

Article

The Impact of Financial Culture on the Operation of Hungarian SMEs before and during COVID-19

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Abstract: The main aim of this study is to explore the conceptual framework of corporate financial culture and its practical relevance in an emerging Central European market economy, at the level of the Hungarian SME, with a special emphasis on the Hungarian SME sector. In our study, we highlight each dimension of corporate financial culture, focusing on the established corporate financial culture index, and within it, we examine the significance of the financial management elements sub-index and the risk and insurance sub-index separately. In addition, we look for logical, causal, and statistically verifiable relationships between corporate financial literacy and the outcome of corporate financial decisions and corporate risk taking. The relationships were broken down over two years in the analysis. Approximately 2167 responses were included in the 2019 sample and 3281 in the 2021 sample. These representative samples were taken from the Hungarian SME sector and multiple linear regression models were built to find a significant moderation effect of financial literacy between perceived risks and the insurance activity of companies. We conducted our research in two different periods, the unique feature of which is that we conducted a survey before and during the coronavirus crisis, so we could make a comparative analysis. The method used in this research study is a literature review analysis of reference manuscripts, discussing topics related to financial literacy, corporate risk management, and corporate financial management, published in the last 10 years. Our results show that there are positive and significant relationships between company management, corporate risk management, and corporate financial literacy. The results of our study draw the attention of company leaders to the practical significance of financial culture—efficiency, profitability, and stability.

Keywords: corporate finance culture; risk management; corporate growth; corporate performance



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1. Introduction

The backbone of many national economies is provided by the micro, small, and medium-sized enterprise segment, so the role and importance of enterprises operating in the sector are significant (Ayyagari et al. 2007; Hirawati et al. 2021; Lima et al. 2020). According to IMF analysis (IMF 2017), the quality and performance of the SME sector has a strong impact on economic growth, job creation, the effectiveness of macroeconomic policy, and macro-financial stability. That is what the study by Oshora et al. (2021) justifies, who also found that SMEs in developing countries are considered a significant tool in job creation, poverty reduction, economic growth, and economic stability. This is particularly important in a decade whose beginning and end were marked by two major crises with different causes (Saáry et al. 2021). The global financial crisis of 2008 clearly brought to light problems arising from the management of systemic risks, both at the microeconomic and macroeconomic levels. The crisis and its economic consequences have also affected households, companies, the banking system, and the functioning of nation states. Over the

past decade, the world's leading governments, international financial institutions, and the players in the banking system have sought to address the economic (financial, banking, and accounting) problems of the 2007/2008 crisis, accompanied by strong monetary policy expansion and, after some consolidation, the coronavirus crisis posed new challenges to the world economy, including national economies and businesses alike. Several authors found that the COVID-19 impact was evident in all countries, but not with the same strength (Juergensen et al. 2020; Nieto and Rubio 2022; Ugurlu and Jindřichovská 2022; Zainal et al. 2022). We witnessed strong government intervention in all parts of the world. Improving and expanding access to financial services, favorable financial resources, was an important policy challenge and required much to be done by governments (Aharon et al. 2021; Schuster et al. 2020). Milojević's (2021) study also emphasizes that rapid and targeted state intervention played a major role during the pandemic. The COVID-19 pandemic put businesses in an extremely difficult situation, but it also opened up many opportunities for innovation, new business strategies, and business models (Csiszárík-Kocsir 2021; Etemad 2020; Fetzer et al. 2021). Taking all this into account, we believe that a complete conceptual change is essential for economic operators. Our study draws attention to an important qualitative change in approach and practice, the need for financial culture and awareness in a sector of major importance, from both an economic and a social point of view. The SME sector is of key importance in the Hungarian economy, employing more than two-thirds of Hungarian workers, producing almost half of value added and more than 30% of corporate investment. SMEs account for a significant share of the supply chain of large companies and have important potential for economic growth due to their flexibility and responsiveness (Hungarian Central Statistical Office 2020). However, these companies are exposed to various risks from their environment on a daily basis, which has also increased as a result of the COVID-19 pandemic (Dias et al. 2022), not only in the field of financial planning and management but also in practice, in all functional areas that particularly affected the Hungarian SME sector (Bajkó et al. 2022). In our research, we also try to capture the dynamics of this with two different sampling dates.

On the one hand, the relationship between the banking and corporate sectors needs to be reconsidered, as the banking sector still does not consider small and medium-sized enterprises to be worthy partners, and companies are afraid to turn to credit institutions, which are bank-oriented (in a country with weak capital market activity). Access to finance is the predominant factor that can influence the growth, performance, and successful future of small and medium enterprises (Ina Ibor et al. 2017). The fact that substantial growth in credit demand can be achieved if market confidence is strengthened and banks put a stable economic vision ahead of the corporate sector should also be treated as a central issue. On the other hand, the corporate sector also needs to change. It is essential to ensure the right scale of cash flow and capital management, as well as to strengthen transparency, accountability, and cooperation, which must be complemented by significant improvements in organizational innovation. All this can be achieved if, in addition to the role of the state, economic organizations also support the continuous training of their employees. Companies would need conscious planning to develop financial strategies that would fully serve corporate stability, enhancing performance (Akhtar and Liu 2018). This must include the timely identification of risks and the means to manage them consciously. Businesses face many different risks in running their business (Lima et al. 2020). These can be risks from the outside of the organization (see the challenges posed by the coronavirus), but there are also a number of risks within the digitalizati that can be identified and mitigated by improving the financial culture. Most authors cite that among the internal risks are capital risk, production risk, marketing risk, human resource risk, corporate financial risk, operational risk, but also expertise, strategy, and information risks (Alifiana and Susanti 2018; As Sajjad et al. 2020; Sajiah et al. 2019). Finally, the state must play a significant role by announcing programs that can support the financial and financing challenges for SMEs (Durst and Gerstlberger 2021; Isensee et al. 2020).

