ORIGINAL PAPER

DOI: 10.26794/2587-5671-2023-27-1-195-207
UDC 336(045)
JEL H61, H83, O33

Digitalization in the Processes of Classification of the Country's Budget Expenditures

L.I. Sergeev[a], D.L. Sergeev[b]
[a] Kaliningrad Technical State University, Kaliningrad, Russia;
[b] Western branch of RANEPA, Kaliningrad, Russia

ABSTRACT

The study of the processes of planning and accounting of budget expenditures in the context of digitalization and the development of the processes of classification and coding of costs is an important urgent task of improving public financial management. The purpose of the study is to generalize the classification of the country's budget expenditures to justify the need for changes in the order of planning and cost accounting on digital platforms. The research methods included: analysis and synthesis; regression analysis; modeling; scientific abstraction; logical method. The novelty lies in the proposed logical justification of the provisions of the theory of financial informatics as a synthesis of two scientific disciplines — the theory of finance and the theory of computer science. The author's view on the digital content of the classification of budget expenditures is proposed, which represents a multi-dimensional hierarchical system for constructing a graph of budget expenditures. Regression models of the dependence of the resource intensity of the conditional classification budget code of expenditures on the quality of financial management of the GRBS have been developed. The conclusions of the study confirmed the hypothesis that the more detailed the differentiation (classification) of budget expenditures, the more opportunities there are for competent organization and management of their financing processes, which is facilitated by the development of ICT. The recommendations are reduced to the need for further research of the scientific and applied provisions of the development and organization of the functioning of digital platforms in the system of public financial management to improve the efficiency of the use of the country's budget resources. Further development of scientific and applied methodological provisions for the development of the electronic budget is required in order to turn it into a form of the digital budget of the country.

Keywords: budget classification; digitalization of accounting; coding of expenses; regression equation

For citation: **Sergeev L.I., Sergeev D.L. Digitalization in the processes of classification of the country's budget expenditures. *Finance: Theory and Practice*. 2023;27(1):195-207. DOI: 10.26794/2587-5671-2023-27-1-195-207**

INTRODUCTION

New technology platforms reveal opportunities that were not available in the traditional forms of organization of any activity — productive (various activities), social, domestic, behavioral and other. At the same time, critical areas for society, such as healthcare, received an important safety cushion in the fight against the pandemic, as Alexey Timoschuk emphasized in his report "Digitalization as a factor of counteraction to a pandemic" on IX International Conference of Civil Society Researchers[1]: "Notably, one of the main results of the pandemic was the worldwide introduction of remote labor, with the help of which the skills of web-classes were increased, familiarity with cloud storage technologies was held, as well as an important component of life was the implementation of large-scale online activities". This postulate applies to the distribution of the state's GDP through the country's budget system also.

DIGITAL TRANSFORMATION AND STATUS OF THE COUNTRY'S BUDGET EXPENDITURE CLASSIFICATION PROCESS

One of the most important elements of the system of budget organization and the functioning of the unified budget system of the country is the subsystem of classification of the planning and accounting of relevant public expenditures. Our **hypothesis** in the study of the processes of formation and classification of budget expenditures is the following: **the more detailed the differentiation (classify) of budget expenditures, the more opportunities to competent organization and manage their formation and financing processes for public needs and solve social problems of the population.**

The essential content of the concept, as "financial informatics", is on the interdisciplinary boundary of two fundamental theoretical scientific disciplines — the theory of finance and the theory of informatics.

The distribution function of finance as an economic category plays an important role in the system of constantly developing processes of organization of State and municipal administration. This fact is developed in the papers of domestic scientists (see report[2] and papers [1, 2]).

New qualitative opportunities of ICT, contributing to talk about such a format as the digital budget — is the development of the electronic budget, which is facilitated by the processes of further transformation and improvement of the fiscal State corporate platforms in Russia [3, 4].

At the moment, many scientific researches and applied developments are devoted to the problems of digitalization of public administration and budget regulation. N. A. Povetkina [5] considers two major ICT groups to the "institute of information resources in the budgetary sphere".[3]

Article [6] notes: "Classification — is a general scientific method of systematization of knowledge, directed at the organization of a certain set (multiple) of studied objects of different areas of reality, knowledge and activity, into a system of subordinated groups (classes) by which these objects are distributed based on their similarity in certain essential properties".

The unified budget classification of expenditures and revenues of the country's budgets was established in 1995. The 20-bit classification of budget expenditures is currently in effect. The code consists of expenditure directions and details budget allocations by expenditure direction, specifying (if necessary) funding of

[1] Transformation of the third sector in the digital age. URL: https://grans.hse.ru/news/414816050.html (accessed on 10.10.2021).

[2] The State as a platform: people and technology. Report of RANEPS. Moscow. 2019. 111 p. URL: https://cdto.ranepa.ru/media/sum_of_tech/materials/attached_pdfs/Государство_как_платформа.pdf (accessed on 10.01.2023).

[3] Information on the official website of the Federal Treasury. URL: https://roskazna.gov.ru/gis/ (accessed on 14.09.2021).

individual activities. In the scientific theory of "databases" the considered extended provisions of interpretation of the content of the budget classification of expenditures, their various structuring represent elements of the database management system, which are studied in the papers [7, 8].

Now we can talk about the budget classification as a system of "big data", which is the foundation and basis of the construction of the digital economy. "Big data" in a broad sense is spoken of as a socio-economic phenomenon associated with the emergence of technological capabilities to analyze huge amounts of data, in some problem areas — the whole world data, and the resulting transformational consequences" [9].

