

METHODICAL APPROACH TO INTEGRAL EVALUATION OF INVESTMENT ATTRACTIVENESS OF ENTERPRISES

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Abstract:

The adoption of investment decisions is based on the results of analytical studies of the attractiveness of investment objects. Often the investor faces the challenge of comparing the investment attractiveness of different enterprises. Solving this problem is simplified if the decision maker has clear clear indicators that can be used to rank enterprises. The purpose of this research is to develop a methodological approach to constructing such an indicator - an integral indicator of investment attractiveness of enterprises. The proposed approach is based on the use of the profitability of assets as a generalizing indicator of the efficiency of the use of enterprise resources and provides for the following steps: calculation of the indicator of return on assets by group of enterprises; defining the ranges of indicator values for the distribution of scores to assess investment attractiveness; Calculation for each enterprise of the average score on the basis of scores distributed for each period; calculation of the average rate of growth of the indicator of return on assets over the whole period under investigation, based on intermediate chain growth rates; calculation of integral indicator of investment attractiveness and ranking of enterprises by its level.

This approach provides a combination of static and dynamic indicators, and thus allows to some extent predict the efficiency of the use of investment resources, as well as to determine the rank of each enterprise in the aggregate of alternative options in terms of its investment attractiveness.

The practical implementation of this methodological approach is based on the group of bakery enterprises.

Key words: investment attractiveness, integral indicator of investment attractiveness, return on assets, investment decisions, investment alternative

JEL classification: D92, G31

1. INTRODUCTION

Investment attractiveness of the enterprise plays a significant and extremely important role in activating investment processes. In the conditions of resource constraints and acute competition between enterprises for obtaining resources, including financial ones, the question is asked about creating an idea of an enterprise as an attractive and, most importantly, an economically safe investment object - that is, the formation of its investment attractiveness. Also, the role of determining the investment attractiveness of enterprises lies in the fact that potential investors need to convince the expediency of investments with specific indicators that are calculated in the process of evaluating it. Therefore, an important issue is the clearest and unambiguous assessment of the enterprise in terms of attractiveness and safety for investors.

The problem of analyzing investment attractiveness is becoming more relevant and is reflected in the writings of such scholars as Ye. Antipenko, S. Shumikin, A. Stoicheva. [1], W. Buffett [2], Z. Body [3], G. Kozachenko [4], S. Kottl [5], O. Nosov [6], T. Ponomarenko [7], O. Yastremska [8], R. Edwards [9], and others. However, further research needs a methodology for an integrated assessment of investment attractiveness.

Integral assessment allows you to combine in one indicator many different names, units of measure, weight and other factors of factors. This simplifies the procedure for evaluating a particular investment proposal, and sometimes it is the only possible option for conducting it and providing objective final conclusions.

Integral indicators of the investment attractiveness of an enterprise include: integral indicator of property status, financial stability, profitability, business activity, liquidity of assets, as well as market activity of the invested object. However, the above methodological approaches have a number of shortcomings, which raises serious concerns about the reliability of the results.

2. CONTENT

We propose a methodology for calculating the integral indicator of investment attractiveness based on the profitability of assets, realized in the sequence of the following stages:

1. Calculation of return on assets by group of enterprises.
2. Define ranges of metric values for the distribution of scores to assess investment attractiveness.
3. Calculation for each enterprise of the average score on the basis of scores distributed for each period.
4. Calculation of the average rate of growth of the indicator of return on assets over the entire period under study, based on intermediate chain growth rates.
5. Calculation of the integral indicator of investment attractiveness and ranking of enterprises by its level.

To calculate the profitability indicator, data from the financial statements of nine bakery enterprises for five years was used. Tables 1 and 2 show information on the average asset value and profit before tax, respectively.

