Article

Improving the system evaluating the quality of governance and effective use of budget funds

Assel Ismailova[1], Lyazzat Sembiyeva[1], Ceslovas Christauskas[2], Gulzhan Alina[3,*]

[1] L.N. Gumilyov Eurasian National University, Astana 010000, Kazakhstan

[2] Kauno Kolegija Higher Education Institution, Kaunas 50468, Lithuania

[3] Esil University, Astana 010008, Kazakhstan

* Corresponding author: Gulzhan Alina, Guljanalina@gmail.com

Abstract: The purpose of the study is to create proposals and recommendations to improve the system evaluating the quality of governance and efficient use of budget funds in order to improve public welfare and sustainable development. The research methodology included application of statistical methods to review scientific articles, legislative acts and other documents, study models for evaluating the quality of governance and efficient use of budget funds. Mathematical modeling and forecasting methods were also used to assess aspects of governance and predict the results when changes are made, including building a trend model and determining the forecast values of accrued taxes and mandatory payments for 2024–2026. The conclusions highlight there is a positive correlation between the accrued taxes and mandatory payments to the budget of the Republic of Kazakhstan, and an economic growth and changes in tax legislation. The key factors influencing the quality of governance and efficient use of budget funds were identified. Recommendations were developed to improve the quality assessment system and governance of budget funds in order to increase efficiency and responsibility in financial management. The results of the study can be used by public administration bodies and financial institutions to optimize the governance of budget funds.

Keywords: budget funds; efficiency; quality of management; resources; taxes

1. Introduction

The relevance of the study to improve the system evaluating the quality of governance and effective use of budget fund is important for a number of reasons:

- evaluation of the quality of governance and the efficiency of usage of budget funds are a critical element for ensuring economic efficiency and achieving national development goals. Effective use of budget funds is important to ensure sustainable economic growth, reduce poverty and ensure social protection of the population;
- evaluating the quality of governance and the efficiency of using budget funds helps to strengthen public confidence in government institutions and improve the transparency of financial processes. This helps on prevention of corruption and abuse in public financial management;
- evaluating the efficiency of using budget funds helps to identify ineffective expenses and direct funds to the highest priority areas, allowing optimization of expenses and achieve the maximum socio-economic effect from public investments;
- evaluating the quality of budget fund governance helps to formulate strategies and priorities for the development of the national economy, allowing the

government to develop more effective policies and programs aimed at achieving socio-economic goals;

- in the context of a changing global economic environment and the challenges it brings, such as climate change, pandemics and geopolitical instability, effective governance of budget funds becomes a key element in ensuring sustainable development and overcoming complex challenges.

Thus, research on improving the system evaluating the quality of governance and the efficiency of using budget funds is a relevant and important task that helps on improvement of the efficiency of public administration and achieve the strategic goals of national development.

The research to improve the system evaluation the quality of governance and efficient use of budget funds is a relevant and strategically important area for government agencies, the academic community, and society as a whole. It allows to identify opportunities to increase an efficiency of expenditure and budget optimization processes, and to identify strengths and weaknesses of the current governance system, whilst proposing recommendations for its improvement.

Modern public financial management is a complex and dynamic system that requires continuous improvement and adaptation to changing circumstances. An important aspect of the effective management is the system evaluating the quality of governance and the use of budget funds. The thoroughness and effectiveness of this system determine how successfully the state achieves its strategic objectives. This study considers why such system requires improvements in the context of the Republic of Kazakhstan.

The modern dynamics of economic and social processes require public institutions to manage budget funds effectively and responsibly. Thereby, it becomes relevant to improve the system evaluating the quality of governance to ensure the optimal use of public funds in the interests of social development.

The scientific novelty of the study contributes to the development of practical recommendations to improve the system evaluating the quality of governance and the effective use of budget funds, tailored to the specifics of the republic.

The existing systems evaluating the quality of governance often suffer from a lack of comprehensiveness, transparency, and internal and external coherence. The evaluation is often limited to the financial indicators, ignoring social and environmental aspects. This creates a distorted view of governance effectiveness and could lead to poor strategic decisions. Therefore, there is a need for recommendations to improve the system evaluating the governance of budget funds to achieve higher efficiency and accountability in financial management.

2. Literature review

The concepts of effective use of budget funds, sources of their formation, methods and evaluation indicators occupy a special place among the scientific areas of accounting, analysis and control. Despite the fact that, efficiency refers to the target characteristics of an economic entity and many researchers have been involved in its assessment, complete clarity in the definition of the concept of budget efficiency has not yet been achieved. This situation is explained by the fact that this concept is closely

related to politics, ways of running the economy at the macro level, organizational and legal forms of management, types of economic activity at the micro level.

Analyzing the essence of efficiency indicators used in budgetary practice, it becomes obvious that the concept of efficiency in relation to the results of the implementation of programs/subprograms needs clarification and specification. In this regard, it seems necessary to evaluate the effectiveness of the results obtained from the point of view of various aspects of effectiveness, among which in practice of program budgeting the most important traditional are: impact on society, effectiveness, productivity, quality of service, quality of the organization (Gilmour, 2007; Khan and Hildreth, 2002; Miller et al., 2010). Examples of such indicators include: indicators of income growth in a specific industry, regional income growth, completion of the development of a specific technology, the level of competitiveness of the industry in the global market (Peacock, 2008).

The public financial management is aimed at achieving set socio-economic goals through the effective use of limited financial resources. The quality of financial management carried out by the chief administrators of budget funds largely determines the effectiveness of the budgetary policy in the country (Atrokhova, 2022).

In a changing business condition, the turbulence in external environment poses new challenges for budget management. When the environmental turbulence is high, individuals' innovation mindset will improve (Bodlaj and Cater, 2019), and the governance system will also promote product innovations by increasing information supply to adapt to these changes (Henri and Wouters, 2020). Accordingly, it is necessary to use interactive control in budgetary activities to meet the requirements of strategic uncertainty.