One of the stages of development of the practice of budget classification was the creation of appropriate guidelines for the budget classification of resources of the programme budget in the Russian regions.[4] These recommendations make it possible to construct such a classification of budget expenditures, which allows to study the program section of budget financing and the effectiveness of the use of funds in the implementation of targeted programs [10–12].

The potential of digital platforms gives an even larger field of scientific-applied activity to expand both analytical and predictive procedures of planning, management and evaluation of results of the use of budget expenditures, as noted in the papers [13–15]. This thesis is based on the fundamental premise of the following logical reasoning and generalizations.

First. The budget hierarchy of the construction of the system of expenditures allows from the lower level (municipal level) to the upper level (federal authority) to obtain such a consolidated component of budget expenditures, which at the top level of construction of the economic system (pyramid) sometimes hardly noticeable and insignificant, but generally felt and relevant.

Second. Digital content classification of budget costs is a multi-dimensional system set of budget digital parameters (databases), which on all procedural planning processes, financing and analysis can provide a multi-vector form of construction of numerical parameters of the budget system.

Third. Digital transformation of budget processes raises the entire technological chain of both planning and budget execution to a new level. All procedures of planning calculations parameters of the expenditure budgets get huge volumes of digital information databases, which can allow much faster and more accurate determination of the necessary values of budget expenditures in the conditions of multi-factor modeling of their formation.

Fourth. The digital platform classification of budget costs describes the logical structures of a huge database, which is an integrated complex system of these data. Methods of manipulation by modification, structural reconstruction can make transitions between the states of the database, but under conditions of integrity of the system as a whole.

Fifth. The hierarchical construction of the system of budgetary classification of expenditures, used at all levels of power hierarchy, on digital platforms can receive not only a twenty-digit grid of code, but also another more extended classification structure of costs, that they allow the capabilities of digital platforms. Despite the rather significant presence in the current classification of budget expenditures target cost items (about 2055 items), subsections (up to 94 items), types (up to 70), general government operations (up to 30), directions (up to 75 items), codes of target cost items

[4] Recommendations for building a program budget classification at the regional and local levels, ensuring the relationship of the structure and dynamics of budget expenditures with the goals and objectives of State and municipal policy. Proposals for methodological support of the organization of work with the State programs of the subjects of the Russian Federation and the application of the program classification of expenditures. Rosminfin. 2017. 92 p.

