THE EFFECT OF FINANCIAL LEVERAGE AND ITS EFFECT ON THE ENTERPRISE'S EQUITY RATE OF RETURN

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Abstract: *The question of capital structure is topical at all phases and stages of the enterprise's development. The general structure of the capital is characterized by the relative shares of own funds and borrowings in the amount of the whole capital invested by the enterprise, as well as by the ratios between the different sources of funds – equity and borrowings.*

The ratio between equity and borrowings invested in the enterprise's business shows the amount of equity that covers one Bulgarian lev of the enterprise's borrowings. In general, this is the financial autonomy ratio. The reciprocal ratio of borrowings to equity is the enterprise's debt ratio. The value of this indicator determines the amount of borrowings that covers one Bulgarian lev of equity.

The ratio between enterprise's equity and borrowings results in different amounts of profit available for the owners, as well as in different rate of return of equity. This means that the values of the enterprise's financial autonomy and debt ratios have impact on the equity rate of return. Therefore, the use of borrowings for the enterprise's business may be a factor that has positive impact on the rate of return of equity and results in its increase. This impact is related to the effect of the financial leverage.

This publication studies the effect of the financial leverage that determines the impact of funding enterprise's business with borrowings on the change of equity rate of return. The extent and the direction of this effect are influenced both by the changes in the enterprise's debt ratio, i.e. the changes in its capital structure, as well as by the dynamics of difference between the aggregate assets' rate of return and the internal interest rate.

The subject matter of this publication is to study the dynamics of equity rate of return under the influence of the direct factors describing the financial leverage effect.

The aim is to present a methodology for analysis and evaluation of industrial enterprises' equity rate of return in relation to the financial leverage effect that is theoretically justified, practically feasible and useful for the financial management.

The methodology for analysis of equity rate of return is verified by the use of business data of leading enterprises operating in the Bulgarian food canning industry.

Keywords: *Analysis, financial leverage, equity rate of return, methodology*

1. INTRODUCTION

Economic enterprises use both equity and borrowings for their business. The equity to borrowing ratio is the financial autonomy ratio that measures the amount of equity corresponding to borrowings of one Bulgarian lev. The relationship between equity and borrowings is the debt ratio measuring the amount of borrowings corresponding to equity of one Bulgarian lev of equity.

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The financial autonomy ratio and the debt ratio result in varied amounts of profit attributable to owners and to varied return of equity. This means that the value of these ratios affects the return of equity. Therefore, the use of borrowings in the enterprise's business is a factor that results in increase of the return of equity. This positive effect is relevant to the effect of the financial leverage. [1]

FINANCIAL LEVERAGE EFFECT

References [2] show a model for analysis of return of equity based on the relationship between the indicator and the return of total assets and the financial leverage effect.
This model for analysis and assessment of return of equity can be outlined with the help of the following equations:

a) Based on the equation between the asset and liability of an enterprise's balance sheet, the average amount of assets ($\bar{A}$) is represented as a sum of the average amounts of equity ($\bar{E}$) and borrowings ($\bar{L}$):

$$\bar{A} = \bar{E} + \bar{L}$$
(1)

b) Interest expenses (E^i) are calculated as a product of the average amount of borrowings and the internal interest rate ($I\%$):

$$E^i = \bar{L} \times I\%$$
(2)

c) Return of total assets (ROTA) is calculated as a percentage of the sum of balance sheet profit (Pf^n) and interest expenses to the average amount of enterprise's assets:

$$ROTA = \frac{Pf^n + E^i}{\bar{A}} \times 100$$
(3)

Being presented in this way, return indicates the return of total assets, provided the enterprise does not charge and does not pay interest expenses for the used borrowings.

