

-RESEARCH ARTICLE-

## DESIGN AND VALIDATION OF A UNIVERSAL MODEL FOR FINANCIAL CONTROL PRACTICES IN CORPORATE FINANCIAL MANAGEMENT SYSTEMS

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### —Abstract—

This study presents the development and testing of a universal model for financial control in corporations aimed at transforming financial conduct into a strategic and risk-oriented approach. The model encompasses tools for risk assessment, current and forecast controlling, self-controlling, and evaluating potential strategic financial risks. The research methodology employs a combination of general scientific and unique

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techniques, including analysis (including indexes), synthesis, generalization and detailing, inductive and deductive reasoning, selective observation, grouping, formalization, analogy, abstract-logical reasoning, monographic analysis, graphical analysis, comparative analysis, economic-statistical analysis, extrapolation, systemic thinking, and the Monte Carlo simulation method. The author has developed specialized software using MS Excel and EXCEL-VBA. The study encompasses the following key outcomes: exploring the essence of financial controlling, classifying types into standard and alternative categories based on the author's rationale, and developing and testing a universal model for financial controlling in corporations utilizing the Monte Carlo method. The application of this universal model enables strategic, forecast, and financial risk controlling, as well as self-controlling, within the financial management systems of corporations. It facilitates assessing strategic goal achievement while automating and rationalizing integrating current and strategic financial decisions. This study contributed based on findings a comprehensive and adaptable universal model for financial control in corporations, integrating strategic, forecast, and financial risk controlling, enabling data-driven decision-making and enhancing financial management systems.

**Keywords:** Financial controlling; risk-controlling; Corporations; predictive controlling; Monte Carlo Method; rational decision-making

## 1. INTRODUCTION

Financial control is a new element of the financial management system in corporations (Shim, 2022). Environmentally friendly financial control is still developing in the current environment, constantly changing and becoming more complex (Ahmad et al., 2019). In the Russian and international financial management systems, the specific terminology of financial controlling, its classification types, and their correlations still need to be fully enlightened (Anankina & Danilochkina, 2002). The correlation between the terms "financial control" and "financial controlling" has not been sufficiently studied by international or Russian economists. These financial terms are interpreted independently of each other, and these interpretations reveal some cross points. However, the methodological aspects of strategic financial controlling need to be appropriately unfolded in corporations and their rational combination with the methods of current financial controlling (Rodionov et al., 2022). When setting a strategic goal, Russian financial managers can only sometimes estimate its achievement due to the need for appropriate methodological tools. In this regard, it is essential to develop a methodological ground that ensures the creation of a comprehensive model for financial controlling, which should integrate its current and strategic types, along with alternative types, which in the end should contribute to achieving strategic goals in corporations (Kuznetsova et al., 2017).

Therefore, there is an obvious need to develop the theoretical and methodological ground for corporate financial control and introduce a comprehensive implementation

approach, which should integrate already functioning and alternative types and methods (Vanauer, Böhle, & Hellengrath, 2015). The feasibility of this task is the essential scientific goal which determined the topic's relevance for this research. Fulfilling the goal of this research implied achievement of the following tasks: explore nomenclature that defines “operational” and “strategic” financial controlling in corporations; classify standard and alternative types of financial controlling in corporations; based on methodology, substantiate selection of a universal model for the conduct of financial controlling in corporations under the current condition of economic environment; introduce and implement a universal stochastic model of financial controlling in corporations based on the particular software product (Khomba, 2015).

The best possible financial structure of capital, studies of international and Russian scholars - financial practitioners, and periodicals on controlling financial conduct in corporations and their internal regulatory system - serve as the theoretical and methodological foundation of the study. The methodological base of this study included logical, complex, situational and process scientific approaches; those were applied to study the types and methods of controlling financial conduct in corporations (Aras, Aybars, & Kutlu, 2010).

The working hypothesis of the study is based on the author's point of view, according to which the current economic reality determines the need for adequate methods of financial control in corporations, taking into account that they operate in the era of the entire digitalization of economic processes. That implies creating an updated model for financial controlling conduct based on the Monte Carlo method (Jäckel, 2002). It provides for a timely apprehension of external and internal factors and digitalization processes that influence various types and methods of financial control in the face of new economic challenges and risks. The theoretical significance of the study brings in expanding theoretical and methodological ground for further research of the current issue; it should be done utilizing extending scientific understanding of how the types and methods of financial controlling are formed and enhanced in the financial management system of the Russian corporations that operate in the environment of new economic challenges and risks. The proposed theoretical provisions put forward the ground for creating a new model for corporate financial control based on the synthesis of current and strategic types and alternative types learned from modern domestic and foreign financial science and specific Russian financial practices. The study's practical significance is justified by introducing a new model and tools that create a new depiction of controlling financial conduct in corporations. Of a particular practical value, there is a universal model for conducting current and strategic, forecast and situational financial controlling, risk controlling, and self-controlling based on the Monte Carlo method and the author's software product.

