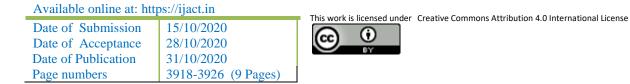
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# INFORMATION DECISION SUPPORT: THE USE OF CALCULATION AND ANALYTICAL TOOLS WHEN MAKING DECISIONS IN A GROUP

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**Abstract:** The authors previously proposed a model of a strategic decision-making system in groups of companies, which allowed to simultaneously integrate several important managerial functions and set clear criteria for the efficiency of future decisions, taking into account the data on the static and dynamic conditions of a subsidiary, as well as to predict the development of the group of companies aimed at long-term sustainable growth of its total value and business reputation. This model receives logical continuation and conditional completion in this article in the form of the so-called "triangle of subsidiaries and affiliates balancing" describing the three border states of organizations that are part of a large business structure. The actual state of the organization determined on the basis of a large set of quantitative measures always falls into different areas of the "triangle" field. This allows to accurately diagnose the current state of the organization and forecast its development in the future. As a result, new knowledge is formed in the support system for informed decisions in the group of companies.

Keywords: Group of companies, strategic decision making, subsidiaries and affiliates, balanced state, investment attractiveness.

## I. INTRODUCTION

The need to balance the information analytical system of strategic management in the group of companies in order to systematically and purposefully increase the efficiency of all the enterprises of the group and the total value of the company is more relevant than ever in the conditions of economic stagnation or recession. A large company can achieve this in the modern economic environment only if it provides high-quality information support for strategic decisions. In this case, the quality was understood [1] both as the ability of the management to simultaneously have timely, reliable, and unambiguously interpreted information about the current situation and the ability to analyze all kinds of cause-and-effect relationships, formulate conclusions, and make high-quality strategic managerial decisions.

The most efficient companies in the global and Russian economies are large and to some extent diversified groups of companies, in the first place, and the feasibility of increasing the size of business structures and their associations is not an unambiguous question. The theoretical vulnerability of the groups of companies and the variable nature of the demand of large owners for new assets are only a starting point in the study of decision making in the company about its enlargement and enrichment of its value chains.

The issue of the goal setting in the group of companies is not a formal one. The standard answer to the question about the main purpose of the business institution (structure) existence is to focus on the receipt of profit and entrepreneurial income by the owner. This answer is true in this case as well, but it is not sufficient. A group of companies is a large and complex system. Therefore, the formation of added value, financial result, and entrepreneurial income in certain parts of the group of companies as a goal setting is complemented by ensuring the multiplication of effects from the combination of these parts. As such, the main goal setting of the group of companies is to ensure sustainable multiplication of effects (financial results, dividends, etc.) for various kinds of entrepreneurs (owners) in the long term.

Most groups of companies exist efficiently if they find a balance between the efficiency of decisions at the corporate center level and the permissible autonomy of business units. In other words, an efficient group of companies is an entrepreneurial formation where a system of managerial decision making can be built properly by transferring the necessary and sufficient (optimal) part of decisions from the upper levels of management to the lower ones.

Strategic planning, organizational development, and mergers and acquisitions management are often included [2] by the experts in the core function of the corporate center. The process of mergers and acquisitions is a difficult reorganization of businesses that has impact on the development of both the participating companies and entire industries and regions. The increase in the size of the company through the addition of new business units has undeniable advantages [3] similar to the ones that rationally explain the meaning of the groups of companies existence: obtaining a synergistic effect (economies of scale) and increasing competitiveness and profitability. At the same time, it is equally important to keep in mind the risks and possible negative consequences of mergers and acquisitions. Some authors note [4] that the lack of the development strategy may be the most important risk.

It is proposed to supplement theories and concepts that can serve as the basis to build a generalized model of strategic decision making in the groups of companies with the systematic approach. System management in its modern form originated from the bowels of cybernetics and transformed into technology of A.A. Bogdanov [5] and later in the synergy of I. Ansoff [6]. It is a universal management method based on the perception of the managed object as a whole consisting of interconnected parts and simultaneously being part of a higher order system. The group of companies as a whole can be trivially represented as a set of businesses and legal entities that are part of and are interconnected by capital ownership relations. In this case, the majority stockholders, the Board of Directors, the state, and the macro environment in the broadest sense can all be considered a supersystem. It is proposed to enrich this standard block diagram with the functional aspect and concepts of statics, dynamics, and development of the system. This enrichment gives it applied and methodical meanings, on the one hand, and cyclicality and completeness, on the other hand.