A critical cornerstone of building a modern budget system is the introduction of a results-based budgeting (RBB), which is defined as "The systematic use of performance results to inform budget decisions, either as a direct input to budget allocation decisions or as contextual information to inform budget planning, and to ensure greater transparency and accountability throughout the budgeting process by providing legislators and the public with information on spending goals as well as results achieved" (Schick, 2014). The RBB aims to generate and use performance results for guiding the budgeting process and influencing resource allocation, both directly and indirectly. It helps managing the efficiency and effectiveness of governments and their agencies, facilitates budget decisions and resource allocation, achieves cost savings, and improves transparency and accountability (Gillan et al., 2021).

For example, countries with a higher proportion of ministries using performance targets in budget discussions tend to have lower public debt and higher GDP growth rates (Shahvalizadeh and Fouman Ajirlou, 2020).

For ministries of finance, the RBB provides new types of information that help ministries of finance making resource allocation decisions based on evidence of what works, as well as tools to hold line ministries accountable for efficiency and effectiveness of expenditure (Blazely, 2018).

While analyzing the participation of the state in economic processes, we note the fact that it ranged from an extreme degree of deregulation of various spheres of human activity to a complete state monopoly of the production of all types of products.

Throughout many stages of state development, as well as historical aspects in different countries, the same economic policy has not always led to the same results, which fluctuated from profound successes and prosperity to failures and collapses of social reproduction.

The most influential works on political economy, and later the economic theory, such as those by Gemmell et al. (2011), Barbiero and Cournede (2013), have paid due attention to the issues of economic growth, as the economic development is intended to ensure an increase in living standards alongside constant population growth.

Accordingly, the adequate functioning of the economic mechanism is impossible without improving budget relations, a consistent implementation of the scientifically developed budget policy, an effective system for managing the budgeting process, and, as a result, achieving budget sustainability.

The fiscal sustainability, as an economic category, expresses the system of economic relations through which the budget of a country (or region) ensures a balance between the revenue base and its expenditure part. It is desirable that the main share of revenues comes from its own, fixed tax, and non-tax revenues. At the same time, the country's (or region's) budget actively invests in the development of the modern economy, considering the prospects of receiving a larger amount of income, as well as in the social sphere, to meet the needs of the population in terms of its services. In addition, in conditions of economic uncertainty, it is necessary to create, whenever possible, financial reserves for unforeseen circumstances.

The region's fiscal sustainability is determined by the influence of internal and external factors. External factors, typically beyond the region's control, force authorities to adapt to circumstances they cannot influence. In contrast to external factors, internal factors depend on the region, allowing regional authorities to adjust their budgetary sustainability by influencing these factors.

The state forms and adjusts budget interrelations, directions and channels of budget flows, thereby influencing the processes of budgetary relations. It changes the principles, methods, ways of formation of budget revenues and expenditures, providing regulation of the country's budget system. It becomes especially important to realize that the basic principles of state budget policy are formed at the republican level (Cuadrado-Ballesteros and Bisogno, 2022). For this purpose, using a variety of financial instruments, the state distributes revenues among entities at one level, as well as between the center, regions, and local authorities. Their application is aimed at equalizing the levels of fiscal capacity and, accordingly, budgetary sustainability (Caruano et al., 2019).

In the last decade, Kazakhstan has been actively engaged in reforming and modernizing its budget systems in order to achieve the Organisation for Economic Co-operation and Development (OECD) norms and international standards as part of the goal of Kazakhstan joining the 30 developed countries of the world by 2050. The focus on financial sustainability is due to the increasing relevance of this concept from both theoretical and practical points of view (Caruana et al., 2019).

The government budget should be used efficiently and democratically to promote economic development and social welfare (Jung, 2022). The budget contains vital information to assess whether government operations are conducted in accordance with the public interest (Deng et al., 2013). With the advent of information and

communication technologies, online open budget systems are being implemented on internet platforms to disclose the budget to the public in order to increase budget transparency and encourage people to participate in the budget process (Rodríguez Bolívar et al., 2015).

In accordance with the findings of Gil-Garcia et al. (2014), the implementation of smart budgeting strategies represents a pivotal approach in contemporary decision-making processes. By harnessing the power of historical data and leveraging sophisticated algorithms, organizations can unlock valuable insights and projections crucial for informed decision-making. These strategies enable creation of diverse scenarios, facilitating a comprehensive assessment of potential outcomes and risks associated with various courses of action. Through the integration of historical trends and predictive modeling, smart budgeting not only enhances the accuracy of financial forecasts but also empowers decision-makers to adapt and respond effectively to dynamic market conditions and changing business environments. Thus, by embracing smart budgeting practices, organizations can optimize resource allocation, mitigate risks, and ultimately achieve their strategic objectives with more efficiency and agility.

Valle-Cruz et al. (2022) assessed the relevance of the organizational context for the budgetary control, management and planning functions. Given the importance of government budgeting, we argue that more empirical evidence is needed on the potential of AI techniques to improve efficiency, effectiveness, and government decision support. Smart budgeting is a systematic process that collects relevant information and uses algorithmic models to develop a budget.

Government performance can be measured in various ways (Hutapea and Widyaningsih, 2017). Alternatively, outcome-oriented approaches such as value for money or effectiveness, efficiency, economic performance and financial performance can also be used (Sutopo et al., 2017).

The state forms and adjusts budget interrelations, directions and channels of budget flows, thereby influencing the processes of budget relations (Kapoguzov and Suleimenova, 2017). Sutopo et al. (2017) describe the audit of the efficiency of the use of public resources as a modern form of financial control, which allows for a review of the validity and rationality of budgetary fund usage (Gemmell et al., 2011).

The most influential works on political economy, and later economic theory, such as those by Gemmell et al. (2011), Barbiero and Cournede (2013), focused on issues of economic growth and the allocation of budgetary resources. It is impossible to achieve a high standard of living without providing an adequate level of welfare (Voznyak et al., 2022). For example, economic and governance effects have a significant impact on socio-economic development and budget allocation, which can be transformed by effective development instruments through appropriate policies and programs (Silva et al., 2018). Thus, some studies of financial self-sufficiency propose measuring it by local budget revenues, while others suggest estimating it spatially based on Moran's I statistics (Kozera and Głowicka-Wołoszyn, 2016).