Previous discussion shown the importance of financial control practices in corporate financial management system but exhibit notable gaps when transitioning from

developed to developing economies. In developed economies, corporations often have well-established financial management systems with access to advanced technologies, comprehensive data, and experienced financial professionals (Gomber et al., 2018; Hendriks, 2012; Jiakui et al., 2023). The adoption of such a universal model can enhance their existing practices, improve forecasting accuracy, and provide valuable insights for strategic decision-making. However, in developing economies, the implementation of this model may encounter challenges related to data availability, technological infrastructure, and financial literacy. Many corporations in developing economies may struggle to access big data resources or lack the expertise to leverage artificial intelligence effectively (Karadag, 2015). Additionally, there could be variations in regulatory frameworks and business practices, requiring the model to be adapted and tailored to suit the specific needs of each country or region. Bridging these gaps necessitates a collaborative effort between researchers, policymakers, and businesses to develop simplified versions of the model, promote technological advancements, and enhance financial education to ensure its successful integration into corporate financial management systems in developing economies. This model's application in the specific Russian corporate landscape provides unique insights into managing financial stability, liquidity, and solvency amidst economic uncertainties, geopolitical challenges, and digitalization trends. By addressing the consequences of the COVID-19 pandemic and geopolitical uncertainties, the model offers a forward-looking perspective on financial risk evaluation and strategic goal accomplishment. Its implementation across diverse corporations, including those in the energy, manufacturing, pharmaceutical, and automotive sectors, demonstrates its universality and applicability in varying business contexts within Russia. This research fills a significant gap by presenting a sophisticated mathematical tool that enables corporations to make informed, data-driven decisions, enhance their financial performance, and navigate the complexities of the ever-changing economic environment in Russia.

The Universal Model for Financial Control Practices significance in Corporate Financial Management Systems lies in its ability to provide unique and valuable insights for managing financial stability, and solvency in the specific Russian corporate landscape. Amidst economic uncertainties, geopolitical challenges, and digitalization trends, the model offers a forward-looking perspective on financial risk evaluation and strategic goal accomplishment, helping corporations proactively address the consequences of the COVID-19 pandemic and other uncertainties. Its successful implementation across diverse sectors showcases its universality and applicability, empowering businesses in energy, manufacturing, pharmaceuticals, and automotive industries to make informed, data-driven decisions that enhance their financial performance. The research have five segregated sections, introduction where discussed the main issue, literature review where discussed the theoretical and practical literature review, third sections discussed the research methodology, forth sections discussion the data analysis and findings and final section consist of discussion and future recommendations.

## 2. LITERATURE REVIEW

### 2.1. Operational and Strategic Financial Controlling in Corporations

The term “financial controlling” is a complex synthesized concept interpreted differently, making it difficult to understand its essence. Mayer (1993) and Mann and Mayer (2014) define financial controlling as a separate course of economic work associated with implementing management's financial and economic function to solve current and strategic goals. This definition represents a combination of current and strategic types of financial control in corporations (Karadag, 2015). Aniskin and Pavlova (2005) and Ullah et al. (2021) believe that financial controlling is a complex system integrating planning, analysis, control and deviations of accurate indicators' values from the planned ones. The definition is purely theoretical and methodological since it reflects the methods of financial controlling, which are only operational and do not include the strategic component. Ssaharti (2022) considers financial control a regulatory control system that integrates database, financial planning, analysis and internal financial control. The authors need to distinguish the strategic component of financial control in corporations.

Adams (1995) defined financial control as a form of internal control that combines, to the greatest extent – financial control means and the essential areas of corporations' operations; it may also take convenient spot out deviations of the fundamental indicators' values from the planned ones. This definition still does not admit the strategic aspect of financial control in corporations. Khodarahmi (2009) admits the strategic aspect of financial controlling in corporations and associates it with practical management that is more linked to identifying weak signals, timely elimination of deviations and ensuring stable strategic development following the plan and the goals. Ullah et al. (2023) and Lisdiono et al. (2022) do not specify the operational and strategic component of financial controlling in corporations and characterize it as a natural function of financial management in corporations that applies methods, techniques, and financial management tools.

Sabbar et al. (2023) and Vakhrushina (2014), the conduct of financial control is identical to that of financial control; such understanding narrows its content, defining it through various approaches, forms and methods of control. This scientist–economist notes the similarity of the functions and the fields of control and controlling and determines the specific cross point of these financial instruments as located “at the intersection of accounting, information support, control and coordination of entrepreneurial activity”. I.e., financial control is a particular component of financial controlling. Pogodaeva and Kovalenko (2014), researching financial control, name it an integral part of financial control focusing on bottlenecks. Scientists explore both concepts in interaction, showing their cross points. The main criterion is the deviation of the accurate results

from the planned and the detection of inaccuracies in a short period. Financial controlling is not narrowed to the internal financial control over operations in corporations; instead, it is an efficient mechanism for equipping the compiled information system with the functions of financial analysis, financial planning and internal financial control (Osadchy & Akhmetshin, 2015).

In essence, financial and internal control in corporations is the systems for collecting and processing information in a certain way, defining its arrangement following the planned goals to identify and eliminate negative deviations (Kinyua, 2016). However, unlike financial control, financial control is aimed at the future, ensuring the achievement of the planned goal at the lowest cost (Chaturvedi, 2009). It is involved in the financial decision-making process.

Manuylenko and Shebzukhova (2021) stipulate that a comparison of financial controlling and financial control shows that financial controlling being a structure of financial management in corporations, is oriented on the integration of all management goals; its tools and models are aimed at the future in order to ensure long-term operation of corporations. On the contrary, financial control is a standard and permanent process of information processing reflecting the past and identifying deviations between the actual and planned values of indicators; that detect possible deviations, discrepancies, and errors. Recognizing the importance of correctly identifying the controlling financial types during its conduct, it is logical to study the classifications of its types (Pompian, 2012).

## **2.2. Classification of standard and alternative types of financial control in corporations**

According to the criterion for classifying the goals of financial controlling into strategic (long-term) and current (short-term), strategic and current financial controlling types are distinguished (Ibrahim, Angelidis, & Parsa, 2008). Strategic controlling, combining the functional purpose of strategic planning, control and informational subsystem, is aimed at the efficient application of existing advantages and building up more potential for the successful performance of corporations in the future; it is used as a tool for internal analytics for the managers when developing new strategies, strategic goals and objectives (Manuylenko & Shebzukhova, 2021).

