

„BABEȘ-BOLYAI” UNIVERSITY CLUJ-NAPOCA

FACULTY OF ECONOMICS AND BUSINESS ADMINISTRATION

PH.D. THESIS

**EMPIRICAL STUDIES ON EQUILIBRIUM,
PERFORMANCE AND RISKS REGARDING THE
ACTIVITY OF SMALL AND MEDIUM-SIZED
ENTERPRISES IN ROMANIA AND IN THE
EUROPEAN CONTEXT**

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TABLE OF CONTENTS

LIST OF APPENDICES	4
INTRODUCTION.....	6
CHAPTER 1. ROLE OF SMALL AND MEDIUM-SIZED ENTERPRISES IN ECONOMIC DEVELOPMENT. EMPIRICAL STUDIES IN MEMBER STATES OF THE EUROPEAN UNION	9
1.1. Importance of small and medium-sized enterprises in nowadays economy	9
1.2. Empirical study on the impact of research and development (R&D), innovation and joint venture on the economic growth of member states from the European Union and Great Britain	14
1.2.1. Introduction	14
1.2.2. Benchmarks from the literature	14
1.2.3. Methodology and results.....	15
1.3. Empirical study on the factors that determine economic growth within the green economy regarding the activity of small and medium-sized enterprises from member states of the European Union and from Great Britain	32
1.4. Empirical study on factors determining economic growth for small and medium-sized enterprises in Romania	41
1.4.1. Method and results	41
1.4.2. Empirical study on factors determining economic growth for SMEs in the textile industry	46
1.4.3. Empirical study on factors determining economic growth for small and medium-sized enterprises in the furniture industry	51
1.4.4. Empirical study on factors determining economic growth for small and medium-sized enterprises in the IT industry.....	55
1.4.5. Empirical study on factors determining economic growth for small and medium-sized enterprises in the pharmaceutical industry	59
CHAPTER 2. EQUILIBRIUM AND FINANCING IN SMALL AND MEDIUM-SIZED ENTERPRISES. EMPIRICAL STUDIES IN ROMANIA AND THE EUROPEAN UNION	64
2.1. Financial stability of small and medium-sized enterprises	64
2.2. Instances of financial equilibrium of the company	64
2.2.1 Liquidity – image of the short-term equilibrium.....	65
<i>2.2.1.1 Theoretical approaches on company liquidity</i>	<i>65</i>
2.2.2. Solvency – instance of long-term equilibrium	69
<i>2.2.2.1. Opinions of professionals regarding company solvency.....</i>	<i>69</i>
<i>2.2.2.2. Solvency ratios – means of quantification for long-term equilibrium.....</i>	<i>71</i>
2.3. Empirical studies on SMEs equilibrium in Romania	72
2.3.1. Empirical study on the liquidity of small and medium-sized enterprises in Romania	72
<i>2.3.1.1. Empirical study on the liquidity of small and medium-sized enterprises in the textile industry</i>	<i>77</i>
<i>2.3.1.2. Empirical study on the liquidity of small and medium-sized enterprises in the furniture industry in Romania</i>	<i>79</i>
<i>2.3.1.3. Empirical study on the liquidity of small and medium-sized enterprises in the IT industry in Romania</i>	<i>82</i>

2.3.1.4. Empirical study on the liquidity of small and medium-sized enterprises in the pharmaceutical industry in Romania	84
2.3.2. Empirical study on the solvency of small and medium-sized enterprises in Romania	87
2.3.2.1. Empirical study on the solvency of small and medium-sized enterprises in the textile industry in Romania	92
2.3.2.2. Empirical study on the solvency of small and medium-sized enterprises in the furniture industry	95
2.3.2.3. Empirical study on the solvency of small and medium-sized enterprises in the IT industry	99
2.3.2.4. Empirical study on the solvency of small and medium-sized enterprises in the pharmaceutical industry in Romania	102
2.4. Empirical studies on the financing of small and medium-sized enterprises at European level	105
2.4.1. Revising the literature	105
2.4.2. Research methodology	106
2.4.3. Analysis of central tendency and variation	108
2.4.4. Correlation analysis	110
2.4.5. Descriptive statistics for small and medium-sized enterprises from Western Europe ...	110
2.4.6. Correlation analysis for small and medium-sized enterprises from Western Europe	112
2.4.7. Descriptive statistics for SMEs from Eastern Europe	112
2.4.8. Correlation analysis for SMEs from Eastern Europe	113
2.4.9. Econometric models applied to small and medium-sized enterprises in the European Union	114
2.4.10. Econometric models for small and medium-sized enterprises from Western Europe ..	116
2.4.11. Econometric models for SMEs from Eastern Europe	117
2.5. Empirical study on sales financing for small and medium-sized enterprises from the European Union	120
2.6. Empirical study on sales financing for small and medium-sized enterprises in Romania	124
2.6.1. Empirical study on sales financing for small and medium-sized enterprises in the textile industry in Romania	128
2.6.2. Empirical study on sales financing for small and medium-sized enterprises in the furniture industry in Romania	132
2.6.3. Empirical study on sales financing for small and medium-sized enterprises in the IT industry in Romania	134
2.6.4. Empirical study on sales financing for small and medium-sized enterprises in the pharmaceutical industry in Romania	137
CHAPTER 3. FINANCIAL PERFORMANCE OF SMALL AND MEDIUM-SIZED ENTERPRISES IN ROMANIA	141
3.1. Aspects of performance analysis for small and medium-sized enterprises	141
3.2. Performance ratios – measure of managerial decisions	144
3.3. Impact of inflation on financial performance	145
3.4. Empirical study on the factors influencing the performance of small and medium-sized enterprises in Romania	146
3.4.1. Empirical study on the factors influencing the performance of small and medium-sized enterprises in the textile industry	151
3.4.2. Empirical study on the factors influencing the performance of small and medium-sized enterprises in the furniture industry	156

3.4.3. Empirical study on the factors influencing the performance of small and medium-sized enterprises in the IT industry	162
3.4.4. Empirical study on the factors influencing the performance of small and medium-sized enterprises in the pharmaceutical industry	167
CHAPTER 4. RISK ASSESSMENT IN THE BUSINESS OF SMALL AND MEDIUM-SIZED ENTERPRISES	174
4.1. Aspects regarding the prevention of bankruptcy risk	174
4.2. Models of insolvency prevention	175
4.3. Z score model	176
4.4. Research methodology	177
4.5. Empirical research	178
4.5.1. Results for small and medium-sized enterprises	178
4.5.2. Comments on results	179
4.6. Research conclusions	179
4.7. Risk assessment indicators	180
4.7.1 Indebtedness degree	180
4.7.2. Equity ratio	181
4.7.3. Ratio of collateralized assets-secured obligations	181
4.7.4. Interest coverage ratio	182
4.8. Bankruptcy risk assessment for small and medium-sized enterprises in Romania	183
4.9. Inflation and financial indicators	183
4.10. Econometric study on eliminating insolvency risk for small and medium-sized enterprises in Romania	184
4.11. Empirical study on the risk for SMEs from the European Union, OECD members	194
CONCLUSIONS AND RECOMMENDATIONS	205
BIBLIOGRAPHY	217

INTRODUCTION

The economy of the European Union has gone through phases of reforms, and its development directions are represented by elements such as: stability; economic and financial progress; legislative changes; research and development; implementation of a modern framework to ensure the creation of a green economy in order to reduce and eliminate carbon emissions. Within this process, a first step is represented by small and medium-sized enterprises from the European Union.

Research aim

The transformations taking place in these economic entities are presented in the Ph.D. thesis suggestively titled ***Empirical studies on equilibrium, performance and risks regarding the activity of small and medium-sized enterprises in Romania and in the European context.*** Through an interdisciplinary approach from fields such as finance, management and economics, the Ph.D. thesis aims to identify and optimize financial resources, but also to analyze the way in which they are distributed and managed by small and medium-sized enterprises.