The analysis shows that it is necessary to clarify and specify the concept of efficiency in the context of the implementation of programs and subprograms. To do this, it is important to evaluate results in terms of various aspects of performance, such as impact on society, effectiveness, productivity, quality of service and organization. Examples of such indicators include revenue growth in a particular industry, regional

income levels, technology completion, and global competitiveness.

Thus, for more accurate assessment of the effectiveness of the use of budget funds, it is necessary to develop and clarify analysis methods and tools, taking into account the variety of factors influencing the results of the implementation of programs and subprograms. This will help organizations and government agencies make more informed decisions and achieve optimal results in the usage of budget funds.

Hypothesis of the study: The introduction of modern assessment methodologies, increasing the transparency of budget processes, taking into account social and economic aspects, stimulating feedback from society, and other measures to optimize the governance of budget funds will contribute to a more efficient use of funds and improve the overall quality of governance. This hypothesis assumes that improvements in the evaluation system will correlate with more successful achievement of strategic objectives and increased efficiency of public finances.

Thus, research on improving the system evaluating the quality of governance and the effective use of budget funds is a relevant and strategically important area for government agencies, the academic community, and society as a whole. It allows for the identification of opportunities to improve expenditure efficiency and optimize budgetary processes, as well as for discerning the strengths and weaknesses of the current management system and offering recommendations for its improvement.

3. Research methodology

The research methodology includes a comprehensive analysis of existing practices and the development of practical recommendations for improving the system evaluating the governance and the efficiency of using budget funds and includes the following stages:

- review of academic literature, legislative acts, as well as analysis of existing practices in governing budget funds in the Republic of Kazakhstan and other countries;
- formulation of the problem and objectives of the study;
- various research methods were used, such as data analysis, statistical methods, expert assessments, surveys, case studies and others. Mathematical modeling and forecasting methods were also used to assess aspects of management and predict the results when making changes, including building a trend model and determining the forecast values of accrued taxes and mandatory payments for 2024–2026. Benchmarking methods were used to compare evaluation and management systems in different regions to identify best practices and areas for improvement;
- data analysis was carried out using selected research methods. This stage included interpretation of the results and identifying major trends and issues;
- based on the results of the analysis, the researchers developed recommendations for improving the system evaluating the quality of governance and the efficiency of using budget fund.

4. Findings and discussion

To study the balance model of the national economic system of the Republic of Kazakhstan and to predict the indicator "Accrued taxes, other mandatory payments to the budget" for 2024–2026, various tools, methods and software were used:

1) Econometric methods—the use of econometric models to analyze time series and forecast indicators. These methods include autoregressive integrated moving average (ARIMA) or seasonal autoregressive integrated moving average (SARIMA) models for analyzing time series and forecasting future values.

2) Statistical analysis—the use of statistical methods to analyze data and identify trends, seasonal fluctuations and cyclical changes in time series. This may include time series decomposition methods such as X-11 or X-12 ARIMA methods.

3) Software—various software tools can be used for calculations and data analysis. For example, statistical packages such as R or Python with data analysis libraries such as stats models or forecast can be used to build models and forecast time series. In addition, there are specialized programs for time series, such as EViews or Statistical Analysis System (SAS).

4) Economic models—the use of economic models and theories to analyze the influence of various factors on economic indicators and predict their values. This may include macroeconomic models or models of supply and demand in various sectors of the economy.

5) Expert assessments—in addition to formal methods of data analysis, you can also use expert assessments and specialist opinions to clarify forecasts and assess the likelihood of various scenarios for the development of events.

All these tools and methods can be used in combination to analyze the balance model of the national economic system and forecast indicators for future periods.

The quality of governance and effective use of budget funds are closely related to the budget security of regions in the Republic of Kazakhstan. Balanced and responsible management creates conditions for sustainable development of all regions of the country, contributing to social, economic, and infrastructural progress (**Table 1**) (Aigazin, 2023).

Table 1. Budget provision of regions of Kazakhstan, %.

Region	01.01.2011	01.01.2016	01.01.2020	01.01.2021	01.01.2022	01.01.2023
Abay	-	-	-	-	-	11
Akmola	24	31	26	23	27	30
Aktobe	50	59	48	36	42	43
Almaty	31	40	43	39	48	61
Atyrau	82	89	86	79	84	86
VKO	29	34	30	27	35	46
Zhambyl	19	23	21	17	21	21
WKO	45	46	44	38	42	44
Karaganda	45	57	49	41	48	54
Kostanayskaya	30	35	31	28	35	37
Kyzylorda	20	22	21	17	20	19

Table 1. (*Continued*).

Region	01.01.2011	01.01.2016	01.01.2020	01.01.2021	01.01.2022	01.01.2023
Mangystau		65	74	70	57	65	64
Zhetisu		-	-	-	-	-	6
Pavlodar		55	58	47	47	53	59
SKO		22	25	21	19	21	26
Turkestanskay		19	22	8	10	13	15
Ulytauskaya		-	-	-	-	-	29
Astana		31	56	64	64	81	70
Almaty		65	71	83	69	88	107
Shymkent		-	-	42	35	37	50
Total		632	742	734	646	760	878

(Aigazin, 2023).

The regions' own revenues, managed by local executive bodies, and allocated funds from the republican budget represent the two main sources of financing at the regional level. As of the end of the first eight months of 2023, the local budget revenues of the Republic of Kazakhstan reached 8.6 trillion tenge, marking a 24.5% increase compared to the same period last year. It is noteworthy that revenues to the local budget have been dynamically growing year over year.

This year, tax revenues accounted for 46.7% of all local budget revenues, while transfers constituted 50.8%.

