

# Economic Factors Affecting Financial Viability of the Small and Middle Enterprises: Case SMEs Processing Agricultural Products in the Republic of Tatarstan

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## Abstract

This article analyzes the financial viability determinants of SMEs using annual financial data from 2013 to 2017 collected from 26 agricultural products processing SMEs in the Republic of Tatarstan. To achieve the analysis, an econometric method of analysis and binary logistic model was been adopted and estimated respectively. The maximum likelihood method was been used for the estimation. Indeed, the estimator was interpreted as probability financial viability SMEs following a possible variation of the exogenous variables. The results showed a positive variation in the financial viability of SMEs depending on income and the level of financial autonomy. Theses relations are significant respectively at the threshold of 10% and 1%. On the other hand, the higher are the operating expenses of SMEs, the less the probability to be financially viable. The relation is no statistically significant. According to the results of the analysis, to ensure the financial viability of SMEs, it is necessary to reduce the operating expenses, diversify the income sources, and enhance their own equity.

**Keywords:** Financial viability; SMEs; logistic model; financial autonomy; probability.

## I. INTRODUCTION

Small and Medium-sized Enterprises (SMEs), play an essential role by contributing in the world economy. They are the main factor of growth in developed economies [16].

In the Russian Federation, the importance of this business category is undeniable. Its contribution to the Gross Domestic Production is 30% (ROSSTAT 2018). In the Republic of Tatarstan, SMEs provide employment for more than a third of the working population and contribute around 66.42 million rubles to the annual budget [17]. The contribution part of SMEs in Gross Production in this region increased from 25.5% to 25.8% from 2013 to 2017 (TATSTAT 2018). This crucial role of a job creator and provider of wealth that SMEs

play in developing allows it to be in the center of reflection international institutions, states and research institutes.

This brings different organizations to focus on the key factors for the development of SMEs. The success factors of Small and Medium-sized Enterprises more cited in the most recent studies are the characteristics of entrepreneur [12; 19]; the characteristics of SMEs [12]; management and know-how (Swierczek and Ha 2003); products and services (Wiklund 1998; 8); customers and the market (William, James, & Susan; 2005); the way of doing business and cooperation (Hitt and Ireland 2000; 11); resources and finance (Swierczek and Ha, 2003; 12); strategy [15]; external environment [9; 10]. They are generally considered as macroeconomic or microeconomic factors; external or internal factors of enterprise in the economic literature.

Finance as pointed Swierczek & Ha (2003); Kristiansen, Furuholt & Wahid (2003) [12] is strategic in the business. The financial viability, an objective of the financial management of SMEs is an important aspect to enhance the sustainability of SMEs and strengthen economic development. It consists of managing the various resources of the company in such a way as to cover operating costs, to ensure investment expenses and debt charges and in order to meet other long-term financial obligations. Regarding its importance in the financial policy of (it financial importance in the politic of) SMEs, we set ourselves the objective in this paper to analyze the determining factors of financial viability by taking an example on SMEs processing agricultural products in the Republic of Tatarstan. However, we will develop respectively in part 2 (conceptual clarification), in part 3 (methodology), part 4 (results and discussion) and in part 5 (conclusion and suggestions).

## II. CONCEPTUAL CLARIFICATION

### II.I Financial viability

Financial viability is a financial term, which the definition is approached in different ways in the economic literature. His

definition depends on the business sector of the company and especially on the uncertain events they may face. Some definitions of financial sustainability are collected in Table 1.

**Table 1.** Some definitions of SMEs.

Year	Author (s)	Definition
2008	Zorobabel	Financial viability reflects the ability of the company to control its operating costs and achieve economies of scale.
2015	Maty Sene [14]	The financial viability of a company is its ability to conduct its business with its own resources.
2004	Deleen and Molenaar	The company's financial viability is its ability to generate autonomously the resources it needs for its operation.
2010	Registrar of Community Housing [18]	Financial viability is the ability to generate sufficient income to meet operating payments, debt commitments and, where applicable, to allow growth while maintaining service levels.
2013	Constancio [2]	Financial viability is the ability of the firm to resist economic conditions, to reduce the probability of business interruption.
2009	Lapusta [13]	The financial viability of a business is its ability to mobilize resources, redistribute them and use them efficiently.
2007	Samiev and Romanovski [20]	The financial viability analysis consists of the balance analysis of financial flows, the risk analysis and of the diversification level of the company's activities.
2010	Dubikova [6]	Based on farms, he defines financial viability as the company's financial situation, characterized by its liquidity and solvency over time.
2005	Sheremet [21]	It defines the financial viability of the organizations as their ability to support their long-term existence.
2015	Demchuk and Guminsky [5]	They emphasize that a viable business is one whose revenues exceed expenses.

