Formation of funding sources for agribusiness organizations

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Abstract. The paper is devoted to summarizing the experience of forming sources of funding in emerging markets and analyzing the efficiency of capital use using the example of agricultural enterprises in the South of Russia. The literature review covers studies revealing the determinants of the formation of sources of capital funding in both developed and emerging markets. It is noted that the features of the establishment of business structures and the country's financial system are factors in the choice of hierarchy theory by the management of companies in the formation of capital structure. A study of the impact of the weighted average cost of capital on return on assets was carried out using the example of agricultural enterprises in the South of Russia. The obtained results confirm the developed hypotheses about the negative impact of an increase in the volume of debt financing of agribusiness organizations on the return on assets, as well as about the choice of a conservative agricultural policy by agricultural organizations in forming funding sources. These results are close to the results of applied research on the formation of capital structure in other sectors of the Russian economy.

1. Introduction
The agribusiness of Russia has shown very impressive results in recent years. At the end of 2017, compared with 2013, the sown area of agricultural crops of all categories increased by 3.27%, the annual yield of grain and leguminous crops increased by 4.03%. In crop production, wheat (by 11.28%) and sunflower (9.86%) production are developing most dynamically [1].

Production of livestock and poultry for slaughter increased by 19.65% for the same period. In the livestock sector, poultry meat (by 28.71%), and pork (26.50%) production are developing most dynamically. Lamb production increased by 10.61%, and beef production continues to decline (−2.96%). The main producers of meat products are large agricultural organizations, whose production volume grew by 32.80%. The proportion of large farms in meat production is constantly growing (from 66.92% in 2013 to 74.28% in 2017) [1].

The summary data on the organizational forms of agricultural producers in the structure of production presented on the Rosstat (Russian Federal State Statistics Service) portal show that large agricultural organizations, whose share in the total structure of agricultural products exceeds 50%, make a significant contribution to ensuring the growth of commodity output. The growth rate of agricultural products in peasant farms is higher than the corresponding indicators of both large agricultural companies and the industry as a whole, but the share of their participation in the overall structure of the agribusiness remains at the level of 12-13%. To maintain the prevailing growth rate, experts recommend gradually moving from the support of some of the largest agricultural firms and agricultural holdings to mass support of medium and small agricultural businesses [2]. The households demonstrate a negative dynamics of production. This indicates not only the transition of production to
professional producers, but also the reduction in the number of private farmsteads and the local
development of agriculture in the country, which also indicates the need to change the approach to
state support for agriculture.

The above results are the result of the development of the material base of agricultural producers
and processors, which are provided with financial resources. The formation of sources of funding
agribusiness has a number of features that are formed under the influence of factors in the functioning
of the industry itself: seasonal, low attractiveness of banking institutions [3] and labor resources,
budget support. Therefore, despite the presence of a large number of studies devoted to assessing the
structure of capital, the formation of funding sources for agricultural organizations is an urgent
scientific problem. This sector is also distinguished by a certain isolation from the rest due to the lack
of experience in independently choosing sources of funding and the search for their optimal structure.

It is equally important to remember that the formation of large farms that can concentrate large
financial resources and technologies will lead to increased competition in the agricultural market, and
this will require market participants to search for additional sources of funding and ways to optimize
them.

2. Literature review and research hypotheses
Since the formulation of the theory of capital structure to the present, the vast majority of researchers
have come to the conclusion that there is no optimal structure of funding sources acceptable to all
entities [4-6].

The task of researchers is complicated by the fact that all three basic theories of capital (the theory
of compromise, the theory of hierarchy and the theory of game in the market) continue to remain
relevant. Nevertheless, most studies based on empirical data on emerging markets conclude that these
markets are influenced by hierarchy theory, which proceeds from the simplest principle of the
sequence of choosing sources of funding: from more profitable to less profitable [7].

In particular, in [8], the results of the regression analysis of financial decisions on the materials of
Russian companies in the period from 2000 to 2004 indicate the presence of a pronounced tendency of
company management when deciding on sources of funding to the theory of hierarchy.

The commitment of Russian public companies when choosing sources of funding to the principles
of hierarchy theory is also discussed in [9]. This study is distinguished by both a large sample of
objects and determinants that affect sources of funding, which allows considering the results obtained
as very reliable.

Among the factors influencing the choice of the postulates of the theory of hierarchy, a high level
of information asymmetry in emerging markets is called in [10, 11]. In conditions of insufficient
information, management prefers simpler algorithms for selecting sources of funding, which is a “fee
for accounting for uncertainties.”

