METHODOLOGICAL APPROACHES TO OPTIMIZING THE STRUCTURE OF OWNED AND LOAN CAPITAL OF AGRICULTURAL ENTERPRISES

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Abstract

The success of the functioning of agricultural business entities largely depends on the ratio of all types of owned and loan financial resources used to finance their assets. Currently, there is no single approach to choosing the optimal ratio of equity and debt capital. And this applies not only to various economic enterprises engaged in the same type of activity, but also to a single participant in the agricultural business in a changing commodity and financial market environment. Therefore, optimization of the capital structure of an economic entity is a continuous process that requires adaptation to a constantly changing market situation and justification of methodological approaches to choosing the best ratio of its components. The urgency of the identified problem justified the need to analyze the composition and movement of equity and land capital of individual participants in the agricultural business of the Penza region. In the current research: an assessment of the main factors that determine the structure of capital is discussed, and the influence of sectorial agricultural specifics on the formation of the share of owned and loan capital in asset financing and in determining the level of financial leverage was observed. Based on the results of the research, a methodology for determining the optimal structure of the capital of a subject of agricultural business was proposed. The ratio of maximizing profitability and minimizing financial risk was chosen as an optimality criterion, which would ensure the success of the implementation of the financial strategy of an economic enterprise.

Key words: owned capital, loan capital, capital structure, return on equity, financial risk

INTRODUCTION

In the current economic conditions in Russia, agricultural activity is seen not only as the primary need for food production for the country's population, but also as a source of income. Agricultural business is successfully developing in all agricultural sectors. Making a profit does not depend on the chosen direction of activity, the main condition is the rational organization of the business. The viability of the agricultural business is ensured by solving many economic problems, including the optimization of the capital structure. The ratio of owned and loan sources of asset formation is one of the basic criteria for the financial stability of a business participant. The issues of capital structure management are widely discussed in economic researches [6, 7, 8, 9, 11, 14], however, the problem of determining methodological approaches to optimizing the structure of equity and debt capital requires further development.

The optimal capital structure is such a ratio of owned and loan funds, which provides the best value of the optimality criteria for a given level of financial stability of the organization. The most important optimization criteria are: the maximum level of projected return on equity and the minimum level of financial risks [1, 13].

MATERIALS AND METHODS

The methodological basis of the study was the fundamental provisions of the scientific theory of the essence of capital, modern research by domestic and foreign scientists. The study is based on the methods used in economic science: general scientific (dialectical, analysis and synthesis, comparison and analogy), special (systemic, comparative analysis). The information base of the study was official statistics; normative legal acts of the federal and regional levels; data from the Ministry of Agriculture of the Penza Region; financial statements of

individual subjects of the agricultural business of the region, materials of their own research; data from Internet resources (scientific articles and works of practitioners, industry portals, economic reviews).

RESULTS AND DISCUSSIONS

For the majority of participants in the agricultural business of the Penza region (Russia), the priority is to maintain a sustainable production process and a stable financial condition. The choice of a scheme for financing activities is inextricably linked with taking into account the peculiarities of using both owned and loan capital. Organizations that use only their own capital have the highest financial stability, but limit the pace of their development, as they could not ensure the formation of the necessary

additional volume of assets during periods of favorable market conditions and do not realize the financial opportunities for increasing return on invested capital, which gives the use of loan capital [3, 10]. The study of the methodological foundations for optimizing the structure of equity and loan capital was carried out according to the accounting data and financial statements of three participants in the agricultural business of the region (Materials of the Federal State Statistics Service, 2022) [12], who have different areas of activity: dairy - Uchhoz Ramsay PGSHA JSC - (I); grain and milk - AK Rodina Radishcheva - (II); grain – Kameshkir Feed Mill LLC - (III). As an example, Table 1 shows the dynamics of the components and the structure of owned and loan capital according to participant (I).

Table 1. Structure of owned and loan capital of an agricultural company, rubles

Source of funds	2018	2019	2020	Absolute deviation 2020 from, (+;-)		Growth rate 2020, %	
				2018	2019	2018	2019
Owned							
Authorized capital	72,380	72,380	72,380	-	-	100.00	100.00
Reserve capital	449	545	583	134	38	129.84	106.97
Undestributed profits	7,893	9,123	8,541	648	-582	108.21	93.62
Total	80,722	82,048	81,504	782	-544	100.97	99.34
Loan capital							
long term duties	4,166	4,552	11,012	6,846	6,460	264.33	241.92
short-term obligations including: loans	474	-	-	-474	-	-	-
Accounts payable	27,868	28,454	17,203	-10,665	-11,251	61.73	60.46
Other current liabilities	4 839	3 116	-	-4,839	-3,116	-	-
Total	37,347	36122	28,215	-9,132	-7,907	75.55	78.11
Total	118,069	118170	109,719	-8,350	-8,451	92.93	92.85

Source: Compiled by the authors on the basis of accounting data and financial statements of an agricultural organization.

