Internationalization of Romanian Small and Medium-Sized Enterprises (SMEs): Key Drivers, Barriers and Strategic Insights from a Monte-Carlo Simulation

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Abstract. *Considering the increasingly globalized economy, the internationalization of small and medium-sized enterprises has become both an opportunity and a necessity. Despite the potential benefits, such as market diversification, economies of scale and enhanced competitiveness, many enterprises of this kind are facing significant challenges, which include resource constraints, regulatory and cultural barriers, and a lack of structured internationalization strategies. This study investigates the key drivers, barriers and strategic instruments that influence the international expansion of Romanian small and medium-sized enterprises, providing a data driven foundation for decision making.*

Through a Monte-Carlo simulation applied to a dataset of forty companies, part of the manufacturing industry, that activate in Romania, this research examines both internationalized and non-internationalized firms, highlighting the critical factors that facilitate or hinder global expansion. The findings indicate that small and medium-sized enterprises with well-defined strategic objectives, access to external networks and adaptive capabilities are more likely to exhibit a successful internationalization. Moreover, the study identifies the core concepts and essential instruments that can enhance firms' global reach and mitigate internationalization risks.

By integrating theoretical frameworks with empirical analysis, this research contributes to the academic discourse on small and medium-sized firms' internationalization while offering practical insights for business practitioners. The structured approach of this study ensures a comprehensive understanding of the internationalization process, enabling Romanian small and medium-sized companies to navigate global markets more effectively.

Keywords: Small and Medium-sized Enterprises' Internationalization, Monte-Carlo Simulation, Romanian Business environment, Globalization, Business strategy.

Introduction

In today's quickly changing global economy, firms must adapt to constant change in order to compete. Many businesses choose to operate both locally and internationally in order to increase awareness, attract consumers, and develop trust. Internationalization is becoming increasingly popular, particularly among small and medium-sized enterprises (SMEs), who account for approximately 90 percent of all businesses globally (World Bank Group, 2019). While large firms frequently have the means to easily expand into overseas markets, SMEs have distinct challenges that might impede international expansion.

Although internationalization provides various benefits, including access to new markets, economies of scale, and risk diversification, SMEs in Romania encounter substantial impediments. These include limited financial and human resources, cultural and technical constraints, intense

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competition, and a lack of well-defined strategies or practical instruments to aid in expansion. The current study aims to close this knowledge gap by highlighting the best approaches and critical tools for SMEs looking to expand internationally.

The primary objective of this study is to examine and categorize important internationalization techniques that businesses are implementing, or should implement, to improve their performance and operational efficiency. Furthermore, this study looks at the differences between internationalized and non-internationalized enterprises functioning in the Romanian market. The research uses Monte-Carlo simulation, as type of analysis, in order to provide insights into patterns, motivations and challenges faced during the internationalization process. Furthermore, this article aims to describe and outline the key strategic components required for Romanian businesses to effectively grow beyond their boundaries.

This study contributes to the current literature by providing essential information on the ways SMEs should perceive internationalization, as while internationalization is often discussed, there is limited empirical data on the specific procedures that SMEs should follow to successfully expand.

Furthermore, the study assesses the effects of internationalization using four important dimensions: Firstly, we will be understanding how globalization affects the internationalization of SMEs. The second dimension is focused on analyzing organizations' tactics for market entry and expansion. The third dimension is based on the identification of barriers to internationalization initiative. Lastly, the fourth dimension is claiming the critical success factors for a firm's worldwide expansion.

We propose that firms might increase their entrepreneurial activity in foreign markets by following a standardized set of recommendations. In this sense, this study offers a set of concepts that SMEs can follow as guidelines for international expansion.

Literature review

Internationalization is an extensive subject that has no universally accepted definition, as its meaning varies depending on the perspective and the context in which it is analyzed. However, considering the subject of this paper, scholars are commonly defining it as the process through which firms identify, develop, and leverage opportunities across national borders (Shane & Venkataraman, 2000). While traditionally associated with foreign direct investment (FDI), internationalization extends beyond market-entry strategies and encompasses international production processes, supply chain integration and cross-border collaborations (Apăvăloaei et al., 2019).