Current controlling focused on achieving strategic goals occurs regularly – annually, through the development and implementation of operational goals. Using setting and achieving operational goals within the right strategy, corporations will gradually achieve their strategic goals. Current controlling combines the processes of current planning, control, accounting and reporting and provides for the modern information subsystem in corporations (Sekścińska, Rudzińska-Wojciechowska, & Jaworska, 2021). A comparison of strategic and current types of controlling is presented in Table 1 below.

**Table 1: Comparison of strategic and operational types of controlling (Source: Manuylenko & Shebzukhova, 2021)**

Comparison criteria	Financial controlling:	
	Strategic	Current
Time horizon	Midterm and long term	Short term
Basic goals	anti-crisis policy, setting strategic goals, analysis of the internal and external environment of the corporation, timely identification of threats	ensuring liquidity and profitability of the corporation, managing financial control, determining indicators following the established current goals
Objectives	comparison of planned and actual values of indicators, analysis of the economic efficiency of the corporation, determination of critical indicators following established strategic goals	comparison of planned and actual values of indicators, identification of the causes of deviations in actual and planned values of indicators, analysis of the impacts of deviations on the implementation of current plans
Sources of information	External environment	Corporation's performance
Uncertainty level	High	Low
Detailization	Low	High

The authors' point: strategic controlling is based on self-control, builds better potential for competent operation of corporations in the long term, and defines goals and objectives for operational controlling; current controlling is based on outside control, aimed at a particular result in the short term, solves the problems of a quantitative assessment of liquidity and profitability. Strategic controlling implies advantage through competition, while current controlling is focused on the long-term retention of competitive advantage.

In current conditions, corporate financial control is defined by activity, rapid growth, and various aspects of its application. Modern analytical tools have been invented, and they require alternative types of controlling - risk controlling, situational controlling, self-controlling, tax, digital, etc.

According to [Bedrinets, Lisnichuk, and Ananieva \(2020\)](#), risk controlling is an integrated system of informational, analytical and methodological support for risk management. She notes that "the critical concept of risk controlling increases the management efficiency in eliminating strategic and tactical risks in organizations via creating a methodological, informational and analytical system that combines elements of planning, accounting, control and analysis for risk management. Thus, in

international practice, risk controlling is an integral part of financial controlling, adapted to identify shadow operations. The risk-controlling system must permeate corporations entirely employing continuous monitoring, where this process is constant over the controlled values of indicators, determines deviations, and identifies their causes. Based on the monitoring results, the efficiency of the risk-controlling system is evaluated according to the goals set. Self-controlling is interconnected with external controlling; its subjects (owners and top-level managers of corporations) correct and verify the shortcomings of external controlling. Small corporations with little financial potential tend to be self-controlling, whereas large corporations – tend to be externally controlling (Bibi & Shaukat, 2023).

Unlike international corporations, self-controlling as an alternative type of financial control is at the initial stage of development in Russian corporations. Strömbäck et al. (2017), studying the connection of self-control with financial behaviour and well-being, found that people with good self-control are more likely to have better overall financial behaviour, less worry about financial matters, and feel more secure in their current and future financial situations. Ali et al. (2022) believe that emotional self-control, rather than objective performance values, predicts financial behaviour and well-being. Sekścińska, Rudzinska-Wojciechowska, and Jaworska (2021) depicted the role of self-control in making risky financial decisions and the impact of past successes and failures in self-control on subsequent risky financial decisions, which showed that success of self-control reduces the propensity of people to financial risks, whereas considering self-control failures makes people more prone to financial risks.

In a digitalization environment, Manuylenko and Shebzukhova (2021) noted that it is necessary to apply financial control in corporations based on digital technologies (blockchain, artificial intellect, machine learning, Big Data, cloud technologies, Software as a Service - Saas, etc.) applied for the process of digital decision making, as well as implemented in the form of remote monitoring, which is aimed at the development of financial controlling at a new level, contributing to the achievement of strategic development goals, and ensuring integration of digital technologies – even those along with better strategic platforms. Evaluating the efficiency of controlling financial conduct in corporations is possible only during the operational processes.

Keeping in view, previous discussion in literature review provides a complexities and variations in financial controlling practices in corporations. It highlights the distinction between operational and strategic financial controlling, with the former focusing on current goals and the latter aiming at long-term strategic objectives. The review also notes the growth of new forms of financial controlling, which are now crucial in the contemporary business environment. Examples include risk controlling, situational controlling, self-controlling, tax controlling, and digital controlling. The goal of "Design and Validation of a Universal Model for Financial Control Practices in Corporate Financial Management

Systems" is to create a comprehensive and adaptable model that incorporates both operational as well as strategic elements of financial controlling in order to address these varied and developing financial controlling practices. Instruments for risk evaluation, forecasting, self-control, and assessing possible strategic financial hazards should all be included in the model. It ought to combine both conventional and novel scientific methods, such as systematic thinking, evaluation, comparison, formalization, analogies, statistical analysis, as well as the Monte Carlo simulation approach. To further demonstrate the model's universality and adaptability in diverse economic settings, its effectiveness should be tested across numerous Russian corporate contexts and industries. Ultimately, the model should offer unique insights into managing financial stability, liquidity, and solvency amidst economic uncertainties, geopolitical challenges, and digitalization trends, providing corporations with a sophisticated mathematical tool to make informed, data-driven decisions and enhance their financial performance in the ever-changing economic environment of Russia. Therefore, this research concern about design and validation of a universal model for financial control practices in corporate financial management systems.