The model diagram can be graphically represented as follows (Fig. 1):

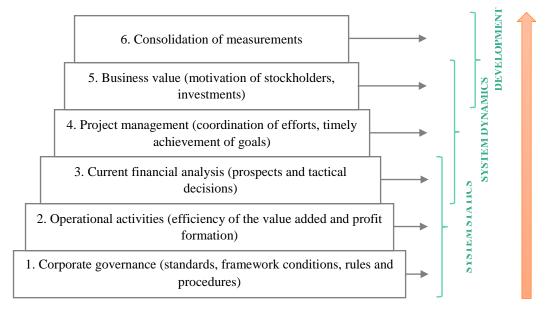


Figure 1: Graphical representation of the model of the strategic managerial decision-making system in the group of companies Compiled by the authors

The authors will rely on this model of the strategic decision-making system further in the study, because it

allows to integrate several important managerial functions simultaneously and set clear criteria for the efficiency of future decisions, taking into account the data on the static and dynamic states of the managed object, as well as to predict the development of the group of companies aimed at long-term sustainable growth of its total value and business reputation.

#### II. THEORY AND METHODS

Specific measurement and analysis results should be used correctly and productively in decision making. In part, it was noted when considering the theoretical aspects of a systematic approach to decision making in the group of companies [7] that calculation and analytical tools helped evaluate the current state of affairs in terms of the impact of subsidiaries and affiliates on the value of the group of companies, its long-term sustainable development, and encouragement of the economic interest of the owners – stockholders. However, it only became possible to describe the very mechanism of "transfer" of quantitative values into managerial actions during the study.

A "triangle of subsidiaries and affiliates balancing" was developed based on the results of testing the calculation and analytical procedures (Fig. 2).

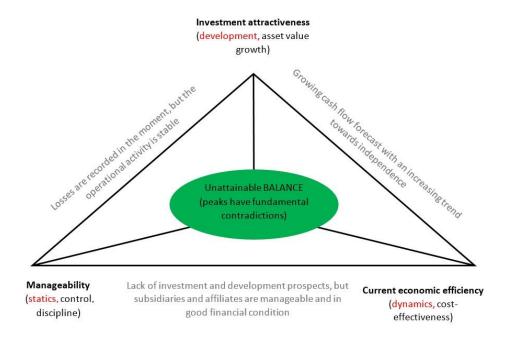


Figure 2: Triangle of subsidiaries and affiliates balancing in the group of companies

Three opposing states of subsidiaries and affiliates are located at the three vertices of the triangle.

State 1 "Manageability" is described by stably positive indicators of statics, their values falling into the green zone. From the standpoint of interaction with the parent company (the core of the group of companies), these enterprises have a high performing discipline, their main goal being to clearly fulfill the instructions of the corporate center, or, in other words, to avoid claims from the corporate center.

State 2 "Current economic efficiency" is described by stably positive indicators of dynamics. From the standpoint of interaction with the parent company, these enterprises are financially transparent and efficient, any support from the corporation yielding a return.

State 3 "Investment attractiveness" is described by stable positive development indicators. From the standpoint of interaction with the parent company, these enterprises are the most valuable liquid asset of the corporation, although it is quite restless, because it may gravitate to autonomy.

Of course, these three states are rarely or even never met in their pure form. Similarly, a 100 % balanced situation (sustainability) is most likely impossible in reality. However, the predominance of the positive features of a particular state (i.e., focusing on one or two of the possible three states): manageability, current economic efficiency, or long-term investment attractiveness can serve as a methodological aid in analysis, diagnosis, forecasting, regulation, and in the management of subsidiaries and affiliates in its broadest sense. The results of testing the methods and information system of decision support at the enterprises of the Tatneft Group of Companies are provided in the appendix.

To classify the status of a particular subsidiary and affiliate, the indicators were reorganized from the initial five modules to the new three (Table 1).