The last formula shows that the balance sheet profit may be presented in the following way:

$$Pf^n + E^i = ROTA \times \bar{A}$$
(4)

$$Pf^n = ROTA \times \bar{A} - E^i$$
(5)

The first two of the above equations are replaced in the last formula for the balance sheet profit, which results in the following formula indicating the book profit of the enterprise:

$$Pf^n = ROTA \times (\bar{E} + \bar{L}) - \bar{L} \times I\%$$
(6)

Return of equity (ROE) is calculated as a percentage of the balance sheet profit to the average amount of enterprise's equity, with the following formula:

$$ROE = \frac{Pf^n}{\bar{E}} \times 100$$
(7)

The above formula for the balance sheet profit is replaced in the original formula for calculation of the return of equity. As a result, we have the following formula for calculation of the return of equity:

$$ROE = \frac{Pf^n}{\bar{E}} \times 100 = \frac{ROTA \times (\bar{E} + \bar{L}) - \bar{L} \times I\%}{\bar{E}} =$$

$$= \frac{ROTA \times (\bar{E} + \bar{L})}{\bar{E}} - \frac{\bar{L} \times I\%}{\bar{E}} = \frac{\bar{E} \times ROTA}{\bar{E}} + \frac{\bar{L} \times ROTA}{\bar{E}} - \frac{\bar{L} \times I\%}{\bar{E}} =$$

$$= ROTA + \frac{\bar{L}}{\bar{E}} \times (ROTA - I\%) = ROTA + K^d \times (ROTA - I\%) \qquad (8)$$

This formula means that the return of equity is equal to the sum of the enterprise's return of total assets and the financial leverage effect, or:

$$ROE = ROTA + K^d \times (ROTA - I\%) \qquad (9)$$

This formula contains two common factors. The first one is the return of total assets (ROTA), and the second – the effect of financial leverage (E), which is calculated with the following formula:

$$E = K^d \times (ROTA - I\%) \qquad (10)$$

In the last formula, K^d is the debt ratio expressing the ratio between the enterprise's borrowings and equity. This indicator characterizing the total structure of capital is calculated with the following formula:

$$K^d = \frac{\bar{L}}{\bar{E}} \qquad (11)$$

Financial leverage effect describes the influence of the enterprise's business funding with borrowings on the changes that occur in the return of equity. The power and direction of this effect depend both on the value of the debt ratio and on the value and direction of deviation between the return of total assets and the internal interest rate. If return of total assets is bigger than the internal interest rate, i.e. than the price of borrowings (ROTA > I%), than the financial leverage effect is positive and the return of equity is higher than the return of total assets. However, if return of total assets is less than the internal interest rate (ROTA < I%), than the financial leverage effect is negative, and the return of equity is less than the return of enterprise's total assets.

With view of the formula describing the relation among return of equity, return of total assets and financial leverage effect, three factors influence the dynamics of return of enterprise's equity.

The first factor – changes in the debt ratio, describes the change of the general structure of capital and is relevant to the enterprise's financial risk level. The increase of the debt ratio above one means that the enterprise has low capital structure where the share of equity is less than the share of borrowings. This results in increase of the financial risk. At the same time, the increase of debt ratio may result in increase of return of equity, however the financial leverage effect needs to be positive in this case. Enterprise's financial management needs to implement

measures to achieve and maintain balance between the debt ratio change rate and the difference between return of total assets and internal interest rate.

The second factor refers to the changes in the internal interest rate. The internal interest rate expresses the price of the enterprise's borrowings and varies among enterprises. This percentage is calculated as a ratio of loan interests to the average amount of all borrowings (long-term and short-term borrowings). Therefore, the value of internal interest rate is less than the loan interest rate.

The third factor refers to the changes in the return of total assets. As stated above, the return of total assets is calculated as a percentage of the sum of book profit and interest expenses to the average amount of assets. In this form the indicator describes the capitalization rate of assets, provided no interests are paid for the borrowings. This means that the enterprise carries its business by using interest-free capital only.

Analysis may go deeper to identify the reasons causing the positive or negative effect of each of those three factors on the change of return of equity for the time period in question.