The post-crisis changes require proper awareness and resolution from market operators, a line of thought that leads to one of the central strands of the thesis, that is, the need for an adequate level of financial literacy (Chhatwani and Mishra 2021; Oshora et al. 2021; Saifurrahman and Kassim 2021). Developing a corporate financial culture, as a result of the financial crisis that unfolded in 2008, is an increasingly common goal in developing countries. When analysing financial literacy, it is important to mention that while several scientific studies deal with the financial literacy of society, there is still very little accurate information about corporate financial literacy, despite its outstanding importance. Having recognized this problem, several training programs have been launched abroad recently to improve the accounting and financial literacy of small entrepreneurs, and young and/or micro-entrepreneurs, which have already had perceivable, positive—albeit mostly moderate—effects (Bruhn and Zia 2013; Cole et al. 2012; Drexler et al. 2014; Karlan and Valdivia 2011). This shows what several authors found: that there is a close link between financial literacy and corporate performance, given that companies with a higher level of financial awareness show performance growth (Mura et al. 2015). In conclusion, it can be stated that a lack of financial knowledge could become a great obstacle in corporate operations, growth, and investment decisions. It also has to be empathized that the standard of corporate financial culture may determine the economic stability and growth of the entire national economy.

This article is focused on corporate financial literacy and the relationship between corporate risk management and the corporate financial culture in SMEs in Hungary. Its main purpose, on one hand, is to identify the direct effect of corporate financial planning and financial analyzing activities on the perception of risks and insurance activities and, on the other hand, to identify the moderating effect of financial literacy on this relationship.

This research is structured in the following order. In the next section, we present the relevant and systematic literature review, where the most pivotal previous works and research are discussed with a special focus on the determinants of corporate financial literacy and related risk management. Moreover, this section represents our hypotheses. Section 3 describes the materials and methods, which the research framework and basic data collection procedures are discussed in. The results are addressed in Section 4. Section 5 presents the discussion and Section 6 demonstrates limitations of the research and future research directions. Finally, Section 7 presents the conclusion of the study, which is a comprehensive evaluation of the results and their applicability for different types of policies.

2. Literature Analysis Underpinning Our Research

2.1. The Business Importance of Corporate Financial Culture

Results of a lot of research in the area of corporate financial literacy indicates the fact that there is no consistent approach to understanding it (Ciemleja et al. 2014). A clear conceptual framework for understanding the concept of corporate financial literacy is necessary to build a theoretical foundation, and then to prove the obtained theoretical knowledge with practical, corporate surveys. In the next section, the study attempts to summarize the most important theoretical approaches and, in some cases, to conflict with them or to evaluate them with a critical approach. This research addresses this gap by exploring firm-level financial literacy in the Hungarian SME sector.

Corporate financial culture basically means knowing the elements of a financial management toolbox (Akhtar and Liu 2018). According to Kefela (2011), financial literacy, thus, includes the following areas: budgeting, savings, debt management, financial negotiations, risk management, taxation, and banking services. Without knowledge of basic financial, economic, and management principles, it is extremely difficult to make well-informed decisions that are most likely to reflect how each decision will affect a company's results, not only in the short but medium to long term as well (Dalton 2021). The decisions, and their outcome clearly affect the future operations of businesses and could potentially jeopardize one of the fundamental principles of accounting, the going concern concept. It is generally expected that financial literacy would improve the quality of financial decisions

(and the outcome of financial decisions) and, hence, performance (Agyei 2018; Lusardi and Mitchell 2006, 2007a, 2007b; Mak and Braspenning 2012; Siekei et al. 2013). Fatoki (2014) also came to a similar conclusion, but made so many additions to his research that MSMEs with higher levels of financial literacy tend to make more effective financial decisions with fewer business faults than their key competitors.

Other authors link financial culture—through financial decisions—to corporate failures and bankruptcies. Kotzé and Smit (2008) and Freiling and Laudien (2013) found that lack of corporate financial literacy and skills in business are the main reasons for the failure of SMSs and startup businesses. Laitinen (1992) and Van Praag (2003), among others, expressed similar views. In his analysis in Africa, Abubakar (2015) highlighted that those entrepreneurs who have a considerable level of financial literacy manage their business much more effectively, better address emerging issues and challenges in business, e.g., policy constraints, cultural barriers, access to new markets, or overcoming operational difficulties.

