ORIGINAL PAPER

DOI: 10.26794/2587-5671-2021-25-1-103-119
UDC 330.1,658.1(045)
JEL C10, C12, C22, D46, D64, G12, G32, O10

Segmental Model for Comparing the Value of Organizations (Utility-Based)

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ABSTRACT

This paper presents a model for visualizing the organization's activities based on the market value-to-sales ratio (utility coefficient), which is a segmented two-dimensional diagram (utility diagram). The **aim** of the study is to develop measures to improve the quality and effectiveness of management decisions taken to implement the principles of sustainable growth of a company's capital value, considering the specifics of the business, with the identification of the optimal ratio of the structure of the balance of assets, costs and net profit with revenue, in order to find a compromise between the current value and development. The author used the following **methods**: financial ratios, statistical, balance, systematic and logical thinking, visual presentation. The **results** of the multivariate analysis indicate that there is a significant correlation between the utility and various ratios of financial reporting indicators for a representative sample of two hundred domestic and foreign companies. The article offers a model to assess the activities of organizations, including those not listed on the stock exchange, and correlate them using a matrix of key factors, according to their influence on the final cost of the business. The author **concluded** that the increase in the market value-to-sales ratio mainly depends on the profits of the asset, however, for different segments of the utility diagram, the influence of this factor is not the same. Effective strategies must be considered depending on the type of activity, then the productivity of solutions and their value for the market as a whole will increase significantly. The implementation of the model makes it possible to compare the dynamics of the activities of organizations with industry competitors for a selected period of time, at the strategic level to determine directions for increasing the utility coefficient, and in the future, it can be used as an alternative method for assessing the value of companies.

Keywords: capitalization; market interest; utility segment; profit; cost; provision; capital; intensity; dynamicity

For citation: **Belykh D.N. Segmental model for comparing the value of organizations (utility-based).** ***Finance: Theory and Practice.*** **2021;25(1):103-119. (In Russ.). DOI: 10.26794/2587-5671-2021-25-1-103-119**

INTRODUCTION

Current ideas about increasing the value of a company are based primarily on the need to maximize its profits — the ability to generate income for stakeholders, considering the minimization of the weighted average cost of capital. In addition, the activities of organizations are assessed by the ability to produce other benefits (economic, social and environmental) that satisfy alternative aspects and create conditions for sustainable development of society.

The dependence of capitalization on profit, expressed by the correlation coefficient, within the sample of TOP 500 largest public companies of the last ten years, shown in *Fig. 1* broadly confirms the basic idea of increasing company value. However, the question of determining the optimal ratio of the structure of balance sheet assets, cost items and profits to sales (Profits/Sales) considering the need for the progressive development of the business, including its specifics, is one of the most relevant in the field of financial management.

Table 1 demonstrates a comparison of the leaders of the Forbes Global 2000 list for 2019 in terms of capitalization with corporations comparable to them in sales and profits. Obviously, in addition to the size of profit and the level of the Profits/Sales ratio, there are other factors related to the characteristics and intangible component of the activities of organizations [1, 2], which determine their market value.

If, within the entire list, we consider the dynamics of the average values of Market Value/Sales, Profits/Sales, Assets/Sales, Market Value/Assets of organizations depending on the size of their capitalization, then only the indicators of the ratio of assets to sales and market value to assets have a corresponding correlation with sample rank (USD million / USD million):

Rank 1–500: MV/S = 4.25; P/S = 0.15; **A/S = 5.41; MV/A = 3.29;**

Rank 501–1000: MV/S = 7.81; P/S = 0.21; **A/S = 7.38; MV/A = 1.96;**

Rank 1001–1500: MV/S = 1.66; P/S = 0.15; **A/S = 7.46; MV/A = 0.56;**

Rank 1501–2000: MV/S = 0.83; P/S = 0.21; **A/S = 14.37; MV/A = 0.14.**

To neutralize the factor of the scale of companies we present a similar comparison, sorted in descending order of the market value to sales ratio (USD million / USD million):

Sort 1–500: MV/S = 11.78; P/S = 0.47; A/S = 10.72; MV/A = 3.54;

Sort 501–1000: MV/S = 1.81; P/S = 0.14; A/S = 10.50; MV/A = 1.60;

Sort 1001–1500: MV/S = 0.74; P/S = 0.08; A/S = 9.31; MV/A = 0.63;

Sort 1501–2000: MV/S = 0.23; P/S = 0.03; A/S = 4.08; MV/A = 0.18.

In this case, all indicators have an obvious sequence of changes in values, respectively, this method of correlating companies (in terms of the market value to sales ratio) is generally indicative, but insufficient, considering their different profile and industry specifics.

From the above comparisons, the Assets/Sales indicator draws attention, which in the case of ranking by capitalization (Rank) has a negative correlation (decreases with an increase in the value of companies), and when sorted by the ratio Market Value/Sales has a positive one (increases with an increase in MV/S), which determines an unambiguous difference in the approaches to comparing companies when assessing their value (areas of activity, the total size of assets and its structure, financial state), which must be expressed and justified.

Accordingly, the search for patterns and specific qualities that determine the investment attractiveness of an organization will make it possible to implement a model of their management.

OVERVIEW OF THE SCIENTIFIC DEVELOPMENT OF THE TOPIC

Currently, business valuation methods are based on three main approaches: profit-based, cost-effective, and market-based.

