

The Function-and-Value Component of Kinesthetic Controlling (in the Example of State-Owned Aircraft Construction Companies)

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Abstract. Relevance of this study derives from the fact that state-owned companies need new approaches to improving performance of their management systems and maintaining the appropriate balance between external and internal environments. To a greater extent than their counterparts from the private sector, such companies are keen to choose and rationalize specific forms of management control which enable them to retain financial stability and competitive edge in the global market, and to create value through the realization of additional competitive advantages by proactively affecting value factors.

The intent of this work is to develop a framework and to validate kinesthetic controlling methodology for state-owned aircraft construction companies that would enable purpose-oriented management actions on a company's competitive position in the global market. The information contained in this work will be of practical value for both top management and executives at different levels across organization structures of production companies and other entities, both in aerospace and other sectors.

As a result of the research conducted, the function-and-value component of kinesthetic controlling model was defined. The model is based on Value Management Concept which includes profit-based and comparative approaches to business value assessment, highlighting controlling indicators at operational and strategic levels, which refer to competence areas of responsibility of different management subjects, considering the possibility and admissibility of reacting to the revealed deviations from critical values and coordination of management actions as they affect strategic priorities of business development in a sustainable way.

1. Introduction

State-owned entities play an important role in development of the national economy, promoting its modernization, economic growth and building up the national welfare. State-owned enterprises both enable public authorities to get directly involved in the organization of resource production and accumulation process and decrease some of the costs associated with decentralization. The objective that is currently pursued is to improve state-owned company management efficiency, of which corporate governance is an integral part. In so doing, Government of the Russian Federation has approved a list of state-owned companies for which the introduction of best corporate management practices is a priority.



Specifics of particular goals and objectives pursued by state in branches of economy where state-owned corporate entities are organized determine the choice of a particular legal form of ownership, the next step being to use legal tools provided within that legal form to achieve business targets and to perform public functions. A modern state-owned company is essentially a business entity that is organized as a joint-stock company or public joint stock company where members are both private parties and the state. Most commonly, such organizations are expressly sector-specific and have the purpose of their incorporation to consolidate efforts of the state in high-priority branches of national economy.

At the same time, state-owned companies need a new balanced scorecard system that would capture Key Performance Indicators (KPIs) which clearly link to their wider purpose. This goes beyond purely economic results to consider total impacts such as on other societal capitals: social, human, innovation, citizen and welfare, and environmental capitals. Indeed, the future state-owned companies will need to act quite differently to deliver on this scorecard and will need to capture new opportunities.

Since the economic basis of state-owned companies is formed by state property designated for satisfaction of public interests, effectiveness of management of such an asset requires specific management control involving the establishment of a new controlling system that would promote higher competitiveness of corporate business model – Kinesthetic Controlling.

2. Literature review

Scientific results obtained by both Russian and international researchers have expanded and developed management control, controlling and company value management terminology significantly. Studies of theoretical and methodological fundamentals of controlling in the modern management framework are presented in works of many Russian and international authors from various perspectives and in different terms.

In contemporary international science, management control is researched and positioned in a close relationship with controlling. Management control and controlling are often interpreted as one and the same concept, which is especially characteristic for German authors (T. Guenther [1], E. Rihli, P. Horvath [2], R. Spekle [3,4]), while U.S. scholars are more concerned with management control (Kruis A.[3], R. Simons, R. Anthony, P. Quattrone [5], At.C [6]).

In Russian school of thought, controlling has developed into a separate research area, established and developed by V. Ivashkevich [7], A. Karminskiy [8], V. Nikolaev [9], S. Falko [10] et al. Presently, scholars have not arrived to an agreement of opinion in respect of controlling functions, however they note some mutual determination between development of the functions and the genesis of controlling as such. Most of the authors (V. Ivashkevich, A Shigaev [11], E. Scherm, P. Labzunov et al.) recognize that controlling has functions of control, servicing and coordinating. Some authors (N. Danilochkina, Yu. Aniskin, L. Vlasova, P. Labzunov, R. Popov and N. Petrusevich) attribute coordinating and managing, as well as planning functions to controlling. Others note that controlling has accounting and information-and-analytical functions (S. Vinogradov, I. Podmolodina, V. Voronin).

