



## ORIGINAL ARTICLE


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## Determinants of capital structure in Russian small and medium manufacturing enterprises

**JEL Classification:** C23; G32

**Keywords:** *financial leverage; capital structure; SMEs, small and medium enterprises; own funds; borrowed funds*

### Abstract

**Research background:** Capital structure decisions are very important for any kind of business, but they have a special meaning for small and medium enterprises (SMEs), because their strategic miscalculations can lead to a crisis or even bankruptcy much faster due to the limited scope of their activities.

**Purpose of the article:** The research investigates the basic theories of capital structure and their applicability to SMEs considering the specificities of their functioning. The study aims to identify the determinants of SMEs own and borrowed funds ratio and the main driving forces of their financial decisions. The paper identifies the reasons why SMEs have difficulties in attracting borrowed funds and problems with collateral provision. The paper also presents the dynamics of the capital structure and the composition of the borrowed funds in Russian SMEs.

**Methods:** The research is based on the panel data of Russian manufacturing SMEs in the period of years 2010–2018. The panel data is unbalanced to avoid a survival bias. The financial ratios selected as variables was calculated using consolidated financial statements published by Russian Federal State Statistics Service. The statistical relations between the indicators were performed by a fixed effects regression with a dummy.

**Findings & Value added:** The results of the research identified that current liquidity and asset structure have the statistically significant negative impact on the financial leverage in Russian manufacturing SMEs. The determinants of capital structure in Russian SMEs have not been investigated before, so the presented empirical findings are novel and can be used as a base for further research and analysis.

## **Introduction**

The sufficiency of financial resources is the driving force of any business, without it a company cannot function, develop and maintain its market niche. Capital structure decisions are very important for enterprises, because they affect its financial condition and can lead to bankruptcy in case of adverse developments. There is a variety of scientific works in capital structure area, but only a small part of them is devoted to the debt and equity capital ratio in small and medium-sized enterprises (hereinafter-SMEs). The possible reason of it is limited and insufficient reliability of information about SMEs activities, especially small ones. They often do not have to disclose their financial details, SMEs accounting statements are not subject to mandatory audit and can be kept in a simplified form.

At the same time, SMEs are best suited to meet fluctuating needs of the market due to their innovation, initiative, creativity and lower fixed cost ratio that makes them more flexible than large enterprises. Taking into account the important role of SMEs in economic and technological development, the study is very relevant, especially because access to finance is one of the most pressing SMEs problems.

Low credit risk rating, dependence on customers and suppliers, small scale of operations and less diversification in comparison to large enterprises impose certain restrictions on application of the capital structure theories to SMEs. However, the paper attempts to find out how the basic theories can explain financial decisions of SMEs. The aim of the paper is identification of capital structure determinants in Russian SMEs, in particular, manufacturing ones, using a regression model. Based on data availability, five factors were analysed — current liquidity, assets structure, taxation, returns on assets and return on sales.

The article is composed of introduction, three chapters, discussion and conclusion. First chapter presents a literature review and highlights the basic capital structure theories with their realisation in different countries according to SMEs modern research. The second chapter contains the methodology and statistic data. The last chapter expresses in figures the results of the investigation. The paper concludes with the findings and their interpretations.

## **Literature review**

Capital structure research began in 1958, when Modigliani and Miller published their paper where they assumed that capital structure of an enterprise

does not depend on its value and the cost of capital (Modigliani & Miller, 1958, pp. 261–297). Assumptions about ideal markets, the absence of transaction and agency costs made the theory not applicable in practice, but it initiated further research in this field. In particular, Modigliani and Miller modified their theory in 1963, taking into account taxation, thus bringing it closer to the real economic conditions (Modigliani & Miller, 1963, pp. 433–443). The researchers linked the effective tax rate to financial leverage and concluded that companies prefer debt financing if they receive a tax deduction from interest payments. The theory was called the trade-off theory, but its validity for SMEs can be called into a question due to the fact that their activities are not so profitable and tax savings could not compensate for the costs associated with debt financing. In addition, the effect of a tax shield is significant only in countries with sufficiently high tax rates, suggesting tangible potential savings on taxes.