Regionally, Almaty stands as the principal contributor to the state budget. From January to August of this year, the local budget revenues of this megacity exceeded 1 trillion tenge, amounting to precisely 1.054 trillion tenge. This is an absolute record among all regions of the country. Over the year, the amount increased by 20.6%. Following Almaty, the Turkestan region ranked second with local budget revenues of 832.6 billion tenge, and Astana was third with 805.9 billion tenge (**Figure 1**) (Ranking, 2023).
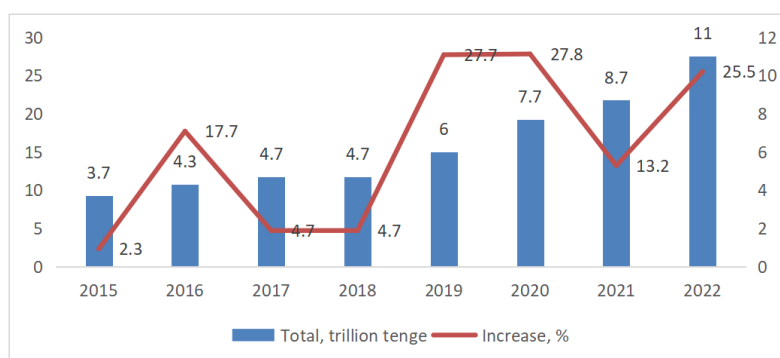

Figure 1. Receipt of funds to the local budget.

(Ranking, 2023).

For many years, Almaty has been the leader among all regions of the country in terms of budget revenues. In 2023, tax revenues comprised the majority of all local budget revenues at 90.9%, while transfer receipts made up only 5.6%. Overall, over five years (2018–2022), Almaty`s local budget revenues reached 4.4 trillion tenge.

Next, a comparative analysis will be conducted of the regions' own revenues (managed by local executive bodies) and the funds allocated from the republican budget (**Table 2**) (Conclusion, 2023).

Table 2. Comparative analysis of regions' own incomes (local executive bodies) and funds allocated from the republican budget (RB), billion tenge.

Region	Selected from RB 2017	Selected from RB 2018	Selected from RB 2019	Selected from RB 2020	Selected from RB 2021
Akmola	165	153	215	242	280
Aktobe	112	106	150	198	231
Almaty	238	216	311	370	441
Atyrau	28	19	59	83	83
VKO	228	214	286	342	374
Zhambyl	193	200	285	315	365
WKO	90	82	119	157	179
Karaganda	164	151	197	265	305
Kyzylorda	172	187	238	268	311
Kostanayskaya	154	153	193	234	249
Mangystau	39	28	74	77	100
Pavlodar	94	100	141	154	163
SKO	145	144	188	228	250
Turkestanskay	471	461	703	632	770
Shymkent	-	30	135	226	284
Almaty	106	75	127	233	178
Astana	226	151	201	252	159
Total	2625	2471	3619	4276	4724

(Conclusion, 2023).

1) Own revenues of the regions:
    (1) taxes and fees—regional authorities may collect various taxes and fees from enterprises, organizations and the population on their territory. This may include property taxes, land taxes, transport taxes and other local taxes;
    (2) localised fees and charges—in some cases, regional authorities may introduce localised fees and charges to fund specific projects or provide certain services;
    (3) income from state-owned enterprises—regions can receive income from state-owned enterprises operating within their territory.
2) Allocated funds from the republican budget:
    (1) transfers—the republican budget may allocate funds to the regions in the form of transfers, intended to compensate for differences in financial potential and to ensure equal socio-economic development;
    (2) grants and subsidies—regions may receive grants and subsidies from the republican budget for implementing specific projects, programs, etc.;
    (3) targeted allocations—the republican budget may provide targeted allocations for specific areas such as healthcare, education, social support,

etc.

It is important to note that the ratio between the regions' own income and allocated funds from the republican budget may vary depending on economic activity, tax base, social needs, and other factors in each region. This dual financing system allows regions to respond flexibly to specific needs and manage their financial resources more accurately while receiving support from the central government in the form of allocated funds.

The relationship between the quality of governance and the effective use of budget funds in the Republic of Kazakhstan, including accrued taxes and mandatory payments, is manifested through various aspects of tax policy, tax collection, targeted use of budget funds, and financial management (**Figure 2**) (Bureau of National Statistics, 2023).
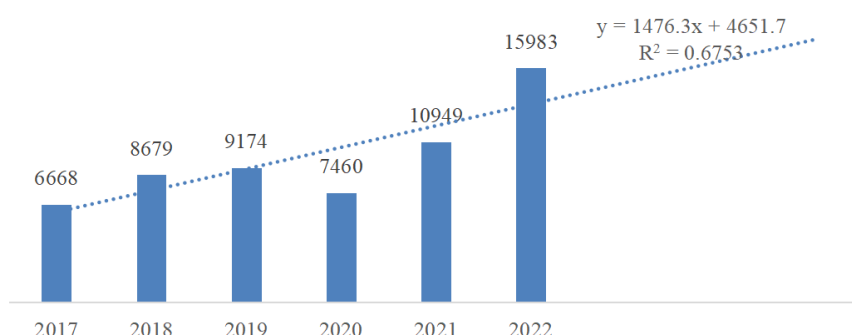

Figure 2. Accrued taxes, other mandatory payments to the budget in 2017–2022, billion tenge.
(Bureau of National Statistics, 2023).