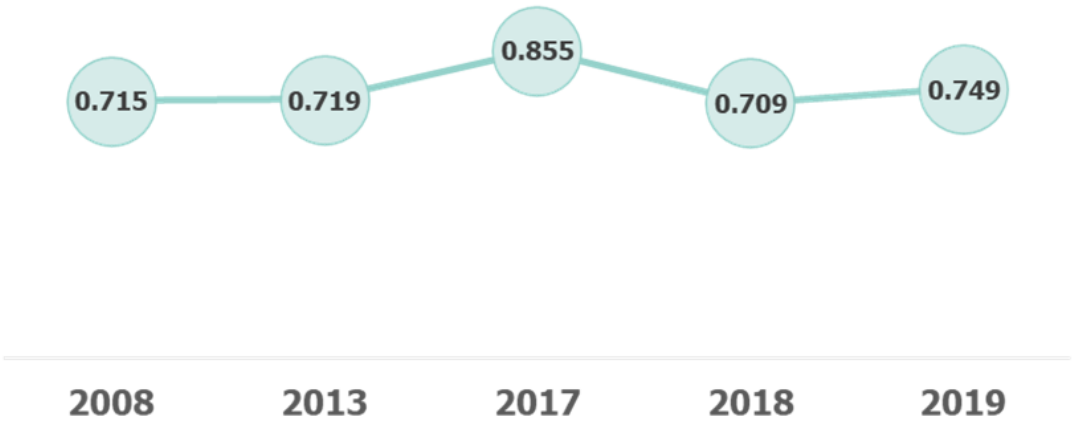

Fig. 1. **Dynamics of the correlation coefficient of market value and net profit indicators of TOP-500 world's largest public companies**

Source: compiled by the authors on the basis of Fortune 500, Forbes Global 2000.

Table 1

The ratio of financial indicators of the leaders of the world list of companies by capitalization, USD million

Rank	Company	Country	Market Value	Sales	Profits	Assets	Market Value / Sales	Profits / Sales	Market Value / Assets
1	Saudi Aramco	Saudi Arabia	1 684 800	329 800	88 200	398 300	5.11	0.27	4.230
2	Microsoft	United States	1 359 000	138 600	46 300	285 400	9.81	0.33	4.762
3	Apple	United States	1 285 500	267 700	57 200	320 400	4.80	0.21	4.012
4	Amazon	United States	1 233 400	296 300	10 600	221 200	4.16	0.04	5.576
5	Alphabet	United States	919 300	166 300	34 500	273 400	5.53	0.21	3.362
9	Berkshire Hathaway	United States	455 400	254 600	81 400	817 700	1.79	0.32	0.557
17	Samsung Electronics	South Korea	278 700	197 600	18 400	304 900	1.41	0.09	0.914
22	ICBC	China	242 300	177 200	45 300	4 322 500	1.37	0.26	0.056
23	Verizon Communications	United States	237 700	131 400	18 400	294 500	1.81	0.14	0.807
32	ExxonMobil	United States	196 600	256 000	14 300	362 600	0.77	0.06	0.542
41	Toyota Motor	Japan	173 300	280 500	22 700	495 100	0.62	0.08	0.350
90	Citigroup	United States	101 100	104 400	17 100	2 219 800	0.97	0.16	0.046

Source: Forbes Global 2000. URL: https://www.forbes.com/global2000/#63707f60335d/ (accessed on 28.11.2020).

The income approach involves the use of two methods of assessment: income capitalization or future income discounting based on the fundamental concepts of the time value of money and the relationship between risk and return [3–7]. It is effective for assessing the business value of a commercial organization.

The cost approach is most suitable for evaluating social facilities and new infrastructure projects. It shows the estimated value of the organization's equity capital (operating or undergoing liquidation) as the difference between the value of its assets and liabilities [6, 7].

The market-based (comparative) approach is effective with comparable objects and the sufficiency of data on them, it includes the methods of a similar company, transactions and industry coefficients.

The valuation of a business, like any other asset, based on comparison with a similar asset, the value of which is known, on the one hand, agrees well with common sense, and on the other hand, it is based on the following fundamental theoretical premises [6]:

- the principle of alternative value;
- the hypothesis about the reflection in the market price of an asset in developed markets of fair market value;
- the existing relationship between the main indicators of the company's performance and its market value, the assumption that for similar companies these ratios should be close.

The comparative approach can be used in assessing the value of non-joint-stock organizations by comparing them with peers that place their shares on the stock market. In addition, according to the listed corporations, one can judge about their overvaluation or undervaluation [6].

The basis of the market-based approach is the use of multiples to neutralize the factors of company size and number of shares. The most used of them are [6]:

- MV/S (Market Value/Sales);
- EV/EBITDA (Enterprise Value/Earnings Before Interest, Tax, Depreciation, Amortization);
- EV/NOPAT (Enterprise Value/Net Operating Profit after Tax);
- MV/E (Market Value/Equity);
- MV/P (Market Value/Profits).

There are studies that link the growth in the value of companies with the quality of corporate governance [8], the amount of capital [9–11], the size of net assets [12], net profit [13], economic profit [14], the number of employees [15, 16], social and environmental conditions of economic activity [17].

An overview of the factors of sustainable growth of Russian companies is given in the work of E.V. Ryabova, M.A. Samodelkina [18]. Non-financial factors of increasing the value of organizations are considered in the works of M. Ararat, B.S. Black, B.B. Yurtoglu [19], J. Garcia-Madariaga, F. Rodriguez-Rivera [20], F. Belo, X. Lin, M.A. Vitorino [21].

In terms of researching the financial performance of companies, it is worth noting E. Altman's seven-factor model [22], which, based on various ratios and characteristics of cash flows, makes it possible to determine the future solvency of an organization in the next five years with a probability of 70%.

ANALYSIS METHODOLOGY AND MODEL BUILDING

At first glance, in terms of comparing companies, the Market Value/Profits ratio is the most appropriate. However, the profits most of all depend on the internal accounting of the organization [23], the taxation system, market conditions, and, as it was said, do not always reflect the objective value of the asset.

The market value to sales ratio (MV/S), which is least affected by the human factor in the formation of internal reporting, is fairly universal and applicable to almost all listed companies. Sales contain almost a complete set of factors for assessing the performance of an organization.