### 3. METHODOLOGY

#### 3.1 A universal model for financial controlling conduct in Corporations within the new economic reality

Grundy, Johnson, and Scholes (2022) stated that the system of corporate financial management, financial controlling brings control functions down to the significant areas of financial activity of corporations, timely reveals deviations of the actual results from planned ones and forces up operational management decisions that normalize the situation. So, the evaluation of controlling financial conduct is based on identifying deviations between the actual values of indicators and the recommended ones, as well as interpretations of the reasons for such deviations. There are absolute and relative deviations. Absolute deviations measured in units show the difference between the analyzed level of the dynamics row and the previous or primary level. The relative deviation measured per cent shows the difference between the compared level of dynamics row and the previous or primary level. Akhmetshin et al. (2018) stated risk and control director at Rusal Company, admitting the importance of financial controlling, believes that during its conduct in the system of current and strategic financial management in modern corporations, it is essential to determine its functional purpose:

- informational and analytical support of the management in the conditions of uncertainty of the economic environment; comparative evaluation of the actual and expected results in terms of the feasibility of the plan.
- timely identification and evaluation of "weak signals" and their causes from internal and external processes.

- systematization of problem-related information, drawing up new plans, and making management decisions to avoid problems in the future.
- forecasting various financial situations in corporations.
- setting up measures to adapt corporations to significant changes and avoid possible losses and negative consequences in future.

Russian practices demonstrate how the functional purpose of corporate financial controlling methods narrows down to financial indicators evaluation and comparison of their planned and actual values in retrospective periods, revealing the operational nature of financial controlling. I.e. it is about the development and conduct of financial control in corporations.

The selection of tools for strategic evaluation of corporate financial control should be carried out according to the list of main criteria shown in [Table 2](#). In our opinion, Monte Carlo stochastic modelling method is the most suitable method since it serves the development of assessment criteria that characterize new economic reality caused by eliminating the coronavirus pandemic consequences, geopolitical uncertainty, and digitalization of economic processes. Accordingly, the model for evaluating corporate strategic goal accomplishment should be grounded in the Monte Carlo method, which is also applied to corporate risk-controlling.

**Table 2: The Monte Carlo method incorporated into the grounds of the model for evaluation of strategic goal achievement in corporations under the new economic reality**

<b>Groups of criteria for the current and future periods</b>	
1) conditioned by elimination of the coronavirus pandemic consequences and geopolitical uncertainty.	2) conditioned by the digitalization of economic processes
Forecast of uncertain external changes to assess the micro, meso and macro environment, which creates future scenarios for the performance of a corporation in the environment of uncertain external changes, and that may adapt financial controlling to the factors of such changes; the uncertainty of the environment for corporations' performance predetermines random nature of the values of financial indicators that characterize the state of their financial controlling.	The synergy of stochastic modelling methods with digital financial technologies (Big Data) ensures the accuracy of the strategic forecast, generating current and new assumptions and an extensive array of predictive analytics retrospectively and for the future.

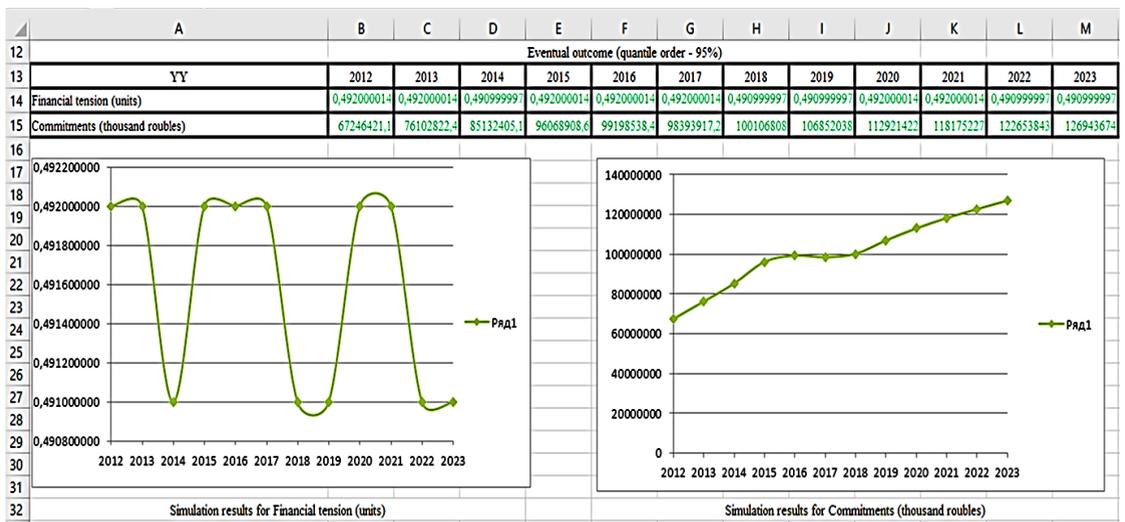
<b>Groups of criteria for the current and future periods</b>	
The revelation of the general and specific character of methodological provisions for controlling financial conduct.	New data that regulate assessment of the financial performance of corporations, creating information database via forecasting, stochastic modelling for future forecasts and strategies.
Identification of deviations of strategic values from the real ones.	Integration of stochastic modelling and artificial intellect methods provides for forecasts and possible scenarios, processes unstructured data into valuable information, and adjusts operations considering changing conditions.
The best possible combination of operational and strategic financial controlling tools.	We are scaling up to certain areas of financial activities to apply unified information.
Integration and promotion of the best types of financial controlling: predictive, risk controlling, situational, self-controlling	Creation of retro data for training a stochastic model based on the best experience, and vice versa
Application of both scenario modelling and stress testing results in making operational and strategic decisions with the choice of alternatives.	
Determination of financial indicators values versus economic cycle phases considering the interval nature of their optimality limits allows stress testing around the change of the corresponding indicators values.	
Automation of the current and strategic financial solutions.	
Assessment of the potential financial risk strategic level determines its deviations from the current and secure value of liabilities (current and strategic), develops risk-controlling tools and determines a risk-oriented system.	
Determination of targets and their achievement in the forecasting process interconnected with planning, information support, risk controlling and GAP analysis.	