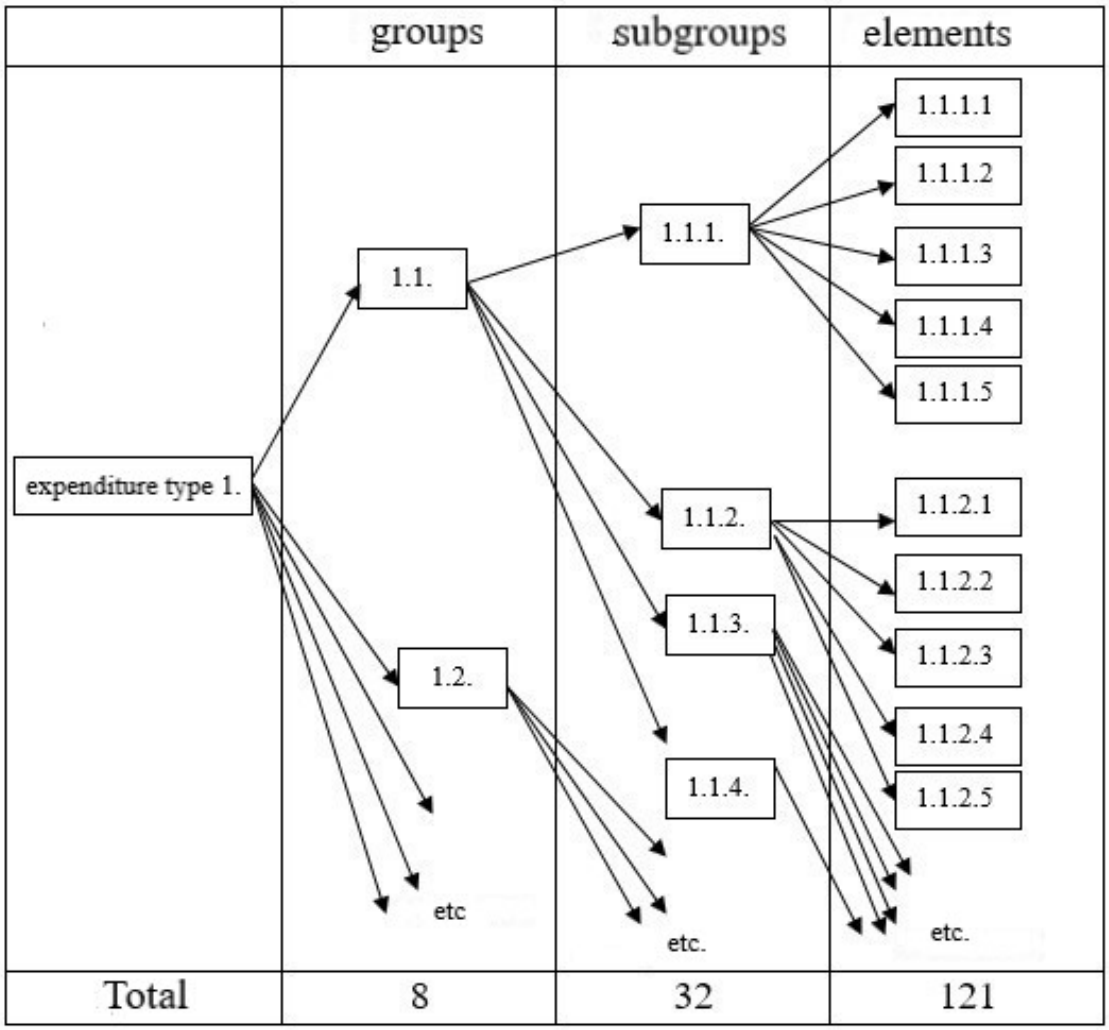

Fig. 1. **Decomposition of Types of Budget Expenditures**

Source: Worked out autoramas in material display Minfina Rossii since 08.06.2020 No. 99n. URL: https://minfin.gov.ru/ru/document/?id_4=130522-prikaz_minfina_rossii_ot_08.06.2020__99n_ob_utverzhdenii_kodov_perechnei_kodov_byudzhetnoi_klassifikatsii_rossiiskoi_federatsii_na_2021_god_na_2021_god_i_na_planovyi_period_2 (accessed on 08.09.2021).

for federal projects (up to 10 items), their structuring on digital platforms can be significantly expanded and unstructured.

Sixth. Digital platforms allow you to quickly classify and rebuild budget expenditures according to a variety of principles and factors of their possible or necessary structural transformation and construction.

Seventh. Cash treasury execution on new digital platforms can significantly accelerate all procedures of funding, monitoring and improve the quality of control over the use of budgetary resources. For example, now in the automated system "Electronic Budget", which is operated by the Ministry of Finance of the Russian Federation and which includes subsystem "Management of National Projects", about 120 000 users of allocated funds from budgets at all levels of federal and regional executive authorities have now been registered.

DECOMPOSITION OF THE COUNTRY'S BUDGET EXPENDITURE CLASSIFICATION SYSTEM

Twenty-digit budget code characterizes a huge array of a large number of digital

databases, which cannot be systematized and generalized without appropriate information and communication software products digital budget.

The budget classification is developed according to the principles of the mathematical device of the decomposition graph, which has the structure of the function tree. At the highest point of the mathematical graph is the total budget expenditure. In the consolidated budget of the Russian Federation is collected a huge database of information, which has both a vertical and a horizontal cut of huge data on the unified structure of the country's budget expenditures. Recently, codes for budget expenditures for national projects and programmes have been introduced, the positions (structure, quantity) of the budget classification target items have been significantly expanded. The budget classification of expenditures is much closer to the system of budget accounting in the budget institutions of the country, as emphasized on the website of the Federal Treasury[5] and in the paper [16].

The economic sense of the classification of budgetary expenditures consists in a gradual decomposition (disaggregation) of allocated in certain cost sections by individual components. For example, the decomposition of types of budget expenditures is presented on *Fig. 1*.

The structure of the budget classification of expenditures consists of ten components at the moment.[6] The number of codes of the budget

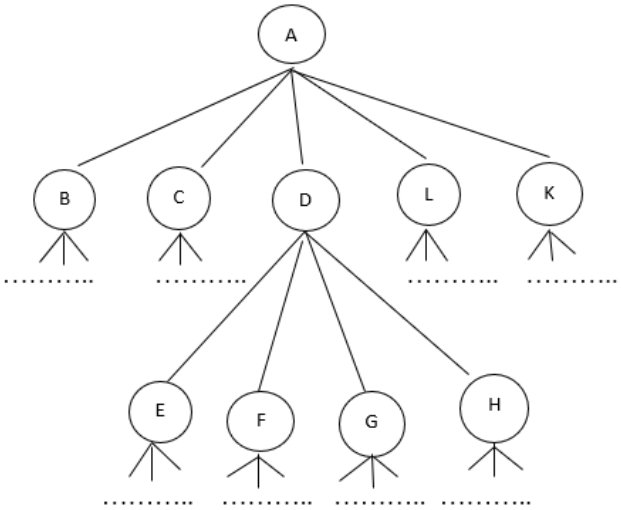

Fig. 2. **A Graph Model of the Decomposition of Budget Classification Codes of Expenditures at the GRBS Level**

Source: Developed by the authors.

classification of expenditures of the federal budget and budgets of the state extrabudgetary funds of the Russian Federation for 2018–2021 is presented in *Table 1*.

Thus, the classification of budget expenditures is represented by ten information arrays of digital databases, which include from 14 to 2 592 digital accounting codes of blocks of budget expenditures with a total value of codes, equal to 4 877. The largest number of codes is for targeted budget expenditure items (2 592) and the smallest — is for the number of budget section codes (14). Accordingly, the largest ratio of information interconnection of code arrays (the ratio of the number of codes of each array in their total value) is in the block of target objects of expenditure (0.531) and the smallest — in the array of codes for payment sections of the budget (0.003).

Schematic representation of the decomposition of the code graph of the budget classification of expenditures at the CMBF level can be considered in the form of a tree of functional and organizational direction of planning and cost accounting (*Fig. 2*).

Formalized, this model can be expressed by the following function (*F*) of dependence of

[5] Requirements for formats and method of transmitting in electronic form of budget reports of chief managers of federal budget funds, chief administrators of revenues, chief administrators of sources of funding submitted to the Federal Treasury. URL: https://roskazna.gov.ru/dokumenty/gis/dokumenty/18287/ (accessed on 04.09.2021).