The *research aim* is to highlight how to achieve financial equilibrium, increase financial performance and prevent risks in the business of European small and medium-sized enterprises (SMEs).

Being aware of the general and particular aspects of ensuring financial equilibrium, financial performance and risk prevention represents the safe path for the economic development of European countries under the conditions of eliminating carbon monoxide emissions, with major implications for the health of the entire population in Europe.

Research objectives

The research is based around the general objective, namely the analysis of financial equilibrium, financial performance and risk in small and medium-sized enterprises, as well as the analysis of the effects they exert on the management of these enterprises.

In addition to this main objective, the Ph.D. thesis has four secondary objectives, divided into the four chapters:

Objective 1. Knowledge and understanding of concepts related to financial equilibrium, financial performance and risks.

Obiective 2. Identifying and analyzing ways to strengthen financial equilibrium and financial performance, predicting risks at the level of small and medium-sized enterprises in the textile industry, furniture industry, IT industry and pharmaceutical industry.

Obiective 3. Correlating financial equilibrium and performance with the risks associated with this business.

Obiective 4. Analysis of the activity of SMEs in the European Union on three dimensions: equilibrium, performance, risks.

Research methodology

In elaborating my Ph.D. thesis, I used *fundamental (theoretical) research* and *empirical research* based on the method of comparison, correlation, and econometric modeling.

The qualitative approach to research is based on interpretation, comprehension and involves a consistent effort in presenting the opinions of different specialists in the financial field with the aim of obtaining new information and issuing new theories in this field of scientific research. In this sense, the analysis and systematization of opinions from the literature is essential for achieving the objectives of this research topic. The scientific works that I studied are approached as a unitary whole, and this method favors both the development of new concepts and the completion of previously defined concepts.

To collect data, I used exploratory analysis, accessing databases such as those of the National Agency for Fiscal Administration (ANAF), the World Bank, the Organization for Economic Cooperation and Development (OECD), and the European Union (Eurostat). Thus, I employed methods such as observation, qualitative analysis, quantitative analysis, comparison, systematization, and data grouping.

Research hypotheses

Identifying the financing needs of SMEs, the sources of financing and their efficient use essentially determine the equilibrium, performance and risk of small and medium-sized enterprises. The research was carried out starting from the following hypotheses presented in the form of four questions whose answers are debated in the content of the thesis:

- a) Does the correct identification of financing needs contribute to ensuring equilibrium in small and medium-sized enterprises?
- b) Does the efficient use of funds by small and medium-sized enterprises generate their performance?

- c) Does developing managerial capacity to attract additional funds ensure risk prevention in the activity of small and medium-sized enterprises?
- d) Is empirical research useful in ensuring equilibrium, performance and risk prevention in the business of small and medium-sized enterprises?

Thesis structure

The Ph.D. thesis contains four chapters and a part with conclusions and recommendations.

The ***opening chapter*** of the thesis, generically titled “*Role of small and medium-sized enterprises in economic development. Empirical studies in member states of the European Union*”, highlights the importance of this sector in the economy. Throughout the chapter, the concept is analyzed by reviewing the literature, its evolution in the context of legal regulations both from the perspective of Romanian legislative norms and at the European level. Also, in this chapter I analyzed how research-development and innovation of small and medium-sized enterprises ensure economic growth in the member countries of the European Union. Studying the concept of green economy in the European context and how factors that amplify this new type of economy represents another objective of the chapter. At the end of this chapter I presented the ways in which small and medium-sized enterprises can influence economic growth in Romania.

In the ***second chapter*** entitled “*Equilibrium and financing in small and medium-sized enterprises. Empirical studies in Romania and the European Union*”, aspects regarding liquidity and solvency are analyzed on a sample of 123 SMEs in Romania, divided into four industries (textile, furniture, IT, pharmaceutical), as well as the financing methods of SMEs in Romania and the European Union.

The ***third chapter*** entitled “*Financial performance of small and medium-sized enterprises in Romania*” contains the empirical analysis of the financial performance in 123 small and medium-sized enterprises in Romania, with details on each of the four industries. This topic was approached in the context of financial circuit management on the three components: operational activity, investment activity, financing activity.

The ***final chapter*** entitled “*Risk assessment in small and medium-sized enterprises*” includes risk assessment methods for both SMEs in Romania and SMEs from the European Union (OECD members).

The Ph.D. thesis concludes with the section on ***Conclusions and recommendations*** drawn from the research on financial equilibrium, financial performance and risks for SMEs from Romania and the European Union.

CHAPTER 1. ROLE OF SMALL AND MEDIUM-SIZED ENTERPRISES IN ECONOMIC DEVELOPMENT. EMPIRICAL STUDIES IN ROMANIA AND THE EUROPEAN UNION

The market economy is characterized by two basic features: private property and a decentralized economic system. From the entrepreneur's point of view, private property is what motivates the entrepreneur, and the decentralized economic system allows him to act according to the situation, possibilities and his own strategy. Both features stimulate entrepreneurs to achieve business performance.

In recent years, characterized by spectacular changes in the economy of the member states of the European Union, small and medium-sized enterprises have become the main engine of development for these economies. SMEs are of particular importance in regional development due to the financial facilities offered by the European Union. They create new jobs, contribute to the growth of the gross domestic product, stimulate the growth of exports, develop the green economy and in this way participate in achieving economic and financial stability at the macroeconomic level. Also, most of the recent inventions and innovations are carried out in small and medium-sized enterprises. There is no doubt that all the achievements of small and medium-sized enterprises are closely related to the state of profitability of entrepreneurial activity, which is the engine for the development of small and medium-sized enterprises and the growth of the gross domestic product in the European Union.

These economic entities play an essential role in the European Union economy due to innovation and research and development, being a benchmark of economic and social cohesion. At the same time, SMEs in the European Union create new jobs, ensure the well-being of the population in the member countries. For example, in 2022, about 24.3 million SMEs (99% of their total) provided approximately 84.9 million jobs. The benefits of these entities are countless: 1) they contribute substantially to the increase in state budget revenues; 2) they contribute to the achievement of gross domestic product; 3) they stimulate the growth of exports by balancing the trade balance and reducing the deficit in the balance of payments. As a result of the implementation of a development strategy for green economy, SMEs respond more quickly to competitiveness on international markets and adapt in a shorter time to cyclical changes in the global economy. Also, a large part of recent inventions and innovations were made in small and medium-sized enterprises.

SMEs are important elements of a functioning market economy and constitute the basis of modern society. Moreover, economic reality shows that these economic entities develop strong complementary relationships and are main promoters of European, social, local and regional

integration. Therefore, national authorities must create an optimal environment for SMEs and entrepreneurial initiatives. As small and medium-sized enterprises face some difficulties in accessing credit (especially in the start-up phase), the European Commission has decided that SMEs represent one of its priorities.

The two empirical studies conducted on a sample of SMEs in the European Union (including the United Kingdom) for the period 2005–2023 showed that the research and development variable had an important contribution to both GDP growth and value added growth.

Also, in the case of the empirical study conducted on the 123 SMEs in Romania, the results indicated that there is a concave relationship with a minimum point between GDP and the cost rate. At the same time, the value added rate was positively influenced by labor productivity, the rest of the exogenous variables negatively influencing the value added obtained between 2013–2022. In addition, the detailed analysis of the observations broken down by four industries (i.e., textile, furniture, IT, pharmaceutical) confirmed the aforementioned results.

CHAPTER 2. EQUILIBRIUM AND FINANCING IN SMALL AND MEDIUM-SIZED ENTERPRISES. EMPIRICAL STUDIES IN ROMANIA AND THE EUROPEAN UNION

Small and medium-sized enterprises make an important contribution to the national economy. The results of their activity are found in the annual financial statements, which are prepared in accordance with the tax regulations and enacted legislation. However, the accounting information that underlies the preparation of financial statements is insufficiently used in the decision-making processes and in the management of SMEs. Therefore, the internal reports of SMEs must detail the financial position, performance and risk of a business. Internal reports constitute one of the important premises for the long-term growth and development of SMEs.