Table 1: Initia	grouping a	nd reorganization	of indicators
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	Table 1: Initial grouping and				
Gr		Gr ou			
ou	Indicator		Indicator		
pin		pin			
g 1		g 2			
1	2	3	4		
	Year of major investment		Year of major investment		
	Asset creation format		Asset creation format		
	Share of PJSC in the capital of the subsidiary or affiliate		Investment form		
ance	Share of revenues of the subsidiary or affiliate formed in the main value chain of the PJSC		Main argument of the transaction		
ern:	Investment form		Date of the latest strategic analysis		
20 V	Main argument of the transaction		Product portfolio balance		
te	Level of corporate standardization (the share of local				
ora	regulations agreed and approved in the PJSC)	~	Pricing mechanism		
orp	Additional investments in subsidiaries and affiliates	Statics	Deviation of the safety zone of the subsidiary or affiliate		
I C	since the main investment	Sta	from the safety zone of the PJSC, %		
Module 1 Corporate governance	Quality management of tangible (noncurrent) assets (increase in asset value)		Net profit, thous. rubles		
Mc	Performance indicator of the head of the subsidiary or affiliate (elasticity of labor supply in the subsidiary or affiliate in relation to the manager's salary)		Total balance liquidity		
	Date of the latest strategic analysis		Liquidity balance (provision with own funds)		
	Results of the latest strategic analysis		Financial sustainability (financial leverage)		
	Stage of the industry life cycle in the region		Financial sustainability (autonomy)		
	Product portfolio balance		Efficiency of the property use		
SS	Pricing mechanism		Share of PJSC in the capital of the subsidiary or affiliate		
activiti	Production dynamics in physical terms		Share of revenues of the subsidiary or affiliate formed in the main value chain of the PJSC		
tional a	Comparative labor productivity		Level of corporate standardization (the share of local regulations agreed and approved in the PJSC)		
Opera	Competitive position		Additional investments in subsidiaries and affiliates since the main investment		
Iodule 2 Operational activities	Assessment of the adequacy of the general strategy		Performance indicator of the head of the subsidiary or affiliate (elasticity of labor supply in the subsidiary or affiliate in relation to the manager's salary)		
Μ	Reserves of operational activities	S	Production dynamics in physical terms		
	Deviation of the safety zone of the subsidiary or affiliate from the safety zone of the PJSC, %	Dynamics	Comparative labor productivity		
~	Net profit, thous. rubles	Dy	Competitive position		
ysi	Dynamics of financial results (by sales profit)		Dynamics of financial results (by sales profit)		
nal	Total balance liquidity		Business activity (asset turnover)		
al a	Liquidity balance (provision with own funds)		ROS		
inci	Financial sustainability (financial leverage)		ROA		
fina					
ant 1	Financial sustainability (autonomy)		OPEX (operating expenses)		
JITE	Business activity (asset turnover)		Index of the physical production volume, %		
Module 3 Current financial analysis	ROS		Number of projects in the subsidiary or affiliate in the moment		
lub	ROA		Share of successful projects over the past five years		
Mo	OPEX (operating expenses)	Develop ment	Quality management of tangible (noncurrent) assets (increase in asset value)		
bu sin	Efficiency of the property use	Dev m	Results of the latest strategic analysis		
**					

Gr ou pin g 1	Indicator		Indicator		
1	2	3	4		
	5-year cash flow forecast		Stage of the industry life cycle in the region		
	Innovation potential		Assessment of the adequacy of the general strategy		
	General valuation of a subsidiary or affiliate Investment performance Index of the physical production volume, %		Reserves of operational activities      5-year cash flow forecast		
			Innovation potential		
c a luls	Number of projects in the subsidiary or affiliate in the moment		General valuation of a subsidiary or affiliate		
Successful Decision	Share of successful projects over the past five years		Investment performance		
Suc	Impact of projects in the subsidiary or affiliate on the net profit of the group of companies		Impact of projects in the subsidiary or affiliate on the net profit of the group of companies		

### III. RESULTS

As a result, the following picture was obtained for the Tatneft subsidiary of LLC Tatneft-Samara (Table 2). Obviously, this subsidiary is a very interesting asset of the Group. The static indicators (financial ratios, financial result, and qualitative estimates) indicate that this asset is poorly managed at the moment, although some indicators

have a positive trend. The dynamic indicators (production efficiency, labor productivity, profitability) reveal positive changes and sufficient efficiency of processes in the organization. The company's development indicators are even more optimistic and confidently located in the "green" zone.