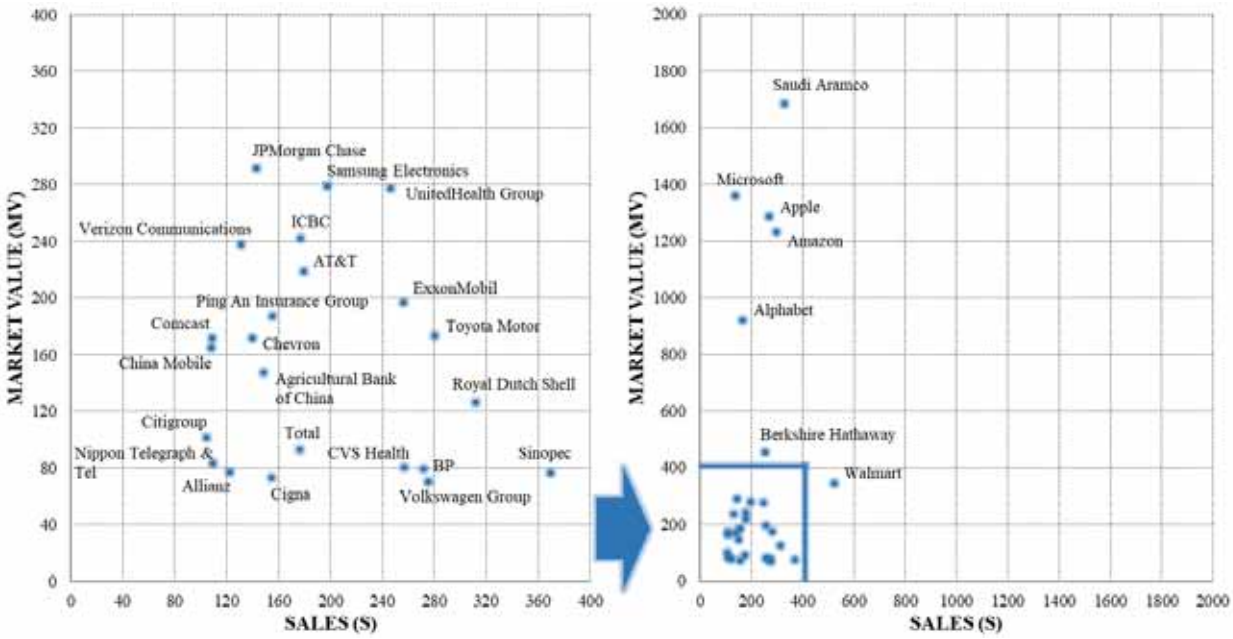

Fig 2. **Comparison of selected companies by MV/S, USD billion**

Source: compiled by the authors on the basis of Forbes Global 2000.

In addition, MV/S has a physical meaning in addition to financial.

Based on the analogy of the functionality of any mechanism, the cost of the organization will be comparable to the cost of the alternative value, which can be expressed in terms of the degree of the benefit obtained from its ownership. Thus, the specific value is the equivalent of the efficiency: the ratio of useful work to perfect work, or the proportion of goods created (creation) in relation to the amount spent (consumption).

Accordingly, if we consider these indicators in a two-dimensional coordinate system, where the abscissa will be consumption and the ordinate will be creation, their ratio will be equivalent to the tangent of the angle α to the consumption axis in the form of the hypotenuse of a right triangle, where the legs are the corresponding values of the axes of consumption and creation.

Consumption is an estimate of the total amount of goods used for the period that satisfy the current needs of the manufacturer, which is expressed by the indicator of the organization's revenue — development, use (including profit).

Creation is the aggregate value of intangible benefits that an asset produced as a result of its activities or is potentially capable of producing over a certain period, expressed by an indicator of its market value (capitalization) — transformation, improvement of the surrounding reality.

Thus, the Market Value/Sales ratio is equivalent to the asset's creativity level or its utility value.

By comparing companies from the Forbes Global 2000 list with sales over $ 100,000, assets over $ 120,000, and market value over $ 70,000 in the market value versus sales diagram (*Fig. 2*), we get a comparison, which is clearly perceived only in the direction of the dimensions of the axes themselves: the most expensive and with the highest sales. To visualize the MV/S ratio on this diagram, you need to draw a line from the point of intersection of the axes to the point of the selected company, which complicates the process. Another option is to divide the diagram into separate sections (segments) according to criteria characterizing the activities of organizations, taking into account their objective state.

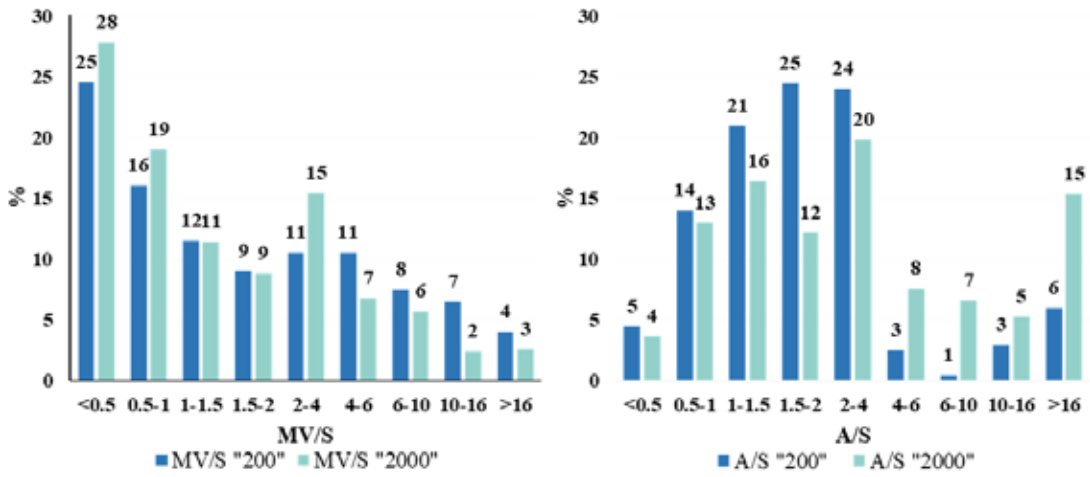

Fig. 3. **Representativeness of a sample of two hundred analyzed companies ("200") from the Forbes Global 2000 ("2000") list**

Source: compiled by the authors on the basis of Forbes Global 2000.