The decrease in the total value of the organization's sources in the reporting year is due to a decrease both in owned and loan funds.
Factors affecting the profitability of the participant's own funds (I) are presented in Table 2.

Among them, we may notice that the most important ones are: return on equity based on net profit, the share of net profit in profit before taxation, profit and profit from sales, profitability from sales in terms of profit from sales, turnover ratio on owned equity.

Table 2. Factors influencing the return on equity, rubles

Indicator	2018	2019	2020	Absolute deviation 2020 from (+;-)		Growth rate 2020, %	
				2018	2019	2018	2019
Return on equity based on net profit, Y	0.017	0.023	0.009	-0.008	-0.014	54.40	39.53
Share of pure profit in profit before taxation, $Y1$	0.762	0.873	0.711	-0.051	-0.162	93.30	81.40
Balance sheet ratio profit and profit from sales, $Y2$	1.249	0.474	0.342	-0.907	-0.132	27.39	72.22
Profitability of sales by profit from sales, $Y3$	0.016	0.042	0.032	0.016	-0.0103	-200.41	75.41
Turnover ratio of owned capital, $Y4$	1.128	1.344	1.198	0.070	-0.145	106.22	89.18

Source: Compiled by the authors on the basis of accounting data and financial statements of an agricultural organization.

The decrease in return on equity compared to 2019 amounted to 0.014 points, which is justified by the influence of each factor:

$$\Delta Y(Y_1) = (Y_{1_1} - Y_{1_0}) \times Y_{2_0} \times Y_{3_0} \times Y_{4_0}$$
= -0.162 x 0.474 x 0.042 x 1.344 = - 0.00434

The share of net profit in profit before tax decreased by 1.62 rub, which indicates a decrease in the effectiveness of the tax policy of the organization, due to this, for each ruble of owned funds, less net profit was received by 0.00434 rubles.

$$\Delta Y(Y_2) = Y_{1_1} \times (Y_{2_1} - Y_{2_0}) \times Y_{3_0} \times Y_{4_0} =$$
= 0.711 x -0.132 x0.042 x1.344 = -0.00528

The efficiency of investment and financial activities in the reporting period decreased by 27.78%. For each ruble of profit from sales, there was less profit before tax by 0.00528 rubles.

$$\Delta Y(Y_3) = Y_{1_1} \times Y_{2_1} \times (Y_{3_1} - Y_{3_0}) \times Y_{4_0} =$$
= 0.711 x 0.342 x -0.010 x 1.344 = - 0.00337

Due to the factor ($Y3$) in the reporting period, each ruble of owned funds accounted for less net profit by 0.00337 rubles.

$$\Delta Y(Y_4) = Y_{1_1} \times Y_{2_1} \times Y_{3_1} \times (Y_{4_1} - Y_{4_0}) =$$
= 0.711 x 0.342 x 0.032 x - 0.145 = - 0.00112

As a result of a decrease in the level of use of owned funds in ordinary activities by 10.82%, each ruble of owned funds accounts for less net profit by 0.00112 rubles.
The total influence of factors was:

-0.00434-0.00528-0.00337-0.00112= -0.014

Considering that all factors had a negative impact on the final result, it could be concluded that the participant (I) in the reporting year used its owned capital inefficiently.
Factor analysis of indicators of profitability of loan capital is presented in Table 3.

Table 3. Factors affecting the profitability of loan funds, rubles

Indicator	2018	2019	2020	Absolute deviation 2020 from (+;-)		Growth rate 2020, %	
				2018	2019	2018	2019
Return on loan capital by pure profit, Y	0.037	0.053	0.027	-0.010	-0.026	72.71	50.27
Return on sales, $Y1$	0.015	0.017	0.008	-0.007	-0.010	51.22	44.33
Total capital turnover ratio, $Y2$	0.771	0.933	0.890	0.119	-0.043	115.41	95.41
Total and loan capital ratio, $Y3$	3.161	3.271	3.889	0.727	0.617	-123.00	118.87

Source: Compiled by the authors on the basis of accounting data and financial statements of an agricultural organization.

Return on loan capital, calculated on the net profit of the organization, decreased by -0.026 points. Such indicators as return on sales (-0.010) and total capital turnover ratio (-0.043) had a negative impact.

To optimize the structure of equity and debt capital of the participant (I), as well as two other subjects under study, a methodology is proposed for determining the best capital structure, the optimality criterion in which is the ratio of maximizing profitability and minimizing financial risks.

However, practice shows that high profitability is most often achieved at the cost of risky financial decisions focused on raising loan funds [5].