Table 1. Average cost of property of bakery enterprises
(calculated according to the site smida.gov.ua [10])

№	Enterprise	Years				
		2012	2013	2014	2015	2016
1	2	3	4	5	6	7
1	The PJSC "Chernivtsi Bakery"	75104,5	69435,5	73262,5	85363	93854
2	The PJSC "Lviv Bakery"	15491	14420,5	13797,5	13267,5	12757,5
3	The PJSC "Kharkiv Bakery Slobozhansky"	64668	76562,5	113624	150555,5	161853
4	The PJSC "Konotop Bakery"	4285	4511	4984	5906	6899
5	The PJSC "Stryj Bakery"	4110,5	4146	4046,5	4037	4007
6	The PJSC "Kryvyj Rig Bakery №1"	15839	13684	11238,5	11454	11838,5
7	The PJSC "Cherkasy Bakery"	170667,5	123805	93867	88277	90362
8	The PJSC "Shostka Bakery"	18286,5	17372	17653	19874,5	21758,5
9	The PJSC "Romny Bakery"	1975,5	2171,5	2125	1881,5	1638,5

3. The results of calculating the return on assets in the group of enterprises are shown in Table

$$\text{Return on assets} = \text{profit before tax} / \text{average cost of property}$$

Table 2. Profit before taxation of bakery enterprises
(according to the site smida.gov.ua [10])

№	Enterprise	Years				
		2012	2013	2014	2015	2016
1	The PJSC "Chernivtsi Bakery"	3502	2501	1567	5901	5279
2	The PJSC "Lviv Bakery"	-1345	-942	-1129	-41	-688
3	The PJSC "Kharkiv Bakery Slobozhansky"	-1998	-8137	-12280	-7282	-10192
4	The PJSC "Konotop Bakery"	396	582	550	1639	309

5	The PJSC "Stryj Bakery"	11	-70	-101	-67	-28
6	The PJSC "Kryvyj Rig Bakery №1"	-2983	-1107	-765	4	3
7	The PJSC "Cherkasy Bakery"	-2051	-491	-138	589	496
8	The PJSC "Shostka Bakery"	2229	695	530	824	852
9	The PJSC "Romny Bakery"	74	150	34	7	4

Table 3. Profitability of assets

№	Enterprise	Years				
		2012	2013	2014	2015	2016
1	The PJSC "Chernivtsi Bakery"	0,0466	0,0360	0,0214	0,0691	0,0562
2	The PJSC "Lviv Bakery"	-0,0868	-0,0653	-0,0818	-0,0031	-0,0539
3	The PJSC "Kharkiv Bakery Slobozhansky"	-0,0309	-0,1063	-0,1081	-0,0484	-0,0630
4	The PJSC "Konotop Bakery"	0,0924	0,1290	0,1104	0,2775	0,0448
5	The PJSC "Stryj Bakery"	0,0027	-0,0169	-0,0250	-0,0166	-0,0070
6	The PJSC "Kryvyj Rig Bakery №1"	-0,1883	-0,0809	-0,0681	0,0003	0,0003
7	The PJSC "Cherkasy Bakery"	-0,0120	-0,0040	-0,0015	0,0067	0,0055
8	The PJSC "Shostka Bakery"	0,1219	0,0400	0,0300	0,0415	0,0392
9	The PJSC "Romny Bakery"	0,0375	0,0691	0,0160	0,0037	0,0024

At the second stage, the grouping of the set of characteristics is performed (data of Table 3). To do this, the grouping interval (h) is first defined by the formula:

$$h = (X_{max} - X_{min}) / m,$$

where X_{max} is the highest value of the sign (0.2775);

X_{min} is the smallest value of the sign (-0.1883);

m - number of groups.

The number of groups is determined by the formula:

$$m = 1 + 3.332 \lg n,$$

where n is the number of elements of the set (45).

The distribution of the ranges of the values of the indicator of return on assets is given in Table 4. For each group a score is defined, for the first one - 1, the second - 2, etc. The higher the ROI value, the higher the score.

Table 4. Distribution of points by groups of values ranges profitability indicator

Group	Range of values of return on assets bakery enterprises		Point of the group
	from	to (inclusive)	
Group 1	-0,1883	-0,1510	1
Group 2	-0,1510	-0,0955	2
Group 3	-0,0955	-0,0401	3
Group 4	-0,0401	0,0003	4
Group 5	0,0003	0,0557	5
Group 6	0,0557	0,1112	6
Group 7	0,1112	0,1666	7
Group 8	0,1666	0,2221	8
Group 9	0,2221	0,2775	9

That is, the enterprise, the value of the indicator of the profitability of assets, which falls: in the range from -0.1883 to -0.1510 (inclusive) gets 1 point, in the range from -0.1510 to -0.0955

(inclusive) - 2 points and so on. Such an assessment is based on profitability indicators in each period (for each year) (Table 5).