RETURN OF EQUITY

As stated above, in relation to the return of total assets and the financial leverage effect, the return of equity may be expressed with the following formula:

$$ROE = ROTA + K^d \times (ROTA - I\%) \tag{12}$$

This formula shows that the following factors influence the difference in the return of equity for the current period in comparison to the previous period: changes of debt ratio; changes of internal interest rate; changes of the return of total assets.
The effect of those factors may be determined by the subsequent substitution method, which is an element of the business analysis method.

APPROBATION OF THE MODEL FOR ANALYSIS OF RETURN OF EQUITY

The model for analysis of return of equity with regard to return of total assets and financial leverage effect can be approbated on the basis of data about the business of leading companies in the canning industry in Bulgaria. The information necessary for the analysis and the assessment of return of equity is summarized in tables 1 and 2. Table 1 presents information about the average values of assets, equity and borrowings, and table 2 – about the book profit and interest expenses of the enterprises in question, and in aggregate for the group of enterprises.

Table 3 shows the calculations of values of return of total assets (formula 3), of internal interest rate (formula 2), and of return of equity (formula 7) of the enterprises and in aggregate for the group.

Table 4 summarizes the values of debt ratio (formula 11) and the difference between the return of total assets and the internal interest rate of the enterprises and in aggregate for the group.

Table 5 presents the calculations of the financial leverage effect (formula 10) and the return of equity with regard to the return of total assets and the financial leverage effect (formula 9).

Table 1: Average size (BGN'000):

Enterprises	Assets			Equity			Borrowed capital		
	2014 y	2015 y	2016 y	2014 y	2015 y	2016 y	2014 y	2015 y	2016 y
E1	19780	20125	20055	12857	11000	12033	6923	9125	8022
E2	36950	36120	36250	25865	23478	23565	11085	12642	12685
E3	20240	20760	20680	15180	14532	14476	5060	6228	6204
E4	19750	19850	19780	11060	11910	10879	8690	7940	8901
E5	2957	6120	8440	2070	4284	5486	887	1836	2954
E6	17240	17240	17300	11206	10344	10380	6034	6896	6920
E7	10285	10315	10360	5143	5160	5180	5142	5155	5180
Total for the group	127202	130530	132865	83381	80708	81999	43821	49822	50866

Table 2: (BGN'000)

Enterprises	Balance sheet profit			Interest expenses		
	2014 y	2015 y	2016 y	2014 y	2015 y	2016 y
E1	762	1105	751	210	355	241
E2	6650	5035	8390	388	506	504
E3	2125	2830	1275	126	162	160
E4	1420	1710	1710	252	223	254
E5	165	645	1920	18	33	42
E6	1810	2055	2125	174	193	195
E7	360	435	572	135	134	135
Total for the group	13292	13815	16743	1303	1606	1531

Table 3: ROE, ROTA and I%

Enterprises	ROE, %			ROTA, %			I %		
	2014 y	2015 y	2016 y	2014 y	2015 y	2016 y	2014 y	2015 y	2016 y
E1	5,9267	10,0455	6,2412	4,9141	7,2547	4,9464	3,0334	3,8904	3,0042
E2	25,7104	21,4456	35,6036	19,0474	15,3405	24,5352	3,5002	4,0025	3,9732
E3	13,9987	19,4743	8,8077	11,1215	14,4123	6,9391	2,4901	2,6012	2,5790
E4	12,8391	14,3577	15,7184	8,4658	9,7380	9,9292	2,8999	2,8086	2,8536
E5	7,9710	15,0560	34,9982	6,1887	11,0784	23,2464	2,0293	1,7974	1,4218
E6	16,1521	19,8666	20,4721	11,5081	13,0394	13,4104	2,8837	2,7987	2,8179
E7	6,9998	8,4302	11,0425	4,8128	5,5162	6,8243	2,6254	2,5994	2,6062
Total for the group	15,9413	17,1173	20,4185	11,4739	11,8141	13,7538	2,9735	3,2235	3,0099

