, innovation, venture investments, R&D.

INTRODUCTION

Technological entrepreneurship is the process of creating a startup from an innovative technological idea. As a rule, the technological type of entrepreneurial activity is increasingly common in the field of information technology, where the product of entrepreneurship can be commercialized most quickly. The technological type of entrepreneurship needs an effective ecosystem, where science is transferred to business, venture financing is developing and the breadth of the technology market is characteristic. Of course, there are restrictions that are present in traditional forms of financing innovative enterprises, but these restrictions are eliminated by such an innovative form as venture capital. Creating conditions for the development of startup infrastructure and the culture of venture investment is one of the areas of state support for innovation in the Republic of Kazakhstan.

Venture financing was developed in the United States of America in the middle of the XX century, during the formation of the knowledge economy. The emergence of technological entrepreneurship into a separate group of firms based on new technologies occurred in the mid-1990s, when the Silicon Valley of Stanford University and MIT Road 128 in the USA became famous – «fields» of high-tech startups.

Financing innovation activities by investing in the authorized capital, buying financial instruments, as well as providing cash loans – all this is risky financing. Investors' equity investments cannot be traded on the stock exchange, and are naturally not convertible quickly. Only upon exiting the project and the success of the product of technological entrepreneurship, the investor has the opportunity to count on profit. The infrastructure of venture financing has reached development in the USA, some European countries, where pension funds have been actively involved in supporting high-risk entrepreneurship, which allowed them to accumulate excess profits, as well as the possibility of state support for innovation. Unlike the USA and Europe, the Unified National Pension Fund of the Republic of Kazakhstan does not participate in investment processes with high risks, therefore, there is no possibility of obtaining excess profits. Such a situation can be interpreted as distrust of Kazakhstani business in general and poor competence in comparing risks and profitability when searching for possible financial investments. Today, venture capital financing in the Republic of Kazakhstan is in its embryonic form, but it has great potential for growth.

To achieve the purpose of the study, the following tasks were set:
• to analyze the Republic of Kazakhstan's the venture capital market;
• to review global ratings of venture investments and indicators of technological entrepreneurship;
• classify the innovative risks of venture financing of technology entrepreneurs;
• conduct a survey of respondents - technological entrepreneurs of the Republic of Kazakhstan;
• to identify or refute the relationship between the indicators of venture investments and the annual turnover of the company.

The development of theoretical approaches of venture capital has been influenced by the works of many scientists. For the first time, the study of the relationship of venture capital to the development and implementation of innovations in the United States in 1998 was conducted by S. Kortum and D. Lerner, who confirmed the positive impact of risk financing on labor productivity growth [1]. Their work became the basis for a quantitative study of the impact of risky capital on the country's economy.

The study of the impact of venture capital on the attractiveness of businesses (in particular small and medium-sized) in further obtaining and diversifying sources of financing (in attracting bank loans) was carried out [2]. The ecosystem of entrepreneurship financing was studied by Vincenzo Capizzi, Annalisa Groce, Francesca Tenca, in their study they studied the ratio of the practice of business angels in further venture financing and confirmed the positive impact, as well as proved the negative impact of monitoring conducted by business angels to further attract venture investments [3].

M. G. Colombo and L. Grilli in their study «On growth drivers of high-tech start-ups: exploring the role of founders' human capital and venture capital», proved that companies funded by venture investors make an undeniable great contribution to the development of the economy and innovation system [4].

Ensuring the economic development of the country at the level of firms through the influence of venture investments on them was studied by S. Manigart and H. Sapienza in the work «Venture capital and growth» [5]. The researchers Fabio Bertoni, Massimo G. Colombo, Luca Grilli also proved the significant impact of venture financing on the growth of high-tech start-ups in Italy [6].

In general, studies conducted earlier in various regions of the world by foreign scientists confirm a positive relationship between venture financing and productivity growth of firms and economies. For example, A. Zh. Baymukhamedova in her research proved the influence of favorable conditions in the form of tax benefits, regulatory and legal framework of innovations and financing for venture investors on the inflow of financial resources, efficiency and improvement of the national innovation system [7].