Accrued taxes and other mandatory payments to the budget of the Republic of Kazakhstan in recent years have an upward trend, which is due to the following factors (**Figure 3**).
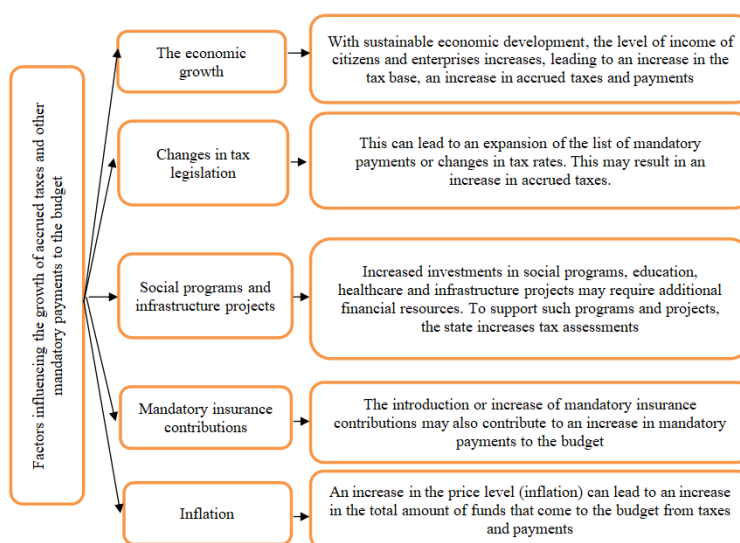

Figure 3. Factors influencing the growth of accrued taxes and payments to the budget.
(Note: composed by the author).

The combination of these factors may explain the upward trend of growth of accrued taxes and mandatory payments to the budget of the Republic of Kazakhstan.

In order to build a trend model and determine the forecast values of the indicator "Accrued taxes, other mandatory payments to the budget" for 2024-2026. The following steps were completed:

1) Checking a time series for the presence of anomalous observations. For this purpose, Irwin's criterion was used (**Table 3**) (Conclusion, 2023).

Table 3. Checking for anomalous observations in a time series.

Year	Accrued taxes, other mandatory payments to the budget, billion tenge	Observed value of Irwin's criterion	Calculation formulas
01.2014	4779		
01.2015	5115.7	0.096	
01.2016	4884	0.066	
01.2017	5776	0.256	Observed value of Irwin's criterion
01.2018	6668	0.256	$\lambda_t = \dfrac{\|y_t - y_{t-1}\|}{\sigma_y},$
01.2019	8679	0.576	$t = \overline{2,\ 10}$
01.2020	9174	0.142	Critical value of Irwin's criterion $\lambda_{0.05} = 1.5$
01.2021	7460	0.491	
01.2022	10,949	1.000	
01.2023	15,983	1.442	

(Bureau of National Statistics, 2023).

Since all observed values of the Irwin's criterion are less than the critical value, we can say with 95% probability that the original time series does not contain anomalous observations.

2) Using the criterion of "ascending" and "descending" series, it was established that the time series under consideration contains a trend component (**Table 4**).

Table 4. Checking for a trend.

General view of the criterion for "ascending" and "descending" series (For a trend to exist, a violation of at least one inequality is sufficient)	Calculated values with the possibility of error $0.05 < \alpha < 0.0975$
$v(n) > \left[\dfrac{2n-1}{3} - 1.96\sqrt{\dfrac{16n-29}{90}}\right]$	$4 < 3$
$K[K_0(n)]_{max}$	$5 > 4$

(Note: compiled on the basis of calculations made).

3) To approximate the raw data, a first-degree polynomial was chosen as the growth curve:

$$y_t = a_0 + a_1 t + \varepsilon_t \tag{1}$$

The parameters of the selected curve were estimated using the least squares method. As a result of data approximation, the following trend model was obtained:

$$y_t = 2388.30 + 1010.63t \tag{2}$$

4) The quality of the resulting model was assessed in two ways: adequacy check

and assessment of model accuracy.

To check the adequacy of the model, a number of residuals were examined, i.e., discrepancy between levels calculated from the model and actual observations. The most important properties of the residual component are: the equality of the mathematical expectation to zero, the randomness of the residuals and their compliance with the normal distribution law.

The results of the analysis of a number of residuals in order to test the model for adequacy are shown in **Table 5**.

Table 5. Checking the adequacy of the model.

Checked property	Statistics used		Border	Conclusion
	Name, calculation formula	**Received value**		
Randomness	The criterion of "peaks" (turning points) $p > \left[\frac{2}{3}(n-2) - 1,96\sqrt{\frac{16n-29}{90}} \right]$	$3 > 2$	2	Adequate
Normality	RS criterion $RS = \frac{e_{\max} - e_{\min}}{S}$	3.65	2.67–3.69	Adequate
Equality of the mathematical expectation of the levels of a series of residues to zero	Student's *t*-statistics $t_{\text{monitoring}} = \frac{|\bar{e}|}{S}\sqrt{n}$	0	2.26	Adequate

(Note: compiled on the basis of calculations made).

To assess the accuracy of the model, the average relative error of approximation was calculated:

$$E_{\text{rel}} = \frac{1}{n}\sum_{i=1}^{n}\frac{|e_t|}{y_t}100\% = 14.95\% \tag{3}$$

Value which indicates a tolerable level accuracy of the model.

Thus, the model is of sufficient quality and can be used for forecasting.

5) To calculate the point forecast, the corresponding factor values were substituted into the constructed model $t = n + k$. To construct an interval forecast, a confidence interval was determined at the significance level $\alpha = 0.05$. The width of the confidence interval was calculated using the formula:

$$U(k) = S_e t_\alpha \sqrt{1 + \frac{1}{n} + \frac{(n+k-\bar{t})^2}{\sum_{t=1}^{n}(t-\bar{t})^2}} \tag{4}$$

Results of constructing point and interval forecasts for 2024–2026 are presented in **Table 6**.

The results of modeling and forecasting the indicator "Accrued taxes, other mandatory payments to the budget" for 2024–2026 are presented graphically in **Figure 4**.

Table 6. Point and interval forecasts of the indicator "Accrued taxes, other obligatory payments to the budget" for 2024–2026.