However, a number of studies also show that, while the lack of corporate financial literacy can lead to business failure in the worst case (due to poor decisions), inadequate financial literacy—i.e., a sub-optimal level of financial literacy—is also a major obstacle to the sustainable development of MSMEs (Ye and Kulathunga 2019). In essence, corporate development can best be served by the various corporate strategies that set the path for business leaders. In an empirical study on SMEs, Nohong et al. (2019) found that the SMEs' financial knowledge inevitably influences their business strategy—not only investment, financial, or even digitalization strategies, but also conscious marketing strategy.

According to some studies, there are positive relationships between financial literacy and performance (Ali and Li 2021; Beverly et al. 2003; Cherugong 2015; Fatoki 2014; Kidwell and Turrisi 2004; Piprek et al. 2004; Ye and Kulathunga 2019). In another study, the positive association between financial literacy, access to finance, and financial risk attitude on the SME performance was clearly demonstrated (Buchdadi et al. 2020).

Based on the theories identified above, as well as our earlier research on the topic, we interpret corporate financial culture as follows. A corporate financial culture is, thus, a conscious and company-specific application of knowledge and tools from the financial management tools within the company and macro-environmental financial variables outside the company that improves the company's efficiency, effectiveness, and competitiveness (own definition).

Therefore, the world, including Hungary, has now reached a stage in its development when supply and demand relations in business relations can be promoted not by capital injections, tax breaks, state subsidies, or other support instruments, but by increasing financial awareness and professionalism (culture) within organisations. This will reduce the use of public transfers, reduce the chances of crises, and reduce the destructive effects on society.

2.2. *The Links between Corporate Risk Management and Corporate Financial Culture*

The importance of financial risk analysis tools is well documented and the benefits of risk management in SMEs are highlighted by several authors (Krauss et al. 2005; Wegner et al. 2017; Yang et al. 2018). For a company, any factor that can change the company's performance and management in a negative direction is a risk; therefore, it is especially crucial to identify the source of risk, conscious risk management, and risk-conscious decision-making in all companies (Oláh et al. 2019). In the current turbulently changing, often unpredictable economic world, business leaders and managers need to focus on managing risks and managing them consciously (Nugraha et al. 2019). The economic (financial and controlling) managers of SMEs must do their utmost to be able to effectively manage the risks that arise in order to ensure the survival of their organization (Cressy 2006; Goswami et al. 2017; Grable and Lytton 1999; Jaroslav et al. 2014; Nugraha et al. 2019). It also means that businesses need to manage the risks they face in order to operate effectively. One group of companies is only passively managing its financial risks,

while others are just trying to gain a competitive advantage by consciously increasing and managing them.

Yaakub and Mustafa (2015) clearly conclude in their research that risk is a barrier in improving SME performance. Díez-Esteban et al. (2017) conducted similar research and found that there is a very close relationship between the risk management (attitude, awareness) of firms and the performance and effectiveness of firms. As a result of their research, all of the authors named above recommend that company leaders adopt a company-specific risk-mitigation strategy as soon as possible. The research also shows that risk-management tools are positively and significantly related to corporate performance. Humaira and Sagoro (2018) reached a similar conclusion, but also found a significant relationship between financial knowledge and financial risk management. Reversing the previous logic, Saifurrahman and Kassim (2021) state in their study that a lack of corporate financial literacy causes poor risk management in firms and, thus, impairs their profitability. According to Ye and Kulathunga (2019), with extensive financial knowledge, executives and managers are more likely to adopt strategies that can target risks that affect their business processes. According to Nohong et al. (2019), based on empirical research among micro, small, and medium enterprises in the Makassar region, corporate financial culture influences effective risk management through a consciously designed capital structure that strives for optimal balance and rational, informed financial decisions. The clear conclusion of their research is that the competitiveness of SMEs is influenced by management and financial literacy (i.e., corporate financial culture), rational financial (investment and financing) decisions, and prudent risk management (Nohong et al. 2019). A similar conclusion was reached by Zizi et al. (2020). In their research, Yang et al. (2018) highlighted that financially highly educated managers and directors are encouraged to participate in different risk reduction strategies and these leaders are much more committed to conscious risk management. They further argue that the level of general financial education of a company's human staff affects the outcome of Enterprise Risk Management, i.e., its effectiveness. A similar view is taken by Csiszárík-Kocsir et al. (2021). Riepe et al. (2022) also examined, in their research (examining the National Bank of the Netherlands and three other European countries), the mechanism of action between corporate financial culture and corporate risk management. They found that lower levels of risk aversion (i.e., firms that exhibit risk-averse behaviour) were significantly more likely to be true for entrepreneurs and businesses with lower financial literacy, while for entrepreneurs and firms with higher financial literacy, a much higher proportion of diversification, which is the conscious sharing of risk to reduce potential losses, is found.

Based on the above, it is clear that most of the authors dealing with this topic focus on the connections between corporate financial culture and risk management affecting companies. Györi (2018) conducted an analysis on the financial vulnerability of SMEs in Hungary, involving a small group, and found that the financial knowledge of company managers can provide a basis for understanding and consciously managing financial risks. Almost all of the above authors found that the specification and quality of financial, accounting, and controlling tools used by companies (in general: financial management tools) underpin the management of financial risks in the case of small and medium-sized enterprises. In addition to the above, after a critical review of the literature, it can be assumed that the conscious use of financial management tools among SMEs can significantly influence the successful operation of enterprises, and there is a link between the range of tools used and short- and long-term planning (Buchdadi et al. 2020).