Kazakh scientists L. A. Kazbekova, A. S. Shaynurova, N. B. Kultanova analyzed the venture capital market in Kazakhstan and came to the conclusion that the venture capital market of Kazakhstan is at very early stages of development, and the main goal of risk funds is not to make a profit but to develop [8].

Existing foreign and Kazakh studies only confirm the need for further in-depth study of the relationship of venture investment in technological entrepreneurship.

In the Republic of Kazakhstan, risk financing acquired the opportunity to develop in 2003 (the creation of «National Innovation Fund» JSC). The main document regulating the legal status and activities of venture funds is the Law of the Republic of Kazakhstan «On Investment and Venture Funds» dated July 7, 2004 No. 576-II (with amendments and additions as of 02.01.2021). All the measures taken have become an important element of the formation of the innovation system of Kazakhstan.

To date, when financing technology entrepreneurs, venture funds have an advantage, which finance up to 100 % of its cost in the project, depending on the terms of agreements on further profit sharing. There is an undeniable advantage of venture funds in comparison with second-tier banks. Small knowledge-intensive firms often do not have sufficient collateral to obtain a loan from banks for business development. Obtaining loans from Kazakhstani banks secured by a patent and an industrial design are provided infrequently. All this is due to the difficulties of assessing the value of intellectual property rights, as well as due to the high cost of valuation services. It is not profitable for banks of the Republic of Kazakhstan to accept intellectual property objects as collateral, due to their low liquidity.

Venture capital is realized through high risk, which is characterized by one of the principles of such investment – «big risk – big income». Figure 1 clearly illustrates the classification of types of innovative risks of venture capital.
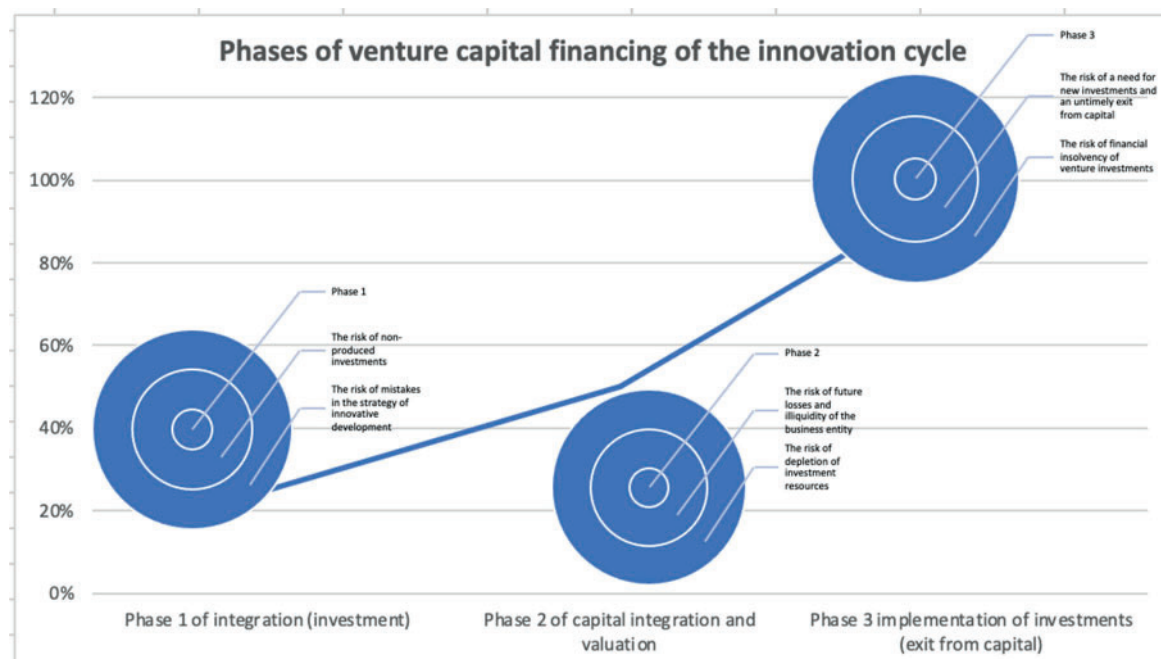

Figure 1 – Classification of innovative risks of venture capital by phases of financing of an innovative project
Note – compiled by the authors based on [9]

At each stage of the development of an innovative project, there are specific risks, where the initial stage of the development of an innovative project is most at risk. There are many factors that influence the magnitude of risks, which include development in the industry, in the region and in the economy of the country as a whole.