For this purpose, a detailed analysis of the impact of financial statements indicators (Balance Sheet, Statement of Financial Results, Statement of Cash Flows) for 2019 of two hundred domestic and foreign companies from the Forbes Global 2000 list on the ratio of their market value to sales was carried out.

The representativeness of the sample was assessed by the indicators Market Value/Sales and Assets/Sales (book value of assets to sales). The results of the percentage of the number of companies meeting a specific criterion of the total number in each of the two lists are shown in *Fig. 3*.

As an example, with MV/S and A/S indicators "<0.5", lists "200" and "2000", respectively, are represented by the following ratio of companies: MV/S — 25% and 28%; A/S — 5% and 4%.

Key items in the reports were decomposed and correlated with the organization's sales on an annualized basis for the purposes of comparison and elimination of economies of scale. The resulting 84 factors for assessing the organization's activities are grouped as a list sorted in descending order by the ratio of market value to the company's sales at the end of the reporting period.

Further, by comparing each factor with the utility coefficient (MV/S) of the organization, the correlation coefficient of the two variables is determined. The obtained dependencies were assessed from the point of view of the stable upward trend (positive correlation) or decline (negative correlation), as well as from the statistical significance of the correlation with a confidence level of 95%.

At the first stage of the analysis (*Fig. 4*), the ratio of the difference between the size of assets-liabilities to sales or Equity/Sales was compared with the ratio of the Market Value/Sales or utility coefficient (hereinafter — Utility), reflecting the assessment of the company's book value (hereinafter — Valuation) [24], and the difference in market value to sales with the valuation (MV/S — E/S), reflecting the investment attractiveness of the organization's activities (hereinafter — Interest).

The obtained dependencies make it possible to highlight in *Fig. 4* relevant intermediate values as criteria for segment formation:

- **T0 — T1 (MV/S ≈ 0.0–0.2)** — stability of Interest with an increase in the Valuation (Utility grows in proportion to the Valuation): the area of the critical financial condition of the asset (the market and book values of companies are close to zero);

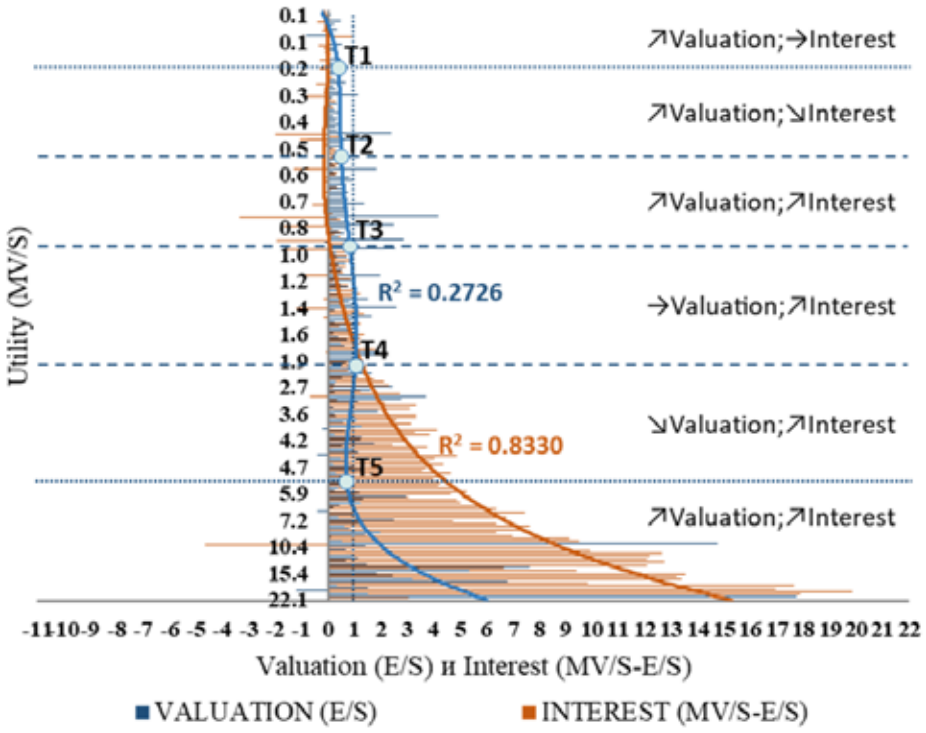

Fig. 4. **Dependence of Valuation and Interest of companies on the level of Utility**

Source: compiled by the author according to data from annual reports of companies.

- **T1 — T2 (MV/S ≈ 0.2–0.5)** — a decrease in Interest with an increase in Valuation (a smaller increase in Utility relative to Valuation): an area where the financial condition of the asset improves (the book value of companies exceeds the market value with an increase in the difference);
- **T2 — T3 (MV/S ≈ 0.5–1.0)** — an increase in Interest and Valuation (greater increase in Utility relative to Valuation): area of stabilization of the financial condition of the asset (the book value of companies exceeds the market value with a decrease in the difference);
- **T3 — T4 (MV/S ≈ 1.0–2.0)** — an increase in Interest and stability of the Assessment (Utility grows without a significant change in the Assessment): area of manifestation of the positive investment attractiveness of the asset (the market value of companies exceeds the book value with an increase in the difference, or Interest > 0,0);
- **T4 — T5 (MV/S ≈ 2.0–5.0)** — an increase in Interest with a decrease in Valuation (Utility increases with a decrease in Valuation): area of manifestation of the intangible component of the asset value (the market value of companies is more than twice the book value with an increase in the difference or Interest > Valuation);
- **T5 — T6 (MV/S ≈ 5.0–∞)** — an increase in Interest and Valuation (a greater increase in Utility relative to Valuation): the area where the potential of the asset value is realized (stabilization of the multiple difference between the market and book value of companies — the size of the equity capital of organizations changes almost in proportion to their capitalization).