## II.II Definition of Small and Middle Enterprises

The definition of Small and Medium-sized Enterprise (SME) varies. The keys criteria of SMEs definition are related to their size, which is measured by the number of employees, income; or by the sector of activity (transformation; trade and distribution; services). Conventional definitions in some countries are recapped in Table 2.

**Table 2.** Some definitions of SMEs.

Country	Number of employees	Country	Number of employees
Norway	100	Vietnam	300
Switzerland	250	Bangladesh	100
Brasilia	100	Ghana	100
Thailand	200	Tanzania	20
Mordovia	250	Malawi	50
Egypt	50	Benin	100
Japan	300	America	500

Source: Gibson, 2008 [7]

In Russia, SMEs are defined by the law of 14 June 1995 in which the substance is recapped in Table 3.

**Table 3.** Criteria for defining SMEs in the Russian Federation.

Criteria	Type of enterprises	Definitions
The average number of employees (unit)	Small Enterprises	$\leq 100$
	Middle Enterprises	$\leq 250$
Annual income (Million)	Small Enterprises	$\leq 800$
	Middle Enterprises	$\leq 2000$
The total sum of shares in the share capital of the organization (%)	Foreign organizations	$\leq 49$
	National organizations, not SMEs	$\leq 49$
	National organizations, regional organizations, civil society organizations, municipal organizations, other foundations.	$\leq 25$

### III. METHODOLOGY

The research is based on the binomial logistic econometric model.

The distribution function of the model is written according (Eq.1):

$$\text{logit: } g(\pi) = \text{logit}(\pi) = \ln(\pi/1-\pi) \quad (1); \text{ with } g^{-1}(x) = \frac{e^x}{1+e^x} \dots \dots \dots (1)$$

The theoretical form of the model is determined according (Eq.2):

$$Y_{it} = a_0 + a_i X_{it} + \mu_{it} \dots \dots \dots (2)$$

With  $Y_{it}$ : Endogenous variable;  
 $a_i$  Column matrix of estimators;  
 $X_{it}$ : Row matrix of the explicative variables of the model;  
 $\mu_{it}$ : Errors.

#### III.I The endogenous variable

Financial viability represents the dependent variable of the model ( $Y_{it}$ ). In this study, it is assessed by the difference between the means available and the company's operating expenses (RD - DT). The assessment is made at 3 levels according to the formulas below:

$$\Delta_1 = \text{Equity (CP) - Total Operating Expenses (DT)} \quad (3);$$

$$\Delta_2 = \text{CP + Long Term Debts (DLT) - DT} \quad (4);$$

$$\Delta_3 = \text{CP + DLT + Short Term Debts (DCT) - DT} \quad (5).$$

The endogenous variable is binary. It is defined by the combination of the indicators  $\Delta_1, \Delta_2, \Delta_3$ . It takes the following values:

- if  $\Delta_1 \geq 0; \Delta_2 \geq 0; \Delta_3 \geq 0$  ou  $\Delta_1 < 0; \Delta_2 \geq 0; \Delta_3 \geq 0$  ;  $Y_{it} = 1$
- if  $\Delta_1 < 0; \Delta_2 < 0; \Delta_3 \geq 0$  ou  $\Delta_1 < 0; \Delta_2 < 0; \Delta_3 < 0$  ;  $Y_{it} = 0$ .

Sign (1) characterizes SMEs which have high solvency and independent at credit, (0) indicates otherwise.

#### III.II The exogenous variables

##### III.II.I Total operating expenses ( $X_{3it}$ )

- Total operating expenses consist of all supply costs, operating and distribution costs, commercial expenses, inventory, personnel expenses, and finance charges. This variable has negative influences on the financial viability of the enterprise.

##### III.II.II Income ( $X_{2it}$ )

This is the sum of income from operating activities, financial activities and the company's exceptional activities. Income may be or not cashable. They strengthen the profit of the company if the expenditures are not increased (ceteris paribus), and impact the SME's own resources. By their effect on equity of the enterprise, incomes would impact positively financial viability. Likewise, income is an enterprise-size indicator. The expected sign of the variable is positive.

##### III.II.III The financial structure of the enterprise ( $X_{1it}$ )

The financial structure represents the share of equity and foreign capital in the total liabilities of the company. The financial structure has a significant impact on profitability and

financial viability. Based on financial orthodoxy, the surplus of permanent resources over fixed assets finances operating expenses. In fact, the larger the equity and long-term debts, the more enterprises have the capacity to finance their expenses,

and therefore viable. The coefficient of financial autonomy will be used as the proxy for the financial structure. Its expected sign is positive.

The variables of the study are recapped in Table 4.