Therefore, we base the basics of our research on the logical conclusions presented above and aim to prove it in the Hungarian SME sector. By analyzing the above references and predicting our own research results, it can be concluded that corporate finance culture helps companies identify, evaluate, and manage risks; on the other hand, an SME's approach to risk management is also dependent on its corporate financial literacy.

Based on the above review of the literature and our previous research, we formulated the following hypotheses, which are also represented by the relationships indicated in the block diagram of the road model.

Hypothesis 1 (H1). *In the case of SMEs, the use of financial management tools depends on their systematic planning and analytical behavior.*

Hypothesis 2 (H2). *For SMEs, the use of financial management tools has an impact on companies' risk sensitivity, risk perceptions, and insurance behavior.*

Hypothesis 3 (H3). *The degree of systematic planning and analysis behavior of SMEs is also directly affected by their risk sensitivity, risk perception, and insurance behavior.*

3. Materials and Methods

Building the methodology of our research, we created the following framework for data processing as presented in Figure 1. The measured variables were merged into single index numbers with a linear transformation. These index numbers were then standardized to z-scores and these scores for each proxy index number constitute the basis of our further analysis: a pre/post comparison with independent samples *t*-test. Obtaining the results, we created a path model and ran it with both pre- and post-COVID-19 data to see the differences.

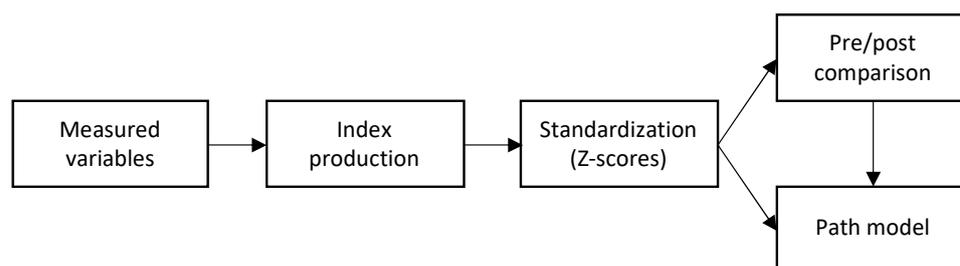


Figure 1. Methodological framework.

To test the hypotheses, we constructed a complex path model, which is a series of regression models that are practically based on each other. The variables in the causal model are connected by arrows that indicate the causal direction of the relationships. Pearson's zero-order linear correlation between independent and dependent variables is broken down into two additive parts. One part is the effect that the independent variable exerts directly on the final dependent variable, and the other part is the effect that the independent variable exerts on that variable through other intermediate, meditative variables. To do this, regression relationships must be constructed and relevant regression coefficients and their significance must be calculated (László et al. 2004; Székelyi and Barna 2004).

All variables in the path model are normalized. Multiple linear regression is a procedure for describing the relationship between a dependent variable (Y —Risk and Insurance Index) and several independent variables (explanatory variables) (X_1, X_2, \dots, X_i —Planning Index, Analyzing Index). Together, we examine not only their direct effects but also their indirect effects through a moderating variable (financial management tools index). The variables describing the same experimental sample (group of subjects, animal models) show the predictive power of the independent variables for the dependent variable. It provides an answer to the extent to which a unit change in independent variables causes a change in a dependent variable. It allows the development of explanatory models by exploring the hidden trends behind the variables. The method can only be used to detect linear relationships (Freedman et al. 2005).

Analyses were conducted in the usual manner for linear regression, following Freedman et al. (2005): we tested the fit of each model with an F-test. This is acceptable if

the significance level of the test is $p < 0.05$. After this, the coefficient of determination R^2 indicating the explanatory power of the model is calculated, and then the standardized regression parameters (β) of each involved independent variable must be interpreted if they fit the model significantly ($p < 0.05$) (Maddala 2004). If $\beta > 0$, then the relationship between the explanatory variable (x_i) and the result variable (Y) is positive, i.e., the high value of the explanatory variable increases the value of the result variable. If $\beta < 0$, the relationship between the explanatory variable (x_i) and the result variable (Y) is negative, i.e., a high value of the explanatory variable decreases the value of the result variable.

We perform the analysis using the enter method, which includes all independent variables in the model, regardless of whether the partial explanatory power of the variable is significant, and then eliminates the non-significant ones one by one (Szabó et al. 2010). A similar method was applied to corporate samples by Wiśniewski (2021, 2022) and Rafiq et al. (2021).

Sampling

The research population consists of companies with a Hungarian location, 25–250 staff headcount, and an annual turnover lower than EUR 50 million or annual balance sheet total does not exceed EUR 43 million (in accordance with EU SME recommendation 2003/361). On this basis the population size in 2019 is $N_1 = 41.191$ and in 2020 $N_2 = 38.511$. (Hungarian Central Statistical Office 2020). To determine the optimal sample size a 95% confidence level was applied, and we aimed for a standard error under 5%.