The main tools and techniques for analyzing financial statements are well known. However, financial statement analysis is not limited to horizontal and vertical analysis. Financial statement analysis is important because reporting is accepted in the business practice of large enterprises due to the simplicity of calculating and using financial statements. Taking this into account, Žager, Sačer and Dečman (2012) state that financial statements indicate trends and dynamics of the position and performance of SMEs.

Financial equilibrium has the following elements:

- Belongs to the economic equilibrium;
- Represents a state for the financial mechanism of the enterprise;
- Is dynamic;
- It is accomplished at microeconomic level, being also a prerequisite for achieving macroeconomic equilibrium.

In addition, financial equilibrium can be analyzed from various perspectives:

Depending on the *aggregation level*: microeconomic, mezeoeconomic, macroeconomic;

Depending on the *method of implementation* and *period analyzed*: static, dynamic;

Depending on the *time* factor: short-term equilibrium (less than 1 year), medium-term equilibrium (3–5 years) and long-term equilibrium (over 10 years);

Depending on the *number of variables* analyzed: partial, total;

Depending on the *analysis moment*: post factum, current, forecasted.

The *financial equilibrium of the enterprise* must be viewed in a broader context, namely through the prism of liquidity, solvency, through the prism of sources and uses, and last but not least through the prism of the balance sheet, profit and loss account and cash flows.

In this chapter, I analyzed the main determinants of the cost of loans and equity using macroeconomic data on the activity of new SMEs in 28 European countries during the period 2005–2023. At the European Union level, I found that the value of the cost of loans was influenced by non-bank loans (NBL) and the increase in the volume of loss-making loans (NPL). From an economic point of view, the increase in the volume of non-bank loans determines the increase in financial costs as SMEs borrow from banks at very high interest rates, therefore financing becomes expensive. Non-performing loans influenced the cost of loans: their significant increase determined the decrease in the cost of the loans. As a result, small and medium-sized enterprises in the European Union were unable to repay loans contracted from commercial banks. These loans were either covered by the public budget or from European funds, especially during the pandemic. In this way, the bank interests of SMEs were substantially reduced.

Comparing SMEs in Western European countries with those in Eastern Europe, we found that for Western Europe, in addition to the aforementioned factors, the legal rights constraints index (LRIND) and imports into the EU area (EUIMP) contributed to reducing the cost of loans. The number of days taken into account in calculating interest positively influenced the cost of credit contracted by SMEs as a result of refinancing loans with a lower interest rate, but over a longer period. For Eastern European countries, the interest rate (INTRATE) decreased and generated a mitigation in the cost of the loan. At the same time, imports into the EU area (EUIMP) increased and attracted new credits to finance imports.

The research results showed that, across the European Union, equity and capital raised from banks, business angels and public funding positively influenced the growth of funds. Financing from private lenders decreased significantly, leading to a reduction in SME funds. For Eastern Europe, the growth in financing is explained only by bank loans, with the remaining sources of financing being insignificant.

In my view, the European Union should support these entities with additional funds by allocating grants for the payment of a portion from the salaries and contributions of employees, given the importance of SMEs in the European economy. Recently, I have noticed a permanent concern of the European Commission for the financial support granted to small and medium-sized enterprises. Thus, a first direction of support during the COVID-19 pandemic consisted in the allocation of European funds for the payment of rent (especially in the HoReCa sector), part of the utilities of SMEs, as well as facilitating access to the European market for products and services.

Another support action came from the governments of EU member states through facilities granted for the payment of taxes and duties (e.g., reducing VAT rates in the HoReCa sector).

Last but not least, support for small and medium-sized enterprises also came from Western European banks, which, through credit access facilities, became more involved in economic activity in the European Union. From the econometric analysis, I found that the banking sector in Eastern Europe was not willing to grant loans on favorable terms for high-risk SMEs. Also, the bureaucratic formalities of some banks in granting loans (especially for working capital) contributed to the rejection of many applications for loan access by SMEs during the financial banking crisis and the sovereign debt crisis of 2007–2013.

Reducing the cost of credit can be achieved by reducing the interest rate, reducing bank fees and charges and mitigating the time for paying invoices to SMEs' suppliers. At the same time, there is a great willingness on the part of local authorities to support these enterprises by directly awarding infrastructure works, purchasing products and services necessary for the activities of central and local public institutions, for job creation, by increasing fiscal obligations to the local and public budgets.

From the empirical research, I concluded that for new projects there were funds made available to SMEs from business angel investors, especially in Western Europe, as well as other investors who wanted the economic activity of SMEs to return to normal.

CHAPTER 3. FINANCIAL PERFORMANCE OF SMALL AND MEDIUM-SIZED ENTERPRISES IN ROMANIA

Any economic entity monitors its economic activities through the results obtained. To the extent that these results are favorable, they represent the added value created by the entity and at the same time a means of remuneration for the production factors (Onofrei, 2004: 261). Also, in a market economy, economic entities survive on the market if they generate added value.

According to van Greuning (2005: 27), *profitability* provides information on the way in which the profit margin is associated with sales and capital. In essence, profit is calculated by making the difference between revenue and expenses. The level of revenue generated depends on a number of factors such as the structure and volume of production, the quality of products and services sold, the selling price (Onofrei, 2004: 262). Profit is a reward that the economic agent obtains from the use of its own capital and professional training, the management of economic activity, the materialization of ideas and talent, the marketing and valorization of goods.

Profitability is the ability of the enterprise to generate higher revenue than the expenses incurred, these elements being presented in the profit and loss account. The financial situation of the small and medium-sized enterprise is analyzed both internally (management) and externally (investors, creditors).

The internal analysis of the management team focuses on *certain parts* of the enterprise. Investors and creditors focus on the *whole* to make decisions regarding an investment in the enterprise or a credit extension. Current and potential investors are interested in the ability of the enterprise to generate profit because the level of profit determines the amount of dividends paid and the future price of shares. Therefore, investors try to determine the future profit of the enterprise based on past profit.

The financial status of a small and medium-sized enterprise can be analyzed in various ways, as follows:

- increase or decrease of an element (absolute value), from one period to another;
- percentage increase or decrease of an element, from one period to another;
- future trends;
- percentage of an element into the whole;
- structure ratios.

The first two methods are based on a comparative analysis of the financial situation. Trend analysis is similar to horizontal analysis, except that a benchmark year or period is chosen, and

comparisons are made related to this benchmark. Information can also be obtained through vertical analysis based on a financial statement, according to which each element is expressed as a percentage of a total. This type of analysis is especially useful if the profit and loss account is analyzed (e.g., the percentage of cost of goods sold). Financial statements expressed only in percentage values are standardized ones. For example, all elements of a balance sheet are expressed as percentages of total assets, while elements of the profit and loss account represent a percentage of the total revenues or total expenses of the enterprise. Indicators that appear in the form of financial ratios indicate the existence of logical relationships between certain elements of a financial statement. An indicator can illustrate the relationships between two elements of the same statement or two elements of different statements (e.g., balance sheet, profit and loss account). However, in this case, the basic condition is that there is a *logical connection* from an economic perspective.

The empirical studies presented in this chapter have shown that the performance of small and medium-sized enterprises in different sectors of activity in Romania was closely related to the costs of the enterprise, its asset structure, liquidity and solvency. Thus, there is a non-monotonic relationship between the financial performance of SMEs and their costs. Therefore, with a 1% increase in the exogenous variable RCOST, the dependent variables will decrease significantly to a minimum point, after which any increase in costs will determine the increase in financial performance.