**Table 4.** Variables of the study.

Variables	Nature	Definition	Formula	Expected sign
Financial viability ( $Y_{it}$ )	Endogenous	Binary	0 no viable 1 viable	
Total expense ( $X_{1it}$ )	Exogenous	Sum of all operating expenses and inventories	$DT = CP + CD + CC + Inventories$	-
Income ( $X_{2it}$ )	Exogenous	Sum of all incomes	$R = Sales + other incomes$	+
Financial structure ( $X_3$ )	Exogenous	Share of equity in total assets	$SF = CP/TP$	+

### III.III Database

Econometric analysis of panel data is used on the 26 enterprises processing agricultural products. The data were collected from the financial statements of the enterprises over the period of 5 years, also there are 130 observations. From 245 these SMEs operating in Republic Tatarstan (TATSAT, 2018), we randomly selected 26 SMEs those who regularly prepared their financial statements between 2013 and 2017. The sample size is determined by applying the Dagnelie formula (2006) [3].

The formula is writing as:  $T = \frac{4p(1-p)}{d \cdot d}$  (6),

Where p: Is the proportion of SMEs that process agricultural products to food on the total SME population,  $p = 0.0163$ ; d: the margin of error (here  $d = 5\%$ ).

The estimation method used is that of Maximum Likelihood as STATA 11. The coefficients from the estimation are considered events of the probabilities. However, the sign of each estimator is the most important.

## IV. RESULTS AND DISCUSSIONS

### IV.I Descriptive analysis

**Table 5.** Repartition of the variable Y (financial viability)

Y	Freq	Percent	Cumul
0	114	87.69	87.69
1	16	12.31	100
Total	130	100	

From Table 5, it is noted that 87.69% of the observations are financially no viable, and 12.31% of the observations show the viability sign.

The estimation of the Fixed Effect Model is non-convergent. The results of the Random Effect Model estimate are recapped in Table 5.

**Table 6.** Factors influencing the financial viability of agricultural products processing SMEs

Random-effects logistic regression				Number of obs = 130		
Group variable: i				Number of groups = 26		
Random effects $u_i \sim$ Gaussian				Obs per group: min = 5		
				avg = 5.0		
				max = 5		
				Wald chi2(3) = 15.09		
Log likelihood = -17.550658				Prob > chi2 = 0.0017		
Y	Coef.	Std. Err.	Z	P> z	[95% Conf.	Interval]
X1	-8.42e-06	6.51e-06	1.29	0.196	[-4.34e-06	; 0.000212]

X2	0.0000193	0.0000112	-1.73	0.084*	[-0.0000412 ; 2.57e-06]
X3	0.3127728	8.202449	3.81	0.000***	[0.152007 ; 0.473537]
_cons	-35.7599	7.378553	-4.85	0.000	[-50.2216 ; -21.2982]
lnsig2u	5.093427	0.655421			[3.808825 ; 6.378028]
sigma_u	12.76508	4.183251			[6.715463 ; 24.2645]
rho	0.9802098	0.0127142			[0.9320097 ; 0.9944433]
Likelihood-ratio test of rho=0: chibar2(01) = 25.40 Prob >= chibar2 = 0.000					

Source: Data provided from ROSSTAT

Table 2 shows the result of the estimation of the binary logistic model on panel data with random effect. The sign of each exogenous variable reflects its effect on the endogenous variable (financial viability of SMEs processing agricultural products).

The result shows a positive variation between the financial viability and the coefficient of financial autonomy of SMEs processing agricultural products. *Ceteris paribus*, the more financially independent an SME, the higher the probability that it will be financially viable.

As for the variable "total operating expenses", has a negative influence on financial viability of SMEs processing agricultural products. Higher are the total operating costs, less the SMEs tend to be financially viable. This relationship between financial viability and total operating expenses is similar to the research results of Deleen and Molenaar (2004) and that of the World Bank (1994). The income, the paroxysm of the size and growth of the enterprise positively impacts the financial viability of SMEs processing agricultural products.

Thus, more SME income increase, the likelihood of financial viability increases. This relationship between financial viability and income is statistically non-significant, but in line with the theory that the increased income impacts the bottom line of the business, which in turn strengthens the equity of the enterprise. This relationship between financial viability and income is similar to that established by the World Bank (1994), which claims a positive relationship between the structure of revenues and the financial viability of railways.

## V. CONCLUSION AND SUGGESTIONS

The financial viability of SME reflects its ability to meet its own total operating expenses. It is an essential condition for the continuation of activities in the SMEs. However, the financial viability of SMEs depends on many external or internal factors of the company. This research which some quantitative factors determining the financial viability of agricultural products processing SMEs in the Republic of Tatarstan, a positive variation between the size or level of growth, a coefficient of financial independence and financial viability; and a negative variation between the total expenditure of the company and its financial viability. It should be noted that the financial situation of the company could be vulnerable if they sell on credit or grant a long time

customer. Indeed, to improve the financial viability of SMEs, business leaders could:

- Minimize operating costs based on expenditure structures;
- Increase business income by diversifying their activities;
- Reduce the time granted to customers;
- Reduce the dividend distribution in order to strengthen the company's equity.

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