### **3.2 Creation and application of a universal stochastic model for financial control in corporations based on a particular software product.**

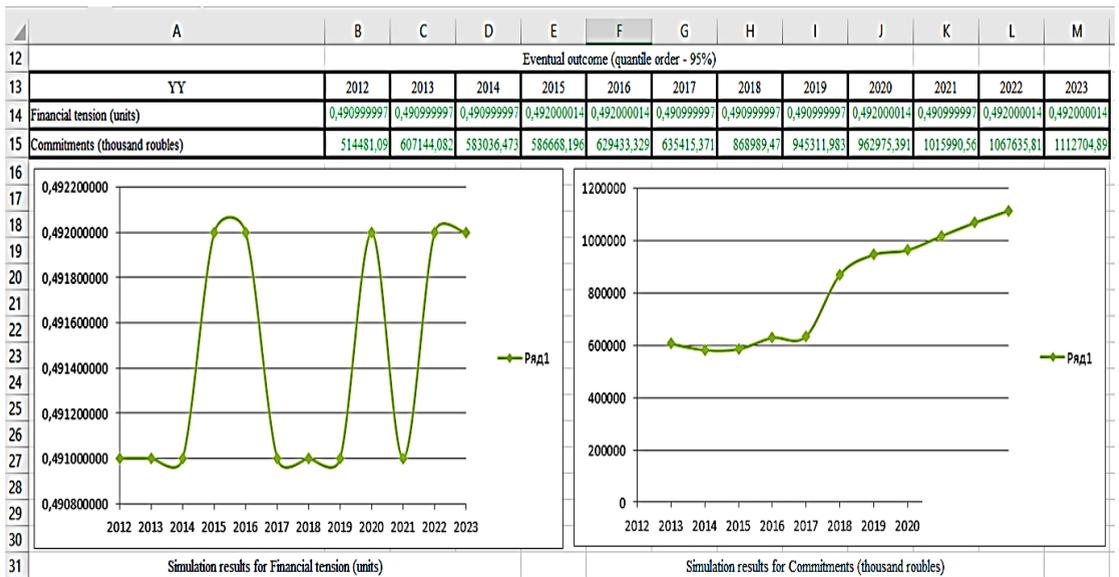
The corporations that conduct financial control in different ways were selected as the objects of the research. PJSC

1. "Second Generating Company of the Wholesale Electricity Market" – a company for the production and distribution of electricity, gas and water (Official site of PJSC "Second Generation Company of the Wholesale Electricity Market");
2. JSC "Dairy Plant "Stavropolsky" – a company producing dairy products in the south of Russia (Official site of JSC "Dairy Plant "Stavropolsky");
3. LLC "Medchesta-M" is a significant supplier of medicine and related beauty and health products; cooperates with European and domestic pharmaceutical manufacturers (Official site of LLC "Medchesta-M");
4. Gedon-Motors LLC is a modern dealer corporation representing the world-famous automobile brand Volkswagen (Official site of Gedon-Motors LLC).

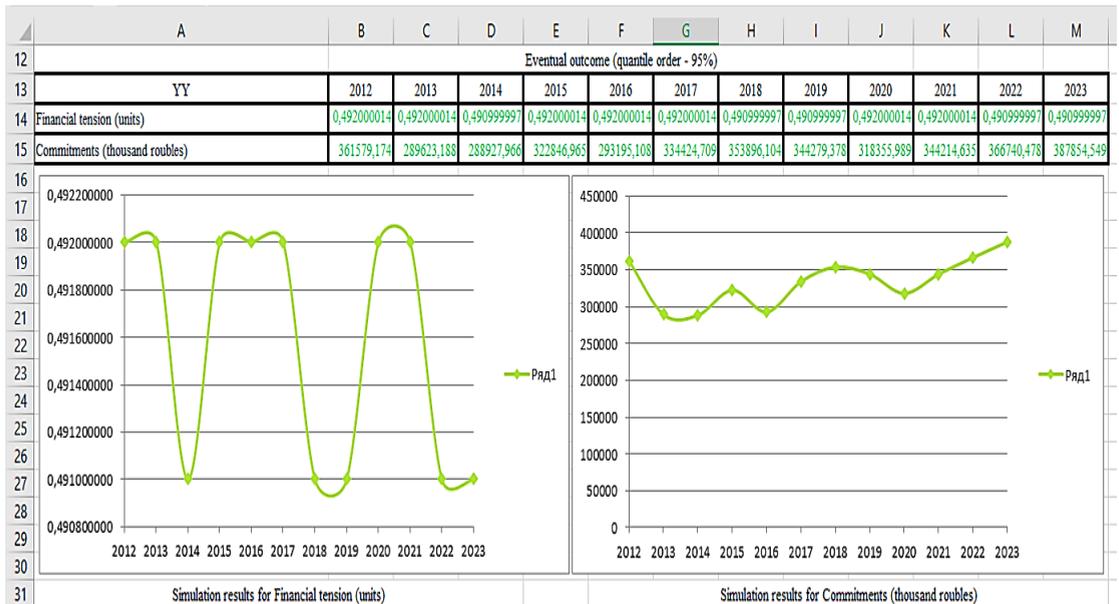
In the conditions of financial instability caused by new challenges, spasmodic changes in the values of the economic tension indicator that are not included in the optimal interval of 0.34 units in most corporations – JSC "Stavropolsky Dairy Plant", LLC "Medchesta-M, LLC "Gedon- Motors" – can be selected as a random value. The indicator of financial tension is opposite to the indicator of general solvency; its criterion level should be less than  $< 0.5$  units. The simulation process produces a range of scenarios for altering obligations and forecasted values of financial tension. Financial tension indicators' strategic values are calculated using the author's Software Excel-VBA, "Software for determining main indicators for operational, strategic, predictive financial controlling, risk controlling and self-controlling in corporations" (Manuylenko & Shebzukhova, 2021). According to the simulation results in the researched corporations (Figure 1–4), the "green" zone of financial tension values range is 0.491–0.492 units.