If we arrange the values of these points on the market value-to-sales ratio diagram, including special cases (T0 and T6), then for clarity, they can form a circle with tangents to the abscissa axis at point T0 and to the ordinate at point T6 (*Fig. 5*). Points T2 and T4, in this case, coincide with the maxima of the values of the axes, and the line connecting the points T3 and the origin, located at an angle of 45° to the abscissa axis, divides the plane into two equal parts.

Using the resulting combination, divide the diagram into the appropriate segments:

- **Segment 1** — points T0 — T2;
- **Segment 2** — points T2 — T3;
- **Segment 3** — points T3 — T4;
- **Segment 4** — points T4 — T6.

The relationships between points T0 — T1 and T5 — T6 are taken as special cases of Segment 1 and Segment 4, respectively, since they only reflect the extreme degree of implementation of their criteria: the market value of companies is less than the book value without reducing the difference as Utility grows (T0 — T2); the market value of companies is more than twice the book value (T4 — T6).

According to the results of the analysis for each segment, the following average values of indicators were obtained:

- **Segment 1 (MV/S = 0.0–0.5)**: Valuation = = 0.31; Interest = –0.07;
- **Segment 2 (MV/S = 0.5–1.0)**: Valuation = = 0.89; Interest = –0.15;
- **Segment 3 (MV/S = 1.0–2.0)**: Valuation = = 0.78; Interest = +0.67;
- **Segment 4 (MV/S => 2.0)**: Valuation = = 1.68; Interest = +5.93.

It can be seen that Interest (MV/S — E/S) acquires a positive value in Segment 3, increasing multiple in Segment 4, and the E/S Valuation grows relatively intensively in Segments 1 and 4, having conditionally stable dynamics in Segments 2 and 3.

Point T0 is characterized by the presence of sales and the absence of the market value, which, taking into account the dynamics of the E/S ratio between T0 —T1 in *Fig. 4*, indicates the value of the company's book value tending to zero, i.e. current valuation of assets is close to total liabilities.

Point T5 expresses another extreme manifestation of the criteria of the Segmental Model — the absence of sales from an asset in the presence of its market value — this is an unrealized project, an idea that has an initial value.

On the basis of the conclusions, the shown

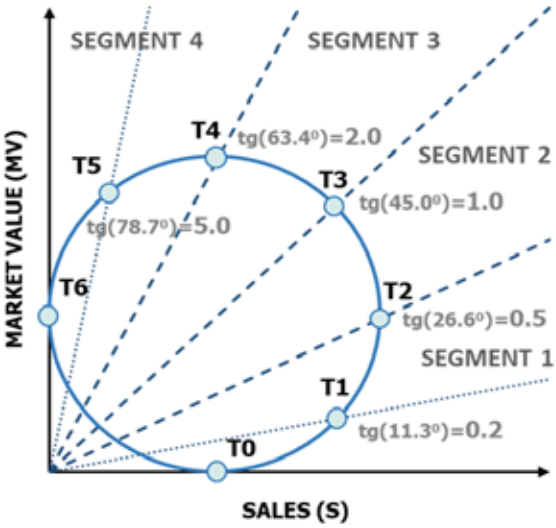

Fig. 5. **Parameters of forming model segments**

Source: compiled by the author.

in *Fig. 2* comparison of companies takes on its final form — *Segmental model for comparing the value of organizations (Fig. 6)*.

The highlighted segments, visually presented according to the key criterion of the model — the utility coefficient (MV/S), now characterize the creative profile, the specifics of the activities, and the financial well-being of companies in a specific period of their development. This allows us to more clearly correlate the assessment of the unit cost of an asset with industry competitors and the market as a whole, create a cognitive perception of the content of their essence.

FACTOR ANALYSIS

At the second stage of the analysis, in order to generalize the obtained dependencies, the factors calculated in an identical or similar way were grouped according to the following principles:

- **Profitability** — factors associated with the difference between sales and the aggregate of any kind of costs;
- **Cost** — factors related to the size (value) of any combination of cost types;
- **Provision** — factors related to the liquidity of assets, dynamics, movement

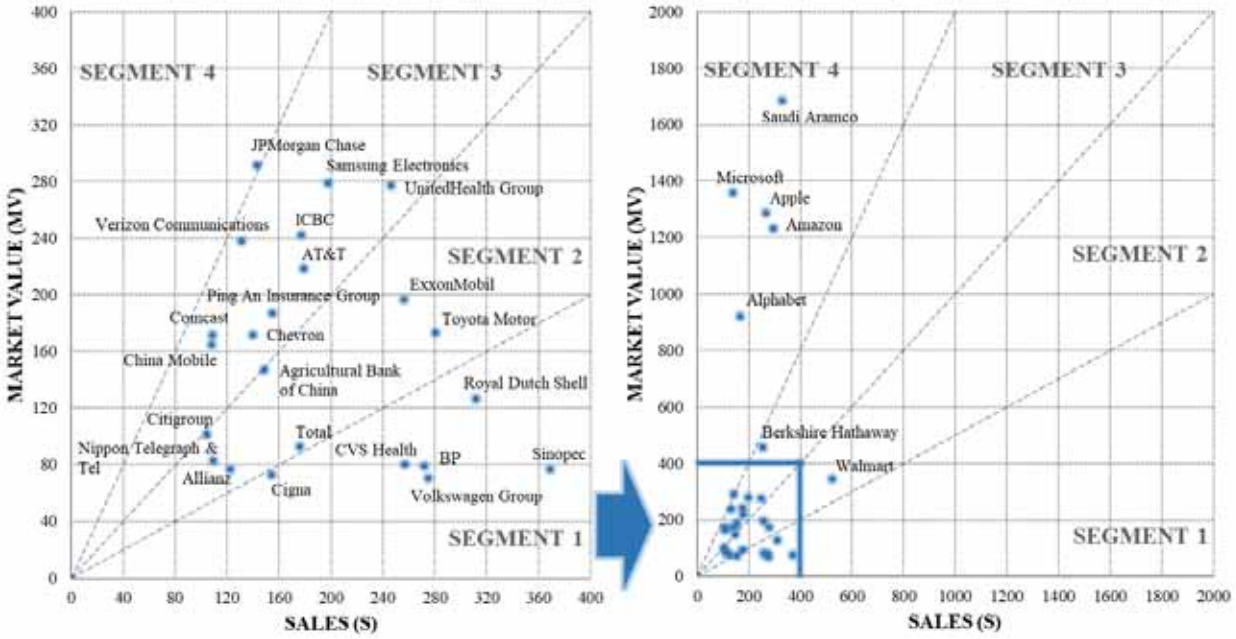

Fig. 6. **Segmental model for comparing selected companies, USD billion**

Source: compiled by the authors on the basis of Forbes Global 2000.