[6] Order of the Ministry of Finance of Russia No. 99 from 08.06.2020 "On approval of codes (code lists) of the budget classification of the Russian Federation for 2021 (for 2021 and for the planning period 2022 and 2023)". URL: https://minfin.gov.ru/ru/document/?id_4=130522prikaz_minfina_rossii_ot_08.06.2020__99n_ob_utverzhdenii_kodov_perechnei_kodov_byudzhetnoi_klassifikatsii_rossiiskoi_federatsii_na_2021_god_na_2021_god_i_na_planovyi_period_2 (accessed on 08.09.2021).

Table 1

Structure and Number of Budget Classification Codes of Expenditures

No.	Designation	Element of the budget classification of expense codes	Element of the budget classification of expense codes
1	A	Chief manager of budget funds (CMBF)	78
2	B	Section	14
3	C	Subsection	92
4	D	Target items of expenditure (TIE)	2 592
5	E	Implementation of public regulatory payments	111
6	F	Interbudgetary transfers	274
7	G	Programme (non-programme) items of the TIE	445
8	H	Federal government functions	166
9	L	Federal projects	808
10	K	Types of costs	121

Source: Worked out autoramas in material display Minfina Rossii since 08.06.2020 No. 99n. URL: https://minfin.gov.ru/ru/document/?id_4=130522-prikaz_minfina_rossii_ot_08.06.2020__99n_ob_utverzhdenii_kodov_perechnei_kodov_byudzhetnoi_klassifikatsii_rossiiskoi_federatsii_na_2021_god_na_2021_god_i_na_planovyi_period_2 (accessed on 08.09.2021).

Table 2

Dynamics of Expenditures of the Consolidated Budget of the Russian Federation (Billion Rubles), the Number of Codes of Budget Classification of Expenditures by Sections, Subsections, Target Items, Directions and Types for 2014–2021

	2014	2015	2016	2017	2018	2019	2120	2021
Costs	27 611.7	29 741.5	31 323.7	32 395.7	34 284.7	37 382.2	38 205.7	40 000.2
CMBF	108	104	102	95	96	94	95	95
Section	14	14	14	14	14	14	14	14
Subsection	92	92	92	92	92	92	92	94
TIE	205	804	688	1292	1362	1380	2592	2403
Direction	86	107	146	733	968	902	1518	1385
Types	143	141	150	88	114	118	121	118

Source: Compiled by the authors based on materials (orders) of the Ministry of Finance and Treasury of Russia. URL: https://minfin.gov.ru/ru; https://roskazna.gov.ru (accessed on 08.09.2021).

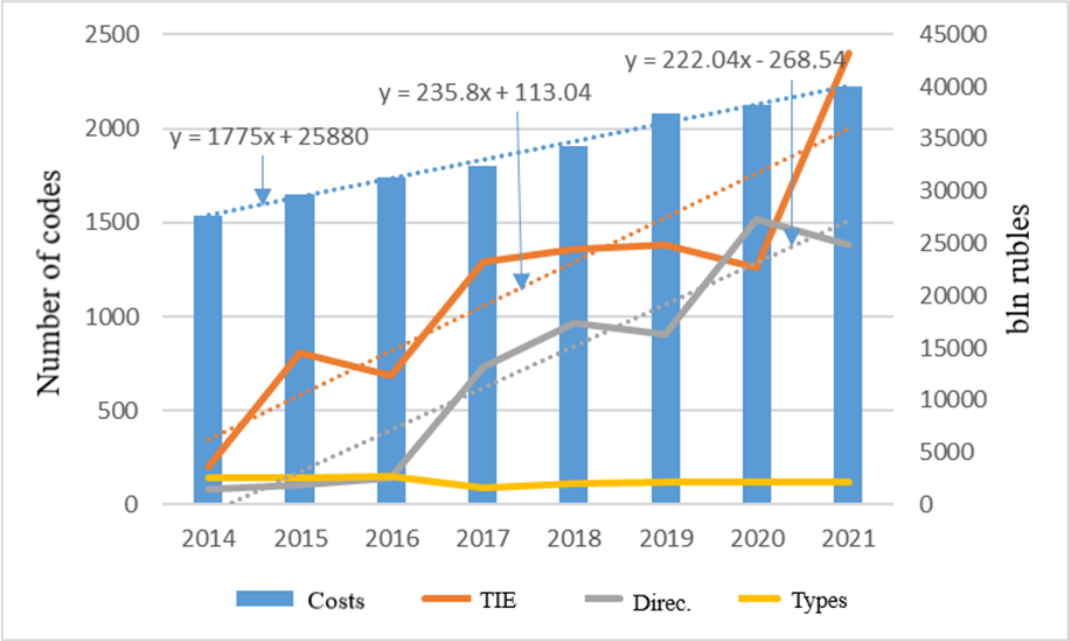

Fig. 3. **The Dynamics of Expenditures of the Consolidated Budget of the Russian Federation and the Number of a Number of Budget Classification Codes of Costs**

Source: Built by the authors based on materials (orders) of the Ministry of Finance and Treasury of Russia. URL: https://minfin.gov.ru/ru; https://roskazna.gov.ru (accessed on 08.09.2021).

the federal budget expenditure of a particular quarter or year on the budget classification of expenditures:

$$\sum (A \in 78) = F\,(B \in 14, C \in 98, D \in 2592, E \in 111, F \in 274, G \in 445, H \in 166, L \in 808, K \in 291),$$

where codes reflect total budget expenditure values for specific budget classification codes.

The system of presented functional modeling of costs allows each j-code of expenses (j = 1,...,2 592), I — that element of the budget classification (I = 1,...,10) present a specific cost item (3Ji), which can be considered and analyzed in a wide range of spectra matrix representation for planning and generalization of budget expenditures in multi-million combinations of relevant cost codes.