The peaking-order theory developed by Myers and Majluf (1984, pp. 187–221) seems to be more applicable for SMEs. According to this theory, enterprises choose financial sources in a certain order, without setting a goal of maximizing company value. It is particularly true for SMEs because they often do not have any choice in funding sources to optimize the capital structure and are forced to use the most affordable of them. The peaking-order theory is also based on the assumption that management of a company is better informed about its real value than external creditors and investors. So-called information asymmetry leads to a disproportionate increase of borrowed capital cost because lenders try to reduce their risk. Therefore, in case of financial need enterprises primarily tend to use internal sources. If they are not available or insufficient, enterprises turn to debt financing. The least acceptable method of financing is involving new participants into business. It leads to a risk of losing control over activities and is used only in cases when the other sources could not be engaged.

Another important capital structure concept is related to life cycle of companies (Lewis & Churchill, 1983, pp. 1–12; Scott & Bruce, 1987, 45–52). Each stage of life cycle is associated with using of the specific financing tools and their set expands with a company development. This concept is actually a logical continuation of the peaking-order theory. Startups, as a rule, have the greatest problems of information asymmetry. Then credit history develops with a company, assets in the form of stocks, receivables and fixed assets accumulate and are used to secure debt, so opportunities for attracting financial resources expand, their cost decreases with the risk.

The influence of information asymmetry on SMEs capital structure with taking into account the costs of data collection and processing was investigated at the end of the last century by Ennew and Binks (1995, pp. 57–73, 1997, pp. 167–178). Financial monitoring can be very expensive, especially considering time required for its realization and cost of information collecting may not be comparable to profitability. Collateral provision could scale down necessary monitoring, however, the need to risk property, especially personal, discourages many SMEs from borrowing.

SMEs capital structure research of the past decade is mostly based on testing hypotheses in order to find out which of two theories — trade-off or pecking-order theory — works better in certain conditions. Depending on a country affiliation, studies have identified different determinants with opposite effects on the capital structure. The research tested the multivariate regression models for panel data using the coefficients of the capital structure as dependent variables. Profitability, lifetime, size, growth trend and assets structure were mostly often chosen as independent variables.

### *Profitability*

Profitability is recognized as the most important determinant of SMEs capital structure almost in all the studies. The trade-off theory links profitability with a possibility of using a tax shield and suggests a direct relationship between profitability and financial leverage. Direct dependence is also explained by the fact that financial markets are reluctant to offer funds to low-income companies. High level of borrowed funds is accompanied by a significant interest burden and it negatively affects value of a company which is already low. The pecking-order theory assumes that more profitable companies have more self-sufficiency and don't need to borrow, that suggests an inverse relationship between profitability and financial leverage.

Studies of many countries show that more profitable SMEs prefer own financial resources, in particular retained earnings — Italian (Rossi, 2014, pp. 130–144), Spanish (Di Pietro *et al.*, 2018, pp. 37–60), Brazilian (Forte *et al.*, 2013, pp. 347–369), Portuguese (Proenca *et al.*, 2014, pp. 182–191), Greek (Balios *et al.*, 2016, pp. 1–11), Polish (Predkiewicz & Predkiewicz, 2015, pp. 331–340), Macedonian (Ferati & Ejupi, 2012, pp. 51–58), Malaysian (Saarani & Shahadan, 2013, pp. 64–73) SMEs, as well as French microenterprises (Adair & Adaskou, 2017, pp. 60–75) are characterized by an inverse relationship between profitability and financial leverage. In case of Croatian SMEs the inverse relationship is observed with respect to long-term financial leverage (Sarlija & Harc, 2016, pp. 251–266). The direct

impact of profitability on financial leverage was revealed only for small (except micro) and medium enterprises in France. At the same time, Spanish researchers emphasize that if more profitable SMEs turn to bank lending, they receive funds for longer use than less profitable enterprises.