With due regard to theoretical value and practical importance of prior research and building on such research, it should be acknowledged, however, that new needs for scientific inquiry have arisen due to challenges of the environment and new opportunities, globalization and digitalization processes as well as achievements in related fields of expertise. A review of scientific publications by national and international economists concerned with controlling has shown that researchers have mainly focused aspects of its significance for improving an organization's business performance (G. Weber, S. Falko, D. Hahn, U. Schaffer) or application of certain controlling tools in business environment (Yu. Aniskin, A. Karminskiy, D. Hahn).

In value management and corporate finance areas, well-deserved consideration and appreciation has been given to works by G. Alexander, G. Bailey, R. Brailey, U. Brigham, G. K. Van Horn, L. Gapensky, A. Damodaran, T. Koller, T. Copeland, S. Meiers, G. Rourrin, M. Scott, P. Fernandez, K. Ferrns, U. Sharp, M. Ephardt, etc. Among Russian authors, mentioned here should be V. Kovalev, A. Gryaznova, T. Teplova, S. Valdaytseva, A. Arkatova, V. Novoselova, N. Klyuchareva etc.

Such aspects as effectiveness of controlling systems and tools being used still need further development, which fact predetermines the expediency of continued research in this direction.

3. Research methods

Kinesthetic controlling is essentially a form of controlling organization on the basis of selective management actions addressing critical values of operating indicators that determine the structure and evolution of strategic business development indicators and reflect the transfer of state priorities in the system of corporate interests. Kinesthetic controlling not only enables identification and transmission of weak alarms – it is able to ensure rationality of corporate governance by minimizing the number of indicators to be controlled and concentration on key business development targets supporting the transfer of state priorities. Kinesthetic controlling in a wider sense is able to concentrate not only on a state-owned company's economic performance indicators and evaluate its contribution in terms of added value, but also to take into account other fields associated with activities of the state-owned company, while creating public value at the same time.

The main difference of kinesthetic controlling is in that selective management actions by the head company are implemented only in case operational controlling performance indicators have reached critical levels and affect targets of strategic controlling, while there is still a risk of development of adverse trends in further development.

When kinesthetic controlling system is being organized in context of business value management concept, management functions should be interconnected as much as possible, which is provided by a scorecard system for all elements of enterprise's business model that feature achievement of particular value characteristics. Controlling system covers all levels of management: strategic, at which goals and quantitative measures are set; operational, at which those targets and measures are specified and reduced to local objectives and detailed for every organization unit. Specification of company's goals for organization units is reflected in standards and regulations and quantitative planning directives, which operate to convey those goals to the implementation location and to perform other management functions with the appropriate level of quality. At the stage of manageability testing, it is important to define management actions which support achievement of the desired result in terms of a key performance indicator. To do this, it is also important to define its components that refer to the key performance indicator. It seems appropriate to build a factor model where the root will be not company's value but rather planning and controlling performance indicator related with it.

In this conjuncture, data on company's value factors originating from different areas of company's business should be considered at strategic level of kinesthetic controlling, where, among other things, much attention should be paid to both internal and external value factors. Strategic alternatives shall be built on the basis of qualitative and quantitative assessment of associated factors. As a result, a strategy will be selected that provides maximum growth of company's value. In the context of strategic kinesthetic controlling, key drivers of company's business and ways for managing those factors are defined. For the arrangement of UAC group companies in the context of value management, the author has validated the need for a strategic and operational kinesthetic controlling to be set up that would support generation of controlled indicators directly related with the figure of company's value, and control of achievement of those indicators.

The following methods have been used for validation of the research results: economic and mathematical, econometric and statistical modeling; factor analysis and sensitivity analysis; empirical generalization; sociological research; expert assessments, etc. Specialized software suits have been used for statistical data processing: GNU Regression, Econometrics and Time-series Library and IBM SPSS Statistics Subscription.

4. Results

On the basis of the proposed algorithm and regression equations derived, a function-and-value model of kinesthetic controlling in UAC (see Fig.1) has been developed. The focus on maximization of value involves implementation of “value thinking” in the organization consisting of a measurement (assessment) system and “value philosophy”, and building a system for enterprise value management on the basis of the above. In this regard, indicators characterizing achievement of particular value characteristics of the organization act as the main reference points.

The author has delineated three categories of value factors (drivers): growth drivers, performance drivers and finance drivers. As shown in Figure 6, companies normally manage those value drivers in four different ways. By focusing value drivers, management may set priorities to particular enterprises which will affect productivity in each area.

Study and definition of ways of creating value allows companies to define and control responsibilities by function and by management level inside the organization. This, in turn, helps management concentrate managerial actions on those drivers which are really important. Two main criteria for definition of value factors (drivers) are identified in the work: influence on value and manageability.