In [12], the postulates of the theory of hierarchy in the construction sector of Russia are confirmed
with respect to such determinants as profitability and risk. And regarding such determinants as the size
of assets and the possibilities of a tax shield, companies prefer theses of the theory of compromise.

Various options for the theoretical justification of management decisions of corporate structures in
Eastern Europe are discussed in [6]: analysis of data from 400 large companies showed that none of
the theories fully reveals the features of the formation of funding sources in this market. Management
decisions of companies are partly consistent with the theory of compromise, and partly with the theory
of hierarchy.

It is important to note that the formation of funding sources for companies is not just based on the
preferences of their management for one of the theories of capital structure, but under the influence of
a number of determinants. The list of factors that influence the structure of funding sources is not
strict. In our opinion, the choice of certain determinants for research purposes is purely applied in
nature and depends on the objectives of the study, the industry being studied, and the availability of
information sources. Most often they are limited by the following determinants: profitability, company
size, growth dynamics, risks, asset structure, availability of sources of loan-based funding, taxes, macroeconomic environment [12].

There is a relationship between the volume of borrowed resources attracted by the company and the main determinants: direct or inverse. The task of the researcher is to find and describe this dependence. A review of the literature allows talking about the following dependence of the main determinants of the formation of the structure of sources of funding companies:

Between the profitability of the company and the volume of attracting external financing, an inverse relationship is more often found, i.e. increase in leverage leads to a decrease in profitability. This conclusion was reached in [5, 13-15]. It is believed that with an increase in profitability, companies increase debt financing [16], however, in a study [17], it is noted that Russian companies do the opposite, to save cash flow for large shareholders (maximize dividends), which corresponds to the “franchise value” hypothesis [18].

Regarding the size of companies and the volume of debt financing, the situation is less clear and more likely individual. A number of studies using international data indicate a positive effect of attracting additional capital for large market participants [13, 14, 19]. However, the data on the assessment of Russian companies suggest the opposite: the higher the size and effectiveness of the company, the more negative the investment effect due to additional financing [17].

Regarding the dependence of the dynamics of asset growth and the level of debt financing, a direct correlation is found [14, 20]. But there are opposite results, for example, in [21], according to the results of data analysis using the example of companies in Malaysia. The data on Russian construction companies tested in [12] indicate the absence of a significant relationship between these indicators.

The inverse relationship is traditionally shown between the degree of risk and the volume of attracting debt financing [13, 14, 21]. The level of risk is assessed through the standard deviation of cash flow indicators: revenue or operating profit. High risks expressed in unstable cash flow do not allow both companies and lenders to be confident in their ability to service the additional debt burden.

The dependence of the financial results of the organization on the structure of funding sources is the base point for finding the optimal capital structure. Therefore, during the analysis, two hypotheses will be tested:

Hypothesis 1. An increase in the volume of debt financing of agricultural organizations negatively affects the profitability of their assets.

Hypothesis 2. Most agribusiness entities prefer a conservative asset financing strategy.

3. Materials and methods

The purpose of this study is to assess the impact of the weighted average cost of capital on return on assets using the example of agricultural enterprises in the South of Russia. The research sample included 15 large agricultural organizations involved in the production of grain crops. One of the factors in the formation of the sample is the availability of data on the financial activities of the organization on the Interfax information disclosure portal (www.e-disclosure.ru).

At the first stage, we will analyze the general structure of capital and assets, which will allow determining the type of financing that the studied agricultural organizations are prone to.

The method of calculating indicators that reveal the results of the financial activities of the sample and form the weighted average cost of funding sources are presented in table 1.

| Indicator name   | Calculation method                        |
|------------------|------------------------------------------|
| Return on assets (ROA) | Net income / Assets (average for the period) |
| Return on equity (ROE)   | Net income / Equity (average for the period)   |
| Return on debt (ROD)     | Net income / Debt (average for the period)    |
| Indicator name                      | Calculation method                                                                 |
|-----------------------------------|-------------------------------------------------------------------------------------|
| Financial leverage (FLS)          | Debt / Equity                                                                       |
| Cost of debt (COD)                | Interest paid * (1-0.2) / Debt (average for the period)                              |
| Financial leverage effect (DFL)   | (Return on Assets - Value of debt) * Financial leverage                              |
| Weighted average cost of capital  | Cost of equity * (Equity / Assets) + Cost of debt * (Debt / Assets)                 |

Due to the lack of reliable data on dividend payments, we assume an alternative risk-free rate as the cost of equity, which is the weighted average key rate indicator of the Bank of Russia.