### *Age and size*

In the framework of the trade-off theory, the direct relationship between a company age and financial leverage is usually explained by the fact that long-existing enterprises have established a reputation and experience, which is why they can quickly attract debt financing. The peaking-order theory is interpreted that more mature companies have stable profits and, therefore, they have less need to resort to borrowed funds. Age of an enterprise has been recognized as significant and having inverse relationship with financial leverage for Irish (Bhaird & Lucey, 2010, pp. 357–375), French, Spanish, Portuguese, Brazilian SMEs. Brazilian scientists explain it by the fact that long-established SMEs are more conservative in choosing of financial sources.

The trade-off theory, as a rule, is interpreted that the size of an enterprise has a direct impact on financial leverage, because larger companies have a lower risk of bankruptcy, and therefore a greater possibility of borrowing. According to the peaking-order theory, a share of borrowed funds should also increase with the size of a company, because larger companies have a less significant problem of information asymmetry and easier access to financial markets. Size has direct relationship with financial leverage in SMEs of Spain, Portugal, Greece, Italy and with long-term debt in Ireland and Croatia (Harc, 2015, pp. 315–324). At the same time, Croatian SMEs are characterized by an inverse relationship between size and total debt ratio (Sarlija & Harc, 2016, pp. 64–73).

### *Assets structure and tendency to growth*

Tangible assets in general, and property, plant and equipment in particular, are a stable source of profit, determine possible bankruptcy costs and can be used as collateral, realized if a company is unable to repay its obligations. The trade-off theory directly links this factor with debt financing — the higher the level of tangible assets, the greater the debt of an enterprise, other things remaining constant. In the framework of the peaking-order theory, the level of tangible assets serves for creditors is an indicator of reliability of a borrower, reducing the impact of information asymmetry. There is a direct relationship between a share of tangible assets and long-

term financial leverage of Portuguese, Italian and Croatian enterprises (Harc, 2015, pp. 315–324), as well as total debt ratio in French SMEs. Asset structure has the opposite effect on short-term financial leverage in Portuguese and Italian SMEs and on total financial leverage in Spanish enterprises.

From the point of view of the trade-off theory a rapid growth of an enterprise entails a threat to stability and high risk, which implies an inverse relationship between growth and financial leverage. According to the peaking-order theory, fast-growing enterprises may lack own funds, so they are forced to turn to external financing. French SMEs with a tendency to grow are highly leveraged, for Croatian (Harc, 2015, pp. 315–324), Spanish, Italian enterprises this statement is true only in relation to long-term financial leverage.

### *Other factors*

In addition to the factors listed above, the research of the last decade also examined cross-sectoral and regional differences in SMEs capital structure, mainly due to differences in asset composition and growth rates. For example, Spanish scientists found that SMEs are less likely to resort to debt financing in more developed regions comparing to less developed. Significant impact of an enterprise industry on capital structure was revealed in the study of Polish SMEs (Koralun-Bereznicka & Ciolek, 2016, pp. 93–107).

The impact of short-term tax shields, specifically depreciation, on SMEs capital structure was examined in the papers of Malaysian (Zabri, 2012, pp. 132–146) and Portuguese researchers (Serrasqueiro & Caetano, 2015, pp. 445–466). In the first case, the reverse effect on short-term, long-term and total financial leverage was revealed, in the second case, no statistically significant effect was found.

The influence of liquidity on financial leverage was studied by Tunisian scientists: a direct link was found in industry, while there was no statistically significant relationship in the service sector (Hadriche & Ghorbel, 2014, pp. 96–111).

### **Research methodology**

The main purpose of the paper is detailed consideration of Russian SMEs capital structure determinants. The data for analysis is collected from Russian Federal State Statistics Service and includes minimum 3580 small and

48838 medium commercial enterprises of manufacturing industry. These enterprises are more suitable for the investigation, because production nature of their activities is associated with a regular significant need for financial resources, while in other industries an equal need arises from time to time. The panel data is unbalanced — the enterprises are not required to be in the sample for the entire research period thus avoiding survival bias. For the analysis, the financial statements of manufacturing SMEs from 2010 till 2018 published by Russian Federal State Statistics Service was consolidated and the following indicators were calculated:

- debt ratio (DR) – share of short-term and long-term debt in balance sheet total;
- current liquidity (LIQ) – ratio of current assets to current liabilities;
- assets structure (STR) – ratio of non-current to current assets;
- taxation level (TAX) – ratio of the difference between earnings before tax and net income to earnings before tax;
- return on assets (ROA) – ratio of net income to total assets;
- return on sales (ROS) – ratio of operating income to sales.