The Kazakhstan venture capital market of the country is on the way to formation. The existing gaps in the support of technological entrepreneurs in the Republic of Kazakhstan can be indicated by the lack of financial resources and high costs of innovation for enterprises [10]. According to the official data, entrepreneurs noted that there are a number of financial problems they face when implementing innovations: lack of financial resources and high costs for innovations and technologies, difficulties in finding partners for innovation. This speaks to the acute issues facing researchers in the financing of technological entrepreneurs in the country, in particular, the issues of venture financing.

THE MAIN PART OF THE STUDY

The Global Entrepreneurship Monitor Report: Kazakhstan 2020-2021, compiled under the guidance of the Higher School of Business (HSE) of Nazarbayev University, demonstrates the results of monitoring entrepreneurship in the Republic of Kazakhstan in terms of «Access to entrepreneurial finance» – 38th place out of 45 GEM countries. A rather low indicator in comparison with the average indicators of global monitoring [11, 42 p.].
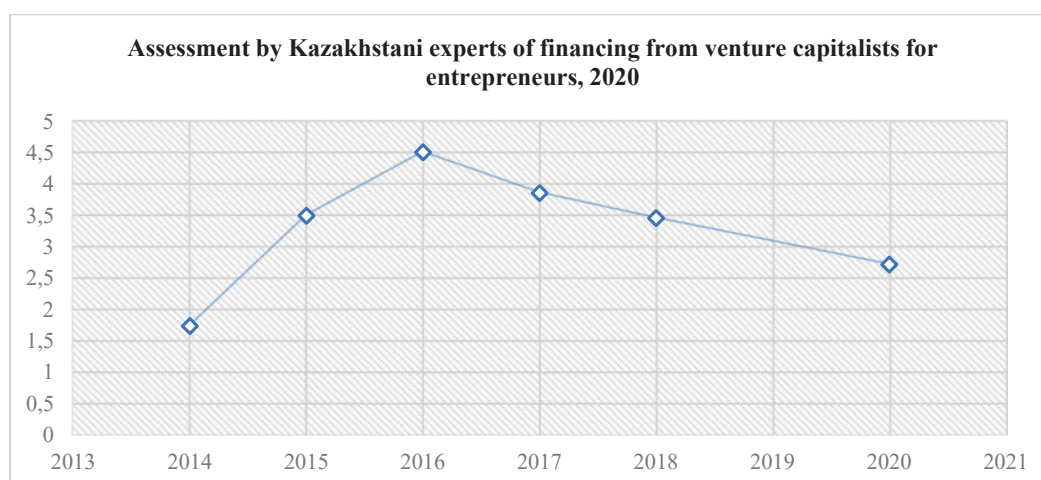

Figure 2 – Assessment by Kazakhstani experts of financing from venture investors for entrepreneurs, 2020
Note – compiled by the authors on the basis of [11]

As we can observe from the results of a survey of the adult population of the 18-64 age group and a survey of national experts, there is a significant decrease in the sources of financing for entrepreneurs from venture capitalists. The survey data of the experts of the report are presented only for 2020, due to the lack of recent statistics. The authors demonstrate the acute relevance of the study of this issue.

The rating of the Republic of Kazakhstan in the Venture Capital & Private Equity Country Attractiveness Index 2021 also clearly demonstrates the relevance and necessity of research and stimulation of the venture industry in Kazakhstan.

Table 1 presents an index that clearly demonstrates how attractive countries are for investors, taking into account venture capital assets and direct investment. This ranking uses the earliest information of the investment environment and the assessment of doing business in 125 countries. The liquidity of the stock market, IPO and public issue activity, activity in the mergers and acquisitions market, debt and credit market, the share of overdue bank loans in the total amount of gross loans, the tax regime, investor protection and corporate governance, the humanistic and social environment, the culture of entrepreneurship and the prospect of concluding transactions.