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Table	2: Visualization of the results of the indicators reorganization	í .
P		

		Re-						
Bloc k	Indicator	groupin	Indicator	2013	201 4	201 5	201 6	201 7
<u>к</u> 1	2	g 3		2013	4 6	5	8	9
1	Asset creation format	3	4 Asset creation format	3	0	/	0	9
	Share of PJSC in the capital of the subsidiary or affiliate		Investment form	100	50	50	50	50
	Share of revenues of the subsidiary or affiliate formed in the main value chain of the PJSC		Main argument of the transaction	100	100	100	100	100
	Investment form		Date of the latest strategic analysis	50	50	0	0	50
	Main argument of the transaction		Product portfolio balance	0	0	0	0	0
	Level of corporate standardization (the share of local regulations agreed and approved in the PJSC)		Pricing mechanism	50	50	50	50	50
	Additional investments in subsidiaries and affiliates since the main investment		Deviation of the safety zone of the subsidiary or affiliate from the safety zone of the PJSC, %	100	100	100	100	100
	Quality management of tangible (noncurrent) assets (increase in asset value)		Net profit, thous. rubles	0	100	100	100	100
	Performance indicator of the head of the subsidiary or affiliate (elasticity of labor supply in the subsidiary or affiliate in relation to the manager's salary)		Total balance liquidity	0	0	0	0	0
	Date of the latest strategic analysis		Liquidity balance (provision with own funds)	0	0	0	0	0
	Results of the latest		Financial sustainability (financial leverage)	0	0	0	0	0

		Re-						
Bloc		groupin			201	201	201	201
k	Indicator	g	Indicator	2013	4	5	6	7
1	2	3	4	5	6	7	8	9
	strategic analysis Stage of the industry life							
	cycle in the region		Financial sustainability (autonomy)	0	0	100	50	50
	Product portfolio balance		Efficiency of the property use	0	0	0	50	50
	Pricing mechanism		Share of PJSC in the capital of the subsidiary or affiliate	100	100	100	100	100
ies	Production dynamics in		Share of revenues of the subsidiary or affiliate formed in the					
Module 2 Operational activities	physical terms		main value chain of the PJSC		0	0	0	0
	Comparative labor		Level of corporate standardization (the share of local regulations	50	50	50	50	50
nal	productivity		agreed and approved in the PJSC) Additional investments in subsidiaries and affiliates since the	50	50	50	50	50
eratio	Competitive position		main investment	100	100	100	100	100
Ope	Assessment of the		Performance indicator of the head of the subsidiary or affiliate					
\$ 2 6	adequacy of the general		(elasticity of labor supply in the subsidiary or affiliate in relation		- 0		100	100
dule	strategy		to the manager's salary)	50	50	50	100	100
Mo	Reserves of operational activities		Production dynamics in physical terms	100	0	100	100	0
	Deviation of the safety							
	zone of the subsidiary or	s	Comparative labor productivity					
	affiliate from the safety	mic		100	100	100	100	100
	zone of the PJSC, % Net profit, thous. rubles	Dynamics	Competitive position	100	100	100	100	100
	Dynamics of financial	D		0	0	0	0	0
~	results (by sales profit)		Dynamics of financial results (by sales profit)	0	0	100	100	100
lysi	Total balance liquidity		Business activity (asset turnover)	0	0	0	0	0
anal	Liquidity balance							
ial a	(provision with own		ROS					
anci	funds)			50	50	100	100	100
Module 3 Current financial analysis	Financial sustainability (financial leverage)		ROA	50	50	50	100	100
rent	Financial sustainability			50	50	50	100	100
Cur	(autonomy)		OPEX (operating expenses)	50	50	0	100	100
e 3 (	Business activity (asset		Index of the physical production volume, %					
duk	turnover)			50	0	0	0	0
Mo	ROS ROA		Number of projects in the subsidiary or affiliate in the moment	50 50	50	100	100 50	100
	OPEX (operating		Share of successful projects over the past five years Quality management of tangible (noncurrent) assets (increase in	50	0	50	50	50
	expenses)		asset value)	100	100	100	100	100
se	Efficiency of the		Results of the latest strategic analysis	100	100	100	100	100
Value of enterprise	property use 5-year cash flow forecast		Stage of the industry life cycle in the region	100 50	100 50	100 50	100 50	100 50
alue ntei	Innovation potential		Assessment of the adequacy of the general strategy	100	100	100	100	50
	General valuation of a			100	100	100	100	50
Module 4 <sup>1</sup> business and	subsidiary or affiliate		Reserves of operational activities	100	100	100	50	100
fod	Investment performance	ent	5-year cash flow forecast	100	100	100	100	100
N bus	Index of the physical	Development	Innovation potential	50	50	50	50	50
	production volume, % Number of projects in the	velc	1	50	50	50	50	50
_	subsidiary or affiliate in	Der	General valuation of a subsidiary or affiliate					
sful	the moment		General valuation of a subsidiary of annual	100	100	100	100	100
Module 5 Successful Projects	Share of successful							
le 5 Succ Projects	projects over the past		Investment performance					
e 5 Pro	five years			0	0	0	0	0
Inp	Impact of projects in the		Import of projects in the subsidiant of section of the sector of					
Mo	subsidiary or affiliate on the net profit of the group	Impact of projects in the subsidiary or affiliate on the net profit of the group of companies						
	of companies		of the group of companies	0	0	100	100	100
	L .							