Presentation of the database as a large hierarchical structure of the system of codes of planning and accounting of budget expenses is at the moment the largest extensive software complex of electronic budget, which, as technological computing processes continue to be digitized, should take the form of a digital budget. The digital budget — is a form of further development of the e-budget system with new functionalities for both planning and budgeting in the context of an extensive coding system for the budget classification of costs.

REGRESSION ANALYSIS OF THE CLASSIFICATION OF BUDGET EXPENDITURES

We have made a sample according to the relevant Orders of the Ministry of Finance of Russia of the dynamics of the number of codes of the budget classification of expenditures (which can be compared) for 2014–2021 (*Table 2*).

As evidenced by the dynamics number of codes of budget classification of expenditures, which can be compared for 2014–2021, their number size as a whole increase (excluding number of codes by type and expenditure section). In general, the general trend of growth in the composition of the budget expenditure codes is particularly noticeable

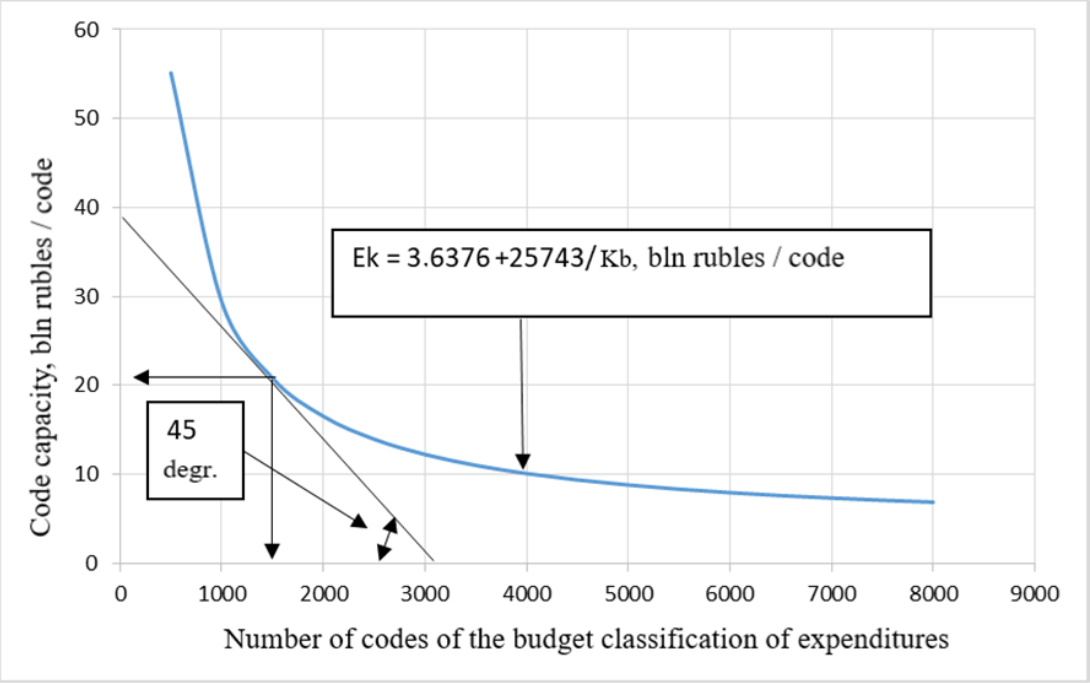

Fig. 4. **The Dependence of the Average Expenditure Intensity of the Code on the Number of Codes of the Budget Classification of Expenses**

Source: Built by the authors based on materials (orders) of the Ministry of Finance and Treasury of Russia. URL: https://minfin.gov.ru/ru; https://roskazna.gov.ru (accessed on 08.09.2021).

in the end of the 1920s and early 1930s. Average annual growth rate of expenditures of the consolidated budget of the Russian Federation for 2015–2022, according to our estimates, amounted to 105.4%. Over the same period, the increase in the number of codes for the budget classification of expenditures was as follows: expenditure directions — 159.5%; target budget expenditure items — 153.75%.

Fig. 3 presents the graphical dynamics of the considered indicators of expenditures of the consolidated budget, the number of codes of the CSR (Center for Strategic Research), directions and types of expenditures of the budget classification for 2014–2021.

On average, for 2014–2021, the annual growth of expenditures of the consolidated budget of the Russian Federation amounted to 1 775 bln rubles, the number of CSR codes — 235.8, the size of the size of the codes of expenditure directions — 222.04. A slight average annual decrease in the number of budget expenditure accounting codes occurred in terms of the number of CMBF (1.8%), the value of the type of expenditure code (0.9%).

Management budget accounting is aimed primarily at assessing the effectiveness of the use of funds in the direction of the organization of financial management of various management structures providing budget financing. The corresponding Order of the Government of the Russian Federation is directed to this effect.[7]

Analyzing the dynamics of expenditures of the consolidated budget of the Russian Federation and the change in the number of codes of the budget classification of expenditures, it is necessary to consider the relationship of these indicators. Our calculations showed that the correlation of the number of codes to the budget expenditures of the consolidated budget for 2014–2021 was:

[7] Order of the Government of the Russian Federation No. 117 from 31.01.2019 "On approval of the concept of increasing the efficiency of budget expenditures in 2019–2024". URL: http://static.government.ru/media/files/oPbFFY 1nPoRrQGx7Q7tfZrV5JGTUuTOR.pdf (accessed on 08.09.2021).