Table 1 – Rating of the Republic of Kazakhstan in the Venture Capital & Private Equity Country Attractiveness Index 2021

Country	Rank	Score
United States	1	100
United Kingdom	2	90,3
Japan	3*	87,4
Russia	30*	66,1
Kazakhstan	54*	54,1
*The increase in the indicator over a 5-year period		
Note – was compiled by the author on the basis of [12]		

The content of the index, individual indices of venture capital and direct investment, as well as calculation weighting schemes include the following indicators: economic indicators (GDP, estimated objective GDP growth, unemployment rate), the significance of the capital market (the vastness of the stock market, the market valuation of companies listed on the stock exchange, the number of national companies), the liquidity of the stock market, IPO and public issue activity, activity in the mergers and acquisitions market, debt and credit market, the share of overdue bank loans in the total amount of gross loans, the tax regime, investor protection and corporate governance, the humanistic and social environment, the culture of entrepreneurship and the prospect of concluding transactions. In this rating, the Republic of Kazakhstan lags behind other countries, which proves the need for further development and study of this issue.
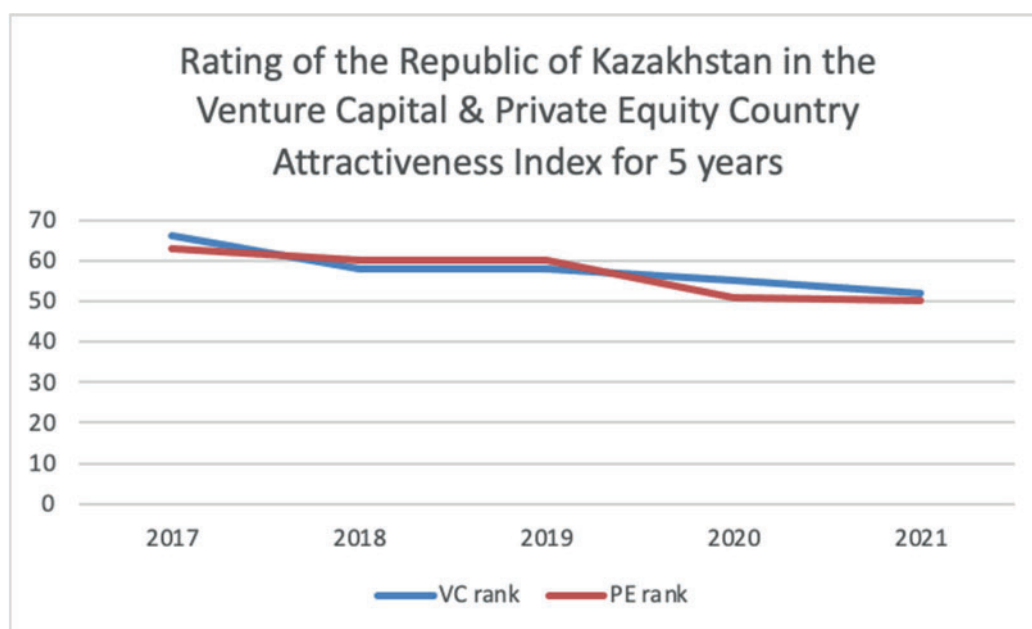

Figure 3 – Rating of the Republic of Kazakhstan in the Venture Capital & Private Equity Country Attractiveness Index for 5 years
Note – compiled by the authors on the basis of [12]

The trends of the Republic of Kazakhstan from 2017 to 2021, that we can observe a decreasing trend in the rating according to the indicator «entrepreneurial opportunities», which includes taking into account such factors as innovation, the number of articles in scientific and technical journals, barriers to starting a busi-

ness, difficulties with closing a business and the development of corporate R&D. The largest decrease can be observed in terms of innovation and corporate R&D. However, in general, there are fluctuating indicators for other indicators at times, which allows the country to improve its rating indicators.