A systematic random sampling method was followed in our survey: companies were contacted during two national roadshows between February and May 2019 (thus, the sample contains companies with financial data based on the 2018 closed financial year), and repeated sampling followed the first one among the same respondents between May and August 2021. Ultimately, the hypotheses were tested on responses from $n_1 = 2.167$ enterprises from survey of 2019 and $n_2 = 3.281$ enterprises of 2021. Considering the Hungarian SME sector described above, our sample holds 5.26% of the population in 2019 and 8.52% in 2021. Therefore, for 2019: (1) standard error: 2.05% and (2) confidence interval: 95%; for 2021: (1) standard error: 1.64% and (2) confidence interval: 95%. The samples thus taken are considered to be representative for the consolidated sectoral breakdown of the Hungarian economy (Mann–Whitney U -test: $p_1 = 0.132$; $p_2 = 0.087$) and provides a uniform distribution for size categories based on number of employees (Kolmogorov–Smirnow test: $p_1 = 0.091$; $p_2 = 0.056$).

Accordingly, the samples are suitable for drawing conclusions and generalizing. Considering the distribution of the sample as detailed in Table 1, it can be seen that it is balanced in other respects as well: half of the sample is below HUF 100 million in annual net sales, and the other half is above it, half of the companies in the sample were established before 2000 and the other half after 2000, the South Transdanubia region is slightly under-represented, but the rest are present in the sample at 10–15%. Most businesses are owned by domestic individuals (88%).

Table 1. Sample distribution.

		n%		n%				
		2019	2021	2019	2021			
National economy	Agriculture, forestry and fishery	4.7	3.9	NUTS-2 regions	Northern Hungary	14.8	15.0	
	Industry	28.2	27.6		Northern Great Plane	13.8	13.8	
	Service	67.1	68.5		Southern Great Plane	13.4	13.2	
Size	Small business	54.7	55.2		Central Hungary	13.4	13.4	
	Medium business	45.3	44.8		Central Transdanubia	15.2	15.4	
sales revenue (million HUF)	1–15	26.1	26.6		Western Transdanubia	12.3	12.2	
	16–29	5.5	5.78		Southern Transdanubia	5.1	5.0	
	30–50	5.7	6.21		Budapest	11.9	12.1	
	51–100	9.1	9.56		Ownership	A domestic individual	36.5	37.2
	101–500	17	15.6			several domestic individuals	51.1	49.6
	501–1000	16.8	16	Domestic and foreign private individuals		3.1	3.8	
	1001–5000	19.7	20.3	Domestic legal person		2.4	2.1	
Year of incorporation	Before 1990	7.8	8.3	Domestic and foreign legal persons		1.8	1.5	
	1990–1999	42.2	40.9	Others	5.1	5.8		
	2000–2009	29.4	28.3					
	After 2009	20.6	22.5					

4. Results

To test the hypotheses of our research, we perform the following research process on the database. Based on the two surveys, two subsamples are formed (2019 and 2021). From these, we form the proxy variables needed to test the research hypotheses in an additive manner. The range of variables measured was identified through an extensive review of the literature on financial culture. This is supported by the results of our previous research and the measurement of corporate financial culture is based on this (Tóth 2020, 2022; Tóth et al. 2021). Since these measured variables show significant variation in terms of their scales and variances (mostly dummy variables), we construct proxy variables describing financial culture additively from the included measured variables: in each index, we measure how much of the related phenomena are true, how much is true, and how much is true for the firm. Thus, the coverage of the indices is bounded at the bottom (0) and between 6 and 13 at the top. Descriptive statistics for these aggregates are shown in Table 2. As their projection basis (scope) is different, standardization of these aggregates is needed for their further use and direct comparisons. We then present descriptive statistics for standard aggregates and differentiate them by age and size of the companies using analysis of variance. The generated indicators are then suitable for modeling, within the framework of which multiple linear regression models are created. These partial models intertwine to create a complex causal model suitable for testing our hypotheses. The descriptive statistics for the indices and the measured variables used for them are given in the table below.

In order for each index to be comparable and to be managed in a model, the variables (Z-score) must be standardized separately by dividing the differences between the individual values and the mean by the standard deviation of the given indicator:

$$z_i = \frac{x_i - \bar{x}}{s_x}$$

Table 2. Mean and standard deviation of proxy indices.

Culture Indices and Ranges	Measured Variable	2019		2021		<i>p</i>
		Mean	st.dev.	Mean	st.dev.	
Planning index (0–6)	Revenue and expenditure plan	3.08	2.23	3.62	2.84	***
	Design premises and conditions					
	Written strategy					
	Short-term operational plan					
	Financial strategy					
Analysis index (0–8)	Financing strategy	2.51	2.54	3.14	2.93	**
	Review of the financial situation					
	Revenue structure analysis					
	Liquidity analysis					
	Analysis of the possibilities of obtaining application funds					
	Cost structure analysis					
	Profitability analysis					
Plan-fact analysis						
Financial management items index (0–13)	Asset analysis	5.48	3.21	5.73	3.47	*
	Profitability					
	Efficiency					
	Cashflow management					
	Regular controlling reports					
	Financial reserves					
	Investment					
	Cost management					
Growth						
Risk and insurance index (0–8)	Conscious financial, strategic management	3.12	2.19	3.48	2.83	***
	Use of modern banking and financial services					
	Risk management					
	Acquisition and analysis of financial information					
	Credit insurance					
	Building insurance					
	Comprehensive insurance					
	Liability insurance					
Property insurance						
Equipment and shipping insurance						
Other insurance						

***: $p < 0.001$; **: $p < 0.01$; *: $p < 0.05$.

In this way, the obtained indicators all follow a standard normal distribution ($p = 0.000$), with 0 expected values and 1 standard deviation $Z \sim \mathcal{N}(0;1)$. Therefore, the indicators normalized in this way can be directly compared, for which the positional averages are the most suitable. Table 3 gives the range (minimum and maximum) for each indicator, the median of the distribution, and the lower and upper quartiles. It can also be seen from these that the medians of the indicators—in line with the averages of the measured indicators—increased in all cases, with the largest increase in the case of the design index, but the shift in the distribution to the right is also high in relation to the analysis index.