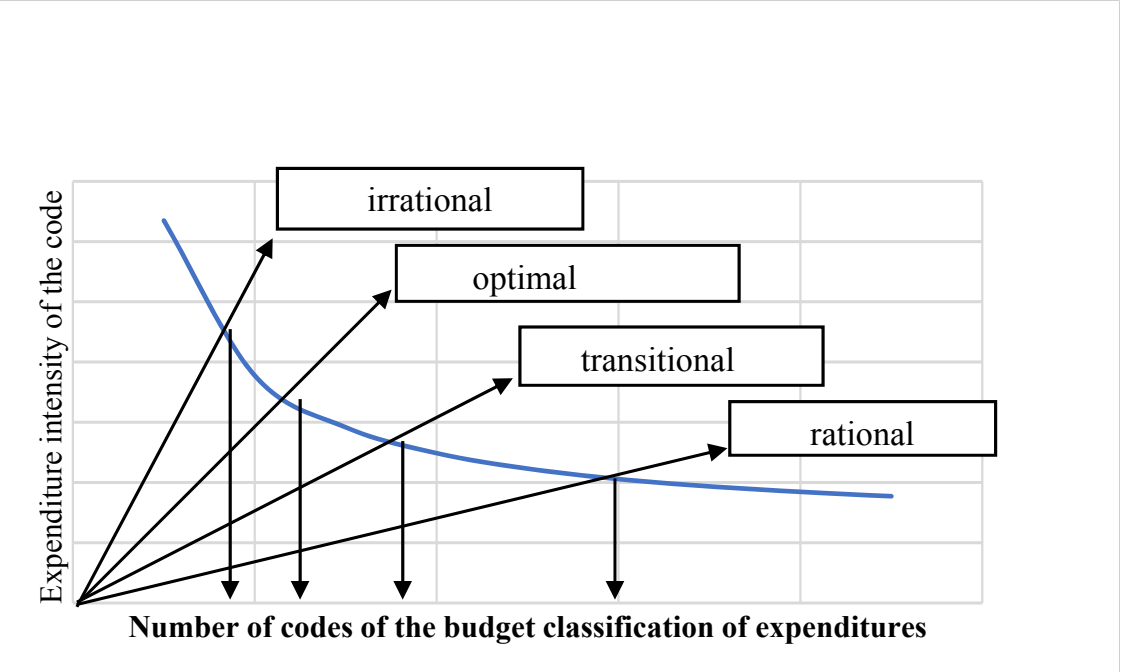

Fig. 5. **The Dependence of the Average Expenditure Intensity of the Code on the Number of Codes of the Budget Classification of Expenses**

Source: Built by the authors.

• number of CMBF codes — (–)0.861;
• number of expenditure codes — 0.459;
• number of expenditure direction codes — 0.928;
• number of CSR codes — 0.878;
• number of expenditure subsections codes — 0.72;
• number of expenditure section codes — 0.

The closest connection of expenditure trends and the growth of the number of codes of classification of budget expenditures has an increase in various areas of use of costs (0.928). The dynamics of these indicators (volume of costs and number of codes) increased on average during the analyzed period at about the same rate. The relationship between the dynamics of budget expenditures and the increase in the number of classification codes of the Russian Federation's consolidated budget objects of expenditure is somewhat lower (0.878). It is necessary to note the negative correlation between the dynamics of the number of CMBF codes and the growth of budget expenditures (–0,861), which indicates a decrease in the average number of CMBF while increasing the budget expenditures of the consolidated budget of the Russian Federation for 2014–2021.

Considering the correlation between the dynamics of budget expenditures and the number of codes of their budget classification, it is difficult to identify a formalized model of their interdependence, since the factors considered have the same nature — budget expenditures, which are signed by different codes (shelves) budget classification. By itself detailing and decomposition of budget costs without its competent use gives nothing. The more detailed the classification of costs, the greater the capacity to analyse the effectiveness of their financing and to take measures to increase the effectiveness of the achievement of goals and objectives with budgetary resources.

We calculated the amount of average expenditure intensity of the code by dividing the costs of the consolidated budget by the total volume of all the codes of the budget classification, which can be characterized as

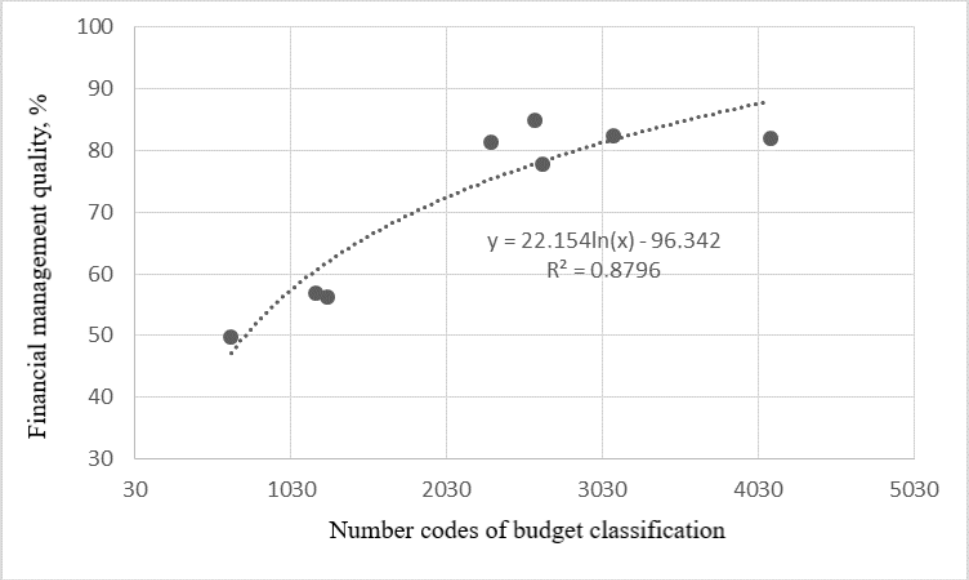

Fig. 6. **Dependence of the Quality of Financial Management of GRBS (in Terms of Budget Costs) from the Number of Codes of the Budget Classification of Expenditures for 2014–2021**