Therefore, when determining the most optimal capital structure of an organization, depending on its specialization, it is advisable to use the following recommendations below to minimize the level of financial risks.

There are three principal approaches to financing various groups of assets of an organization:

(1) an aggressive approach - up to 40% of fixed capital, up to 50% of the fixed part of current assets and all variable working capital is usually financed by raising loan funds on a long-term and short-term basis;

(2) a moderate approach - up to 30% of the fixed capital and up to 20% of the permanent part of current assets is usually formed from long-term bank loans, the variable part of current assets - from short-term loan capital, the rest of the assets is formed from equity;

(3) a conservative approach - up to 20% of the fixed capital is financed by long-term bank loans and up to 50% of the variable part of current assets - by short-term bank loans. The rest of the assets is created from equity [4].

The constant part of current assets is their minimum, which is necessary for the implementation of the current activities of an economic entity. Its value does not depend on seasonal fluctuations in the volume of production and sales of products.

As a rule, current assets are fully financed by equity and long-term borrowings. Accounts receivable and cash are accepted as a permanent part of current assets.

The variable part of current assets, on the contrary, is subject to fluctuations depending on seasonal changes in the volume of activities.

They are usually financed at the expense of short-term loan capital, and with a conservative approach - partially at the expense of equity capital (for example, reserves) [2].

A significant share of loan funds in the capital structure of business entities is due to the effect of financial leverage (financial leverage). Its effect is manifested in the fact that an enterprise that rationally uses loan funds, despite their payment, has a higher profitability of its own funds [3].

Further, the level of financial leverage of the studied subjects of the agricultural business of the Penza region was calculated based on the three indicated approaches to asset financing. The initial data for calculations are presented in Table 4.

Table 4. Initial data for determination the level of financial leverage

Indicator	Agricultural business enterprises		
	I	II	III
Average annual cost of fixed capital, thousand rubles	52,115.5	34,112.5	37,481.0
Permanent part of current assets, thousand rubles.	1,919.0	1,640.5	11,684.0
Variable part of current assets, thousand rubles.	59,910.0	54,750.5	36,061.0
Total	113,944.5	90,503.5	67,226.0

Source: Own calculation.

The calculation of the share of loan capital, with three different approaches to asset financing, is presented in Table 5.

The result of determining the normative value of the financial risk ratio is shown in Table 6.

Table 5. Calculation of the share of loan capital

Method of financing	Agricultural business entities		
	I	II	III
Aggressive	$52,115.5 \times 0.4 + 1,919 \times 0.5 +$ $+ 59,910 = 81,715.7$ $81,715.7/113,944.5 = 71.7\%$	$34,112.5 \times 0.4 + 1,640.5 \times$ $\times 0.5 + 54,750.5 = 69,215.7$ $69,215.7/90,503.5 = 76.5\%$	$37,481 \times 0.4 + 11,684 \times 0.5 +$ $+ 36,061 = 54,895.4$ $54,895.4/67,226 = 84.6\%$
Moderate	$52,115.5 \times 0.3 + 1,919 \times 0.2 +$ $+ 59,910 = 75,928.5$ $75,928.5/113,944.5 = = 66.6\%$	$34,112.5 \times 0.3 + 1,640.5 \times$ $\times 0.2 + 54,750.5 = 65,312.3$ $65,312.3/90,503.5 = 72.2\%$	$37,481 \times 0.3 + 11,684 \times 0.2 +$ $+ 36,061 = 49,642.1$ $49,642.1/67,226 = 73.8\%$
Conservative	$52,115.5 \times 0.2 + 1,919 \times 0.5 =$ $= 11,382.6$ $11,382.6/113,944.5 = 10\%$	$34,112.5 \times 0.2 + 1,640.5 \times$ $\times 0.5 = 7,642.7$ $7,642.7/90,503.5 = 8.4\%$	$37,481 \times 0.2 + 11,684 \times 0.5 =$ $13,338.2$ $13,338.2/67,226 = 19.8\%$

Source: Compiled by the authors on the basis of accounting data and financial statements of an agricultural organization.

Table 6. Calculation of the normative value of the financial risk ratio

Method of financing	Agricultural business entities		
	I	II	III
Aggressive	$71.7/(100 - 71.7) = 2.5$	$76.5/(100 - 76.5) = 3.2$	$84.6/(100 - 84.6) = 5.5$
Moderate	$66.6/(100 - 66.6) = 2.0$	$72.2/(100 - 72.2) = 2.6$	$73.8/(100 - 73.8) = 2.8$
Conservative	$10/(100 - 10) = 0.1$	$8.4/(100 - 8.4) = 0.09$	$19.8/(100 - 19.8) = 0.2$

Source: Compiled by the authors on the basis of accounting data and financial statements of an agricultural organization.