Table 4: K^d and (ROTA – I%)

Enterprises	K^d, BGN			Difference ROTA - I%)		
	2014 y	2015 y	2016 y	2014 y	2015 y	2016 y
E1	0,5385	0,8295	0,6667	1,8807	3,3642	1,9422
E2	0,4286	0,5385	0,5383	15,5471	11,3380	20,5620
E3	0,3333	0,4286	0,4286	8,6314	11,8112	4,3601
E4	0,7857	0,6667	0,8182	5,5659	6,9295	7,0756
E5	0,4285	0,4286	0,5385	4,1594	9,2810	21,8246
E6	0,5385	0,6667	0,6667	8,6245	10,2407	10,5925
E7	0,9998	0,9990	1,0000	2,1874	2,9168	4,2181
Total for the group	0,5256	0,6173	0,6203	8,5004	8,5907	10,7439

Table 5: Effect of financial leverage and ROE

Enterprises	Effect of financial leverage, %			ROE, %		
	2014 y	2015 y	2016 y	2014 y	2015 y	2016 y
E1	1,0127	2,7908	1,2948	5,9267	10,0455	6,2412
E2	6,6631	6,1051	11,0685	25,7104	21,4456	35,6036
E3	2,8771	5,0619	1,8686	13,9987	19,4743	8,8077
E4	4,3732	4,6196	5,7891	12,8391	14,3577	15,7184
E5	1,7823	3,9776	11,7517	7,9710	15,0560	34,9982
E6	4,6439	6,8271	7,0617	16,1521	19,8666	20,4721
E7	2,1870	2,9140	4,2181	6,9998	8,4302	11,0425
Total for the group	4,4674	5,3031	6,6647	15,9413	17,1173	20,4185

The data in tables 3 and 5 shows that during the three-years' period being subject to analysis, the return of equity of all enterprises and in aggregate for the group of enterprises, calculated in accordance with formula 7 and formula 9, has equal values. This means that the determined model for analysis and assessment of return of equity with regard to the return of total assets and the financial leverage effect is theoretically correct and applicable in business practice.

Table 6 describes the influence of the direct factors on the change of return of equity of the enterprises for 2015 in comparison to 2014.

The data in table 6 show that the return of equity of Agri Bulgaria EOOD (E1) has increased under the effect of the changes of the debt ratio by 0,5474, as well as under the effect of the change of the return of total assets by 4,2822 points, and has decreased under the effect of the changes of the internal interest rate by 0,7110 points. We can see that in Agri Bulgaria EOOD the debt ratio for 2015 has increased by BGN 0,291 in comparison to 2014 (0,8295 - 0,5385), i.e. BGN 0,291 of more borrowings are attributable to every one Bulgarian lev of equity. At the same time, the internal interest rate describing the price of borrowings in its nature has increased by 0,857 points (3,8904 - 3,0334), which also causes the decrease of the return of equity. The general effect of these two factors (changes of debt ratio and changes of internal interest rate) has caused the decrease of return of equity by 0,1636 points [(+0,5474) + (- 0,7110)].

Table 6: Influence of factors

Enterprises	Influence of factors			Total influence of factors
	changes in the debt ratio	changes in the internal interest rate	changes in the return of total assets	
E1	0,5474	-0,7110	4,2822	4,1187
E2	1,7085	-0,2705	-5,7028	-4,2648
E3	0,8220	-0,0476	4,7011	5,4756
E4	-0,6626	0,0609	2,1204	1,5186
E5	0,0003	0,0994	6,9853	7,0850
E6	1,1057	0,0566	2,5522	3,7145
E7	-0,0017	0,0260	1,4061	1,4304
Total for the group	0,7800	-0,1543	0,5503	1,1760

The changes of the debt ratio have caused decrease of the rate of return for 2015 in comparison to 2014, in Deroni OOD (E4) by 0,6626 points, and in Fructo Sliven AD (E7) – by 0,0017 points. In all other enterprises, the effect of this factor is positive. This factor has strongest positive effect in the enterprises Kuminyano Fruit OOD (E2) – an increase by 1,7085 points, Viktoria Nuts EOOD (E6) – an increase by 1,1057 points, Olineza Premium OOD (E3) – an increase by 0,8220 points, and Agri Bulgaria EOOD (E1) – an increase of the return of capital by 0,5474 points.