Source: Calculated and constructed by the author according to the orders and analytical tables of the quality of financial management of the GRBS of the Ministry of Finance of the Russian Federatio. URL: https://minfin.gov.ru/ru (accessed on 08.09.2021).

the average consumption of the conditional budget code by annual indicators. Based on the results of calculations, the regression dependence of conditional expenditure intensity of the average budget code (E_k) is obtained from the total sum of budget codes (K_b) by the expenditure dynamics and the total amount of the applied expenditure codes of the consolidated budget of the Russian Federation for 2014–2021:

$E_k = 3.6376 + 25\,743/K_b$, bln rubles/code.

Fig. 4 shows the graphical dependence of average conditional expenditure intensity of the conditional budget code on the total number of codes of the budget classification of expenditures. This dependence is in the form of hyperbola, where with the increase in the number of codes of classification of budget expenditures for 2014–2021, the volume of expenditure of the conditional code decreased — the number of budget expenditures taken into account on average in one classification code.

During the analyzed period of time, it can be said that the increase in the number of codes of the budget classification of the consolidated federal budget led to a decrease in the capacity of the conditional code of budget expenditures. The increase in the number of codes per thousand the volume of budget expenditures, taken into account and planned in the average conditional code, decreased on average by 25 743 mln rubles. The possible optimal ratio of the number of codes and the average resource intensity of the codes of the budget classification of expenditures can be the point of intersection of the tangent straight line to the considered hyperbola at an angle of 45 degrees to the vertical and horizontal axes on *Fig. 4*.

The increase in the conditional expenditure intensity average code (the decrease in the number of classification codes of cost accounting) below the optimal level leads to a sharp increase in this indicator, this rapidly reduces the analytical capacity to generalize the use of resources in the budget management process of the organization. Therefore, despite the existing optimum ratio of number and capacity of codes, it should strive to increase the

number of accounting classification codes of budget expenditures, which allows the present stage of development of digitization of technological budget processes in the Russian Federation.

Digital software products change the logic of establishing optimal solutions, but should not bring the system of classification of budget costs to extremely small splitting of costs in different types and directions, which will reduce the real possibilities for an effective analysis of their effectiveness. *Fig. 5* presents our proposed structure of 4 different types of number of codes depending on the value of conditional expenditure intensity of one average planning code and record of budget expenditures.

By the number of codes of the budget classification of expenditures can be distinguished, in our opinion, irrational, optimal, transitional and rational volumes of the number of codes used. State budget management in these conditions contributes to more effective planning and analysis of the use of resources of the budget system of the country. For example, the paper[8] analyses the results of the use of State information systems in the federal authorities of the countries. Every year, the Ministry of Finance of Russia conducts an analysis of the quality of financial management in all federal authorities, in the Russian regions in the process of organizing the use of budgetary resources, which is summarized in the papers [17, 18].

When conducting monitoring of quality of budget implementation on expenditures by the Ministry of Finance of Russia, such indicators are calculated, which do not directly relate to the number of forms of coding and the content of the composition of the classification of expenditures of the budget by appropriate grades and codes. But in any case, the assessment is made on the basis of an analysis of the structure of budget expenditures in different categories and codes, the change of the number and content of which contributes to a qualitative generalization of the performance of budget resources management.

We built dependence of quality of financial management of CMBF (in the part of budgetary expenses) from the number of codes of the budget classification of expenditures, based on the results of calculations of the Ministry of Finance of the Russian Federation of the average country quality of financial management in terms of the use of funds of the federal budget CMBF for 2014–2021 (on 01.10.), as shown in the *Fig.6*.

The quality of financial management of federal CMBF is closely related to the number of codes of the budget classification of expenditures (coefficient of determination — 0.8796). The logarithmic function, based on the results of the time series, shows a logical change in the quality of CMBF financial management in terms of budget expenditure management, which increases as the number of classification codes of federal budget expenditures is grows

CONCLUSION

Generalization of organization of processes of classification of budget expenses has shown that our hypothesis "the more detailed differentiation (classification) of budget expenditure, the more possibilities of competent organization and management of processes of their financing" confirmed by the results of the research. Not only digitalization of the budget system of the country, but also digital transformation of almost all branches of the economic complex of the State is being carried out, which is considered in the paper [19]. Digital possibilities of development of classification of budget expenditures of the country allow much deeper penetration into processes of formation of State resources, which contributes to increase of efficiency of their use.

[8] The Accounting Chamber counted and evaluated federal GIS. Department of Analysis. URL: https://geovestnik.ru/articles/russia/schyetnaya_palata_soschitala_i_otsenila_federalnye_gis/ (accessed on 08.09.2021).