Table 3 summarizes the results of testing the decisionmaking support system of the Group of Companies by the example of 16 subsidiaries and affiliates of the Tatneft Group. It can be seen from the above data that the system allows to draw conclusions, helps make informed decisions regarding specific subsidiaries and affiliates, and helps identify the general pattern in the development of the entire network of subsidiaries and affiliates to a certain degree of accuracy. For example, according to Table 3, it can be established that only 5 out of 16 companies received a general "above average" score. This general estimate is made at the time of the analysis (in this case, at the end of 2017, although the "on the day of request" mode can be implemented in the final software product). A third of the companies expectedly do not reach half of the maximum possible level, because the formation of the groups of companies in Russia was not always dictated by market motives or considerations of economic efficiency. The indicators from the Corporate governance module mainly obtained the highest scores with a significant margin. Such predominance indicates that each subsidiary is a part of a large corporation, in the first place, and only after this it is everything else: an independent legal entity, a representative of an industry or a geographic market, etc.

The indicators of the Current financial analysis module mainly obtained the lowest scores with a significant margin. Indeed, the study indicated that many subsidiaries and affiliates suffered a net loss for at least a five-year period, sometimes even worsening year by year. A small but positive value of net profit is often achieved not through competent management in the subsidiary or affiliate, but through covering the losses by the parent company. In other words, at least two-thirds of subsidiaries and affiliates were created without visible market arguments at the time (in the 2000s) and still continue to be "planned unprofitable" and to have budget "spending" and "justification" of costs as their main goal.

After the evaluation indicators were regrouped as shown in Table 3, a picture of an unbalanced focus was obtained for all 16 subsidiaries and affiliates: ignoring manageability in eight out of 16 and "distortion" towards manageability while ignoring efficiency and investment attractiveness in five out of 16. Half of the subsidiaries and affiliates that demonstrate a lack of manageability as a mandatory characteristic of activity is a serious drawback in ensuring the sustainability of the entrepreneurial system. A certain infantilism of subsidiaries can be noted, on the one hand, and a readiness for autonomy can be noted, on the other hand. This situation poses serious risks to the integrity and sustainability of the system.

Recommendations in the field of strategic managerial decisions are given based on the analysis of a combination of the obtained estimates. It is recommended to sell (liquidate) or restructure in a meaningful way five out of 16 subsidiaries and affiliates. The authors admit that it is slightly more than was expected (10 % of the total number of subsidiaries and affiliates was considered a normal level prior to the testing).

Subsidiary or affiliate name	Total (quantitative) score at the time of analysis (maximum is 4,000)	Most prospective module of evaluation	Most vulnerable module of evaluation	Position of the subsidiary or affiliate in the "balancing triangle"	Total impact of the subsidiary or affiliate on the group of companies	Recommendations in strategic managerial decision
1	2	3	4	5	6	7
LLC Tatneft-Samara (oil and gas exploration)	2,350	Corporate governance	Current financial analysis	dynamics – development	rather positive	Keep and develop the asset
OJSC Kalmneftegaz (oil and gas exploration)	1,650	no	Current financial analysis	dynamics – development	negative	Sell or restructure
OJSC TANECO (production of petroleum products)	3,050	Operational activities Business value	Current financial analysis	dynamics – development	rather positive	Keep the asset
LLC Tatneft-AZS Center (wholesale trade in motor fuel)	1,800	Corporate governance	Operational activities Current financial analysis	development	neutral	Keep the asset but change the strategy
LLC ProcessingovyiCentr (processing service)	1,600	Corporate governance	Operational activities	statics	neutral	Keep and develop the asset
LLC MC Tatneft- Neftekhim (management of	1,750	Corporate governance	Operational activities Current	statics – dynamics	neutral	Keep and develop the asset