The average score (Ma) for all periods is determined by the formula:

$$Ma = \sqrt[n]{M_1 \cdot M_2 \cdot \dots \cdot M_n}$$

where M1, M2 ... - the score of the corresponding period.

Table 5. Balance rating on the level of profitability of assets

№	Enterprise	Period (years)					Average point
		2012	2013	2014	2015	2016	
1	The PJSC "Chernivtsi Bakery"	5	5	5	6	6	5,4
2	The PJSC "Lviv Bakery"	3	3	3	4	3	3,2
3	The PJSC "Kharkiv Bakery Slobozhansky"	4	2	2	3	3	2,7
4	The PJSC "Konotop Bakery"	6	7	6	9	5	6,5
5	The PJSC "Stryj Bakery"	5	4	4	4	4	4,2
6	The PJSC "Kryvyj Rig Bakery №1"	1	3	3	5	4	2,8
7	The PJSC "Cherkasy Bakery"	4	4	4	5	5	4,4
8	The PJSC "Shostka Bakery"	7	5	5	5	5	5,3
9	The PJSC "Romny Bakery"	5	6	5	5	5	5,2

As can be seen from the data in Table 5, the highest average score was received by Konotop Bakery Plant, the lowest - PJSC "Kharkiv Bakery" Slobozhansky. "PJSC" Chernivtsi Bakery " is in second place according to this criterion.

However, this criterion can not be considered final, since it does not reflect the stability of trends. It is necessary to take into account the dynamics of the studied indicators.

Therefore, at the next stage of the analysis, the absolute and relative indicators of dynamics are calculated (Table 6).

As a generalization of the dynamics, it is proposed to consider the average growth rate (Ta), which is determined on the basis of chain growth rates:

$$Ta = \sqrt[n]{T_1 \cdot T_2 \cdot \dots \cdot T_n}$$

where T1, T2 ... - the chain growth rate of the corresponding period.

Table 6. Profitability dynamics indicators

№	Enterprise	Growth (loss)				Chain rate of growth (coefficient)			
		2013 p.	2014 p.	2015 p.	2016 p.	2013	2014	2015	2016
1	The PJSC "Chernivtsi Bakery"	-0,0106	-0,0146	0,0477	-0,0129	0,772	0,594	3,232	0,814
2	The PJSC "Lviv Bakery"	0,0215	-0,0165	0,0787	-0,0508	1,248	0,747	1,962	0,065
3	The PJSC "Kharkiv Bakery Slobozhansky"	-0,0754	-0,0018	0,0597	-0,0146	0,695	0,983	1,552	0,698
4	The PJSC "Konotop Bakery"	0,0366	-0,0187	0,1672	-0,2327	1,396	0,855	2,515	0,161
5	The PJSC "Stryj Bakery"	-0,0196	-0,0081	0,0084	0,0096	0,159	0,522	1,335	1,579
6	The PJSC "Kryvyj Rig Bakery №1"	0,1074	0,0128	0,0684	-0,0001	1,570	1,159	2,005	0,726
7	The PJSC "Cherkasy Bakery"	0,0081	0,0025	0,0081	-0,0012	1,670	1,629	6,538	0,823
8	The PJSC "Shostka Bakery"	-0,0819	-0,0100	0,0114	-0,0023	0,328	0,750	1,381	0,944

9	The PJSC "Romny Bakery"	0,0316	-0,0531	-0,0123	-0,0013	1,844	0,232	0,233	0,656
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The results of calculating the average rate of return on assets of the group of bakery enterprises are given in Table 7. The highest figure was PJSC Cherkassy Bakery, the lowest was PJSC "Romny Bakery", PJSC "Chernivtsi Bakery" ranked third in this criterion.

However, this indicator itself can not fully reflect the level of investment attractiveness, since the level of absolute indicators remains out of the question.