Table 3. Distribution characteristics of normalized indices.

	Planning Index		Analyzing Index		Financial Management Tools Index		Risks and Insurance Index	
	2019	2021	2019	2021	2019	2021	2019	2021
Minimum	−1.553	−1.273	−1.117	−1.012	−1.807	−1.605	−1.491	−1.353
Percentiles 25	−1.059	−0.694	−1.117	−0.979	−0.830	−0.648	−0.995	−0.896
Median 50	−0.071	0.314	−0.263	0.034	−0.179	0.029	−0.004	0.226
Percentiles 75	0.917	1.142	1.019	1.213	0.798	0.991	0.987	1.171
Maximum	1.411	1.794	2.301	2.590	2.426	2.630	2.474	2.681

The distribution of the normalized indices was also examined by calculating the average according to the age of the companies, the results of which are shown in Table 4. It is clear that almost all indices between the two samples increased in all categories, with only a few cases of substantial stagnation (slight, non-significant decrease). For companies founded before 1990, the analysis index is below average; however, the risk and insurance index rose to its highest level by 2021. Companies established between 1990 and 1999 have indices around or above average, and by 2021, those established between 2000 and 2009; however, the youngest businesses perform surprisingly below average for all indices, and even the index for financial management assets has decreased, the COVID-19 crisis being one reason. However, they perform the worst in the risk and insurance index—but there is a slight increase here as a result of the epidemic. Between the age categories of the companies, these differences are significant in all cases ($p < 0.05$).

Table 4. Development of averages of normalized indices by age of companies.

Indices	Sampling	Date of Foundation				Differences		
		Before 1990	1990–1999	2000–2009	After 2009	F	Sig.	<i>p</i>
Planning index	2019	0.028	0.026	0.104	−0.212	4.184	0.049	*
	2021	0.049	0.044	0.154	−0.193	3.012	0.037	*
Analyzing index	2019	−0.070	0.037	0.176	−0.299	4.957	0.002	**
	2021	−0.022	0.075	0.229	−0.201	4.788	0.008	**
Financial management tools index	2019	0.187	0.005	0.091	−0.210	4.874	0.039	*
	2021	0.168	0.018	0.071	−0.250	6.361	0.049	*
Risks and insurance index	2019	0.120	0.188	−0.004	−0.424	9.466	0.000	***
	2021	0.310	0.278	0.106	−0.334	8.971	0.000	***

* $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$.

We see a similar increase in the financial indices of companies according to size categories: the values of individual indices increased significantly ($p < 0.001$) for all types of company as shown in Table 5. This is true most significantly for medium-sized companies (employing 100–249 people) and most so for the risk and insurance index.

Table 5. Development of averages of normalized indices by company size.

Indices	Sampling	How Many People Does the Company Currently Employ?			Differences		
		25–49 People	50–99 People	100–249 People	F	Sig.	<i>p</i>
Planning index	2019	−0.413	0.443	0.742	64,065	0.000	***
	2021	−0.326	0.638	0.977	59,843	0.000	***
Analyzing index	2019	−0.446	0.48	0.867	81,419	0.000	***
	2021	−0.399	0.612	1.102	83,221	0.000	***
Financial management tools index	2019	−0.428	0.437	0.976	76,088	0.000	***
	2021	−0.181	0.669	1.271	71,205	0.000	***
Risks and insurance index	2019	−0.301	0.359	0.46	32,226	0.000	***
	2021	−0.114	0.441	0.889	38,298	0.000	***

*** $p < 0.001$.

4.1. Planning

The averages of the design index normalized values increased significantly for all company types by 2021. This suggests that, as a result of the crisis, companies increased their planning activity, both in terms of revenue and expenditure plans and operational and strategic financing plans, and in terms of revising their planning premises. This increase is most significant for companies established between 2000 and 2009. A similar increase is observed as the size of the company increases, with the largest increase in the 100–249 employee size category.

4.2. Analysis

The analysis index also starts between 2000 and 2009 and is the highest for companies in the top size range in the SME sector. It is lowest for the youngest and smallest (25–49 employees) companies. The rate of increase from 2019 to 2021 is similar to the design index, for companies in the 100–249 employee size category and for companies established between 2000–2009. This suggests that companies have significantly prioritised the analysis of their financial environment and internal financial situation. This index is below average for small whale enterprises and young enterprises created after 2009, but also increased here as a result of the COVID-19 crisis.