The author has validated and tested a matrix of value factors (drivers) in kinesthetic controlling system, in accordance with which both influence of drivers on company's value (high or low) and the degree of manageability of those factors (high or low) can be identified (see Fig. 2). The matrix of value factors illustrates the basis for definition of value factor priorities. The objective is to define variables that are in quadrant IV, and to manage resources allocated to be used to act on variables in quadrants I-III.

In the context of this approach, selective management actions are justified and effective only if they strongly influence the value. Those indicators featuring a high degree of manageability include: current assets, net profit, shareholders' equity, gross profit, invested and borrowed capital. Some indicators strongly affect value but are scarcely manageable for the company (industry and exchange risks, company size, risk-free rate); nevertheless, those drivers (due to special influence by the state) also fall within the scope of kinesthetic controlling.

To build a mechanism for managing key company value factors as part of strategic kinesthetic controlling, market multipliers have been calculated for UAC's main business areas on the basis of a comparative approach. Results of analysis of the multipliers compared to the industry's leading benchmarks will allow the company to identify the most important controlled performance indicators affecting its value-building process.

Boeing and Airbus were used as comparable entities for benchmarking in the study. The analysis used consolidated reporting published by the companies for the year 2017. Using data from Paris Stock Exchange (France), London Stock Exchange (UK) and Moscow Stock Exchange (Russia), number of shares issued and size of equity of either company were obtained (price of a share multiplied by the number of shares issued). Results of the calculations are summarized in Table 1.

Multiplier 1 (price of a share to sales revenue per 1 share ratio) was used to compare companies from the same industry, where marginality will be at the same level. Value of this indicator was 2.28 for Boeing and 1.56 for Airbus. Multiplier 2, calculated as a ratio of price of one share to profit from sales per 1 share, reflects the company's business payback period and allows a comparison, among other things, of companies from different industries. Value of this indicator was 12.33 for Boeing and 13.39 for Airbus. Multiplier 3, calculated as a ratio of invested capital to sales revenue, characterizes the degree of dependence on borrowed capital. Value of this indicator was 2.28 for Boeing and 2.31 for Airbus. Value of multiplier 4, calculated as a ratio of price of one share to operating costs per 1 share, was 30.43 for Boeing and 21.86 for Airbus.

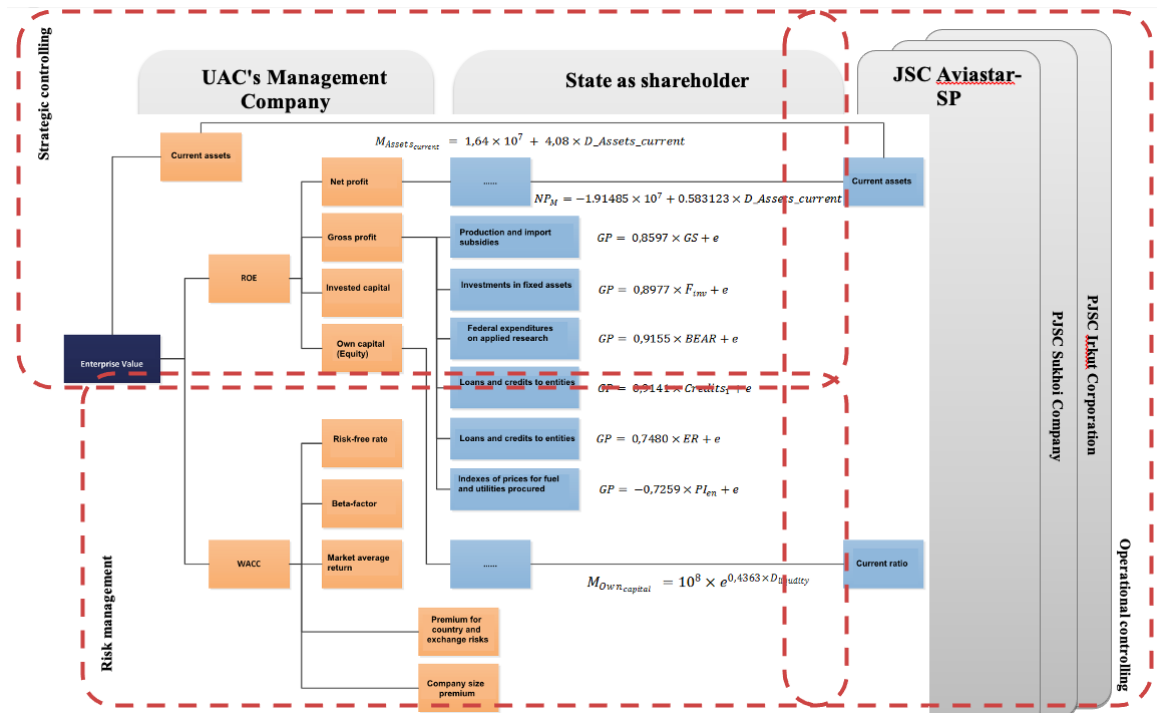


Figure 1. Function-and-value model of kinesthetic controlling in PJSC UAC (compiled by the author).