Role of small and medium-sized enterprises in internationalization

Small and medium-sized enterprises (SMEs) have increasingly become key players in global trade owing to their ability to adapt rapidly to economic, technological, and political changes in foreign markets. However, the internationalization of SMEs differs significantly from that of large corporations due to resource constraints, market uncertainty, and regulatory challenges (Lecerf & Omrani, 2020).

In Romania, SMEs face additional obstacles, including intense competition, bureaucratic barriers, and financial limitations. Research suggests that many Romanian SMEs prefer a gradual approach to internationalization, first strengthening their domestic operations before expanding globally, which happens usually through partnerships or strategic alliances (Belu & Țarțavulea, 2016).

Barriers and success factors in SME internationalization

Small and medium-sized enterprises encounter multiple challenges in their journey of international expansion, which can be grouped into three categories of challenges: country-specific, industry-specific and firm-specific challenges. However, these barriers, widely discussed in internationalization literature, result from regulatory constraints, market uncertainty and resource limitations (Bandi & Bhatt, 2008). Overcoming these barriers requires a strategic approach, including effective strategic planning, leveraging international partnerships, investments in innovation etc.. The table below provides a structured synthesis of these barriers and the corresponding success factors that facilitate SME internationalization, offering a conceptual foundation for understanding the factors influencing global expansion.

Table 1. Summarization of barriers and success factors in internationalization

Core challenges	Barriers	Internationalization success factors
Country-specific	Regulatory complexity, economic volatility, political instability	Policy stability, government support, access to trade agreements
Industry-specific	Intense competition, market risk, demand uncertainty	Industry networks, market adaptation, competitive differentiation
Firm specific	Limited financial, managerial, and human resources	Strategic planning, international partnerships, innovation

Source: Bandi & Bhatt, 2008.

Models of Internationalization

Internationalization is often considered a business model in itself, as it fosters innovation, enables firms to gain a competitive advantage through cost efficiencies, and reduces reliance on local resources (Danciu, 2012). Various theoretical models explain the internationalization process, offering frameworks that businesses can use to implement and manage their global expansion strategies.

While internationalization strategies and models are distinct concepts, the literature emphasizes the importance of selecting an appropriate internationalization model, as this choice directly influences a firm's global expansion trajectory (Apăvăloaei et al., 2019). Sorensen categorizes internationalization models into four primary groups: progressive models, firms that expand gradually through experience; contingency models based on market conditions and institutional support; interactive models, as business networks and partnerships drive internationalization; social construction models, because cultural and social influences are shaping the internationalization process (Danciu, 2012).

Since Romania’s economy is largely driven by SMEs facing competitive pressures both locally and internationally, research indicates that many firms adopt progressive internationalization models. These models emphasize stepwise knowledge accumulation, risk reduction, and incremental market entry strategies.

1. The Uppsala model

The Uppsala Model was developed by Johanson and Vahlne in 1977 and later refined in 1990, 2009 and 2013, and it describes internationalization as a gradual process of increasing commitment to foreign markets. This model highlights experiential learning and risk management, emphasizing that firms expand internationally as they accumulate knowledge about foreign markets (Awuah et al., 2011).

Johanson and Vahlne argue that firms gain international market insights through direct experience rather than imitation. Unlike businesses that expand aggressively based on market research alone, firms following the Uppsala Model progressively engage with foreign markets, ensuring that each expansion step is based on a solid foundation of acquired knowledge and reduced uncertainty (Glowik, 2009).

For Romanian SMEs, this model provides a practical framework for minimizing risk while expanding internationally. Many companies start with export activities or small-scale partnerships before committing to larger international investments.

2. The Product Life Cycle Model: a Market-Driven Internationalization

Another well-known progressive model is the Product Life Cycle Model, introduced by Raymond Vernon in 1966. This model explains internationalization as a sequential process driven by the life cycle of a product.