Current liquidity characterizes a company's policy regarding lending to customers, amount of stock balances, disposal of temporarily free cash, i.e. effectiveness of current assets management in general. Assets structure, on the one hand, is associated with willingness of owners to invest in long-term projects that are quite risky, and on the other hand, gives potential creditors information about enterprise reliability. Taxation level is largely determined by literacy of accounting policy, which includes such an important element as using bonus depreciation, allowing enterprises that actively invest in fixed assets to get significant reduction of income tax in the period of their commissioning. Return on sales shows ability of an enterprise to manage production costs effectively. This indicator was chosen in order to exclude such a factor as currency fluctuation. It is of great importance in calculation of Russian SMEs financial results, but almost uncontrollable by companies. Return on assets measures how efficiently a company can manage all its assets to generate profits.

For empirical testing the dependence Russian SMEs financial leverage on asset structure, liquidity, profitability and taxation a fixed effects panel regression was constructed. It has the following form:

$$DR_{it} = \beta_M + \beta_1 D_i^S + \beta_2 STR_{it} + \beta_3 LIQ_{it} + \beta_4 ROS_{it} + \beta_5 ROA_{it} + \beta_6 TAX_t + \varepsilon_{it}, \quad (1)$$

where:

t – the period of time,

$i$  – type of the sample (small or medium enterprises),  
 $\beta_M$  – intercept for the medium-sized enterprises,  
 $\beta_1, \dots, \beta_6$  – the regression coefficients,  
 $D_i^S$  – dummy variable for the small-sized enterprises ( $D_i^S = 1$  for small-sized enterprises,  $D_i^S = 0$  for medium-sized enterprises),  
 $\varepsilon_t$  – a random perturbation.

A dummy was included in the regression to calculate the difference between the intercepts for the small and medium enterprises.

## **Results**

Referring to the capital structure of Russian SMEs in the period from 2010 to 2018 (see Figure 1), it should be noted that almost throughout the period under review, both small and medium-sized enterprises had a significantly low share of their own funds in financial sources (its optimal value is 0.5), i.e. the Russian SMEs sector lacks own financial resources.

At the same time, the main debt liability in small enterprises was accounts payable: their share fluctuated from 48 till 69,5% in years 2010-2018 (see Figure 2). The share of accounts payable was also quite large in medium-sized companies, but it is characterized by a greater volume of short-term and long-term borrowings.

Such situation bases on the main problem of Russian SMEs — differentiation of interest rates depending on size of enterprises. For example, when Sberbank provides loans to small and medium-sized enterprises, the maximum rate is 10.6% and 9.6% respectively. Most of the studies discussed above also show size differentiation of interest rates by banks alongside increased administrative rigidity in lending to SMEs.

Financial institutions are usually concerned about the possibility that after receiving a loan, a company will change its behavior to detriment of their interests. Collateral provision, including the personal assets of the owners, is a means for banks to encourage borrowers to maximize the efficiency of their activities. But not all the types of assets can be adequately assessed in terms of credit coverage and a possibility of their immediate sale to other market participants in the event of a company bankruptcy. The sale price of collateral assets will be significantly lower than their value in the context of an existing company. Thus, it can be difficult for SMEs and credit institutions to reach agreement on the terms of a contract. The lack of mutual trust only exacerbates the situation, bank financing is not provided or its terms are disadvantageous and SMEs are forced to increase accounts payable.



The descriptive statistics for the indicators used in the regression model are presented in Table 1. Table 2 demonstrates the results of the analysis. We can see that the intercept for the small enterprises is lower by about 0.07 compared to the medium ones and the difference is significant. Only two of the selected factors have an impact on the capital structure of Russian manufacturing SMEs — current liquidity and asset structure are significant at the level of 0.1%, the relationship is negative. Profitability and taxation don't have significant influence on financial leverage.