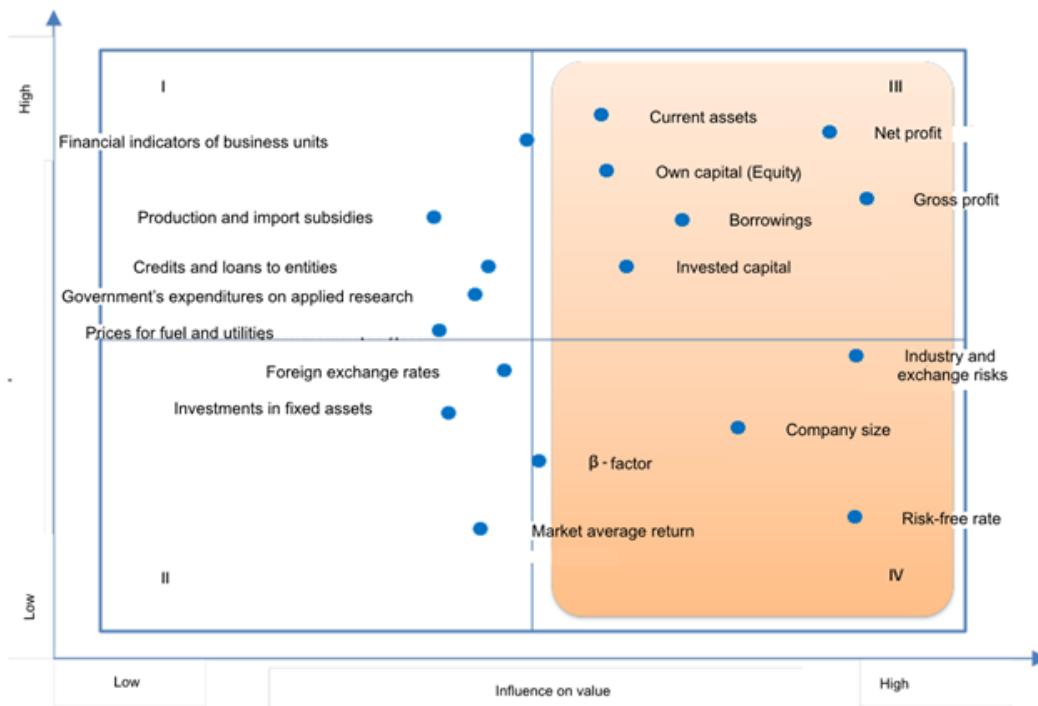


Figure 2. Matrix of value factors (drivers) in kinesthetic controlling system for UAC Group (compiled by the author).

Multiplier values obtained allow identification of different variants of UAC's value. The company achieves the highest value when assessed using multiplier 4 (29.2 billion U.S. dollars), and the lowest value – with multiplier 1 (billion U.S. dollars), which characterizes the company's best competitiveness level in terms of operating costs, which is, however, is associated with the lowest financial performance. Provisional weighted average value of the entity was 22.7 billion U.S. dollars. This indicator exceeds the market value 4.4 times, which allows drawing a conclusion that the company is undervalued.

Table 1. Company value by multiplier (compiled by the author).

Indicator	Share price / Sales revenue per 1 share	Share price / Sales profit per 1 share	Invested capital/ Sales revenue	Share price / Operating costs per 1 share
	Multiplier 1	Multiplier 2	Multiplier 3	Multiplier 4
Comparable companies:				
Boeing	2.28	12.33	2.28	30.43
Airbus	1.56	13.39	2.31	21.86
Mean value	1.92	12.86	2.30	26.15
Median	1.92	12.86	2.30	26.15
Selected multiplier value	1.92	12.86	2.30	26.15
Value of corresponding financial indicator of the enterprise assessed	0.0143	0.0030	1.4862	0.0023
Company value by multiplier	13,481,410,719.08	18,692,599,119.10	23,965,807,282.32	29,238,466,485.70
Specific weight of value variant	0.25	0.125	0.25	0.375
Provisional value	22,662,804,322.38			

5. Discussions

In Russian economics literature, there are very few works dedicated to implementation of effective controlling systems in state-owned companies. Methodological aspects of organization of a controlling unit under conditions of functional transformation often are left unattended by research. Both in Russia and abroad, this a lack of an integral understanding of what an effective controlling tool is, as well as a unified approach to justification of choice of a particular controlling model for the prevailing business environment.