Vernon's theory posits that firms in advanced economies first develop and commercialize innovative products within their domestic markets. As the product matures and becomes standardized, firms shift production to lower-cost regions, leveraging cheaper labor and operational efficiencies to maintain competitiveness (Sorensen, 1997).

For Romanian SMEs, this model is particularly relevant in manufacturing, information technology (IT), and technology-intensive industries, where firms initially target domestic or regional markets before outsourcing production or expanding their sales networks abroad.

Both the Uppsala Model and the Product Life Cycle Model emphasize gradual internationalization, where firms mitigate risks and build competitive advantages through structured, experience-based learning. These models serve as valuable theoretical foundations for understanding how Romanian SMEs navigate international markets.

Despite extensive research on internationalization, a significant gap remains in understanding how SMEs, particularly those in emerging economies such as Romania, navigate and manage the internationalization process. Existing literature has primarily focused on multinational corporations (MNCs) and firms from developed markets, offering limited empirical insights into the strategies and limitations faced by resource-constrained SMEs (Hitt & Tihanyi, 2003).

This study seeks to bridge this gap by applying a Monte-Carlo simulation to analyze key factors influencing SME internationalization in Romania.

Methodology

The current study is investigating the internationalization process of Romanian SMEs in the manufacturing sector through a mixed-methods approach, integrating quantitative surveys and qualitative semi-structured interviews, ensuring a comprehensive analysis of the factors influencing internationalization.

The study's hypothesis are:

1. Small and medium-sized enterprises face significant barriers to internationalization due to limited resources and market uncertainty.

SMEs often struggle with financial and managerial constraints due to their size, limiting their ability to invest in foreign markets (Knight & Cavusgil, 2004). Additionally, market uncertainty, which is caused by regulatory differences, economic volatility and the lack of foreign market knowledge, makes it more complicated to internationalize (OECD, 2009), which frequently result in slower expansion strategies.

2. Companies that adopt structured internationalization strategies are more likely to succeed in expanding abroad.

In this study, structured internationalization strategies refer to well-defined and carefully planned approaches that firms establish before entering foreign markets. These strategies involve thorough market research, gradual expansion and strong partnerships (Johanson & Vahlne, 2009). Firms that adopt such structured models are more likely to gain experiential knowledge and mitigate risks and achieve sustainable international growth (Paul & Rosado-Serrano, 2019).

In order to test these hypotheses, data was collected from public databases of key Romanian institutions, targeting SMEs in the manufacturing sector due to its significant contribution to the national economy, from Bucharest and Dâmbovița County. A total of 1961 companies were contacted, but only 40 firms agreed to participate by completing an online self-administered questionnaire. Some participants also provided additional insights through semi-structured interviews through an online conferencing platform.

The online questionnaire was developed based on established internationalization theories, including the Uppsala Model (Johanson & Vahlne, 2009), the Eclectic Paradigm (Dunning, 1988) and many more. These theories helped to create the main key dimensions for the study. The first dimension collected general company information, including size and type, which is summarized in table 2 below.

Table 2. General information on surveyed firms

Firms	Number of companies involved	Type of company	Size of the company
Internationalized firms	14	5 multinational companies	5 large sized enterprises
		2 national companies	2 medium sized enterprises
		7 small and medium sized companies	7 micro sized enterprises
Non-internationalized firms	26	26 small and medium sized companies	3 medium sized enterprises
			7 small sized enterprises
			16 micro sized enterprises

Source: Authors' own research.

For internationalized companies, the survey explored the role of globalization in their internationalization process, strategies for entering and operating in foreign countries, barriers and challenges encountered during internationalization and lastly key success factors identified in the process.

For non-internationalized companies, the structure remained similar but focused on their perception of globalization as a local business, strategies considered necessary for success in both domestic and foreign markets, barriers and difficulties faced in the business environment and finally, reasons for not expanding internationally and their views on best practices for internationalization.