Year	Point forecast, billion tenge	Interval forecast, billion tenge	
		Upper line	**Bottom line**
2024	5215.88	14,515.87	9299.99
2024	5483.53	15,526.50	10,042.97
2026	5774.25	16,537.13	10,762.88

(Note: compiled on the basis of calculations made).
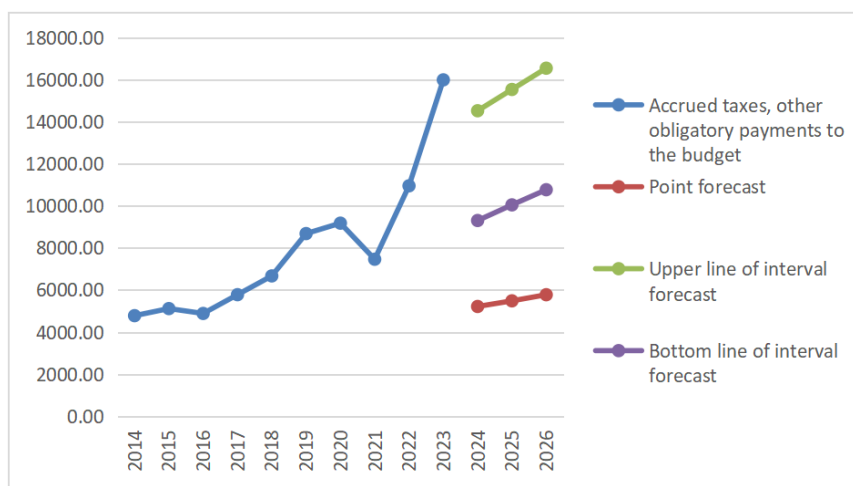
Figure 4. Point and interval forecasts of the indicator "Accrued taxes, other mandatory payments to the budget" for 2024–2026, billion tenge.
(Note: compiled on the basis of calculations made).

The impact of accrued taxes and other mandatory payments to the budget on the quality of governance and effective use of budget funds in the Republic of Kazakhstan can be considered from several key points of view (**Table 7**).

Table 7. Impact of accrued taxes and other mandatory payments to the budget on the quality of governance and effective use of budget funds in the Republic of Kazakhstan.

No.	Key aspects	Influence	Usage
1	State budget financing	The accrual of taxes and mandatory payments is the main source of the formation of the state budget.	These funds are used to finance key community and economic programs, including health, education, infrastructure and social support. The level of assessed taxes directly affects the amount of funds available for the effective management and development of the country.
2	Stimulating or inhibiting the business environment	The level of tax obligations can influence the business environment and investment climate in the country. High taxes can be a burden on entrepreneurship and investment, while lower tax rates can encourage business growth and attract investment.	The effective use of budget funds also depends on the creation of a favorable tax environment for enterprises.
3	Transparency and management efficiency	The quality of financial management, budgetary discipline and reporting affects the efficiency with which funds are used, and therefore the overall success of government programs and projects.	An important aspect of the impact of assessed taxes is the transparency and efficiency of budget fund governance.

Table 7. (*Continued*).

No.	Key aspects	Influence	Usage
4	Social justice	Tax policy has an impact on social justice.	Developing a progressive tax system can help distribute the tax burden more evenly among different segments of the population
5	Stimulating economic growth	Tax policy can stimulate economic growth.	Special tax breaks and incentives can attract investment, promote innovation and industry development, which in turn promotes the efficient use of budget resources to support economic development.
6	Cost efficiency control	The quality of governance also depends on monitoring the efficiency of expenses.	Mechanisms for auditing and monitoring budget programs and projects help ensure that budget funds are used effectively and in accordance with their goals.

(Note: composed by the author).

The relationship between the quality of governance and the effective use of budget funds in the Republic of Kazakhstan and accrued taxes and other mandatory payments can be considered in the following aspects (**Figure 5**).
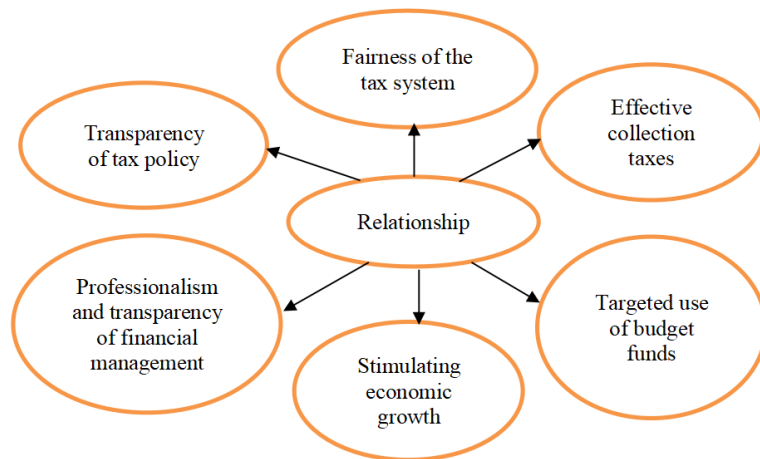

Figure 5. The relationship between the quality of governance and the effective use of budget funds in the Republic of Kazakhstan.
(Note: composed by the author).

According to **Figure 4**, the relationship between the quality of governance and the effective use of budget funds in the Republic of Kazakhstan is as follows:

1) quality of governance is manifested in the transparency and predictability of tax policy. The clarity of tax rules and their stability create conditions for more effective planning of business processes, investments, and use of budget fund;

2) good governance involves developing a tax system that is perceived to be fair and consistent with the economic and social realities of the country. This could include progressive tax rates, incentives for small businesses, and other measures to ensure a balanced distribution of the tax burden;

3) good financial management includes effective mechanisms for collecting taxes and mandatory payments:

   - effective monitoring and control over the fulfillment of tax obligations, ensuring timely receipt of funds into the budget, and minimizing tax evasion;

   - assessment of taxes and mandatory payments, which has a significant impact on the quality of governance and effective use of budget funds in the

Republic of Kazakhstan, determining the financial stability, economic development, and social well-being of the country;

4) the quality of governance is manifested in the targeted use of budget funds. Setting spending priorities, monitoring budget execution, and effective project administration are important to ensure maximum efficiency in the use of funds, including those received from taxes and mandatory payments;

5) professional level of financial and budget fund governance affects the quality of use of funds. The presence of qualified personnel, a clear accounting and reporting system create conditions for effective budget governance;

6) good tax and budget governance includes measures that help stimulate economic growth. For example, reasonable tax rates and investment in key sectors can support sustainable development;

7) effective management also requires public participation in decision-making processes on tax policy and spending budget funds. Transparency and openness in this context create the conditions for broad discussion and informed decision-making.