The urgent requirement for further development of the control function of management, the need for continuation of its further theoretical, methodological and practical development in the conditions of new challenges and opportunities, have all predetermined the choice of the topic of this thesis as well as the statement of its purpose and main objectives.

6. Conclusion

The result of the study presented is that a framework has been developed and controlling methodology has been validated for state-owned aircraft construction companies that would enable purpose-oriented management actions on a company's competitive position in global markets. The proposed concept of kinesthetic controlling in state-owned companies in the context of a holistic multidisciplinary approach involves development of a new Balanced Scorecard System including an extended list of key performance indicators, supplemented by the capability of braking-down the targeted management actions into value factors (drivers) according to responsibility level. Interdisciplinary approach methodology for state-owned company management has been validated which determines structure and trends of strategic indicators of business development and reflects the transfer of state priorities in the system of corporate interests, and also covers the area of responsibility of state in the achievement of strategic targets and implementation of preventive management actions.

Kinesthetic controlling methodology based on its function-and-value component has been developed and tested in companies of PJSC United Aircraft Corporation (UAC) group. In the context of kinesthetic controlling, a comparative analysis of value multipliers has been completed to reveal key financial value indicators for the purposes of competitor benchmarking (Airbus and Boeing) in the global aerospace market.

7. References

- [1] Guenther T 2013 Conceptualisations of 'controlling' in German-speaking countries: analysis and comparison with Anglo-American management control frameworks: Springer-Verlag Berlin Heidelberg 2013 Published online
- [2] Horvath P, Gleich R, Seiter M 2019 Controlling14 end edn. (Vahlen)
- [3] Kruis A, Speklé R & Widener S 2016 The Levers of Control Framework: An exploratory analysis of balance *Management Accounting Research* **32** 27-44
- [4] Speklé R F Configurations of control: a transaction cost approach https://www.researchgate.net/publication/4781396_Configurations_of_Control_A_Transaction_Cost_Approach. (last accessed 2020/03/21)
- [5] Quattrone P 2016 Management accounting goes digital: Will the move make it wiser? *Management Accounting Research* **31** 118-122
- [6] At C.: The Market for Corporate Control with Influential- and Dependent-Stakeholder Protection http://apps.webofknowledge.com/full_record.do?product=WOS&search_mode=GeneralSearch&qid=18&SID=F2DS2IFuBT2ovJXBCri&page=30&doc=292&cacheurlFromRightClick=no (last accessed 2020/04/12)
- [7] Ivashkevich V B 2018 Strategic Controlling (INFRA-M) Moscow
- [8] Karminskii A, Falko S, Zhevago A and Ivanova N 2017 Controlling: textbook.: 3rd edn. Infra-M (Moscow)
- [9] Chuvashlova M, Nikolaev V 2018 Efficiency of Managerial Control Systems: The optimal Model. *European Research Studies Journal* Volume XXI Issue 3 675-689
- [10] Falko S 2019 Controlling: preparation of management solutions in real time: Nonprofit Partnership Association of Controllers (Moscow)
- [11] Shigaev A 2008 Controlling of enterprise strategy, Unity-Data (Moscow)
- [12] Klein A, Schnell H 2018 Produktionscontrollerl-Gefragter den je! ZumZustanddes Produktionscontrollings von heute und morgen *Controller Magazin* **4** 78-81
- [13] Reut D, Falko S, Postnikova E 2019 About scaling of controlling information system of industrial complex by streamlining of big data arrays in compliance with hierarchy of the present lifeworlds *International Journal of Mathematical, Engineering and Management Sciences* **4(5)** 1127-1139

- [14] Dietger H, Harald H 2001 PuK - Wertorientierte Controllingkonzepte.= 6th edn. Springer Gabler (Wiesbaden)
- [15] Burger A, Rohm A, Weber S 2020 Branchenspezifisches Controlling (Springer Gabler, Wiesbaden)

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