I have also showed that there was a linear relationship between performance ratios and asset structure ratios. The empirical results indicated that the fixed asset ratio positively influenced the ROA and RRG factors and negatively the ROS and ROE factors. From an economic perspective, SMEs in Romania efficiently use the fixed assets they own to generate profit from their operating activity. At the same time, the negative impact on the ROS and ROE performance ratios can be justified as follows: the turnover of fixed assets has slowed down, and the profit obtained was insufficient to increase performance. Also, the slowdown in the turnover of inventories, receivables and cash flow explains from an economic point of view the negative impact on the performance of small and medium-sized enterprises.

I identified a linear relationship between financial performance and liquidity. In this sense, liquidity ratios had a positive impact on the performance status measured by ROS, ROE and RRG, but also a negative impact on ROA. According to the economic literature, the positive influence of liquidity ratios is explained by the fact that these ratios are closely connected to current assets and their financing from short-term loans.

Based on empirical data, I found that solvency ratios also had a relevant impact on the performance of small and medium-sized enterprises. Their positive influence on some performance ratios is explained by the fact that long-term financing provided additional resources for the development of the operating process and investment process. The negative influence is explained by the fact that the fixed assets and current assets of the analyzed SMEs did not generate enough cash to finance the operating cycle, investment cycle and financing cycle.

CHAPTER 4. RISK ASSESSMENT IN THE BUSINESS OF SMALL AND MEDIUM-SIZED ENTERPRISES

In the current economic context, there are numerous attempts to identify the best way to measure the prediction of corporate bankruptcy. Many researchers have focused on defining the concept of “bankruptcy” in recent decades (Charitou et al., 2004; Daubie & Meskens, 2002; Van Caillie, 1999), and the proposed models have been built on the criterion of “financial distress” (Laitinen, 1994), implicit lending (Ward & Foster, 1997), capital reconstructions, informal government renegotiations and renegotiations with banks (Agarwal & Taffler, 2008).

The Z-score model introduced by Altman (1968) and the revisions that followed between 1983 and 2005 have dominated empirical studies. Therefore, although this model has existed for over 57 years, it is heavily used in research and practice, being the main tool or support for predicting the financial difficulty of companies, especially Italian ones (Altman et al., 2013). Altman model is still applied because it focuses on the basic elements that allow SMEs to determine their financial stability and profitability.

The chapter focuses on the application of Altman Z-score model to small and medium-sized enterprises in Romania. The chapter also evaluates the effectiveness of the revised Z'-score (Altman, 1993) in predicting bankruptcy in the textile, furniture, IT and pharmaceutical industries for SMEs in member states of the European Union, belonging to the OECD.

From the analysis conducted, I found that, out of the 1,230 observations, 21.95% indicated a state of insolvency, 38.21% indicated a state of temporary financial difficulty, and 39.84% suggested a financially robust state.

Another possibility for estimating the risk of bankruptcy is to analyze the degree to which SMEs in Romania fully finance fixed assets from equity. According to the empirical results, in the case of SMEs that do not fully finance fixed assets from equity, the favorable influence of receivables ratio and general rate of return is explained as follows: some of the SMEs have registered a sustained commercial activity, which generates a significant gross profit and an increase in equity; thus, some investments are financed from their own financial resources. The negative influence of current liquidity ratio is explained by the fact that operating funds are used in the operating activity and are not used in the investment activity.

In the case of SMEs that *fully finance fixed assets from equity*, the positive influence of the return on assets ratio is explained as follows: SMEs recorded a significant profitability, which contributed to the increase in equity and to the increased financing of investments in fixed assets.

On the other hand, the increase in equity as a result of net profit generated by SMEs determined an additional financing of fixed and current assets. The negative influence of return on equity is due to the fact that the growth rate of net profit was lower than the growth rate of equity.

The analysis of the evolution in the number of bankruptcies showed that 35.39% of its variation is due to the influence of the factors considered. *From an economic perspective*, the increase in the number of bankruptcies was significantly influenced by the increase in the number of loan applications and growth rate of the number of application rejections. In the absence of financing sources, some small and medium-sized enterprises went bankrupt. Also, the increase in the volume of outstanding loans and non-performing loans had a negative impact on the decrease in the number of bankruptcies, because the postponement of loan installment payments created a temporary surplus of funds for SMEs.

Another aspect analyzed was the evolution of annual rate of bankruptcies. *From an economic point of view*, the annual increase in the rate of bankruptcies of SMEs was determined by the increase in the rate of non-performing loans, number of loan applications and the growth rate in the number of rejections for these applications. Similarly, the increase in the volume of outstanding loans determined a decrease in the annual growth rate for the number of bankruptcies.

Empirical analysis of *venture capital* suggested that an annual increase in the venture capital rate was also influenced by the increase in the non-performing loan rate, the number of loan applications, and the growth rate of the number of rejections for these applications. Also, outstanding loans caused a decrease in venture capital.

CONCLUSIONS AND RECOMMENDATIONS

In my Ph.D. thesis entitled “*Empirical studies on equilibrium, performance and risks regarding the activity of small and medium-sized enterprises in Romania and in the European context*”, I highlighted the importance of small and medium-sized enterprises (SMEs) for economic activity.

I have found that the last ten years have been characterized by considerable changes in technical, economic, social, informational, educational, cultural and political terms. In this context, SMEs represent an essential element for the development of a modern and dynamic economy. Moreover, SMEs play an important role in supporting social and regional development. The experience of the European Union shows that small and medium-sized enterprises generate jobs within the common market, contribute to a large extent to the achievement of GDP and the growth of exports, supporting macroeconomic stability and growth.

Also, many recent inventions and innovations have been achieved by small and medium-sized enterprises, and dynamic leading companies (e.g., IT, e-commerce, genetics, biotechnology) are or were until recently also SMEs. Notable achievements of all these economic entities are closely linked to performance, which is the engine of SME development and the GDP of the European Union countries.

The econometric analyses presented in this Ph.D. thesis are based on a system of financial indicators that highlight the equilibrium, performance and risk of bankruptcy in the activity of SMEs in Romania and the European Union.

The aim of the Ph.D. thesis was to identify the steps taken by the financial analyst in substantiating the decision to lend to SMEs based on liquidity, solvency and profitability indicators. Throughout this process, one aims to identify the strengths and weaknesses of an enterprise, from a financial point of view. One also analyzes how these aspects will influence the future evolution of the enterprise to highlight the risks to which the respective economic entity is exposed.

The picture provided by the financial analysis of small and medium-sized enterprises weighs considerably in substantiating the lending decision, the difference being covered by the so-called “non-financial aspects”, but also by the financial analyst’s assessment of the viability of the business carried out by the enterprise. Thus, it was observed that one SME can be successfully credited even if it registers a less positive evolution at a certain point. At the same time, a loan granted to a SME that had a very good evolution up to a certain date can turn into a loan taken off the balance sheet in a short period of time.