## **Discussion**

The above analysis of SME capital structure studies has shown that more profitable enterprises primarily prefer to use internal resources and are less debt financed, so their decisions relate to the pecking-order theory. Russian manufacturing SMEs are an exception in this regard — in years 2010–2018 ROS and ROA do not have any significant effect on their capital structure. The same result was found in Indonesian (Rokhayati *et al.*, 2019, pp. 1155–1161) and Malaysian SMEs (Zabri, 2012, pp. 132–146).

The calculations also show that financial leverage has an inverse relationship with assets structure and current liquidity in Russian SMEs engaged in manufacturing. A similar impact of assets structure was found in Spanish (Di Pietro *et al.*, 2018, pp. 37–60) and Greek studies (Balios *et al.*, 2016, pp. 1–11). As for the liquidity, it was found significantly negative for financial leverage in Portuguese small firms (Serrasqueiro *et al.*, 2016, pp. 13–28).

The fact that enterprises with a higher portion of non-current assets use less borrowed funds is associated with greater opportunities for financing with self-generated cash flows. The negative relationship between liquidity and financial leverage corresponds with the high share of accounts payable in borrowed funds — the enterprises with an ability of quick covering their short-term liabilities don't see a reason to overpay for trade credit without the necessity.

It should be highlighted that the capital structure of Russian manufacturing SMEs seems to be very unbalanced. Low share of bank financing in contrast to extremely high share of accounts payable gives reason to think about possible ways out of this situation. There is an empirical evidence that SMEs are more likely to rely on trade credit financing if they are experiencing difficulty in accessing bank financing (McGuinness & Hogan, 2014, pp. 1–34, McGuinness *et al.*, 2018, pp. 81–103). Making an adjustment that only manufacturing SMEs were considered in this paper, it

should be noticed that they are more dependent on trade credit compared to other industries (Rahman *et al.*, 2018, pp. 132–148). However, according to the Russia Small Business Index Survey (RSBI), obtaining credit is perceived as difficult for a third of the SMEs (World bank, 2019). Such difficulties can impede SMEs development which means the relations between Russian credit institutions and SMEs need to be improved.

## **Conclusions**

Management decisions regarding SMEs financing sources depend on many factors — a current stage of development, operating conditions, individual characteristics of an enterprise, including its industry, degree of innovation and competitiveness. The approach of owners to capital structure based on their personal qualities, preferences and risk appetite is also important.

Different studies demonstrate diametrically opposite relationship between the same factors and SMEs capital structure or their absence. So, there are no capital structure guidelines suitable for all types of SMEs, as their operating conditions can vary significantly depending on a country, region and industry.

The paper results are limited by the fact that not all the SMEs submit statistical reports and often they are not audited. The lack of information also takes place — Russian Federal State Statistics Service publishes narrow indicators of SMEs financial statements. It excludes the possibility to calculate more detailed coefficients used as independent variables that could be more effective and let make more profound conclusions.

The future direction of research might consider investigating such an element of borrowed funds as deferred tax liabilities, and in particular, bonus depreciation, which is essentially an interest-free loan provided by the state to enterprises with high investment activity.

Testing the issues raised in this paper across SMEs of different regions and economic sectors would help to form a deeper understanding of SMEs capital structure decisions. In addition, it is necessary to study capital structure determinants, given whether borrowed funds are long-term or short-term, as conditions of their provision may differ significantly. Trade credit as the main external funding source of Russian SMEs also require detailed consideration.

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## Annex

**Table 1.** Descriptive statistics for the period of years 2010–2018

Variable	Size	Mean	Standard deviation	Minimum	Maximum
DR	small	0.7503	0.0743	0.5973	0.8386
	medium	0.7547	0.0222	0.7048	0.7788
STR	small	0.3965	0.1315	0.2896	0.6543
	medium	0.4593	0.0493	0.3890	0.5420
LIQ	small	1.1902	0.0576	1.1157	1.2678
	medium	1.2571	0.0552	1.1810	1.3708
ROS	small	0.0534	0.0075	0.0409	0.0619
	medium	0.0580	0.0058	0.0503	0.0656
ROA	small	0.0311	0.0109	0.0107	0.0480
	medium	0.0257	0.0150	-0.0065	0.0448
TAX	small	0.2959	0.1096	0.2315	0.5787
	medium	0.4754	0.4838	0.2514	1.7573