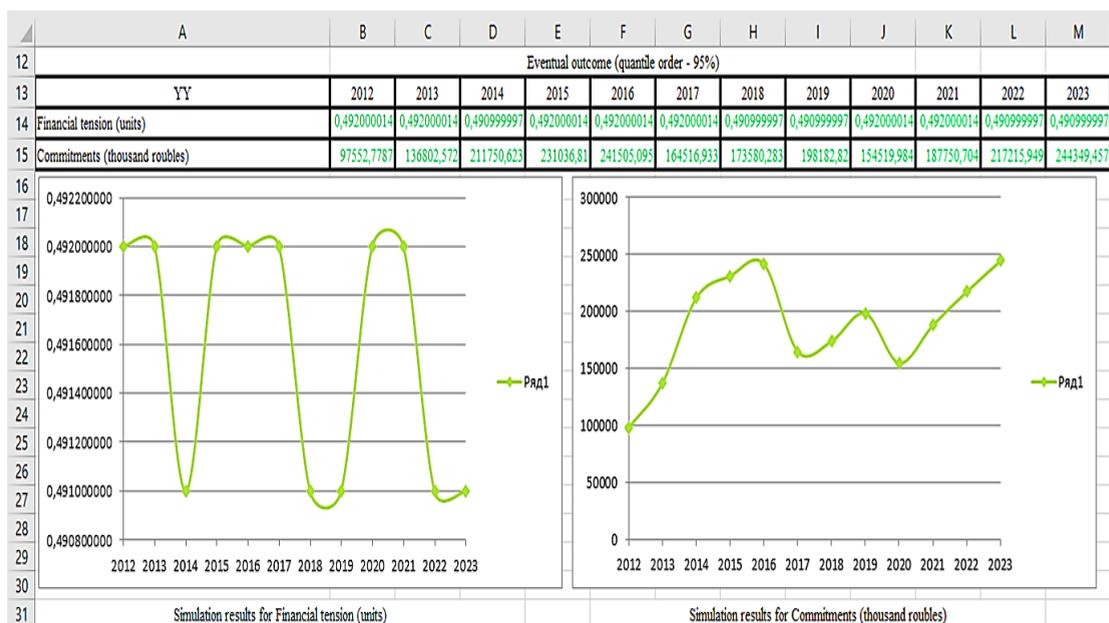
**Figure 1:** Simulated values of the primary indicators for the conduct of operational, strategic, predictive financial controlling, risk controlling and self-controlling in PJSC "Second Generating Company of the Wholesale Electricity Market"



**Figure 2:** Simulated values of the primary indicators for the conduct of operational, strategic, predictive financial controlling, risk controlling and self-controlling in JSC "Dairy Plant "Stavropolsky"



**Figure 3:** Simulated values of the primary indicators for the conduct of operational, strategic, predictive financial controlling, risk controlling and self-controlling in LLC "Medchesta-M"



**Figure 4:** Simulated values of the primary indicators for the conduct of operational, strategic, predictive financial controlling, risk controlling and self-controlling in Gedon-Motors LLC

## 4. RESULTS AND DISCUSSION

### 4.1. In the theoretical block of the research:

- The basic difference between the concepts of "financial controlling" and "financial control" is determined, where financial controlling is identified as a tool for future management to ensure a long life of corporations.
- a comparison of strategic and current financial controlling was carried out according to such criteria as time horizon, main goals and objectives, sources of information, level of uncertainty and detailing, so establishing that strategic controlling identifies the goal and objectives for current controlling.
- identified are alternative types of financial controlling (risk controlling, situational, self-controlling, tax, and digital), etc.

### 4.2. In the methodological block of the research:

- Practical value of a universal model for conducting financial controlling in corporations based on the simulation Monte Carlo method was justified using a particular software product is shown in [Table 3](#).

**Table 3: Evaluation of absolute and relative deviations of strategic values of financial indicators from actual ones in corporations**

YY	Indicators:							
	Absolute				Relative			
	Commitments (thousand Rubles)		Deviations		Financial tension (units)		Deviations	
	Fact	Strategic	Absolute (thousand Rubles)	Relative, %	Fact	Strategic	Absolute (units)	Relative, %
<b>PJSC “Second Generating Company of the Wholesale Electricity Market”</b>								
2012	57028589	67246421	+10217832	+18,0	0,417	0,492	+ 0,075	+18,0
2013	47545300	76102822	+28557522	+ 60,3	0,307	0,492	+ 0,185	+ 60,3
2014	64566185	85132405	+ 20566220	+32,0	0,372	0,491	+ 0,119	+ 32,0
2015	84111951	96068909	+ 11956958	+14,2	0,431	0,492	+ 0,061	+ 14,2
2016	87387906	99198538	+11810632	+13,6	0,433	0,492	+ 0,059	+ 13,6
2017	79838611	98393917	+ 18555306	+23,3	0,399	0,492	+0,093	+23,3
2018	72839699	100106808	+ 27267109	+37,5	0,357	0,491	+ 0,134	+ 37,5
2019	75757404	106852038	+31094634	+41,1	0,348	0,491	+ 0,143	+ 41,1
2020	81371529	112921422	+31549893	+38,6	0,355	0,492	+0,137	+38,6
2021 <sub>strateg.</sub>		118175227				0,492		
2022 <sub>strateg.</sub>		122653843				0,491		
2023 <sub>strateg.</sub>		126943674				0,491		