BIBLIOGRAPHY

BOOKS AND BOOK CHAPTERS

1. Altman, E.I. (1993). *Corporate financial distress and bankruptcy*. John Wiley & Sons.
2. Altman, E.I., Hartzell, J., & Peck, M. (1998). Emerging market corporate bonds - a scoring system. În R.M. Levich (Coord.), *Emerging market capital flows* (pp. 391–400), vol. 2. Springer.
3. Altman, E.I., & Hotchkiss, E. (2005). *Corporate financial distress and bankruptcy: Predict and avoid bankruptcy, analyze and invest in distressed debt*. Wiley.
4. Andersen, P.H. (1995). *Collaborative internationalization of small and medium-sized enterprises: SMEs participation in the international division of labour*. DJØF Publishing.
5. Andreeva, G., Calabrese, R., & Osmetti, S.A. (2016). A comparative analysis of the UK and Italian small businesses using Generalised Extreme Value models. *European Journal of Operational Research*, 249, 506–516.
6. ATD (2017). *All about SMEs: Building a successful partnership*. American Society for Training & Development.
7. Bărbulescu, C., Gavrilă, T., Lefter, V., Badea, F., Pârvu, F., & Fransua, E. (1999). *Economia & gestiunea întreprinderii*. Editura Economică.
8. Bell, E.R.J. (1994). *Oxfordshire firms and technology transfer: Interactions between small and medium sized enterprises (SMES) and the local research base*. Oxford Trust.
9. Birkett, W.P. (2000). *Setting strategic directions in small and medium enterprises: A guide for professional accounting advisors*. International Federation of Accountants.
10. Boustras, G., & Guldenmund, F.W. (Coord.) (2017). *Safety management in small and medium sized enterprises (SMEs)*. CRC Press.
11. Cahn, A., & Donald, D.C. (2018). *Comparative company law: Text and cases on the laws governing corporations in Germany, the UK and the USA*. Cambridge University Press.
12. Chamboko, R. (2010). *Applying IFRS for SMEs*. John Wiley & Sons.
13. Chua, C.L. (1996). *Singapore small and medium-sized enterprises (SMEs) in manufacturing sector: the financial aspect*. Oxford Brookes University.
14. Crecă, C. (2000). *Ghidul afacerilor mici*. Editura Economică.
15. Cruz-Cunha, M.M. (2009). *Enterprise information systems for business integration in SMEs: Technological, organizational, and social dimensions*. IGI Global.
16. Cohen, J. (1988). *Statistical power analysis for the behavioral sciences*. Lawrence Erlbaum Associates Publishers.
17. Dabić, M., & Kraus, S. (2024). *An introduction to a theory of SME entrepreneurship*. De Gruyter.
18. Daubie, M., & Meskens, N. (2002). Business failure prediction: A review and analysis of the literature. În C. Zopounidis (Coord.), *New trends in banking management* (pp. 71–86). Springer.
19. Devos, J., Landeghem, H., & Deschoolmeester, D. (2014). *Information systems for small and medium-sized enterprises: State of art of IS eesearch in SMEs*. Springer.
20. Di Bitteto, M., Gilardoni, G., & D'Anselmi, P. (2024). *SMEs as the unknown stakeholder: Entrepreneurship in the political arena*. Palgrave Macmillan.
21. Dougherty, H.N., & Schissler, A.P. (2020). *SME mining reference handbook*. Society for Mining, Metallurgy & Exploration.
22. Dominguez, N. (2018). *SME internationalization strategies: Innovation to conquer new markets*. Wiley.
23. Durst, S., & Henschel, T. (Coord.) (2022). *Crisis management for small and medium-sized enterprises (SMEs)*. Springer.
24. Elliot, B., & Elliot, J. (2002). *Financial accounting and reporting*. Prentice Hall.
25. Etemad, H. (2013). *The process of internationalization in emerging SMEs and emerging economies*. Edward Elgar.
26. Fernande, M. (2013). *The handbook: Growth of SMEs (small and medium enterprises)*. CreateSpace Independent Publishing.

27. Fernandes-Esquinas, M., van Oostrom, M., & Pinto, H. (2024). *Innovation in SMEs and micro firms: Culture, entrepreneurial dynamics and region*. Taylor & Francis.
28. Foster, G. (1978). *Financial statement analysis*. Prentice-Hall.
29. Gay, C., & Szostak, B.L. (2019). *Innovation and creativity in SMEs: Challenges, evolutions and prospects*. Wiley.
30. Gillie, S.P. (2002). *Factoring and the small and medium sized enterprise (SME)*. Kingston University.
31. Jacobsson, A. (2000). *SHE management systems for small to medium-sized enterprises*. Institution of Chemical Engineers.
32. Jansen, J. (2020). *Understanding IFRS for SMEs*. Juta & Co.
33. Jianu, I. (2007). *Evaluarea, prezentarea și analiza performanței întreprinderii*. Editura CECCAR.
34. Jones, E., & Sloman, J. (2023). *Essential economics for business*. Pearson Education.
35. Klapper, R. (2001). *The magic and mystery of cross-national research into small and medium sized enterprises (SMEs) and sustainable development*. ESC Rouen.
36. Kline, R.B. (2011). *Principles and practice of structural equation modeling*. Guilford.
37. Koch, R. (2001). *Dicționar de management și finanțe*. Editura Teora.
38. Kotecha, K., Kumar, S., Bongale, A., & Suresh, R. (2022). *Industry 4.0 in small and medium-sized enterprises (SMEs)*. CRC Press.
39. Konstantinos, B. (2022). *Small business management and control of the uncertain external environment*. Emerald.
40. Lalinsky, T., & Pál, R. (2022). Distribution of COVID-19 government support and its consequences for firm liquidity and solvency. In *Structural change and economic dynamics* (pp. 305–335). Elsevier.
41. Levene, G.A. (1998). *The strategic management and operational control of inventory within a small to medium sized enterprise (SME)*. UMIST.
42. Loewe, M. (2013). *Which factors determine the upgrading of small and medium-sized enterprises (SMEs)?: The case of Egypt*. Deutsches Institut für Entwicklungspolitik.
43. Matt, D.T., Modrák, V., & Zsifkovits, H. (2020). *Industry 4.0 for SMEs, challenges, opportunities and requirements*. Palgrave Macmillan.
44. Millers, M. (2021). *Governance of the owner-managed small and medium-sized enterprises*. RTU Press.
45. Modaffari, G. (2023). *Equity crowdfunding for SMEs*. Springer.
46. Mullineux, A.W. (1994). *Small and medium-sized enterprise (SME) financing in the U.K.: Lessons from Germany*. Anglo-German Foundation for the Study of Industrial Society.
47. Munyai T., Mbonyane, B., & Mbohwa, C. (2023). *Productivity improvement in manufacturing SMEs: Application of work*. Taylor & Francis.
48. Nicolescu, O. (2001). *Managementul întreprinderilor mici și mijlocii*. Editura Economică.
49. Onofrei, M. (2004). *Finanțele întreprinderii*. Editura Economică.
50. Perrone, A. (2018). *Small and medium enterprises growth markets*. Oxford University Press.
51. Rand, J., & Tarp, F. (Coord.) (2020). *Micro, small, and medium enterprises in Vietnam*. Oxford University Press.
52. Stancu, I. (2002). *Finanțe*. Editura Economică.
53. Stettner, U., Aharonson, B.S., & Amburgey, T. (2014). *Exploration and exploitation in early stage ventures and SMEs*. Emerald.
54. Subhes, B.C. (2023). *Energy economics: Concepts, issues, markets and governance*. Springer.
55. Toma, M., & Alexandru, F. (1998). *Finanțe și gestiune financiară*. Editura Economică.
56. Turner, P. (2023). *Industry 4.0 in SMEs across the globe: Challenges and opportunities*. Clanrye International.
57. van Greuning, H. (2005). *Standarde internaționale de raportare financiară*. Institutul Ericson.
58. Văcărel, I. (2003). *Finanțe publice*. Editura Didactică și Pedagogică.
59. Wong, C.-S. (2000). *Analysis, design and implementation of e-commerce for small and medium enterprises (SMEs) in Hong Kong*. Oxford Brookes University.

SCIENTIFIC ARTICLES

1. Aftab, R., Naveed, M., & Hanif, S. (2021). An analysis of Covid-19 implications for SMEs in Pakistan. *Journal of Chinese Economic and Foreign Trade Studies*, 14(1), 74–88.