Table 3: Summary table of the results of testing the decision-making support system of the group of companies by the example of 16 subsidiaries and affiliates in the Tatneft Group

Subsidiary or affiliate name	Total (quantitative) score at the time of analysis (maximum is 4,000)	Most prospective module of evaluation	Most vulnerable module of evaluation	Position of the subsidiary or affiliate in the "balancing triangle"	Total impact of the subsidiary or affiliate on the group of companies	Recommendations in strategic managerial decision
1	2	3	4	5	6	7
commercial activities of enterprises)			financial analysis			
OJSC NMZ (production of special purpose machines)	1,400	Corporate governance Operational activities	Current financial analysis	statics	negative	Sell or restructure
LLC Nizhnekamsk TEC (production of electricity by thermal power plants)	1,850	Corporate governance	Operational activities Current financial analysis	statics – dynamics	neutral	Keep and develop the asset
LLC Tatneft- Energosbyt (electricity distribution)	2,550	Current financial analysis Business value	Operational activities	dynamics – development	rather positive	Keep the asset
LLC Tatneft-URS (catering organization)	1,400	Corporate governance Operational activities	Business value	statics	negative	Sell or restructure
OJSC TatNIIneftemash (R&D)	1,350	no	Current financial analysis	statics	negative	Sell or restructure
LLC NTC Tatneft (R&D)	1,650	Corporate governance Operational activities	Business value	dynamics – development	rather positive	Keep and develop the asset
LLC Tatneft-Aktiv (property rental)	2,200	Corporate governance	Current financial analysis	dynamics – development	rather positive	Keep the asset
LLC SKP Tatneft-Ak Bars (fuel wholesale and sports activities)	2,050	Business value	Operational activities Current financial analysis	statics	neutral	Keep the asset but change the strategy
LLC Television company Luch (broadcasting and television)	1,900	Corporate governance	Operational activities	statics – dynamics	neutral	Keep the asset but change the strategy
LLC Snezhinka (restaurants and food delivery)	1,750	Corporate governance	Operational activities Current financial analysis	statics – dynamics	neutral	Sell or restructure

### IV. CONCLUSION

1. Based on the well-known concepts (strategic management concept) and approaches (system and process approaches), the management of a group of companies can be described as a fairly wide list of managerial competencies: corporate governance, operational and financial analysis of enterprises, business value analysis, and project management. In the system of strategic decision-making support in the group of companies proposed in the study, these competencies are presented systematically in relation to the levels of information

decision support and multicriteria assessment elements. The system of strategic decision-making support in the group of companies is represented by five modules, four of which are responsible for the management of a specific subsidiary or affiliate and one is responsible for the overall consolidation in the management of the subsidiaries and affiliates by the group.

2. The three-color "field" has been obtained during testing, which allows to immediately see and perceive the predominant color, color clusters, their localization horizontally (in dynamics) and vertically (by evaluation modules). The calculation of annual indicators allows

enriching the strategic analysis of enterprises with scientifically based estimates, while the calculation of these indicators over a five-year period allows to identify stable trends in the development of enterprises and to improve the quality of plans and forecasts.

The system of strategic decision-making support in the group of companies proposed in the study has significant development reserves. In particular, the "triangle of subsidiaries and affiliates balancing" was developed during the testing process, three opposing states of subsidiaries and affiliates being located on its three peaks: "Manageability", "Current economic efficiency", and "Investment attractiveness". The predominance of the positive features of a particular state (i.e., focusing on one or two of the possible three states) can serve as a methodological aid in analysis, diagnosis, forecasting, regulation, and in the management of subsidiaries and affiliates in its broadest sense. Approaching the conditional center of the triangle, provided that the evaluation of all three states falls mainly on the "green" field, ensures the sustainability of the business unit and the entire entrepreneurial institution such as a "group of companies".

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