The changes of the internal rate of return have negative impact on the change of return of equity in the following enterprises: Agri Bulgaria EOOD (decrease by 0,7110 points); Kuminyano Fruit OOD (decrease by 0,2705 points) and Olineza Premium OOD (decrease by 0,0476 points). The negative effect of changes of the internal interest rate in these enterprises also influences the general negative effect of the factor on the value of return of equity in general for the entire group of enterprises. Changes of the internal interest rate have positive effect on the change of return of equity in the rest of the enterprises within the group, however it cannot compensate the negative effect of the factor in the first three enterprises.

Only in Kuminyano Fruit OOD, the changes of return of total assets have significantly negative effect on the change of the return of equity for 2015 in comparison to 2014. In all other enterprises within the group, as well as for the group in general, the impact of the factor is positive, and the most positive effect is demonstrated in the enterprise Filicon – 97 AD (increase by 6,9853 points).

Table 7 shows the influence of direct factors on the change of the enterprises' return of equity of for 2016 in comparison to 2015.

Table 7: Influence of factors

Enterprises	Influence of factors			Total influence of factors
	changes in the debt ratio	changes in the internal interest rate	changes in the return of total assets	
E1	-0,5480	0,5908	-3,8471	-3,8043
E2	-0,0019	0,0158	14,1441	14,1580
E3	0,0000	0,0095	-10,6761	-10,6666
E4	1,0499	-0,0369	0,3476	1,3607
E5	1,0199	0,2022	18,7200	19,9422
E6	0,0000	-0,0128	0,6183	0,6055
E7	0,0028	-0,0068	2,6162	2,6122
Total for the group	0,0259	0,1325	3,1429	3,3013

The data in table 7 show that the changes of the debt ratio result in decrease of the return of equity in the following enterprises: Agri Bulgaria EOOD by 0,5480 points, and Kuminyano Fruit OOD – by 0,0019 points. In the rest of the enterprises, the factor has had positive effect, which is strongest in the following enterprises: Deroni OOD (increase by 1,0499 points) and Filicon – 97 AD (increase by 1,0199 points).

Changes of the internal interest rate have had negative effect on the dynamics of the return of equity in the following enterprises: Deroni OOD (decrease by 0,0369 points), Viktoria Nuts EOOD (decrease by 0,0128 points) and Fructo Sliven AD (decrease by 0,0068 points). In all other enterprises, the factor has had positive effect, the strongest one being in Agri Bulgaria EOOD (increase by 0,5908 points) and Filicon – 97 AD (increase by 0,2022 points).

Changes of return of total assets have negative effect on the occurred changes of the return of equity for 2016 in comparison to 2015 in the following enterprises: Agri Bulgaria EOOD (decrease by 3,8471 points) and Olineza Premium OOD (decrease by 10,6761 points). We can highlight the negative effect of the factor in Olineza Premium OOD, which is due to the significant decrease of the return of total assets by 7,4732 points (6,9391 – 14,4123). If we compare the values of return of total assets for 2015 and for 2014, we can see that such return has increased by 3,2908 points (14,4123 – 11,1215).

In the rest of the enterprises, changes of return of total assets have had positive effect on the dynamics of return of equity. Strongest effect is observed in the following enterprises: Filicon – 97 AD (increase by 18,72 points) and Kuminyano Fruit OOD (increase by 14,1441 points).