This index gives an idea of the «possibility of successful transactions» when investors evaluate Kazakhstan taking into account institutional and socio-economic factors. The situation can be improved by improving the development of the index indicators, as indicated above.

One of the important problems that creates difficulties in the development of the venture capital investment market is the lack of transparency and accessibility of transactions in the republic. For example, according to the statistics of venture investments of the countries of the Organization for Economic Cooperation and Development (hereinafter – the OECD), there is a big gap between these indicators and indicators of Kazakhstan risky investments (Table 2).

Table 2 – Statistics of venture investments in the OECD countries, the Russian Federation and the Republic of Kazakhstan

Country	Development stage	2018	2019	2020	2021
United States	Total (Seed, Start-up (other early stage), Later stage venture	137 856.936	135 648.691	-	-
United Kingdom		2 745.083	3 349.978	3 406.929	5 176.394
Japan		2 285.752	2 502.530	2 074.464	3 031.316
NON OECD economy Russia		155.000	131.000	-	-
Kazakhstan		9.160	9.270	27.800	-
Note – compiled by the authors on the basis of [13]					

As can be seen from table 2, the indicators of Kazakhstan lag behind global trends. This can be explained by the novelty and momentum of the venture capital industry in the country, as well as the existing institutional and socio-economic gaps in the current national innovation system. As a result, the issue of the development of venture financing and research of Kazakhstan's risky investment market and its impact on the development and promotion of technological entrepreneurship in the country should become a subject for further research by scientists.

The development of the innovation infrastructure, as well as the interest of the authorities, naturally have a great impact on the survival of investment projects and on their ability to further commercialization. This fact is clearly demonstrated by the share of expenditures on research and development (hereinafter referred to as R&D) in the gross domestic product of the country (hereinafter referred to as GDP) (Table 3).

Table 3 – Research and development expenditure in Kazakhstan 2013-2021 (% of GDP)

Country	Period					
	2013 2014 2015	2016	2017	2018 2019	2020	2021
Kazakhstan	0,17	0,14	0,13	0,12	0,13	0,13
Note – compiled by the authors on the basis of [14]						

Due to the lack of statistics at the global level on R&D expenditures for 2021,2022, the authors conducted comparative statistics on the available data (Table 4). As can be seen from Table 3, R&D expenditures in the GDP of the country of the Republic of Kazakhstan have significantly decreased over the past 10 years and

lag behind the indicators of developed countries (Table 4). However, it is worth mentioning that by 2025 the government expects growth of 0.87 % of the country's GDP. In this connection, systematic work is underway (there was an increase of 8.1 % in 2020 compared to 2019), and the effect of the work undertaken should not be expected immediately.

Table 4 – Research and development expenditure (% of GDP), comparative statistics of countries for 2 years (from 2019-2020)

Country	Research and development expenditure (% of GDP)		Change R&D, 2019 to 2020
	2019	2020	
United States	3,17	3,45	+0,28
United Kingdom	1,71	-	-
Japan	3,2	3,26	+0,6
Russia	1,04	1,10	+0,6
Kazakhstan	0,12	0,13	+0,1
Note – compiled by the authors on the basis of [14]			

Today, monetary studies are being conducted in the country, which are aimed at detecting and removing barriers to the development of entrepreneurship.

One of the most important such factors is access to finance. There is not a little data confirming the lack of financial resources. For example, 1/3 of startups in Kazakhstan have difficulties with access to financing, while startups from large sectors have easy access to financing. To date, according to official data from the Tech Hub of the Astana International Financial Center (hereinafter – AIFC), venture capital accounts for only 8.3 % of startups according to the results of the study for May 2021 [15]. The quality of Kazakhstani startups competes with startups from foreign countries, but their number does not increase, as a result of which it is impossible to talk about a significant increase in the number of investments provided. The reason for the current situation is the stage of development of the startup ecosystem of the Kazakh market, which, with newly issued and prepared financing and subsidy support programs, as well as with still emerging and changing support measures, is still the initial stage of the formation of a solid and effective startup ecosystem.