The research process was structured into four key stages. First, the survey questions were selected based on the response formats, which were either probability values or values based on the Likert scale. Open-ended questions and interview responses served to validate the conclusions drawn from the survey. The collected data was then converted into probability distributions, with cumulative probabilities calculated for each category of enterprises. To transform the collected data into research variables, a Monte-Carlo simulation was applied using Microsoft Excel application. By generating 10,000 random scenarios mapped to the probability distributions, the simulation provided a comprehensive view of possible response patterns. The choice for this approach was because it helps qualify uncertainty and offers a dynamic analysis of SME internationalization patterns beyond static survey responses.

Finally, the results were analyzed by calculating response frequencies, visualizing trends through graphical representations, and conducting a comparative assessment between internationalized and non-internationalized firms. Monte-Carlo simulation was chosen for its ability to model probabilistic distributions, offering deeper insights into the challenges and strategies shaping the internationalization of Romanian SMEs.

Results and discussions

As mentioned in the previous part, Monte-Carlo simulation was used for the two sets of companies, internationalized and non-internationalized, for which three variables were analyzed per category of firms, as presented in table 3 below.

Table 3. Monte-Carlo simulation results

Question	Company category	Response options	Survey results (%)	Simulation results (%)	Key observation
Q1. Do you think that a best practices guide would help you in your decision to internationalize?	Non-internationalized firms	To a small extent (20%)	14.81	14.91	Neutral impact, but high necessity for development of the internationalization process
		Weak (40%)	7.41	7.6	
		Neutral (60%)	44.44	44.39	
		Moderate (80%)	18.52	18.1	
		To a great extent (100%)	14.81	15	
Q2. How do you rate the level of preparation and adaptability of your management team to address the challenges of internationalization?	Non-internationalized firms	Unprepared and unadaptable (20%)	11.11	10.95	Moderate impact for level of preparation, but there is a need of training and resources for development
		Ready, but not adaptable (40%)	14.81	14.91	
		Moderate prepared and adaptable (60%)	44.44	44.13	
		Prepared and adaptable (80%)	18.52	18.84	
		Very Prepared and adaptable (100%)	11.11	11.17	
Q3. To what extent do you consider culture to be an obstacle in the internationalization process?	Non-internationalized firms	Very small extent (25%)	33.33	33.3	Low impact, considered a minor obstacle, influence on internationalization is limited
		Small extent (50%)	18.52	18.35	
		Moderate extent (75%)	40.74	41.37	
		Great extent (100%)	7.41	6.98	
Q4. How do you assess the level of support and assistance provided by government institutions for businesses seeking to	Internationalized firms	To a small extent (20%)	39.98	40.03	The factor has a high impact, current level of support provided to firms is insufficient.
		Weak (40%)	13.33	10.96	
		Neutral (60%)	20.01	21.86	
		Moderate (80%)	13.33	13.91	
		To a great extent (100%)	13.33	13.24	

expand internationally?					
Q5. How important do you think cooperation with an international partner is?	Internationalized firms	Less important (25%)	0	0	Cooperation with international partners is important, key chain of success.
		Important (50%)	33.33	33.29	
		Very important (75%)	60	60.01	
		Absolutely necessary (100%)	6.67	6.69	
Q6. To what extent do you consider geographic localization to be important for your business in the context of internationalization?	Internationalized firms	Less important (25%)	26.67	27.12	Decisive factor in influencing the internationalization process.
		Important (50%)	33.33	32.62	
		Very important (75%)	26.67	26.94	
		Absolutely necessary (100%)	13.33	13.32	

Source: Authors' own research.

The results of the applied Monte-Carlo simulation fairly reproduced the initial distribution of the answers given by the respondents in the online questionnaire. This similarity in the responses, in an overall picture, shows the stability and validity of the data collected from the SME representatives, together with the reliability of the factors identified from the responses, ensuring that the conclusions drawn from the simulation have a high degree of confidence.

Considering both the results of the simulation and the general data obtained from the questionnaire addressed to the respondents, it can be summarized that the process of internationalization is a combination of internal and external factors that influence a company's ability to expand successfully.

Internally, factors such as cultural adaptability, strategic resource management, and managerial flexibility play a crucial role in overcoming organizational and technical barriers. The simulation results emphasize the importance of an integrated strategy, where innovation and financial stability further enhance a firm's capacity to compete globally.