JSC “Dairy Plant “Stavropolsky”								
2012	641061	514481	– 126580	– 19,8	0,612	0,491	– 0,121	– 19,8
2013	848086	607144	– 240942	– 28,4	0,686	0,491	– 0,195	– 28,4
2014	794613	583036	– 211577	– 26,6	0,669	0,491	– 0,178	– 26,6
2015	742629	586668	– 155961	– 21,0	0,623	0,492	– 0,131	– 21,0
2016	808884	629433	– 179451	– 22,2	0,632	0,492	– 0,14	– 22,2
2017	780964	635415	– 145549	– 18,6	0,603	0,491	– 0,112	– 18,6
2018	1211886	868989	– 342897	– 28,3	0,685	0,491	– 0,194	– 28,3
2019	1343774	945312	– 398462	– 29,7	0,698	0,491	– 0,207	– 29,7
2020	1337601	962975	– 374626	– 28,0	0,683	0,492	– 0,191	– 28,0
2021 <sub>strateg.</sub>		1015991				0,491		
2022 <sub>strateg.</sub>		1067636				0,492		
2023 <sub>strateg.</sub>		1112705				0,492		
LLC “Medchesta-M”								
2012	542039	361579	– 180460	– 33,3	0,738	0,492	– 0,246	– 33,3
2013	439451	289623	– 149828	– 34,1	0,747	0,492	– 0,255	– 34,1
2014	422379	288928	– 133451	– 31,6	0,718	0,491	– 0,227	– 31,6
2015	437511	322847	– 114664	– 26,2	0,667	0,492	– 0,175	– 26,2
2016	371551	293195	– 78356	– 21,1	0,623	0,492	– 0,131	– 21,1
2017	453814	334425	– 119389	– 26,3	0,668	0,492	– 0,176	– 26,3
2018	548694	353896	– 194798	– 35,5	0,668	0,491	– 0,177	– 26,5
2019	522907	344279	– 178628	– 34,2	0,746	0,491	– 0,255	– 34,2
2020	383606	318356	– 65250	– 17,0	0,593	0,492	– 0,101	– 17,0
2021 <sub>strateg.</sub>		344215				0,492		
2022 <sub>strateg.</sub>		366740				0,491		
2023 <sub>strateg.</sub>		387855				0,491		

Gedon-Motors LLC								
2012	169154	97553	- 71601	- 42,3	0,853	0,492	- 0,361	- 42,3
2013	201933	136803	- 65130	- 32,3	0,726	0,492	- 0,234	- 32,3
2014	339290	211751	- 127539	- 37,6	0,787	0,491	- 0,296	- 37,6
2015	368157	231037	- 137120	- 37,2	0,784	0,492	- 0,292	- 37,2
2016	364130	241505	- 122625	- 33,7	0,742	0,492	- 0,25	- 33,7
2017	323986	164517	- 159469	- 49,2	0,969	0,492	- 0,477	- 49,2
2018	334234	173580	- 160654	- 48,1	0,945	0,491	- 0,454	- 48,1
2019	358374	198183	- 160191	- 44,7	0,888	0,491	- 0,397	- 44,7
2020	232391	154520	- 77871	- 33,5	0,740	0,492	- 0,248	- 33,5
2021 <sub>strateg.</sub>		187751				0,492		
2022 <sub>strateg.</sub>		217216				0,491		
2023 <sub>strateg.</sub>		244349				0,491		

Based on the allocation frontier of financial tension indicator in PJSC "Second Generating Company of the Wholesale Electricity Market", in the retrospective period, the commitments shortage is 13.6–60.3%. In the retrospective period, JSC "Dairy Plant" Stavropol" had to reduce commitments by 18.6-29.7%. In Medchesta-M LLC and Gedon-Motors LLC, the interval for reducing commitments varies between 17.0–35.5% and 32.3–49.2%, respectively.

It is fair to assume that at relative deviation from the optimal limit of financial tension indicator values, commitments up to 10% lay in the “yellow” risk zone, whereas those that are more than 10% lay in the “red” zone – i.e., all the researched corporations – according to the values of the indicated indicators – are positioned in the “red” zone;

exploit areas for promising types of financial controlling are defined such as predictive, situational, risk controlling, self-controlling;

- selection of the stochastic Monte Carlo modelling method is justified since it is incorporated into the model and is an essential part of the conduct of operational, strategic, predictive, situational controlling, risk controlling and self-controlling; that will serve to determine the values for indicators by the economic cycle phases and due to the interval nature of their optimal limits by carrying out scenario modelling and stress testing to change the values of the relevant indicators and choosing the best scenario in the process of making current and strategic decisions;
- assessment of the potential strategic financial risk was carried out by implementing the described model, which made it possible to develop risk-controlling tools, bringing financial controlling to the risk-oriented focus;
- "Green", "yellow", and "red" zones were suggested for risk zones of indicators' values for financial tension, provided values of the latter are in the range of 0.491–0.492 units, which would be the "green" zone, whereas relative deviation of its values from the optimal limit up to 10% brings those to "yellow" zone, and more than 10% - to the "red" zone;
- “green” risk zone of hierarchically interconnected inverse indicators of financial tension and overall solvency is indicated, reflecting the range of their values between 0.491–0.492 units and 2.033–2.037 units, respectively.