or availability of current assets (excluding inventory), non-current assets (excluding fixed assets), short-term and long-term liabilities, capital (excluding dividends), interest, free cash flow;

- **Capital** — factors related to the movement and availability of inventories and fixed assets, as well as the size of fixed assets acquired and the level of depreciation;
- **Intensity** — factors related to return on assets, investments and capital, turnover of assets in general, current assets, cash, fixed assets, and inventory;
- **Dynamicity** — factors related to the dynamics of operating profit, the size and dynamics of dividends.

The calculation results, common for the entire sample and separately for each segment for the eight factors most affecting the ratio of the market value to sales (correlated with sales), indicating the name of their group, are presented in the form of a sorted list in descending order of the magnitude of the correlation (*Table 2*).

The boundary indicator of the significance of the correlation coefficient at a confidence level of 95% of the analyzed sample of organizations within the framework of the analysis was 0.1388 modulo.

Without considering the criterion of a very weak interdependence of variables, in further study, we used indicators of factors with a correlation coefficient value of more than 0.20 in modulus.

Since a certain combination of assessment factors is a close or identical calculation method, it is advisable to use the value of their specific weight to determine the degree of influence of their groups on the utility coefficient (MV/S).

For this purpose, the specific value of the approximation reliability (the square of the correlation coefficient — the coefficient of determination) was calculated as follows for each group of factors in the context of segments and for the sample as a whole (*Table 3*):

- total correlation coefficient ($\Sigma R_{0,20}$) is the total of the correlation coefficients of a group of factors with a modulus value exceeding 0.20;
- the average correlation coefficient (R_{cp}) is the ratio of the total correlation coefficient ($\Sigma R_{0,20}$) of the group to the number of factors involved in its calculation;

Table 2

Correlation of factors for assessing the financial performance of companies with a utility ratio (MV/S)

SAMPLE	Assessment factor	Factor group	Corr. coef.
TOTAL	Cost (including depreciation and other operating expenses)	Cost	–0.7024
	Net profit	Profitability	0.6555
	EBT	Profitability	0.6453
	Operating income –Taxes – (Value of long-term liabilities × Long-term liabilities)	Profitability	0.5967
	Operating expenses + Tax	Cost	–0.5681
	(Sales – Operating expenses) × Dynamics of operating profit	Dynamicity	0.4864
	ROA	Intensity	0.4859
	Capital	Provision	0.4834
SEGMENT 4	Cost (including depreciation and other operating expenses)	Cost	–0.5683
	(Net profit – Other income / expenses (not operating) – Revaluation and extraordinary items) – (Value of long-term liabilities × Long-term liabilities)	Profitability	0.5462
	Net profit	Profitability	0.5395
	EBT	Profitability	0.5313
	Net profit – Other income / expenses (not operating) – Revaluation and extraordinary items	Profitability	0.5161
	NOPAT	Profitability	0.4927
	EBIT	Profitability	0.4874
	Operating income – Taxes – (Value of long-term liabilities × Long-term liabilities)	Profitability	0.4817
SEGMENT 3	Financial investments and Bills / Assets	Provision	–0.3332
	Short-term liabilities / Assets	Provision	–0.3075
	(Current Assets – Inventories – Current Liabilities + Changes in Working Capital) / Assets	Provision	0.2659
	Operating expenses + Tax	Cost	–0.2550
	Interest received (paid)	Provision	–0.2479
	(Current assets – Cash – Inventories) / Fixed assets	Provision	0.2318
	Other income / expenses (not operating)	Cost	–0.2280
	Free Cash Flow	Provision	0.2270
SEGMENT 2	SOA Asset Turnover (Sales / Assets)	Intensity	–0.5464
	(Fixed assets – Depreciation) / Assets	Capital	–0.4771
	Fixed assets / Assets	Capital	–0.4371
	Turnover of current assets (Sales / Current assets)	Intensity	–0.4366
	ROIC	Intensity	–0.4322
	ROI	Intensity	–0.4209
	Long-term liabilities / Assets	Provision	0.4137
	ROA	Intensity	–0.4130
SEGMENT 1	ROA	Intensity	0.4816
	Dividend	Dynamicity	0.4414
	ROI	Intensity	0.4340
	(Sales – Operating expenses) × Dynamics of operating profit	Dynamicity	0.4137
	Operating expenses + Tax	Cost	–0.4076
	EBT	Profitability	0.3797
	Operating income – Taxes – (Value of long-term liabilities × Long-term liabilities)	Profitability	0.3690
	Retained earnings	Provision	0.3316

Source: compiled by the author according to data from annual reports of companies.

Table 3

The results of calculating the specific reliability of the approximation (R_{av}^2, %) using correlation coefficients greater than 0.20 modulo

GROUP	R_{av}^2, % / R_{av}^2, %					Number of factors in calculation				
	Seg. 1	Seg. 2	Seg. 3	Seg. 4	TOTAL	Seg. 1	Seg. 2	Seg. 3	Seg. 4	TOTAL
Profitability	14.44	13.96	0.00	**26.71**	**21.79**	6	11	0	**10**	**6**
Cost	15.29	18.01	**50.27**	17.60	**24.71**	4	6	**2**	4	**4**
Provision	12.59	15.09	**49.73**	12.27	13.26	18	20	**11**	12	11
Capital	12.81	**15.29**	0.00	9.97	10.28	1	**8**	0	4	4
Intensity	**19.84**	**22.34**	0.00	7.68	16.04	8	**9**	0	6	4
Dynamicity	**25.04**	15.31	0.00	**25.77**	13.92	**3**	2	0	**1**	2
TOTAL	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**40**	**56**	**13**	**37**	**31**

Source: compiled by the author according to data from annual reports of companies.