Based on the coefficients of financial autonomy and financial dependence, calculated according to the data of business entities and based on three different approaches to their financing, the normative values of equity and loan capital were determined (Table 7).

Table 7. Calculation of the normative value of equity and debt capital

Method of financing	Agricultural business enterprises		
	I	II	III
Coefficient of financial enterprise autonomy	0.743	0.871	0.953
Coefficient of financial dependencies	0.257	0.129	0.047
Aggressive:			
share of loan capital	$0.743 \times 0.4 + 0.257 \times 0.5 = 0.43$	$0.871 \times 0.4 + 0.129 \times 0.5 = 0.41$	$0.953 \times 0.4 + 0.047 \times 0.5 = 0.40$
owned share	$0.709 \times 0.6 + 0.291 \times 0.5 = 0.57$	$0.871 \times 0.6 + 0.129 \times 0.5 = 0.59$	$0.953 \times 0.6 + 0.047 \times 0.5 = 0.60$
Moderate:			
share of loan capital	$0.743 \times 0.3 + 0.257 \times 0.5 = 0.35$	$0.871 \times 0.3 + 0.129 \times 0.5 = 0.33$	$0.953 \times 0.3 + 0.047 \times 0.5 = 0.31$
owned share	$0.743 \times 0.7 + 0.257 \times 0.5 = 0.65$	$0.871 \times 0.7 + 0.129 \times 0.5 = 0.67$	$0.953 \times 0.7 + 0.047 \times 0.5 = 0.69$
Conservative:			
share of loan capital	$0.743 \times 0.2 + 0.257 \times 0.5 = 0.28$	$0.871 \times 0.2 + 0.129 \times 0.5 = 0.24$	$0.953 \times 0.2 + 0.047 \times 0.5 = 0.21$
owned share	$0.743 \times 0.8 + 0.257 \times 0.5 = 0.72$	$0.871 \times 0.8 + 0.129 \times 0.5 = 0.76$	$0.953 \times 0.8 + 0.047 \times 0.5 = 0.79$

Source: Compiled by the authors on the basis of accounting data and financial statements of an agricultural organization.

The level of the financial leverage ratio is measured by the ratio of the growth rate of net profit (rn, %) to the growth rate of gross profit (*n*, %):

$$y_{ф.л.} = \frac{\Delta rn\,\%}{\Delta n\,\%}. \qquad \text{..........(1)}$$

It shows how many times the growth rate of gross profit has increased. This excess is ensured by the effect of financial leverage, one of the components of which is its leverage (the ratio of loan capital to equity). Increasing and decreasing the leverage depending on the

prevailing conditions, it could be possible to influence the profit and return on equity.

An increase in financial leverage is accompanied by an increase in the degree of financial risk associated with a possible shortage of funds to pay interest on loans and borrowings. A slight change in gross profit and return on invested capital in conditions of high financial leverage could lead to a significant change in net profit, which is dangerous during a decline in production.

Table 8. Calculation of the normative value of the financial leverage ratio

Method of financing	Agricultural business enterprises		
	I	II	III
Aggressive	0.43/0.57 = 0.75	0.41/0.59 = 0.69	0.40/0.60 = 0.67
Moderate	0.35/0.65 = 0.54	0.33/0.67 = 0.49	0.31/0.69 = 0.45
Conservative	0.28/0.72 = 0.39	0.24/0.76 = 0.32	0.21/0.79 = 0.27

Source: Compiled by the authors on the basis of accounting data and financial statements of an agricultural organization.

Comparison of the actual value of the financial leverage ratio (0.346), calculated according to the participant (I), with the obtained standard value (0.39) for 2020, allows us to conclude that in the reporting period he used a conservative approach to financing groups of his assets. Participant (II) acted in a similar way. The leverage ratio was 0.148. Both business enterprises finance from short-term loan capital only half of the variable part of current assets, and everything else is financed from their owned and long-term loan funds. The degree of financial risk when choosing a conservative approach is low, which could characterize it as the most optimal when determining the capital structure. Participant (III) uses a moderate approach to asset financing in its practice (financial leverage ratio was 0.491, and the resulting normative value was 0.45). This is a riskier financing approach given the current economic conditions. However, the priority in choosing a strategy for attracting loan funds is predetermined by the prospects for the further development of the organization and largely depends on the specialization of the activity of the economic entity.

CONCLUSIONS

Management of the capital structure of agricultural business entities should become an important component of their financial policy. The best ratio of owned and loan sources of financing of activities is achieved subject to the maximum increase in net return on equity and an acceptable level of financial risks, which ensures the maximum market value of the business. The success of the financial strategy of the organization as a whole depends on how effectively the capital structure is optimized.

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