Another reason is the lack of conditions of benefit while seeking investments by technological entrepreneurs in the Republic of Kazakhstan. The main sources of financing are the enterprises' own funds. This can be confirmed by the official innovation statistics for 2021 of the Bureau of National Statistics of the Agency for Strategic Planning and Reforms of the Republic of Kazakhstan, where we can observe this trend among 28,203 enterprises of the republic. Of which 89.5 % are innovatively passive.

To conduct the study, the authors used the method of descriptive statistics, based on data from the Bureau of National Statistics, on data from the Global Entrepreneurship Monitor report: Kazakhstan 2020-2021, on data from The World Bank research group, as well as on the study "Startup Ecosystem in Kazakhstan" conducted by Tech Hub AIFC together with Tuz Ventures. Basic statistics were analyzed through basic statistical procedures as well as through logical analysis. The authors conducted a correlation analysis of the results of the survey of 101 respondents from the Republic of Kazakhstan. The total aggregate of all respondents of enterprises as of May 24, 2022 is 28,203 people; 10.5 % (2,960) of them are innovatively active, among them 3.4 % (101) participated in the study.

The questionnaire was sent to 101 respondents; it consists of 9 items ($\alpha = 0.723$), Cronbach's Alpha based on standardized elements of 0.671.

Internal consistency is interpreted as «good», being between the values of $0.7 \leq \alpha < 0.8$.

Portrait of the respondent:

● an entrepreneur engaged in innovative / high-tech entrepreneurial activity, or organizing an innovative project at an early stage its development;

● employees of companies engaged in innovative / high-tech entrepreneurial activities.

● participants of startup teams who have their own project in the form of a pitch deck, but have experience in attracting investments and are engaged in raising capital.

Territorial scope of the study: The Republic of Kazakhstan. Age coverage: 18-35 [16].

To analyze the factors affecting technological entrepreneurship, the indicators listed below were taken. The study uses a correlation analysis method that takes into account such factors as:

● sources of innovation financing (own funds (family, friends), venture capital, IPO of strategic and portfolio investors, loans and borrowings, foreign funds, the republican budget, grant funds, start-up funds);

● annual turnover of the company;

● the period of operation of the company.

The authors put forward the following hypotheses:

H0 Venture financing has a significant impact on the company's annual turnover;

H1 Venture financing does not significantly affect the annual turnover of the company;

The results show that venture financing significantly affects the development of technological entrepreneurship in the country.

According to the report of the Bureau of National Statistics of the Agency for Strategic Planning and Reforms of the Republic of Kazakhstan «On innovative activity of enterprises in the Republic of Kazakhstan» [10], among the most painful reasons for which innovative activity was not carried out at enterprises, it is possible to highlight the lack of financial resources. For 2021, in the republic as a whole, out of the total cost of innovation 800 089.05 million tenge, the largest expenses, namely 77.6 %, are borne by enterprises (own funds). There are no statistics on venture investments.

As a research base, we can conduct a survey of the results of the survey, where we trace the existence of the relationship and the need for the development of venture financing. For the analysis, the authors calculated a measure of the degree and direction of the relationship between the values of variables, analyzed statistical indicators of the probability of a relationship between variables measured on a quantitative scale. The authors tested hypotheses about the relationships between the variables shown in the table 5, using correlation coefficients.

Table 5 – Correlation analysis

		Innovation costs at the expense of venture funds	Approximate value of the annual turnover
Innovation costs at the expense of venture funds	Pearson Correlation	1	,498**
	Sig. (double-sided)		,000
Approximate value of the annual turnover	Pearson Correlation	,498**	1
	Sig. (double-sided)	,000	
	N	101	101
Note – compiled by the authors ** The correlation is significant at 0.01 (two-way).			

As can be seen from Table 5, there is a moderate positive relationship of a high degree of significance between the indicators "The innovation costs at the expense of venture funds" and "The annual turnover of the company", which may indicate that there is a link between the impact of venture financing on the annual turnover of the company. The results of the regression analysis show a significant relationship between the

sources of financing, in particular venture capital on the annual turnover of the company, as well as the value of R 2 = 24.8 % implies an increase in variance of 24.8 %. The results also showed Sig significance = 0.000b, which means a significant relationship between the variables «The innovation costs due to venture funds» and «The annual turnover». For example, S. Kortum and D. Lerner proved the connection between venture capital and innovation. Their research touched on the US economy and the conclusions are limited to the framework of one national economy [1].