Externally, access to tailored support, strategic market selection, and strong international partnerships are key drivers of success. However, the findings also highlight challenges, particularly the lack of sufficient institutional support and the necessity for market-oriented strategic planning. To navigate these complexities effectively, businesses must align their internal capabilities with external market conditions, ensuring a well-structured and adaptive approach to internationalization.

Going further, based on these factors and their practical implementation strategies, provide a structured approach for firms aiming to expand beyond domestic markets, as distributed in table 4.

Table 4. Main concepts for internationalization

Key concept	Description	Implementation strategies
Intercultural agility and managerial adaptability	The ability to navigate cultural differences and integrate diversity into international strategies is essential for success in foreign markets. Firms must also remain adaptable to rapid changes in the external environment	- training managers in intercultural competencies - adapting products and services to align with local cultural preferences

Key concept	Description	Implementation strategies
Organizational capacity and resource allocation	Successful international expansion depends on the effective allocation of financial, human, and technological resources. The level of investment in global operations determines the firm's ability to compete internationally	- establishing dedicated teams for foreign market operations - strengthening IT infrastructure to manage global business processes
Strategic planning for international markets	A well-defined internationalization strategy enables firms to adjust their processes to the demands of external markets while minimizing risks.	- in-depth market analysis before expansion and developing a market penetration strategy, including pricing and distribution planning.
Strategic networks and international partnerships	Collaborating with local and international partners provides essential logistical, financial, and informational support, reducing entry barriers in foreign markets.	- forming strategic alliances with local distributors, partnering with financial institutions and business support organizations.
Integrating external market conditions into strategy	SMEs can enhance their internationalization efforts by leveraging external support mechanisms such as institutional assistance and financial programs	- export financing programs and government incentives, as well as compliance with regulatory frameworks of target markets.
Innovation towards internationalization	competitive differentiation in international markets is strongly linked to innovation in both product development and marketing strategies	- introducing unique, market-specific products - utilizing digital technologies to optimize international sales

Source: Authors' own research.

Conclusion

In an increasingly globalized economy, where internationalization is becoming more accessible, Romanian small and medium-sized enterprises continue to face significant challenges in expanding abroad. This study highlights key obstacles such as the lack of clear strategic orientation, organizational and technical barriers, and limited knowledge about foreign markets. At the same time, the opportunities provided by internationalization, such as competitive advantages and access to diversified markets, emphasizes the need to provide SMEs with practical resources and guidance to help them navigate the internationalization process effectively.

From a theoretical point of view, this research integrates established internationalization theories, such as the Uppsala Model and the Eclectic Paradigm, with empirical findings, demonstrating how limited resources and uncertainty about foreign markets influence SMEs' decisions and ability to expand. The Monte-Carlo simulation provided valuable insights into the differences between internationalized and non-internationalized firms in Romania, identifying both the necessary local adjustments to facilitate internationalization and the internal transformations that companies must undertake, confirming that structured internationalization strategies can significantly improve the chances of success.

On the other hand, from a practical perspective, the findings emphasize the importance of external networks, strategic planning and organizational flexibility in overcoming internationalization barriers. This research provides a solid foundation for both academic and business practitioners, offering a structured framework for assessing internationalization practical insights into the internationalization process.

However, this study has certain limitations, which are referring to the lack of specialized resources on SMEs internationalization process in Romania, that offer clear, practical information, including concrete guidelines on processes, risks and recommended strategies. Additionally, another limitation is about the reluctance among companies to share insights regarding their experiences in the international environment in academic contexts, which restricts even more the scope of empirical data. The hesitation may be referring to concerns about competition, a lack of perceived opportunities, or the substantial investments required for international expansion.

In conclusion, even though it is not easy to reach generalized conclusions, this study provides a solid foundation for future research. As a next step, this research lays the groundwork for developing a best practices guide tailored to Romanian SMEs, equipping them with the knowledge and strategies needed to strengthen their international presence.

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