- reliability of approximation (R_{cp}^2) is the square of the average correlation coefficient (determination coefficient);
- the specific value of the accuracy of approximation (R_{cp}^2,%) is the percentage of the value of the reliability of the approximation (R_{cp}^2) of a particular group to the total of the same indicator for all groups.

An example of calculation for the "Profitability" group within the general sample (generalized for all segments):

- total correlation coefficients of assessment factors with a modulus value of more than 0.20 ($\Sigma R_{0,20}$) is 2.7621;
- the average correlation coefficient (R_{cp}) = = $\Sigma R_{0,20}$ / the number of factors involved in its calculation is, respectively: 2.7621 / 6 = 0.46;
- the reliability of approximation (R_{cp}^2): $0.46^2 = 0.21$;
- the specific value of approximation reliability (R_{cp}^2,%) = (R_{cp}^2) / total R_{cp}^2 of all groups × 100: 0.21 / 0.97 × 100 = 21.79%.

As a result, attention is drawn to the heterogeneity of the distribution of the proportion of groups of factors in relation to the company's costs to sales. If for the general sample the results are predictable — more expensive companies have higher profitability and, accordingly, lower operating costs, then when considered within the Segmental Model, different groups of factors manifest themselves in different ways.

The right side of the *Table 3* shows the range from 0 to 20 values of the number of assessment factors involved in calculating the specific reliability of the approximation of groups. Considering the conditional identity of the algorithms for calculating individual indicators, such a multiple difference can distort the results of the assessment.

To make the conclusions more convincing, we make a comparison in the form of two-factor (*Table 4*) and one-factor (*Table 5*) methods for calculating the total correlation coefficient of groups, which are supposed to use, respectively, two and one factors from each group, with the highest values of the correlation coefficient in modulus, regardless of the significance of the indicator.

In this case, there is a certain pattern of the results obtained, in particular for Segment 1 (Intensity and Dynamicity), Segment 2 (Capital and Intensity), Segment 3 (Cost and Probability) and for the sample as a whole (Profitability and Cost), the key factors affecting the utility coefficient (MV/S) groups are identical and close to the calculation method with the value of correlation coefficients more than 0.20 modulo.

Table 4

The results of calculating the specific reliability of the approximation (R_{av}^2, %) by two-factor method

GROUP	R_{av}^2, % / R_{av}^2, %				
	Seg. 1	Seg. 2	Seg. 3	Seg. 4	TOTAL
Profitability	17.66	11.60	6.12	**28.46**	**27.59**
Cost	13.77	14.51	**22.77**	25.53	26.32
Provision	13.04	16.61	**40.06**	18.40	15.17
Capital	6.07	**21.77**	10.61	9.38	8.36
Intensity	**26.41**	**25.18**	10.35	8.16	13.74
Dynamicity	**23.04**	10.33	10.09	10.07	8.83
TOTAL	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**

Source: compiled by the author according to data from annual reports of companies.

Table 5

The results of calculating the specific reliability of the approximation (R_{av}^2, %) by one-factor method

GROUP	R_{av}^2, % / R_{av}^2, %				
	Seg. 1	Seg. 2	Seg. 3	Seg. 4	TOTAL
Profitability (Net profit)	8.97	7.86	12.54	**25.59**	**25.14**
Cost [Cost ((including depreciation and other operating expenses)]	10.35	2.36	**23.51**	**28.39**	**28.87**
Provision (Capital)	15.65	15.25	**35.94**	17.47	13.67
Capital (Fixed Assets / Assets)	0.09	**29.40**	10.31	5.76	4.66
Intensity [Return on assets (ROA)]	**37.36**	**26.25**	0.46	4.65	13.82
Dynamicity ((Sales — Operating expenses) × Dynamics of operating profit)	**27.57**	18.87	17.24	18.14	13.84
TOTAL	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**

Source: compiled by the author according to data from annual reports of companies.

The groups of factors with the highest specific value of the approximation reliability for Segment 4 in the calculation method with the value of the correlation coefficients in modulus more than 0.20 differ from the two-factor and one-factor calculation methods. In the first case, the "Dynamicity" group, represented by one factor participating in the calculation, exceeds the indicator of the "Cost" group, represented by 4 factors, by 8.17 percentage points, but according to the one-factor method, it is less by 10.25 percentage points, which is correct for comparison purposes (one factor — to one factor).

Thus, summarizing the specifics of companies from different sectors according to *Fig. 4* and *6*, as well as the main criteria for increasing the utility coefficient (MV/S) according to *Table 2–5*, a short description of each segment will be given.

Segment 1 (MV/S < 0.5) — the sector of crisis or financially supported companies:

- the market value does not exceed the book value, which, in turn, is less than half of the annual sales;
- the growth of the utility coefficient is mainly associated with:

– with an *increase* in the return on assets, investments, and capital, the dynamics of

operating profit, the size, and dynamics of dividends;

– with a *decrease* in the turnover of assets, including current assets, cash, fixed assets and inventories.

Segment 2 (0.5 <= MV/S < 1.0) — sector of manufacturing (processing and extracting raw materials) companies:

• the market value does not exceed the book value (which tends to the level of annual sales), with the difference decreasing as the MV/S ratio increases within the segment;

• the growth of the utility coefficient is mainly associated [25–28]:

– with an *increase* in the level of renewal of fixed assets, return on assets, investments, and capital;

– with a *decrease* in the size of inventories and fixed assets, asset turnover, including current assets, cash, fixed assets, and inventories.