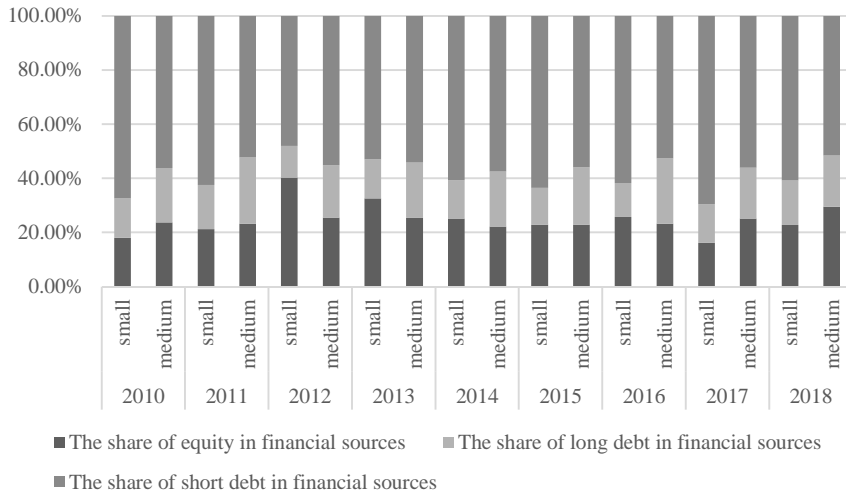
Source: own calculations based on Russian Federal State Statistics Service data.

**Table 2.** The results of the regression analysis of Russian small and medium manufacturing enterprises in years 2010–2018

	Estimate	Standard error	T value	Pr(> t )
$\beta_M$	1.6544	0.1256	13.1800	4.42e-08***
$\beta_1$	-0.0701	0.0130	-5.3850	0.0002***
$\beta_2$	-0.3946	0.0577	-6.8410	2.80e-05***
$\beta_3$	-0.5922	0.1173	-5.0510	0.0004***
$\beta_4$	0.3456	1.0400	0.3323	0.7459
$\beta_5$	0.3442	0.8723	0.3946	0.7007
$\beta_6$	-0.0061	0.0319	-0.1913	0.8518
Standard error	0.0200			
R-squared	0.9083			
Adjusted R-squared	0.8583			
F-statistic	18.1677 on 6 and 11 degrees of freedom			
p-value	0.000041			

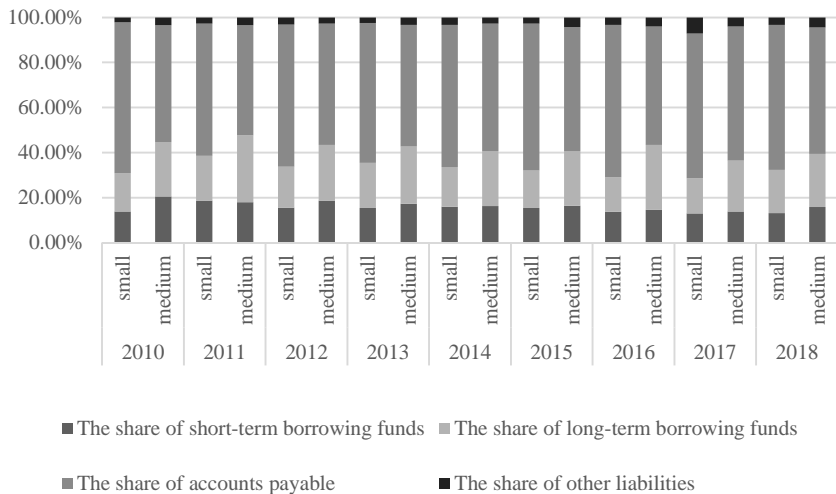
Note: Significance code: \*\*\* - 0,1%.

**Figure 1.** Capital structure of Russian manufacturing SMEs in years 2010–2018



Source: own calculations based on Russian Federal State Statistics Service data.

**Figure 2.** Borrowed funds structure of Russian manufacturing SMEs in years 2010–2018



Source: own calculations based on Russian Federal State Statistics Service data.