Data in table 5 show that the financial leverage effect in all enterprises during each year within the three-years' period in question is positive. This means that the return of equity is bigger than the return of total assets of the enterprises. This conclusion is further verified by the data in table 8.

Table 8: ROE, ROTA and differences ROE and ROTA

Enterprises	ROE, %			ROTA, %			Differences between ROE and ROTA, %		
	2014 y	2015 y	2016 y	2014 y	2015 y	2016 y	2014 y	2015 y	2016 y
E1	5,927	10,045	6,241	4,914	7,254	4,946	1,012	2,790	1,294
E2	25,710	21,445	35,603	19,047	15,340	24,535	6,663	6,105	11,068
E3	13,998	19,474	8,808	11,121	14,412	6,939	2,877	5,061	1,868
E4	12,839	14,357	15,718	8,465	9,738	9,929	4,373	4,619	5,789
E5	7,9710	15,056	34,998	6,188	11,078	23,246	1,782	3,977	11,751
E6	16,152	19,866	20,472	11,508	13,039	13,410	4,643	6,827	7,061
E7	6,999	8,430	11,042	4,812	5,516	6,824	2,187	2,914	4,218
Total for the group	15,941	17,117	20,418	11,473	11,814	13,753	4,467	5,303	6,664

Based on the data in the last table we can make the respective conclusions about the differences between the return of equity and the return of total assets in the individual enterprises. In 2014 the biggest difference is seen in the second enterprise, Kuminyano Fruit OOD, followed by the sixth enterprise, Viktoria Nuts EOOD, and the smallest difference is seen in the enterprise Agri Bulgaria EOOD.

With regard to 2015, the biggest difference is seen in the sixth enterprise, Viktoria Nuts EOOD, followed by the second enterprise Kuminyano Fruit OOD. The smallest difference is observed in the first enterprise Agri Bulgaria EOOD again.

During 2016 the biggest difference is observed in the fifth enterprise, Filicon – 97 AD, followed by the second enterprise, Kuminyano Fruit OOD, whereas the smallest difference is also seen in the first enterprise, Agri Bulgaria EOOD.

We can see that the values of differences between the return of equity and the return of total assets in different enterprises during each of the years within the three-years' period in question vary significantly. Furthermore, the enterprise Agri Bulgaria EOOD is characterized with the smallest differences during all of the three years.

Based on the dependence among the return of equity, the return of total assets and the financial leverage effect, we can make the conclusion that namely the difference between the return of equity and the return of total assets expresses, in its nature, the financial leverage effect. This conclusion is verified by the calculations made in table 5 (for the financial leverage effect) and in table 8 (for the difference between the return of equity and the return of total assets of enterprises).

CONCLUSION

The main source of information for the analysis is accounting. „It is of exceptional importance to organize accountancy in such a way that it would satisfy to the highest degree the requirements set by the analysis, and the provided information should offer an opportunity for its detailed working out in specific directions and sections". [3]

The resultative information is useful for the industrial enterprises' management to consider and make effective management decisions for the purposes of improving the efficiency of the business in operating and strategic aspect. This is an objective prerequisite for the successful development of the enterprises, the increase of their competitive power and their good position on a dynamic market.

The usefulness of the resultative analytical information confirms the significance of the management function *Analysis* within the governance system of every enterprise. The information needs of the management may have opposite effect with regard to expansion, building-up and improvement of the methodology for analysis and assessment of the enterprises' return of equity. This is further verified by the identification of the power and direction of the direct factors' impact on the dynamics of the return of equity with regard to the return of total assets and the financial leverage effect. Enterprise's management pays attention to different problems that need to find their theoretical solutions.

The methodology for analysis of the return of equity allows to identify and systemize the weaknesses and strengths with regard to the enterprises' business funding and the effectiveness of the use of their assets and capital, on the basis of which specific measures and actions for improvement of the business efficiency may be developed and proposed.

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