2. Agarwal, V., & Taffler, R. (2008). Comparing the performance of market-based and accounting-based bankruptcy prediction models. *Journal of Banking & Finance*, 32(8), 1541–1551.
3. Aimurzina, B., Kamenova, M., Omarova, A., Bodaubayeva, G., Dzhunusova, A., & Kabdullina, G. (2019). Major sources of financing investment projects. *Entrepreneurship and Sustainability Issues*, 7(2), 1555–1566.
4. Altman, E.I. (2002). Managing credit risk: A challenge for the new millennium. *Economic Notes*, 31(2), 201–214.
5. Altman, E.I. (1971). Railroad bankruptcy propensity. *The Journal of Finance*, 26(2), 333–345.
6. Altman, E.I. (1968). Financial ratios, discriminant analysis and the prediction of corporate bankruptcy. *Journal of Finance*, 23(4), 589–609.
7. Altman, E.I., Danovi, A., & Felini, A. (2013). Z-score models' application to Italian companies subject to extraordinary administration. *Journal of Applied Finance (Formerly Financial Practice and Education)*, 23(1).
8. Altman, E.I., Eom, Y.H., & Kim, D.W. (1995). Failure prediction: Evidence from Korea. *Journal of International Financial Management & Accounting*, 6(3), 230–249.
9. Altman, E.I., Haldeman, R.G., & Narayanan, P. (1977). ZETA analysis. A new model to identify bankruptcy risk of corporations. *Journal of Banking & Finance*, 1(1), 29–54.
10. Al-Shubiri, F.N. (2015). The impact of economic and financial variables on cash conversion cycle of energy, oil and gas sectors listed in Muscat Security Market. *International Journal of Energy Economics and Policy*, 5(1), 174–181.
11. Ali, A.Q.S., Hanafiah, M.H., & Hedley Mogindol, S. (2023). Systematic literature review of Business Continuity Management (BCM) practices: Integrating organisational resilience and performance in Small and medium enterprises (SMEs) BCM framework. *International Journal of Disaster Risk Reduction*, 99, 104135.
12. Arora, N., & Singh, B. (2020). Determinants of oversubscription of SME IPOs in India: Evidence from quantile regression. *Asia-Pacific Journal of Business Administration*, 12(3–4), 349–370.
13. Artzner, P., Delbaen, F., Eber, J.M., & Heath, D. (1999). Măsurile coerente ale riscului. *Matematică. Finanțe*, 9, 203–228.
14. Auzzir, Z., Haigh, R., & Amaratunga, D. (2018). Impacts of Disaster to SMEs in Malaysia. *Procedia Engineering*, 212, 1131–1138.
15. Barbu, T.C., Bucur, R.C., Cepoi, C.O., & Strachinaru, A.I. (2019). Is the increase on SMEs' access to finance in the capital markets union context real? An empirical investigation. *Ekonomicky Casopis*, 67(3), 245–263.
16. Bardia, S.C. (2012). Predicting financial distress and evaluating long-term solvency: An empirical study. *The IUP Journal of Accounting Research & Audit Practices*, 9(1), 47–61.
17. Beaver, W.H. (1966). Financial ratios as predictors of failure. *Journal of Accounting Research*, 4, 71–111.
18. Bellovary, J.L., Giacomino, D.E., & Akers, M.D. (2007). A review of bankruptcy prediction studies: 1930 to present. *Journal of Financial Education*, 33, 1–42.
19. Berger, A.N., & Udell, P. (2006). Capital structure and firm performance: A new approach to testing agency theory and an application to the banking industry. *Journal of Banking & Finance*, 30(4), 1065–1102.
20. Batrancea, L., & Chermezan, L. (2024). Empirical study on short-term financial equilibrium of small and medium-sized enterprises in Romania. *Annals of the „Constantin Brâncuși” University of Târgu Jiu, Economy Series*, 6, 5–10.
21. Batrancea, L.M., Balci, M.A., Chermezan, L., Akgüller, Ö., Masca, E.S., & Gaban, L. (2022). Sources of SMEs financing and their impact on economic growth across the European Union: Insights from a panel data study spanning sixteen years. *Sustainability*, 14(22), 15318.
22. Bauer, J., & Agarwal, V. (2014). Are hazard models superior to traditional bankruptcy prediction approaches? A comprehensive test. *Journal of Banking & Finance*, 40, 432–442.
23. Ben Abdelaziz, F., Alaya, H., & Dey, P.K. (2020). A multi-objective particle swarm optimization algorithm for business sustainability analysis of small and medium sized enterprises. *Annals of Operations Research*, 293(2), 557–586.
24. Bongini, P., Ferrando, A., Rossi, E., & Rossolini, M. (2019). SME access to market-based finance across Eurozone countries. *Small Business Economics*, 56, 1667–1697.

25. Bora Durdu, C., Mendoza, E.G., & Terrones, M.E. (2013). On the solvency of nations: Cross-country evidence on the dynamics of external adjustment. *Journal of International Money and Finance*, 32, 762–780.
26. Brei, M., Gadanez, B., & Mehrotra, A. (2020). SME lending and banking system stability: Some mechanisms at work. *Emerging Markets Review*, 43, 100676.
27. Breuillot, A., Bocquet, R., & Favre-Bonté, V. (2024). Diversity management and firms' internationalization: Evidence from French SMEs. *International Business Review*, 102276.
28. Brockett, P.L., Cooper, W.W., Golden, L.L., Rousseau, J.J., & Wang, Y. (2004). Evaluating solvency versus efficiency performance and different forms of organization and marketing in US property-liability insurance companies. *European Journal of Operational Research*, 154(2), 492–514.
29. Clemente-Almendros, J.A., Popescu-Nicoara, D., & Pastor-Sanz, I. (2024). Digital transformation in SMEs: Understanding its determinants and size heterogeneity. *Technology in Society*, 102483.
30. Charitou Professor, A., Neophytou, E., & Charalambous, C. (2004). Predicting corporate failure: empirical evidence for the UK. *European Accounting Review*, 13(3), 465–497.
31. Chen, A.H., Cheng, K., & Lee, Z. (2011). The behavior of Taiwanese investors in asset allocation. *Asia-Pacific Journal of Business Administration*, 3(1), 62–64.
32. Chen, H.-L., Hsu, W.-T., & Huang, Y.-S. (2008). Top management team characteristics, R&D investment and capital structure in the IT industry. *Small Business Economics*, 35, 319–333.
33. **Chermezan, L.**, & Batrancea, L. (2025). Empirical study on the solvency of small and medium-sized enterprises in Romania. *Annals of the „Constantin Brâncuși” University of Târgu Jiu, Economy Series*, 1, 253–259.
34. Chien, C.F., Gen, M., Shi, Y., & Hsu, C.Y. (2014). Manufacturing intelligence and innovation for digital manufacturing and operational excellence. *Journal of Intelligent Manufacturing*, 25(5), 845–847.
35. Chiriac, S.C.V. (2015). Considerations regarding the evolution of the liquidity and solvency indicators of the most important Romanian HORECA companies in the period 2010–2013. *Procedia Economics and Finance*, 32, 833–840.
36. Ciampi, F., Demi, S., Magrini, A., Marzi, G., & Papa, A. (2021). Exploring the impact of big data analytics capabilities on business model innovation: The mediating role of entrepreneurial orientation. *Journal of Business Research*, 123, 1–13.
37. Coffinet, J., & Pop, A. (2013). Monitoring financial distress in a high-stress financial world: The role of option prices as bank risk metrics. *Journal of Financial Services Research*, 44(3), 229–257.
38. Cuevas-Vargas, H., Estrada, S., & Larios-Gómez, E. (2016). The effects of ICTs as innovation facilitators for a greater business performance. Evidence from Mexico. *Procedia Computer Science*, 91, 47–56.
39. D'Apolito, E., Galletta, S., Iannuzzi, A.P., & Sylos Labini, S. (2024). Sustainability and bank credit access: New evidence from Italian SMEs. *Research in International Business and Finance*, 69, 102242.
40. Detthamrong, U., Chancharat, N., & Vithessonthi, C. (2017). Research in international business and finance corporate governance, capital structure and firm performance: Evidence from Thailand. *Research in International Business and Finance*, 42(7), 689–709.
41. Dolz, C., Iborra, M., & Safón, V. (2019). Improving the likelihood of SME survival during financial and economic crises: The importance of TMTs and family ownership for ambidexterity. *BRQ Business Research Quarterly*, 22(2), 119–136.
42. Ebben, J.J., & Johnson, A.C. (2011). Cash conversion cycle management in small firms: Relationships with liquidity, invested capital, and firm performance. *Journal of Small Business and Entrepreneurship*, 24(3), 380–396.
43. Eldrige, D., Nisar, T.M., & Torchia, M. What impact does equity crowdfunding have on SME innovation and growth? An empirical study. *Small Business Economics*, 56, 105–120.
44. el Alaoui, A.K.O., Ismath Bacha, O., Masih, M., & Asutay, M. (2017). Leverage versus volatility: Evidence from the capital structure of European firms. *Economic Modeling*, 62(9), 145–160.
45. Figini, S., Bonelli, F., & Giovannini, E. (2017). Solvency prediction for small and medium enterprises in banking. *Decision Support Systems*, 102, 91–97.
46. Filipović, D., & Vogelpoth, N. (2008). A note on the Swiss Solvency Test risk measure. *Insurance: Mathematics and Economics*, 42(3), 897–902.