The impact of the weighted average cost of capital on return on assets is assessed using the Pearson pair correlation coefficient.

4. Results

Table 2 presents the results of the analysis of the structure of capital and assets of agricultural organizations.

It should be noted that most organizations pursue a conservative policy in relation to attracting debt funds, as indicated by the average value of the share of equity in the sample, which exceeds 60%. At the same time, there are some companies, the share of equity of which reaches 95%. This type of funding allows fully covering the needs of the business entity in financing non-current assets, and the amount of own working capital with a large margin of safety forms current assets. This reduces financial risks, but at the same time, these companies do not use borrowing options to expand their activities and implement investment programs. On the other hand, the conservative financial policy pursued by agricultural organizations is also connected with restrictions from the banking sector, which is reluctant to participate in financing agricultural producers. De facto, only two credit organizations of the country participate in agricultural lending, which account for almost 86% of all issued loans, the total amount of which in 2017 amounted to 1,569 billion rubles, of which 365 billion rubles were investment loans. [1]. The total volume of loans to agricultural organizations is only 3.7% of the total loans of Russian banks to the non-financial sector.

Only a few companies from the studied sample can be attributed to the aggressive type of funding with a share of equity of 30%. Such entities are subject to financial risks, since equity does not fully fund non-current assets, and current assets are financed from short-term debt funds. Such companies include, for example, Argokompleks named after N.I. Tkachev receives bank financing despite unsatisfactory financial results.

Table 3 presents the results of indicators for assessing the efficiency of capital use for 2016 and 2017. In 2017, the average for the sample showed a decrease in profitability indicators, which is consistent with industry-wide trends. Only four out of 15 organizations have positive dynamics, which may indicate a balanced financial policy that allows achieving faster growth rates of profit. It should be noted that these results are partially associated with a decrease in the balance sheet currency of individual companies due to the repayment of long-term and short-term debt funds.

This conclusion confirms the developed thesis that an increase in the volume of debt financing of agricultural organizations negatively affects the profitability of their assets.

The indicator of financial leverage for the analyzed period on average in the sample does not exceed 1, which confirms the hypothesis of conservatism of agricultural organizations regarding the attraction of funding sources. But at the same time, it should be noted the increased volatility of this indicator by the end of 2017, which, along with a decrease in ROA and rates in the financial market, may mean an attempt to search for alternative funding sources. This is also evidenced by the growth of the “financial leverage effect” indicator: by the end of the analyzed period, the average for the sample increased from 2.54% to 3.82%, which means a corresponding increase in return on equity through the
use of debt funds. At the same time, it should be mentioned that 1/3 of the studied entities in 2017 demonstrate a negative value of this coefficient and, accordingly, inefficient use of debt funds.

At the last stage, the impact of the weighted average cost of capital on the return on assets is assessed using the Pearson pair correlation coefficient, which showed the absence of a relationship between these indicators. This once again confirms the insignificant influence of market factors on the formation of funding sources for agricultural organizations.

Table 2. The structure of capital and assets of the sample for 2016-2017 (Source: Authors' calculations).