Reliable information on investment attractiveness can only be obtained on the basis of the indicator, which integrates information on trends in the development of the phenomenon and information on the absolute characteristics of this phenomenon.

Table 7. Average rate of growth of profitability of assets for the period of 2012-2016 .

№	Enterprise	Coefficient of average growth rate
1	The PJSC "Chernivtsi Bakery"	1,048
2	The PJSC "Lviv Bakery"	0,587
3	The PJSC "Kharkiv Bakery Slobozhansky"	0,927
4	The PJSC "Konotop Bakery"	0,834
5	The PJSC "Stryj Bakery"	0,646
6	The PJSC "Kryvyj Rig Bakery №1"	1,276
7	The PJSC "Cherkasy Bakery"	1,956
8	The PJSC "Shostka Bakery"	0,753
9	The PJSC "Romny Bakery"	0,505

As such, an integral indicator of investment attractiveness (I) is proposed, which is defined:

$$I = T \cdot Ma$$

where Ta - average rate of growth of profitability of assets;

Ma - the average score of the company, determined by the average level of profitability of assets.

The results of calculating the indicator I are given in Table 8.

Table 8. Calculation of the integral indicator of investment attractiveness

№	Enterprises	The average growth rate	Average point	Integral indicator of investment attractiveness
1	2	3	4	5
1	The PJSC "Chernivtsi Bakery"	1,048	5,4	5,6
2	The PJSC "Lviv Bakery"	0,587	3,2	1,9
3	The PJSC "Kharkiv Bakery Slobozhansky"	0,927	2,7	2,5
4	The PJSC "Konotop Bakery"	0,834	6,5	5,4
5	The PJSC "Stryj Bakery"	0,646	4,2	2,7
6	The PJSC "Kryvyj Rig Bakery №1"	1,276	2,8	3,6
7	The PJSC "Cherkasy Bakery"	1,956	4,4	8,6
8	The PJSC "Shostka Bakery"	0,753	5,3	4,0
9	The PJSC "Romny Bakery"	0,505	5,2	2,6

According to the results of calculating the integral indicator of investment attractiveness, a rating of bakery enterprises was made (Table 9).

Table 9. Ranking of enterprises by level of investment attractiveness

№	Enterprise	Rang
1	The PJSC "Chernivtsi Bakery"	2
2	The PJSC "Lviv Bakery"	9
3	The PJSC "Kharkiv Bakery Slobozhansky"	8
4	The PJSC "Konotop Bakery"	3
5	The PJSC "Stryj Bakery"	6
6	The PJSC "Kryvyj Rig Bakery №1"	5
7	The PJSC "Cherkasy Bakery"	1
8	The PJSC "Shostka Bakery"	4
9	The PJSC "Romny Bakery"	7

Thus, of the nine enterprises for the investor, the investment attractiveness (in order of decreasing attractiveness) will be the most investment attractive: PJSC "Cherkassy Bakery", PJSC "Chernivtsi Bakery" and PJSC "Konotop Bakery". It is these enterprises that have shown the best aggregate result in terms of the rate of return on assets and the sustainability of trends in its growth. Accordingly, for an investor in a relative comparison, they are considered as the most investment attractive. The worst result was shown by PJSC "Lviv bread-baking complex".

3. CONCLUSIONS

Investigation of the methods of integral estimation of investment attractiveness has shown that in theory and practice the possibilities of such indicator as profitability of aggregate assets are insufficiently used. In this connection, the method of calculating the integral indicator of investment attractiveness on the basis of profitability of assets is proposed. Implementation of this method involves the following stages of analytical research: calculation of the indicator of profitability of assets by group of enterprises; defining the ranges of indicator values for the distribution of scores to assess investment attractiveness; calculation for each enterprise of the average score on the basis of scores distributed for each period; calculation of the average rate of growth of the indicator of return on assets over the whole period under investigation, based on intermediate chain growth rates; calculation of integral indicator of investment attractiveness and ranking of enterprises by its level. Thus, in this approach, the static values of performance indicators and trends in their change are combined.

The use of this technique will ensure the adoption of optimal investment decisions in the presence of many alternative investment objects.

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