47. Ghauri, S., Mazzarol, T., & N. Soutar, G.N. (2024). Values congruence and SMEs' active membership in business co-operatives. *Journal of Co-operative Organization and Management*, 12(1), 100227.
48. Gill, A., Biger, N., & Obradovich, J. (2015). The impact of independent directors on the cash conversion cycle of American manufacturing firms. *International Journal of Economics and Finance*, 7(1), 87–96.
49. Gök, O., & Peker, S. (2020). The impact of marketing's innovation-related capabilities on a firm's innovation performance. *International Journal of Innovation Management*, 24(6), 1–31.
50. Grenadier, S.R. (2002). Option exercise games: An application to the equilibrium investment strategies of firms. *Review of Financial Studies*, 15(3), 691–721.
51. Henriquez-Calvo, L., & Díaz-Martínez, K. (2023). The importance of strategic thinking and innovation for the growth of SMEs: Case of the Colombian SMEs. *Procedia Computer Science*, 224, 495–501.
52. Hotchkiss, E.S., John, K., Thorburn, K.S., & Mooradian, R.M. (2008). Bankruptcy and the resolution of financial distress. Hotchkiss, Edith S. and John, Kose and Thorburn, Karin S. and Mooradian, Robert M., Bankruptcy and the Resolution of Financial Distress (January 2008). Available at SSRN: <https://ssrn.com/abstract=1086942> sau <http://dx.doi.org/10.2139/ssrn.1086942>.
53. Hossain, M., Yashino, N., & Taghizadeh-Hesary, F. (2021). Optimal branching strategy, local financial development, and SMEs' performance. *Economic Modelling*, 96, 421–432.
54. Huang, Y., & Yan, C. (2020). Global accounting standards, financial statement comparability, and the cost of capital. *International Review of Economics & Finance*, 69, 301–318.
55. Hussinger, K. (2010). On the importance of technological relatedness: SMEs versus large acquisition targets. *Technovation*, 30(1), 57–64.
56. Isberg, S., & Pitta, D. (2013). Using financial analysis to assess brand equity. *Journal of Product & Brand Management*, 22(1), 65–78.
57. Iqbal, Q., Ahmad, N.H., & Halim, H.A. (2021). Insights on entrepreneurial bricolage and frugal innovation for sustainable performance. *Business Strategy and Development*, 4(3), 237–245.
58. Ji, J., Ye, Z., & Zhang, S. (2013). Welfare analysis on optimal enterprise tax rate in China. *Economic Modeling*, 33, 149–158.
59. Johnsen, T., & Melicher, R.W. (1994). Predicting corporate bankruptcy and financial distress: Information value added by multinomial logit models. *Journal of Economics and Business*, 46(4), 269–286.
60. Kapitsinis, N., Munday, M., & Roberts, A. (2021). Exploring a low SME equity equilibrium in Wales. *European Planning Studies*, 29(10), 1777–1797.
61. Kuo, T.C., Hong, I.-H., & Lin, S.C. (2016). Do carbon taxes work? Analysis of government policies and enterprise strategies in equilibrium. *Journal of Cleaner Production*, 139, 337–346.
62. Laitinen, E.K. (1994). Traditional versus operating cash flow in failure prediction. *Journal of Business Finance & Accounting*, 21(2), 195–217.
63. Latorre, M.C. (2012). Industry restructuring in transition after the arrival of multinationals: a general equilibrium analysis with firm-type costs differences. *Post-Communist Economies*, 24(4), 441–463.
64. Latorre, M.C. (2013). On the differential behaviour of national and multinational firms: A within - and across-sectors approach. *World Economy*, 36(10), 1294–1317.
65. Lennox, C.S. (1999). Audit quality and auditor size: An evaluation of reputation and deep pockets hypotheses. *Journal of Business Finance & Accounting*, 26(7), 779–805.
66. Li, Y., Li, Z., Wang, S., & Xu, Z.Q. (2020). Dividend optimization for jump-diffusion model with solvency constraints. *Operations Research Letters*, 48(2), 170–175.
67. Li, Z., Zhang, H., & Gao, R. (2020). Frugal innovation in supply chain cooperation considering e-retailer's platform value. *Soft Computing*, 24(20), 15373–15387.
68. Liang, Q., & Hendrikse, G. (2016). Pooling and the yardstick effect of cooperatives. *Agricultural Systems*, 143, 97–105.
69. Lin, B., & Dong, X. (2024). Empirical study on the impact of digital finance on commercial credit allocation in SMEs. *Finance Research Letters*, 61, 105011.
70. Lin, L.-H., Lin, S.-H., Lin, Y.-M., & You, C.-F. (2014). The analysis of company liquidity a using cash conversion cycle application: Evidence from Taiwan. *Global Journal of Business Research*, 8(5), 97–103.

71. Margaritis, D., & Psillaki, M. (2010). Capital structure, equity ownership and firm performance. *Journal of Banking & Finance*, 34(3), 621–632.
72. Martin-Rios, C., Demen-Meier, C., Gössling, S., & Cornuz, C. (2018). Food waste management innovations in the foodservice industry. *Waste Management*, 79(9), 196–206.
73. Mazzucato, M. (2013). Financing innovation: Creative destruction vs. destructive creation. *Industrial and Corporate Change*, 22(4), 851–867.
74. Mkhair, A., & Werner, R.A. (2021). The relationship between bank size and the propensity to lend to small firms: New empirical evidence from a large sample. *Journal of International Money and Finance*, 110, 102281.
75. Nawazish M., Birjees, R., Bushra, N., & Abbas Rizvi, S.K. (2023). Impact of Covid-19 on corporate solvency and possible policy responses in the EU. *The Quarterly Review of Economics and Finance*, 87, 181–190.
76. Nigohosyan, D., Vutsova, A., & Vassileva, I. (2021). Effectiveness and efficiency of the EU-supported energy efficiency measures for SMEs in Bulgaria in the period 2014–2020: Programme design implications. *Energy Efficiency*, 14(2), 24.
77. Mina, A., Di Minin, A., Martelli, I., Testa, G., & Santoleri, P. (2021). Public funding of innovation: Exploring applications and allocations of the European SME Instrument. *Research Policy*, 50(1), 104131.
78. Mirza, N., Rahat, B., Naqvi, B., & Abbas Rizvi, S.K. (2023). Impact of Covid-19 on corporate solvency and possible policy responses in the EU. *The Quarterly Review of Economics and Finance*, 87, 181–190.
79. Moss, J.D., & Stine, B. (1993). Cash conversion cycle and firm size: A study of retail firms. *Managerial Finance*, 19(8), 25–34.
80. Mutua Mathuva, D. (2014). An empirical analysis of the determinants of the cash conversion cycle in Kenyan listed non-financial firms. *Journal of Accounting in Emerging Economies*, 4(2), 175–196.
81. Myers, S.C. (1977). The determinants of corporate borrowing. *Journal of Financial Economics*, 5(2), 147–175.
82. Neville, C., & Lucey, B.M. (2022). Financing Irish high-tech SMEs: The analysis of capital structure. *International Review of Financial Analysis*, 83.
83. Nguyen, D.K., & Vo, D.-T. (2020). Enterprise risk management and solvency: The case of the listed EU insurers. *Journal of Business Research*, 113, 360–369.
84. Ohlson, J.A. (1980). Financial ratios and the probabilistic prediction of bankruptcy. *Journal of Accounting Research*, 18(1), 109–131.
85. Osborne, M.J., & Pitchik, C. (1986). The nature of equilibrium in a location model. *International Economic Review*, 27(1), 223–239.
86. Ozturk, I., Alqassimi, O., & Ullah, S. (2024). Digitalization and SMEs development in the context of sustainable development: A China perspective. *Heliyon*, 10(6), e27936.
87. Pitselis, G. (2009). Solvency supervision based on a total balance sheet approach. *Journal of Computational and Applied Mathematics*, 233(1), 83–96.
88. Pham, H.S.T., & Nguyen, D.T. (2020). Debt financing and firm performance: The moderating role of board independence. *Journal of General Management*, 45(3), 141–151.
89. Richards, V.D., & Laughlin, E.L. (1986). A cash conversion cycle approach to liquidity analysis. *Financial Management*, 9(1), 32–38.
90. Rodríguez-Rebés, L., Ibar-Alonso, R., Ruíz Gómez, L.M., & Navío-Marco, J. (2024). The use and drivers of organisational eco-innovation in European SMEs. *Research in International Business and Finance*, 70, 102297.
91. Sarfo, C., Zhang, J.A., O’Kane, C., & O’Kane, P. (2024). Perceived value of microfinance and SME performance: The role of exploratory innovation. *International Journal of Innovation Studies*.
92. Sati, Z.E. (2024). Comparison of the criteria affecting the digital innovation performance of the European Union (EU) member and candidate countries with the entropy weight-TOPSIS method and investigation of its importance for SMEs. *Technological Forecasting and Social Change*, 200, 123094.
93. Shleifer, A., & Vishny, R.W. (1992). Liquidation values and debt capacity: A market equilibrium approach. *Journal of Finance*, 47(4), 1343–1366.
94. Smith, R.F., & Winakor, A.H. (1935). Changes in the financial structure of unsuccessful industrial corporations. *University of Illinois Bureau of Business Research Bulletin*, 51.