4.3. Financial Management Tools

The picture is not as consistent for the elements of the financial management index, where the data also show a basic increase from 2019 to 2021, but for the oldest companies and those founded between 2000 and 2009, it is not so clear. However, the value of the index increases significantly in proportion to the increase in company size, with the largest increase for large companies. This implies that these companies significantly increased their use of financial management tools, such as profitability analysis, efficiency monitoring, cash flow management, liquidity management, financial reserve management, and more efficient cost management, as a result of the crisis. The value of this index is below average for the smallest SME size category and for the youngest companies, and highest for large companies founded before 1990.

4.4. Risks and Insurance

The risk and insurance index also increased significantly for all company types and subsamples. The index increases with the age and size of companies: the older and larger a company, the higher the value of the index. The value is below average in the category of companies founded after 2009 and those with fewer than 50 employees. The largest

increase is for companies founded before 1990 and employing more than 100 people in 2019–2021, but all categories show significant increases.

4.5. Model

The relationships shown in the path model represent cause-and-effect relationships. The strength of these effect lines was calculated for our samples in both study years. The results are shown by the partial standardized beta coefficients and their significance by the p values. Based on these, the following findings can be filtered from the model:

- The design index of companies and their analytical index directly influence what systematic financial management tools they use. This explanatory power is important (above 50%) and significant ($p = 0.000$) in both years. However, while in 2019 the planning index had a somewhat stronger impact on the financial assets index, by 2021, the analysis index has a somewhat stronger impact. These effects were significant ($p = 0.000$).
- The financial management assets index has a direct and significant ($p = 0.000$) effect on corporate risk management and this effect increases by 2021. At the same time, the analysis index affects risk management not only indirectly but also directly through financial management tools ($p = 0.001$ in 2019; $p = 0.002$ in 2021), and this effect also became stronger by 2021.
- However, the planning index only indirectly affects risk management through the financial management index, not directly.
- These indices form a well-fitting model ($p = 0.000$) and the model explains the planning and insurance index well, and this explanatory power also increased by 2021 (from 14% to 19.2%).

5. Discussion

Our research constitutes a conceptual, theoretical approach to the financial literacy of the Hungarian SME sector and its measurement. In our research, the financial culture index was presented and, within it, a more detailed description was linked to the financial management elements sub-index and the risk and insurance sub-index. Furthermore, logical, causal, and statistically verifiable relationships between corporate financial literacy and the outcome of corporate financial decisions and corporate risk-taking were demonstrated.

Based on our model (Figure 2), we can draw the following conclusions regarding the formulated hypotheses:

- T1: we accept the hypothesis that the use of financial management tools by SMEs depends on the degree of systematic planning and analysis behaviour.
- T2: we accept the hypothesis that the use of financial management tools by SMEs has an impact on the risk sensitivity of companies, their perception of risk factors, and their insurance behaviour.
- T3: we partially accept that the SMEs' risk sensitivity, perception of risk factors, and insurance behaviour are directly influenced by their systematic analytical behaviour, but not by how thorough their planning is.

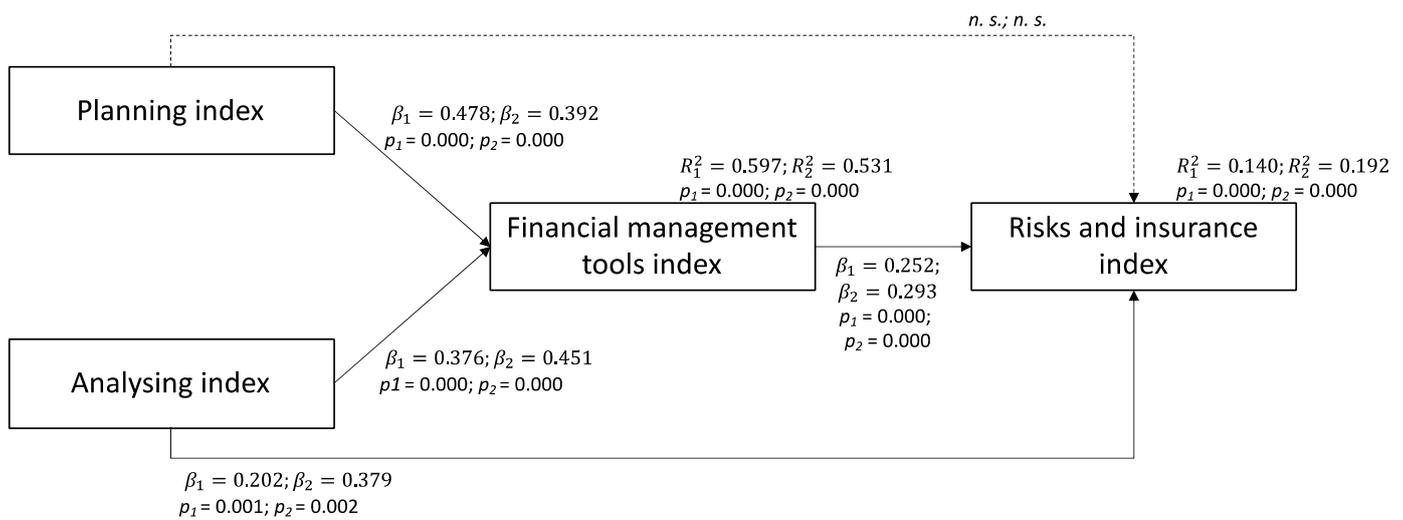


Figure 2. Block diagram of path model.