Segment 3 (1.0 <= MV/S < 2.0) — the sector of trading (network) companies:

• the market value exceeds the book value, which is close to the level of annual sales within the segment;

• the growth of the utility coefficient is mainly associated with:

– with an *increase* in the liquidity of assets, free cash flow and the share in the balance sheet structure: current assets (excluding inventory), non-current assets (excluding fixed assets), long-term liabilities, capital (excluding dividends);

– with a *decrease* in the size (level) of any combination of types of costs, short-term liabilities, investments and interest received in the balance sheet structure.

Segment 4 (MV/S >= 2.0) — the sector of innovative companies:

• the market value is more than twice the book value, which is higher than the level of annual sales within the segment;

• the growth of the utility coefficient is mainly associated with:

– with an *increase* in the difference between revenue and the aggregate of any type of costs;

– with a *decrease* in the size (level) of any combination of cost types.

FACTOR COMPARISON OF ORGANIZATIONS

Considering various priorities of organizations in terms of their development, to assess their current state and compare with other market participants, we will use the results of the factor analysis of companies' activities, according to *Table. 2* determining the conditions for increasing the utility coefficient depending on the segment of the ratio of the market value to sales.

If companies in terms of MV/S have similar values (within the same segment or in its boundary values), it is advisable to correlate them by factors for a particular segment, if the difference is significant, the assessment should be carried out in the table of the general sample.

As an example, we compare Apple, Alphabet, and Berkshire Hathaway from *Table 1* for 12 key factors, distinguished by the most characteristic features of the inconsistency of indicators (*Table 6*).

At first glance, Berkshire Hathaway has large net income, assets, and sales comparable to Apple and Alphabet, which also demonstrates a higher Profits/Sales ratio. However, it is half the price of Alphabet and three times the price of Apple.

Berkshire Hathaway's profits are associated with major factors that exceed those of comparable companies, with most of the rest being worse.

The largest bias in the factors justifying Berkshire Hathaway's lower utility relative to Apple and Alphabet is associated with relatively high production costs and operating expenses, less free cash and its ratio to asset size, lower return on assets (ROA) and investment (ROI), smaller equity capital (all indicators are relative to sales).

In total, out of 31 factors assessing the general comparison (for all segments), having

Table 6

Factorial comparison of Apple, Alphabet, and Berkshire Hathaway within the total sample

No.	Assessment factor	Factor group	Corr. coef.	Apple	Alphabet	Berkshire Hathaway
1	Cost (including depreciation and other operating expenses)	Cost	–0.7024	0.62	0.45	0.81
2	Net profit	Profitability	0.6555	0.21	0.21	0.32
3	EBT	Profitability	0.6453	0.25	0.24	0.40
4	Operating income – Taxes – (Value of long-term liabilities × Long-term liabilities)	Profitability	0.5967	0.19	0.18	0.02
5	Operating expenses + Tax	Cost	–0.5681	0.79	0.82	0.97
6	(Sales – Operating expenses) × × Dynamics of operating profit	Dynamicity	0.4864	0.23	0.20	0.11
7	ROA	Intensity	0.4859	0.17	0.12	0.10
8	Equity	Provision	0.4834	0.30	1.24	1.67
9	Cash / Assets	Provision	0.4811	0.29	0.43	0.08
10	Urgent liquidity ((Current assets – Inventories) / Short-term liabilities)	Provision	0.4773	1.46	3.44	1.50
11	Equity – Retained earnings	Provision	0.4372	0.17	0.30	0.09
12	ROI	Intensity	0.4320	0.25	0.15	0.11

Source: compiled by the author according to data from annual reports of companies.

a correlation coefficient of more than 0.20 in modulus, for 16 of them Berkshire Hathaway has values inferior to Apple and Alphabet, in 6 factors — exceeding and in 9 factors — intermediate.

Since Berkshire Hathaway's utility has a marginal value between Segment 3 and Segment 4, a similar analysis can be made by comparing the factors in Segment 4. The result is similar since its key criteria are identical to the total sample.

CONCLUSIONS

As a rule, the life cycle of a company's development is represented by one or two, less often three segments. The transition between segments requires a significant change in the structure of the organization's balance sheet and other indicators of financial statements, which in market conditions implies significant changes in the business model or its complete change.

Accordingly, the focus solely on profits and costs as key conditions for increasing the value of an organization, in this case, is justified only in Segment 4. For other sectors, other factors should be taken into account, sometimes with a large dominant value.

Based on this, each segment can be represented as a level of creative activity of companies, while the transition to the next of them within the market as a whole is carried out by releasing the capabilities of the previous ones, complementing them (not replacing them), relying on them as an increase in the size of the structure, the stability of which is determined by the uniform distribution of the load [29]. That is, the need to increase the average market utility, primarily by increasing profitability, should be decomposed into components in relation to individual segments of the model. They prioritize different groups of factors, which together create a single picture of goals.

With the obvious social utility for the market as a whole, an increase in the ratio of companies' market value to sales as an indicator of economic development, consumer and business activity of its participants, the implementation of this goal requires a revision of an unambiguous judgment about maximizing profit as the main goal of the business. The profitability and level of costs of firms in the lower segments of the model should stimulate the development of organizations in the upper segments, considering the use of targeted instruments that take into account the characteristics and specifics of their type of activity. [30]. Moreover, the lower the segment of the company's location, the greater the synergistic effect this circumstance will have.

The implementation of the Segmental Model implies that, in addition to the actual evolution in the form of a stage of the life cycle (beginning, growth, stagnation, decline, completion) and size (assessment of the occupied market share), the key characteristic of the company's activities is the segment of its public utility, which is a conditionally constant entity formed a unique internal culture associated with the characteristics of birth (a type of activity) and existence (competitive environment) [31].

The correlations of various indicators and multipliers of the financial statements of organizations obtained in the course of the analysis in relation to their current and calculated ratio of capitalization from proceeds allow us to assess the value of companies, to compare the dynamics of their activities with industry competitors and the market as a whole for a selected period of time, and to define directions for increasing utility coefficient.

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The article was submitted on 01.12.2020; revised on 14.12.2020 and accepted for publication on 27.12.2020.
The author read and approved the final version of the manuscript.