REFERENCES

1. Osipov Yu.M., Yudina T.N., Geliskhanov I.Z. Digital platform as an institution of the technological breakthrough era. *Ekonomicheskie strategii = Economic Strategies.* 2018;20(5):22–29. (In Russ.).
2. Sidorenko E.L., Bartsits I.N., Khisamova Z.I. The efficiency of digital public administration assessing: Theoretical and applied aspects. *Voprosy gosudarstvennogo i munitsipal'nogo upravleniya = Public Administration Issues.* 2019;(2):93–114. (In Russ.).
3. Sergeev L.I., Yudanova A.L. Digital services of fiscal regulation. *Baltiiskii ekonomicheskii zhurnal = Baltic Economic Journal.* 2020;(2):102–116. (In Russ.).
4. Sergeev L.I., Yudanova A.L. Digital economy. Moscow: Urait; 2020. 332 p. (In Russ.).
5. Povetkina N.A. "Digital" budget: The future or the present? *Finansovoe pravo = Financial Law.* 2019;(8):8–11. URL: https://urfac.ru/?p=2535 (accessed on 06.09.2021). (In Russ.).
6. Subbotin A.L., Abushenko V.L., Bocharov V.A., Edel'man V.A. Classification. Humanitarian portal. Nov. 18, 2022. URL: https://gtmarket.ru/concepts/6879 (accessed on 04.09.2021). (In Russ.).
7. Kuznetsov S.D. Database fundamental. 2nd ed. Moscow: Internet University of Information Technologies; BINOM. Laboratoriya znanii; 2007. 484 p. (In Russ.).
8. Kogalovskii M.R. Encyclopedia of database technologies. Moscow: Finansy i statistika; 2002. 800 p. (In Russ.).
9. Chernyak L. Big Data: A new theory and practice. *Otkrytye sistemy. SUBD = The Open Systems Journal. DBMS.* 2011;(10):18. URL: https://www.osp.ru/os/2011/10/13010990 (accessed on 04.09.2021). (In Russ.).
10. Akatkin Yu.M., Yasinovskaya E.D. Digital transformation of public administration: Data-centricity and semantic interoperability. Moscow: DPK Press; 2018. 48 p. (In Russ.). URL: URL: https://www.rea.ru/ru/news/SiteAssets/prepint-monografii.pdf (In Russ.).
11. Mokhnatkina L.B. Improvement of approaches to classification and grouping of budget expenditures of the budgetary system of the Russian Federation. *Azimut nauchnykh issledovanii: ekonomika i upravlenie = ASR: Economics and Management (Azimuth of Scientific Research).* 2020;9(4):245–248. (In Russ.). DOI: 10.26140/anie-2020–0904–0057
12. Gadzhieva A.G. Performance of the regional budget, problems and prospects for development in modern conditions. *Fundamental'nye issledovaniya = Fundamental Research.* 2020;(7):20–24. (In Russ.). DOI: 10.17513/fr.42799
13. Bogacheva O.V., Smorodinov O.V. Creation of enabling environment for spending reviews in Russia. *Finansovyi zhurnal = Financial Journal.* 2019;(1):21–33. (In Russ.). DOI: 10.31107/2075–1990–2019–1–21–33
14. Artemenko D.A., Zenchenko S.V. Digital technologies in the financial sector: Evolution and major development trends in Russia and abroad. *Finance: Theory and Practice.* 2021;25(3):90–101. DOI: 10.26794/2587–5671–2021–25–3–90–101.
15. Dobrolyubova E.I., Yuzhakov V.N., Efremov A.A., Klochkova E.N., Talapina E.V., Startsev Ya. Yu. The digital future of public administration by results. Moscow: Delo; 2019. 114 p. (In Russ.).
16. Putilov B.N. The cross-cutting model for transforming financial processes into digital. *Tsifrovaya ekonomika = Digital Economy.* 2020;(4):85–96. (In Russ.). DOI: 10.34706/DE-2020–04–09
17. Bychkov S.S., Kokarev A.I., Lavrov A.M. Development of methodology and practice of quality assessment in financial management of the chief administrators of the federal budget resources. *Finansovyi zhurnal = Financial Journal.* 2018;(1):9–25. (In Russ.). DOI: 10.31107/2075–1990–2018–1–9–25
18. Bertyakov A.V. IT budgets of federal authorities: Explicit and implicit knowledge. Moscow: Accounts Chamber of the Russian Federation; 2020. 51 p. URL: https://ach.gov.ru/upload/pdf/Zapiska_IT_budgets.pdf (In Russ.).
19. Abdrakhmanova G.I., Bykhovskii K.B., Veselitskaya N.N., Vishnevskii K.O., Gokhberg L.M. et al. Digital transformation of industries: Starting conditions and priorities. Reports for 22nd April Int. sci. conf. on the problems of economic and social development (Moscow, April 13–30, 2021). Moscow: HSE Publ.; 2021. 239 p. URL: https://conf.hse.ru/mirror/pubs/share/463148459.pdf (In Russ.).

ABOUT THE AUTHORS

Leonid I. Sergeev — Dr. Sci. (Econ.), Prof., Head of the Department of Economic Theory and Instrumental Methods, Kaliningrad State Technical University, Kaliningrad, Russia
https://orcid.org/0000-0001-7092-125X
Corresponding author:
doc_sergeevli@mail.ru

Dmitry L. Sergeev — Cand. Sci. (Econ.), Assoc. Prof., Department of State and Municipal Administration, Western branch of RANEPA, Kaliningrad, Russia
https://orcid.org/0000-0002-5275-1178
sergeev-dl@ranepa.ru

Conflicts of Interest Statement: The authors have no conflicts of interest to declare.

The article was submitted on 15.10.2021; revised on 01.11.2021 and accepted for publication on 27.11.2022.
The authors read and approved the final version of the manuscript.