Thus, the relationship between the quality of governance and the effective use of budget funds in the Republic of Kazakhstan with accrued taxes and mandatory payments is manifested through various aspects of tax policy, tax collection, targeted use of budget funds and financial management.

5. Conclusion

Recommendations for improving the system evaluating the quality of governance and effective use of budget funds include the following measures:

1) Improving the efficiency and transparency of public administration:
   - assessment of the current governance system and identification of its strengths and weaknesses;
   - development and implementation of innovative approaches and methods in evaluating the quality of governance and use of budget funds;
   - increasing transparency and accountability in the processes of allocation, use and monitoring of budget funds.

2) Introducing innovations in assessment methodology:
   - development and implementation of modern methodologies and criteria evaluating governance quality;
   - use of advanced technologies and analytical tools for more accurate and objective performance assessment.

3) Optimization of budget processes:
   - analysing the effectiveness of current budgetary mechanisms and proposing measure to optimize them;
   - developing of recommendations to improve mechanisms for the distribution of funds aimed at best meeting the needs of society;
   - a study of modern trends in the governance of budget funds for informed decision-making.

4) Increased adaptability to change:
   - adaptation of the management quality evaluation system to rapidly changing

conditions, including economic and social changes;

- integration of new technologies and innovations to improve budget fund governance processes.

5) Reducing the level of corruption:

- development and implementation of measures to reduce corruption risks in the processes of management and distribution of budget funds;
- increasing responsibility and transparency in making financial decisions;
- introduction of monitoring and control mechanisms aimed at preventing corrupt practices.

6) Strengthening public trust:

- creation of feedback mechanisms with society to take into account the opinions and interests of citizens in budget governance processes;
- increasing public confidence in government bodies and their ability to effectively manage budget funds.

7) Promoting sustainable development:

- analysis of the impact of budget fund governance on the sustainable socio-economic development of the country;
- development of strategies and practices that promote economic sustainability and growth through effective management of budgetary processes;
- integration of social and economic indicators into the performance assessment system in order to assess the impact of budget fund governance on public welfare;
- taking into account the needs and interests of various social groups in the processes of budget allocation.

8) Conducting audits and examinations:

- conducting regular audits and examinations of the effectiveness of budget governance to identify problems and propose measures to solve them.

These recommendations are aimed at improving the system evaluating and governing budget funds in order to achieve higher efficiency and responsibility in financial management.

As a result of this study, the author made the following conclusions:

Improving the system evaluating the quality of governance and effective use of budget funds is a key aspect for ensuring sustainable development and economic growth. Optimizing budget expenditures, increasing transparency and public trust in government financial processes, as well as improving socio-economic results are the main goals of improving the system evaluating the governance of budget funds. The use of modern analysis methods and assessment tools makes it possible to more accurately determine the effectiveness of the usage of budget funds and identify areas for improvement.

One limitation may be the availability of data and information needed to conduct the analysis. Insufficient information may reduce the accuracy of evaluating the effectiveness of budget fund governance. It is also important to consider the limitations of financial and organizational resources when implementing recommendations for improving the system of budget fund governance.

The development and implementation of an effective system evaluating the

quality of budget fund governance helps to increase transparency, improve public administration, and achieve strategic goals of national development. Increasing the efficiency of using budget funds can have a positive impact on the socio-economic development of the country, including poverty reduction, infrastructure, and education development, as well as improving the quality of life of the population.

Regular monitoring and analysis of the improvement of results of the system evaluating the governance of budget funds will allow us to detect problems and timely adjust strategies to achieve optimal results.

The study "Improving the system evaluating the quality of governance and effective use of budget funds" combined practical and theoretical approaches. Such research is based on a practical analysis of current systems evaluating and governing budget funds, and based on this analysis, theoretical models and methods are developed for their improvement.

The object of research in this case can be both leaders and managers responsible for governing budget funds and evaluating performance, as well as scientists and specialists in the field of budget governance. Policymakers may also be interested in the research, especially if it is aimed to improve the efficiency of government programs and the use of public funds.

Conflict of interest: The authors declare no conflict of interest.

References

Aigazin, Z. (2023). Losing financial independence: how tax centralization slows down the development of the regions of the Republic of Kazakhstan. Available online: https://m.forbes.kz/actual/expertise/teryaya_finansovuyu_nezavisimost_kak_nalogovaya_tsentralizatsiya_tormozit_razvitie_regionov_rk (accessed on 1 February 2024).

Atrokhova, A. N. (2022). Improvement of Methods of Quality assessment of Financial Management of chief administrators of budgetary Funds. Finance: Theory and Practice, 26(5), 33–48. https://doi.org/10.26794/2587-5671-2022-26-5-33-48

Barbiero, O., Cournède, B. (2013). New Econometric Estimates of Long-Term Growth Effects of Different Areas of Public Spending. OECD Economics Department Working Papers, 1100.

Blazely, A. (2018). OECD best Practices for performance budgeting. Available online: https://one.oecd.org/document/GOV/PGC/SBO(2018)7/en/pdf (accessed on 1 February 2024).

Bodlaj, M, Čater, B. (2019). The Impact of Environmental Turbulence on the Perceived Importance of Innovation and Innovativeness in SMEs. Journal of Small Business Management, 57(sup2), 417–435. https://doi.org/10.1111/jsbm.12482

Bureau of National Statistics. (2023). Data from the Bureau of National Statistics of the Agency for Strategic Planning and Reforms of the Republic of Kazakhstan for 2013-2022. Available online: https://www.stat.gov.kz (accessed on 1 February 2024).