However, we can conclude that risky financing has significantly affected the results of the annual turnover of the respondents surveyed by the authors of the study.

THE RESULTS OBTAINED (CONCLUSIONS)

A special place in the development of technological entrepreneurship is occupied by financial resources, which are needed not only in significant quantities and are subject to high risks, but must be formed through the joint efforts of public and private capital. Today, all measures taken by the state in the field of technological entrepreneurship development, both legislative and economic, do not lead to the expected results. The authors conclude that there are no real incentives for the development of innovative and technological entrepreneurship and the imperfection of the innovation policy, the lack of real incentives for competition, as a result of which the authors come to the conclusion that the innovation process in the Republic of Kazakhstan falls into an institutional trap. As a result of the study, the authors conclude that venture financing of technological entrepreneurship in development faces a number of serious problems that hinder its effectiveness. After analyzing the global ratings, the authors demonstrate the lagging positions of the Republic of Kazakhstan in venture investments. Confirms the position of the country – R&D indicators. When considering this aspect in the context of a 9-year period, stability is observed, and the state's policy in this direction assumes significant shifts by 2025.

If we analyze the data on R&D spending as a percentage of GDP of the countries presented in the study (United States, United Kingdom, Japan, Russia, Kazakhstan), we can see that the greatest progress in the increase is in the countries that are leading in terms of attractiveness for placing venture and private investments. Kazakhstan increased spending on R&D by 0.1 percent (54th place in the ranking of the attractiveness of venture capital investment), while the United States by 0.28 (1st place), Japan (3rd place) and the Russia by 0.6 % (30th place). The relationship between the indicators of R&D spending and venture capital investments can be clearly seen in the study of the authors.

The authors also come to the conclusion that innovation and corporate R&D suffer most in the country, in the period from 2017 to 2021 there is a significant decrease in the position in the country in the Venture Capital & Private Equity Country Attractiveness Index in terms of «entrepreneurial opportunities».

Among the hypotheses put forward by the authors, the authors confirm the following:

H: venture financing has a significant impact on the annual turnover of the company;

Venture financing significantly affects the development of technological entrepreneurship in the country. But today, this method of financing is mainly available only to large enterprises. The analysis of venture financing of technological entrepreneurship allows us to conclude that state support measures are important in this regard. Technology entrepreneurs in the Republic of Kazakhstan have the need to finance investments both at the early stage of project launch and at the implementation stage, however, in most cases the amount of requested investments ranges from 50 to 100 thousand dollars on average per project.

Based on the survey conducted, the authors come to the conclusion that today technology entrepreneurs find access to venture financing moderately difficult and mainly rely on personal savings and friends, family for initial and ongoing financing. There is a trend where entrepreneurs attract their own capital, and its amount is high due to the early stage of a startup.

In conclusion, authors note the need for higher activity of venture investors, which would contribute to changing the current structure of innovation financing from public to private and would minimize difficulties in attracting investments.

The study of venture investments and its impact on the development of high–tech startups by studying a wider range of entrepreneurs and studying at the global level is the basis for further study by domestic

scientists. The authors also recommend paying attention to the lack of statistics on the venture capital market in Kazakhstan.

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ТЕХНОЛОГИЯЛЫҚ КӘСІПКЕРЛІКТІ ВЕНЧУРЛЫҚ ҚАРЖЫЛАНДЫРУДЫҢ ҚАЗАҚСТАНДЫҚ ТӘЖІРИБЕСІ

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АННОТАЦИЯ

Экономиканын манызды элементы – сапалы технологиялық өндіріс секторы. Технологиялық өндіріс секторы дамуы үшін ғылым мен бизнес арасында байланыс орнатылуы қажет. Олардың арасындағы байланысты орнатудың бірінші кезеңі технологиялық кәсіпкерлікті қолдау болып табылады. Технологиялық кәсіпкерлік – жоғары қосылған құны бар ғылымды қажетсінетін технологияларды коммерцияландырудың жоғары бір деңгейі.