Thus, this paper filled the gap in the existing literature and bridged the gap between the theory and practice of corporate financial literacy. This paper also answered the research questions and the formulated hypotheses, proposing the conscious development of corporate financial planning.

As a summary of the above, it can be stated that the 2007/2008 crisis and the ongoing coronavirus pandemic revealed the need for change on the part of economic operators in order to avoid economic downturns of this scale and magnitude in the future. In our view, improving the level of corporate financial culture may be one appropriate tool for this. We are convinced that increasing financial, management, and management knowledge will go hand in hand with improving the skills of business leaders, managers, and owners, as well as higher motivation. We believe that the results of our research are useful for policy makers, practitioners, and entrepreneurs alike. The conclusions drawn from the analysis provide relevant new and meaningful information for managers of domestic companies. On the basis of the above, it can be concluded and recommended that companies should give high priority to the importance of corporate financial culture. To this end, it is recommended that conscious corporate governance and strategic thinking, as well as the wider use of elements in the financial management toolkit, be applied. Particular attention should be paid to maintaining cash-flow balance, conscious cost management, ensuring a conscious financing structure, and developing appropriate investment and investment policies. Our research results clearly suggest that the financial management tools used by companies have an impact on the companies' risk sensitivity and perception of risk factors. It follows that the more well-established (company-specific and sector-specific) management and controlling tools companies use, the more accurate they can assess, estimate, and manage their risks. In a difficult economic situation, such as the current one, it is clear that this form of entrepreneurial behaviour can be interpreted as a significant factor in competitiveness.

Thus, based on our research, the efforts invested by companies in financial planning and analysis, thus, clearly seem to be paying off in terms of more effective risk taking, the role of which has been intensified in the economic environment of the epidemic. At the same time, our results also show that the role of analysis has become much more valued than that of planning in the wake of the epidemic, given that the role of planning is inherently marginalised in such an economic environment. Overall, the epidemic has led to a shift from the complementary role of planning and analysis to an increased role of analysis, so the emphasis has shifted from planning to analysing the companies' own financial situation and macro-environment.

6. Conclusions

The main target of our study was to examine the determinants that effect the corporate financial literacy among SMEs in Hungary. In our research, the financial culture index was presented and, within it, a more detailed description was related to the financial management elements sub-index and the risk and insurance sub-index. In addition, logical, causal, and statistically verifiable correlations were demonstrated between corporate financial literacy and the outcome of corporate financial decisions and corporate risk taking.

Our results show that businesses with higher levels of financial awareness are more and more aware of the importance of risk management. Although the financial analysis techniques and methods of companies anticipate the importance of risk management, we also find that by 2021, the relationship between companies' financial and planning awareness and their risk management and insurance activities became stronger. However, we can also conclude that the degree and quality of financial planning awareness of companies do not directly influence their risk management activities, which are carried out independently. Only through financial culture does financial planning have an impact on the specifics of risk perception and management.

Our findings have potentially important implications for managers, policy makers, and for the literature on financial literacy and risk management. We found that the financial awareness and financial culture of companies have a strong moderating effect on the impact of their financial planning and analysis on risk management; that is, only those firms that have a conscious financial culture based on the use of financial management tools can put their financial functions (primarily financial planning) at the service of risk management.

7. Limitations and Future Research Directions

Despite the fact that our research provides several pivotal contributions to the existing literature on corporate financial literature, it is still not beyond limits that can be addressed in near-future analyses. We mainly analyzed the Hungarian SME sector, which may not be a suitable representative of the whole world. This research can be extended to other countries in the future to obtain a better understanding of the importance of corporate financial literature in different countries around the world.

The future direction related to this research is to examine the extent to which the level of corporate financial literacy affects national economic competitiveness and its growth as a percentage of GDP. It may be worth examining how the recovery from a crisis in a national economy would fare if we were to measure the performance of firms against the corporate finance culture index presented above. In this case, of course, it would be necessary to be able to target and well delineate the external factors affecting the performance of national economies. Nor can we neglect the future measurement of the statistically verifiable relationship between corporate financial literacy and employment (both at the corporate and national economy level). However, we plan to extend our methodology and tests by using a larger sample of Hungarian companies and applying a cross-country analysis in our research.

It should be noted, however, that no survey similar to our own, rather complex and large sample survey has been conducted for the SME sector in Hungary, especially not in the perspective of the pre- and post-COVID-19 era. Most of the studies analysing the domestic SME segment on the topic of financial awareness (Bárczi and Zéman 2015; Kovács and Sütő 2020; Csiszárík-Kocsir 2021; Nyikos et al. 2021) only cover the interpretation of the concept of corporate financial culture and its anomaly, while they do not include specific measurement tools (related to financial performance, profitability, risk management, probability of failure). This is why we consider our study to be novel, as it deepens the understanding of the existing relationships with corporate financial culture on the basis of concrete mathematical–statistical models. In order to provide further results and recommendations to support domestic business leaders and economic policy makers, we consider it essential to continue our research, as described above, and to utilize the results as widely possible.

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