95. Talonpoika, A.-M., Monto, S., Pirttilä, M., & Kärri, T. (2014). Modifying the cash conversion cycle: revealing concealed advance payments. *International Journal of Productivity and Performance Management*, 63(3), 341–353.
96. Tanriverdi, H. (2006). Performance effects of information technology synergies in multibusiness firms. *MIS Quarterly*, 30(1), 57–77.
97. Thomas, A., Scandurra, G., & Carfora, A. (2023). Profiling green innovative behaviour: Evidence from Italian technology-based SMEs. *Journal of Engineering and Technology Management*, 69, 101764.
98. Tibor L., & Pál, R. (2022). Distribution of COVID-19 government support and its consequences for firm liquidity and solvency. *Structural Change and Economic Dynamics*, 61, 305–335.
99. Tiberius, V., & Hauptmeijer, R. (2021). Equity crowdfunding: Forecasting market development, platform evolution, and regulation. *Journal of Small Business Management*, 59(2), 337–369.
100. Titman, S., & Wessels, R. (1988). The determinants of capital structure choice. *The Journal of Finance*, 43, 1–19.
101. Townsend, R. (2010). Financial structure and economic welfare: Applied general equilibrium development economics. *Annual Review Economics*, 2, 507–546.
102. Ullah, B. (2020). Financial constraints, corruption, and SME growth in transition economies. *Quarterly Review of Economics and Finance*, 75, 120–132.
103. Van Caillie, D. (1999). Business failure prediction models: What is the theory looking for? *International Conference on Risk and Crisis Management*.
104. van Hemert, P., Nijkamp, P., & Masurel, E. (2013). From innovation to commercialization through networks and agglomerations: Analysis of sources of innovation, innovation capabilities and performance of Dutch SMEs. *The Annals of Regional Science*, 50, 425–452.
105. Verma, S., Shome, S., & Patel, A. (2020). Financing preference of listed small and medium enterprises (SMEs): evidence from NSE Emerge Platform in India. *Journal of Entrepreneurship in Emerging Economies*, 13(5), 992–1011.
106. Vo, X.V., & Ellis, C. (2017). An empirical investigation of capital structure and firm value in Vietnam. *Finance Research Letters*, 22, 90–94.
107. Vuillemeijer, G. (2014). Solvency vs. liquidity. A decomposition of European banks' credit risk over the business cycle. *International Economics*, 137, 32–51.
108. Wang, F., Ding, L., Yu, X., & Zhao, Y. (2019). Big data analytics on enterprise credit risk evaluation of e-Business platform. *Information Systems and e-Business Management*, 18, 311–350.
109. Wang, X., Han, L., & Huang, X. (2020). Bank market power and SME finance: Firm-bank evidence from European countries. *Journal of International Financial Markets, Institutions and Money*, 64, 101162.
110. Wang, X., Han, L., Huang, X., & Mi, B. (2021). The financial and operational impacts of European SMEs' use of trade credit as a substitute for bank credit. *The European Journal of Finance*, 27(8), 796–825.
111. Wang, H., Xiang, X., & Han, L. (2023). Financial development, legal systems and SME finance: Cross-country evidence. *International Review of Economics & Finance*, 88, 981–1002.
112. Ward, T., & Foster, B. (1997). A note on selecting a response measure for financial distress. *Journal of Business Finance and Accounting*, 24, 869–879.
113. Wasiuzzaman, S., Nurdin, N., Abdullah, A.H., & Vinayan, G. (2020). Creditworthiness and access to finance of SMEs in Malaysia: Do linkages with large firms matter? *Journal of Small Business and Enterprise Development*, 27(2), 197–217.
114. Wolf, C.A., & Karszes, J. (2023). Financial risk and resiliency on US dairy farms: Measures, thresholds, and management implications. *Journal of Dairy Science*, 106(5), 3301–3311.
115. Wozniak, M., Duda, J., Gasior, A., & Bernat, T. (2019). Relations of GDP growth and development of SMEs in Poland. *Procedia Computer Science*, 159, 2470–2480.
116. Wu, C.-Y., Liang, W.-J., & Mai, C.-C. (2016). Public enterprise privatization: A general equilibrium analysis. *Review of Development Economics*, 20(2).
117. Xia, X., & Gan, L. (2020). SME financing with new credit guarantee contracts over the business cycle. *International Review of Economics & Finance*, 69, 515–538.

118. Yeo, H. (2016). Solvency and liquidity in shipping companies. *The Asian Journal of Shipping and Logistics*, 32(4), 235–241.
119. Yu, H., & Su, T. (2024). ESG performance and corporate solvency. *Finance Research Letters*, 59, 104799.
120. Žager, K., Sačer, I.M., & Dečman, N. (2012). Financial ratios as an evaluation instrument of business quality in small and medium-sized enterprises. *International Journal of Management Cases*, 14(4), 373–385.
121. Zeitun, R., Temimi, A., & Mimouni, K. (2017). Do financial crises alter the dynamics of corporate capital structure? Evidence from GCC countries. *The Quarterly Review of Economics and Finance*, 63, 21–33.
122. Zhang, L., Zhang, S., & Guo, Y. (2019). The effects of equity financing and debt financing on technological innovation: Evidence from developed countries. *Baltic Journal of Management*, 14(4), 698–715.
123. Zhuang, G.Y., & Chen, Y. (2005). International climate regime in China. *World Affairs Press*, 251.

INTERNET SOURCES

1. www.anaf.ro
2. europa.eu/growth/smes
3. www.eurostat.ec
4. <https://www.gemconsortium.org/wiki/1142>
5. <https://www.inegi.org.mx/app/mapa/denue/>
6. www.mfinante.ro
7. https://single-market-economy.ec.europa.eu/smes/sme-definition_en
8. <https://stats.oecd.org>
9. www.worldbank.org