## 4.2 DISCUSSION AND CONCLUSION

The authors believe that based on the synergy of current (assets and equity) and strategic (liabilities) values of indicators – that characterize financial stability, liquidity and solvency of corporations – it is possible to obtain modified risk indicators, evaluation results of which will provide for a rational combination of current and strategic financial decisions making during the conduct of financial controlling and risk controlling in corporations. Obtained values of strategic and modified financial risk indicators can be included in the strategic guidelines of corporations, subsequently becoming the planning elements for other key financial indicators, thus measuring the potential financial risk.

So, in the process of developing a financial controlling model based on the Monte Carlo method that integrates the tools of operational, strategic, predictive, situational controlling, risk controlling and self-controlling in corporations in the new economic reality, the following was achieved: A combination of stochastic modelling methods with digital financial technologies Big Data and artificial intellect is recommended; it improves the accuracy of strategic forecasting and ensures the automation of current and strategic financial decisions;

Gao (2022) noted that Big Data for predictive analytics is used to predict future events and the forecast grounded in real-time and emphasizes the need to develop analytical models based on digital technologies that improve information choice. It is recommended to

determine modified values of financial risk indicators by including the "green" zone commitments indicators values in the calculation, which ensures a balance between current and strategic financial decisions in corporations' financial controlling and risk controlling.

A newly created stochastic forecasting model for determining basic indicators of operational, strategic forecasting, situational financial controlling, risk controlling, and self-controlling can be used to develop strategies and financial management tactics for both corporations in general and their financial units. Implementation of the model serves the new level of corporations' development, which integrates such elements as strategic thinking of the management that conducts financial controlling, their knowledge of the state and future dynamics of the external environment factors.

Based on above findings, it is concluded that implementation of the universal model of financial controlling in corporations based on the Monte Carlo method served the following: Comparison of the concepts of "financial control" and "financial controlling" was carried out and demonstrated that financial controlling and internal control in corporations are essentially the systems for collecting and processing information on the achievement of the planned goals, aimed at identification and elimination of negative deviations; but financial controlling, unlike financial control, is aimed at the future. A comparative description of strategic and current financial controlling in corporations is prepared and shows that strategic controlling is based on self-control, is aimed at the future, creates new perspectives for the masterful performance of corporations in the long term, defines the goal and objectives for current controlling; current controlling is based on outside control, aimed at specific results in the short term and serves quantitative liquidity and profitability evaluation; risk-controlling toolkit is developed for assessment of possible strategic financial risk level using "green", "yellow" and "red" risk zones. The presented universal model for conducting operational, strategic predictive, situational financial controlling, risk controlling and self-controlling is implemented in PJSC "Second Generating Company of the Wholesale Electricity Market", JSC "Stavropolsky Dairy Plant", LLC "Medchesta-M" and LLC Gedon -Motors. Efficient in all areas implementation of the universal model for financial controlling in corporations based on Monte Carlo stochastic modelling in financial management systems will require the detection of future scenarios, providing for and creation and development of methods for assessing potential strategic innovation risks of banks in the innovation system along with the assessment of financial risks in the financial management system of corporations.

The universal model for conducting operational, strategic, predictive, situational financial controlling, risk controlling and self-controlling in corporations based on the Monte Carlo method equips corporations with the self-standing possibility to develop the types and methods of controlling financial conduct, considering the specifics of the business and determining the trends of future development.

## 5. IMPLICATIONS

The research contributed through their findings from both of theoretical and practical perspective. In the theoretical view, study introduces a comprehensive universal model for financial controlling in corporations based on the Monte Carlo stochastic modeling method. By distinguishing between financial control and financial controlling, the research highlights the forward-looking nature of financial controlling, making it a valuable tool for future management and ensuring the long-term sustainability of corporations. The model identifies alternative types of financial controlling and emphasizes the significance of strategic controlling in setting goals and objectives for current controlling. Additionally, the integration of stochastic modeling with digital financial technologies and artificial intelligence advances strategic forecasting accuracy and automation of financial decisions, enhancing corporations' adaptability in the new economic reality.

In other words, practically, the proposed universal model is practically implemented in four diverse corporations, showcasing its applicability across various industries. The model aids in evaluating financial indicators, identifying potential deviations, and determining risk zones for effective financial risk management. By providing a rational combination of current and strategic financial decision-making, corporations can use the model to develop financial strategies and management tactics. The incorporation of Big Data and predictive analytics enables corporations to forecast future events and make informed decisions based on real-time information, optimizing financial performance and adaptability. Ultimately, the universal model empowers corporations to navigate the complexities of the new economic reality and achieve long-term financial stability and success.

## 6. LIMITATIONS AND FUTURE DIRECTIONS

The research still has some limitations with consist of significant contributions. For example, the study was conducted on a small sample size of four corporations. This limits the generalizability of the findings. The study was conducted in a specific context (Russia). This limits the applicability of the findings to other contexts. The study only looked at the short-term effects of implementing the universal financial control model. There are longer-term effects that were not studied. Future studies could replicate the study with a larger sample size and in different contexts and look at the longer-term effects of implementing the universal model of financial controlling lastly could also explore the use of the model in different industries and sectors. Moreover, research was not conducted on survey-based model, therefore future research could be conducted on survey methods and used the Partial Least Square (PLS) - Structural Equation Modeling (SEM) to know the variation in the results.

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