Технологияға негізделген кәсіпкерлікке венчурлық капиталды инвестициялау дамитын тиімді экожүйе қажет, өйткені ол инвестициялаудың жоғары қауіпті құралы болып табылады. Зерттеудің өзектілігін мынадай көрсеткіштер көрсетеді: соңғы 10 жылда елдің ЖІӨ-де ҒЗТКЖ шығындары айтарлықтай төмендеді; Қазақстан Республикасының gem рейтингі, «кәсіпкерлік қаржыландыруға қол жеткізу» көрсеткіші бойынша – 45 елдің ішінен 38 орын; the venture Capital & Private Equity Country Attractiveness Index рейтингінде – 54 орын.

Зерттеудің мақсаты Қазақстан Республикасындағы технологиялық кәсіпкерліктің венчурлық инвестициялаудың аналитикалық және эмпирикалық шолуы болып табылады.

Зерттеу әдістемесі негізгі статистика, логикалық талдау, корреляциялық-регрессиялық талдау, сауалнама, және талдау мазмұнынан турады.

Зерттеудің бірегейлігі / құндылығы Қазақстан Республикасының Технологиялық кәсіпкерлеріне сауалнама жүргізу арқылы технологиялық кәсіпкерліктің венчурлық қаржыландыру сияқты елімізде қарқын алып келе жатқан құбылысты зерттеу болып табылады.

Зерттеу нәтижелері венчурлық қаржыландыру технологиялық кәсіпкерліктің дамуына айтарлықтай әсер ететіндігін көрсетеді. Алайда, қаржыландырудың бұл әдісі негізінен ірі кәсіпорындарға ғана қол жетімді. Авторлардың қорытыны бойынша техно-пренерлер венчурлық қаржыландыруға қол жетімділікті орташа күрделі деп санайды және негізінен жеке қаржыға сүйенеді.

Түйін сөздер: технологиялық кәсіпкерлік, инновация, венчурлік инвестициялар, ҒЗТКЖ.

КАЗАХСТАНСКИЙ ОПЫТ ВЕНЧУРНОГО ФИНАНСИРОВАНИЯ ТЕХНОЛОГИЧЕСКОГО ПРЕДПРИНИМАТЕЛЬСТВА

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АННОТАЦИЯ

Качественный технологический производственный сектор – то без чего не может существовать экономика. Для этого необходимо наладить связь между наукой и бизнесом. Первым этапом на пути установления коммуникации между ними является поддержка технологического предпринимательства. Технологическое предпринимательство – высокий уровень коммерциализации наукоемких технологий, обладающее высокой добавленной стоимостью.

Предпринимательство, основанное на технологиях, нуждается в эффективной экосистеме, где развивается венчурное инвестирование, так как представляет собой высоко-рискованный инструмент инвестирования. Актуальность исследования демонстрируют следующие показатели: затраты на

НИОКР в ВВП страны значительно понизились за последние 10 лет; рейтинг Республики Казахстан в GEM, по показателю «Доступ к предпринимательскому финансированию» – 38 место из 45 стран; рейтинг в the Venture Capital & Private Equity Country Attractiveness Index – 54 место.

Целью исследования является аналитический и эмпирический обзор венчурного инвестирования технологического предпринимательства в Республике Казахстан.

Методология исследования основана на методах базовой статистики, логического анализа, корреляционно-регрессионного анализа, анкетирования, и контент анализа.

Оригинальность / ценность исследования заключается в исследовании такого набирающего обороты в стране явления как венчурного финансирование технологического предпринимательства, посредством опроса технологических предпринимателей Республики Казахстан.

Результаты исследования показывают, что венчурное финансирование существенно влияет на развитие технологического предпринимательства. Однако такой способ финансирования в основном доступен лишь крупным предприятиям. Автор приходят к выводам что техно-пренеры находят доступ к венчурному финансированию умеренно сложным и в основном полагаются на личные финансы.

Ключевые слова: технологическое предпринимательство, инновации, венчурные инвестиции, НИОКР.

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