| Organization                        | Structure of capital | Structure of assets |
|-------------------------------------|----------------------|---------------------|
|                                     | 2016  | 2017  | 2016  | 2017  | 2016  | 2017  |
| E, % SD, % LD, % E, % SD, % LD, %  |       |       |       |       |       |       |
| Agro-Association “KUBAN” (AK)      | 55.56 | 34.83 | 9.61  | 54.21 | 39.26 | 6.53  |
| Agrofirm “Razdolye” (AR)           | 81.16 | 10.81 | 8.03  | 83.06 | 8.02  | 4.83  |
| “Kolos” CJSC (CKL)                 | 52.36 | 47.24 | 0.40  | 72.40 | 6.87  | 26.28 |
| Grain farm Kushchevsky (GK)        | 27.58 | 46.50 | 25.92 | 21.94 | 56.24 | 21.82 |
| Kolos (KO)                         | 95.12 | 4.88  | 0.00  | 94.00 | 6.00  | 0.00  |
| Collective agricultural enterprise (CE) | 41.58 | 58.42 | 0.00  | 38.06 | 14.22 | 47.72 |
| Novoplastunovskoe (NO)             | 82.64 | 14.37 | 2.99  | 93.77 | 4.68  | 1.55  |
| Perekopskoe (PE)                   | 82.62 | 17.38 | 0.00  | 85.99 | 0.44  | 13.57 |
| RASSVET (RA)                       | 91.68 | 2.04  | 6.28  | 94.56 | 1.73  | 3.71  |
| Rodnik (RO)                        | 87.20 | 1.56  | 11.24 | 91.59 | 0.19  | 8.22  |
| Perelazovskoe (PR)                 | 43.15 | 56.85 | 0.00  | 62.18 | 37.82 | 0.00  |
| Trad (TR)                          | 29.87 | 15.17 | 54.96 | 21.73 | 17.20 | 61.07 |
| Argocomplex named after N.I. Tkachev (AT) | 42.66 | 26.00 | 31.34 | 44.86 | 24.51 | 30.63 |
| Tsimlyansky (TS)                   | 60.63 | 39.37 | 0.00  | 65.35 | 34.65 | 0.00  |
| CJSC named after T.G. Shevchenko (CS) | 51.52 | 44.13 | 4.35  | 45.24 | 54.76 | 0.00  |

Descriptive statistics

|                        | Average value | Deviation | Minimum | Maximum |
|------------------------|---------------|-----------|---------|---------|
| E, % SD, % LD, %       | 61.69         | 0.23      | 27.58   | 95.12   |
| 2016 2017              | 27.97          | 0.20      | 1.56    | 58.42   |
| 2016 2017              | 15.51          | 0.17      | 0.40    | 54.96   |
| 2016 2017              | 64.60          | 0.26      | 21.73   | 94.56   |
| 2016 2017              | 21.77          | 0.19      | 0.19    | 56.24   |
| 2016 2017              | 18.22          | 0.20      | 0.73    | 61.07   |
| 2016 2017              | 45.17          | 0.14      | 0.73    | 71.81   |
| 2016 2017              | 54.83          | 0.14      | 0.00    | 73.37   |
| 2016 2017              | 47.92          | 0.15      | 0.00    | 78.39   |
| 2016 2017              | 52.08          | 0.15      | 0.00    | 73.46   |

Table 3. Indicators of efficiency of capital use (Source: Authors' calculations).

| Org. | ROA, % | ROE, % | ROD, % | FLS | COD, % | DFL | WACC, % |
|------|--------|--------|--------|-----|--------|-----|---------|
|      | 16     | 17     | 16     | 17  | 16     | 17  | 16      | 17   | 16    | 17   |
| AK   | 17.2   | 12.6   | 17.6   | 11.5 | 19.4   | 13.9| 1.0     | 0.84 | 9.5   | 7.9  | 0.08  | 0.04 | 10.1 | 8.6  |
| AR   | 14.8   | 21.7   | 18.1   | 25.7 | 80.8   | 139.6| 0.2     | 0.15 | 10.2  | 9.1  | 0.01  | 0.02 | 10.5 | 9.1  |
5. Conclusion

Assessment of the efficiency of using funding sources for agricultural organizations has confirmed both of our hypotheses. Regarding the hypothesis of the conservatism of agricultural organizations in the formation of funding sources, it should be noted that indeed the majority of agribusiness entities prefer a conservative asset financing strategy. We assume that the reason for this is, first of all, the high risks of lending to agricultural organizations associated with weather dependence, insufficient distribution of insurance services in the sector and low profitability of most households, i.e. the unattractiveness of the industry for financial and credit institutions. In addition to this, the demotivating effect is caused by the availability of an alternative in the form of state financial support.

Regarding the hypothesis of a decrease in the return on assets of agribusiness organizations with an increase in the volume of debt financing, it should be noted that the low profitability does not make it possible to compensate for market interest payments on loans. In the absence of subsidies for the repayment of part of the interest on the loan, the profitability of agricultural producers is sharply reduced. This can also be judged by the content of the National Report “On the progress and results of the implementation of the State Program for the Development of Agriculture and Regulation of Agricultural Products, Raw Materials and Food Markets for 2013-2020”: without taking into account state subsidies, the return on capital of agricultural producers is 8.5% [1].

The results of applied research in other sectors of the Russian economy (in the construction industry) also indicate that domestic entrepreneurs perceive debt capital as a risky source of funding, especially in conditions of high volatility [12].

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