Caruana, J., Brusca, I., Capercione, E., et al. (2019). Exploring the relevance of accounting systems in the pursuit of financial sustainability of public sector enterprises: a holistic approach. In: Caruana, J., Brusca, I., Capercione, E., et al. (editors). Financial Sustainability of Public Sector Organizations. Palgrave Macmillan, Cham. pp. 1-18.

Conclusion. (2023). Conclusion to the report of the Government of the Republic of Kazakhstan on the execution of the republican budget for 2022. Available online: https://www.gov.kz/memleket/entities/esep/documents/details/470570?lang=ru (accessed on 1 February 2024).

Cuadrado-Ballesteros, B., & Bisogno, M. (2022). Budget transparency and financial sustainability. Journal of Public Budgeting, Accounting & Financial Management, 34(6), 210–234. https://doi.org/10.1108/jpbafm-02-2022-0025

Deng, S., Peng, J., & Wang, C. (2013). Fiscal transparency at the Chinese provincial level. Public Administration, 91(4), 947–963. https://doi.org/10.1111/padm.12031

Gemmell, N., Kneller, R., Sanz, I. (2011). Fiscal Policy Impacts on Growth in the OECD: Are They LongRun? Available online: https://pdfs.semanticscholar.org/eca1/08deaf73c53bfec78c30e673a2b240b17a83.pdf (accessed on 1 February 2024).

Gil-Garcia, J. R., Helbig, N., & Ojo, A. (2014). Being smart: Emerging technologies and innovation in the public sector. Government Information Quarterly, 31, I1–I8. https://doi.org/10.1016/j.giq.2014.09.001

Gillan, S. L., Koch, A., & Starks, L. T. (2021). Firms and social responsibility: A review of ESG and CSR research in corporate finance. Journal of Corporate Finance, 66, 101889. https://doi.org/10.1016/j.jcorpfin.2021.101889

Gilmour, J. B. (2007). Implementing OMB's Program Assessment Rating Tool (PART). OECD Journal on Budgeting, 7(1), 1–40. https://doi.org/10.1787/budget-v7-art5-en

Henri, J. F., & Wouters, M. (2020). Interdependence of management control practices for product innovation: The influence of environmental unpredictability. Accounting, Organizations and Society, 86, 101073. https://doi.org/10.1016/j.aos.2019.101073

Hutapea, F. L., Widyaningsih, A. (2017). The Effect of Good Government Governance and Legislative Size on Local Government Performance (Study on Provincial Governments in Indonesia) (Indonesian). Jurnal Aset (Akuntansi Riset), 9(1), 173–186. https://doi.org/10.17509/jaset.v9i1.5446

Jung, H. (2022). Online Open Budget: The Effects of Budget Transparency on Budget Efficiency. Public Finance Review, 50(1), 91–119. https://doi.org/10.1177/10911421221093412

Kapoguzov, E. A., Suleimenova, G. K. (2017). Evaluation of the effectiveness of government agencies in the context of strategic management and organizational development in the Republic of Kazakhstan. Art of Management, 9(3), 452–475. https://doi.org/10.17072/2218-9173-2017-3-452-475

Khan, A., Hildreth, W. B. (2002). Budget Theory in the public sector. L.: Quorum books. 298p.

Kozera, A., & Głowicka-Wołoszyn, R. (2016). Spatial Autocorrelation in Assessment of Financial Self-Sufficiency of Communes of Wielkopolska Province. Statistics in Transition New Series, 17(3), 525–540. https://doi.org/10.21307/stattrans-2016-036

Miller, G., Hildreth, W. B., Rabin, J. (2010). Performance-Based Budgeting. An ASPA Classic. Colorado: Westview Press. 504p.

Peacock, S. (2008). An Evaluation of Program Budgeting and Marginal Analysis Applied in South Australian Hospitals. Melbourne. 128p.

Ranking. (2023). Budget donors: which regions fill the budget of Kazakhstan the most? Available online: https://ranking.kz/reviews/banking-and-finance/donory-byudzheta-kakie-regiony-bolshe-vseh-napolnyayut-byudzhet-kazahstana.html (accessed on 1 February 2024).

Rodríguez Bolívar, M. P., del Carmen Caba Pérez, M., & López-Hernández, A. M. (2015). Online Budget Transparency in OECD Member Countries and Administrative Culture. Administration & Society, 47(8), 943–982. https://doi.org/10.1177/0095399713509238

Schick, A. (2014). The metamorphoses of performance budgeting. OECD Journal on Budgeting, 13(2), 49–79. https://doi.org/10.1787/budget-13-5jz2jw9szgs8

Shahvalizadeh, A., Fouman Ajirlou, N. (2020). The impact of performance based budgeting on improving the quality of financial reporting (case study: Ardabil province social security). Journal of Accounting and Management Vision, 3(31), 137–154.

Silva, A. S., Santos, H., Ramalho, J., Moreira, R. (2018). Theatre and sustainable territorial communities: A case study in Northern Portugal. Journal of Rural Studies, 63, 251-258. https://doi.org/10.1016/j.jrurstud.2018.04.004

Sutopo, B., Wulandari, T. R., & Adiati, A. K. (2017). E-Government, Audit Opinion, and Performance of Local Government Administration in Indonesia. Australasian Accounting, Business and Finance Journal, 11(4), 6–22. https://doi.org/10.14453/aabfj.v11i4.2

Valle-Cruz, D., Fernandez-Cortez, V., & Gil-Garcia, J. R. (2022). From E-budgeting to smart budgeting: Exploring the potential of artificial intelligence in government decision-making for resource allocation. Government Information Quarterly, 39(2), 101644. https://doi.org/10.1016/j.giq.2021.101644

Voznyak, H., Mulska, O., Bil, M., Radelytskyy, Y. (2022). Financial wellbeing of households in instability. Investment Management and Financial Innovations, 19(1), 135–144. https://doi.org/10.21511/imfi.19(1).2022.10