Financial Literacy in Micro- Small-Medium-sized Enterprises

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Prologue

Financial literacy, as a complex construct is an essential determinant for all entrepreneurs in business success. In Hungary, the entrepreneurial culture and environment is still developing, but these businesses form a significant share of the economy yet face challenges in sustaining growth and competitiveness. So for this reason the study surveys the overall level and the core components of financial literacy of the Hungarian Micro, Small, Medium-sized Enterprises (MSMEs) and self-employed individuals, from business perspective. It investigates financial literacy in MSMEs, focusing on how financial knowledge, financial behaviour and financial attitudes manifest in small businesses. Research combines theory, literature, and empirical investigation to explore how firm size and age shape financial literacy profiles A researcher-developed questionnaire was used in this study. Primary data were collected and analysed through descriptive statistics, t-tests, and correlation methods. Findings aim to provide actionable insights for policymakers, educators, and entrepreneurs to enhance business performance. This paper offers not only a diagnostic of current conditions but also a conceptual and methodological contribution to measuring financial literacy in MSMEs, paving the way for more targeted education, policy interventions, and business support programs in Hungary.

Abstract

Relevance: Financial literacy significantly impacts MSME performance and competitiveness. **Purpose:** To assess financial literacy levels among Hungarian MSMEs and self-employed individuals, integrating financial and entrepreneurial competencies into the analysis. **Methods:** This study utilised a custom-designed questionnaire created specifically for its purposes, and was administered to small business owners. Based on the OECD's three-dimensional model such as financial knowledge, financial behaviour, financial attitude, nevertheless this work proposes an expanded construct, split the financial knowledge dimension into two separate sub-dimensions, theoretical and operational ones. Financial behaviour and financial attitud dimensions are align with entrepreneurial competencies approved by the European Comission. Quantitative analysis included descriptive statistics, Welch t-tests. **Results:** Financial knowledge scores varied significantly by business size and age, with larger and more established firms exhibiting higher literacy. Behavioural and attitudinal dimensions revealed patterns of "financially savvy" decision-making among experienced entrepreneurs, while smaller and younger firms displayed gaps in financial planning and risk management. **Conclusion:** The study confirms that MSME financial literacy in Hungary is unevenly distributed, with entrepreneurial experience and firm maturity linked to stronger, higher-level competencies. The proposed integrated construct offers a more precise tool for assessing business-oriented financial literacy, informing targeted education and support initiatives.

Keywords: financial literacy; financial behaviour; entrepreneurial competencies; MSMEs; financial decision-making

JEL-codes: D14, D91, G53, L26, M21

1. Introduction

Significance: Financial literacy is key to help business people, especially entrepreneurs to manage their business operation efficiently at work from day one, to be able to understand and evaluate financial information to make appropriate financial and business decisions.
Relevance: MSMEs constitute over 90% of enterprises globally and are key to economic growth, innovation, and job creation. In Hungary, their role is amplified by a relatively young market economy and a rising trend toward self-employment. Yet, limited entrepreneurial traditions and competitive pressures necessitate a clear understanding of their financial competencies.
Structure: This paper is structured into five main sections: literature review, methodology, results, discussion, and conclusion, supported by summary tables for hypotheses, findings, and recommendations.
Purpose: The aim is to evaluate the current state of financial literacy among Hungarian MSMEs and self-employed individuals, focusing on the interaction between financial knowledge, behaviour, and attitudes, and how these vary by firm size and age.
Problem statement: Existing financial literacy frameworks, particularly the OECD model, provide valuable benchmarks but are primarily designed for individuals and households but for special survey for small firms exist. With the speciality of the developing Hungarian market economy and the speciality of small businesses, a custom-developed questionnaire was necessary to sufficiently capture the entrepreneurial decision-making context of the national small businesses. This research addresses that gap by adapting measurement tools to reflect MSME realities, their evolving níture, seeking to identify patterns that can inform targeted interventions for improved business performance and their competitiveness.

2. Literature Review

Financial literacy research has evolved from individual and household contexts, by today to encompass entrepreneurial and small business domains also. While FL researches in personal finance is extensive, empirical evidence specific to MSMEs remains scarce. The Hungarian MSMEs face unique challenges, stemming from a young market economy, a short and limited entrepreneurial tradition, and the global competitive pressures - that needs a contextualised understanding of their financial literacy.
This review summarises conceptual definitions, theoretical models, and empirical studies, identifying gaps in measurement tools for small enterprises. It also synthesises prior findings on the interaction between FL and entrepreneurial competencies, providing the foundation for this study's expanded construct, the research questions and hypotheses development.

2.1. Conceptual

Definition of financial literacy in MSMEs encompasses awareness, knowledge, behaviours skills, and attitudes, enabling entrepreneurs to make effective decisions for starting, operating, and growing a business (OECD, 2018b; Németh et al, 2025). It differs from personal finance by incorporating entrepreneurial competencies, operational decision-making, market-driven adaptability.

Related Concepts: Financial awareness, financial intelligence (Berman & Knight, 2007), and financial competence (Ambuehl et al., 2014; Jenei et al., 2024) overlap but vary in scope, and entrepreneurial competencies interact with financial literacy to influence firms' performance. **Conceptual Frameworks and Models:** The OECD's three-dimensional model (knowledge, behaviour, attitude) remains widely applied to examine FL in MSMEs, but underrepresents entrepreneurial-specific financial knowledge and competencies. This study proposes an adapted model with two knowledge subcategories - financial products/services and operational finance - integrated with entrepreneurial competencies, as those outlined by the EU Joint Research Centre framework (Bacigalupo et al., 2016; Poór et al., 2023).

Construct of this study defined by the author:

Financial Literacy is *a complex entity which is necessary to run a business. Therefore, financial literacy is a multi-faced competency (competency family) containing many elements, such as financial knowledge, calculation skills, financial management abilities, products cognition; and finacial institution and service learning; financial data analysis and inter-pretation; investment and risk management; debt management; financial decision-making, business ethics, accountancy, and several emotional and cultural factors.*

FL is partly identical in MSMEs and personal finance, there are significant differencies operating on different principles. PF focuses on individuals or households, and a different economic environment and philosophy can be found behind it. FL in businesses requires some extra elements, a different set of competences, especially entrepreneurial ones, in addition conscious or unconscious personal factors also influence financial behaviour and attitudes.

2.2. Theoretical

Main Theoretical Models: Theories behind this research refers to knowledge-base theories the dynamic capabilities concept, the Human Capital theories (HCT), and the resource-based theories beside physical and other organisational resources (J. Kraaijenbrink, 2011; Módosné Szalai et al., 2025). As these theories also based on human capital theory, Pereire and Bamel suggested that this complex view for future researches is necessary (Pereira, V., & Bamel, U., 2021). How HCT has been developed, many scientists stressed, that investment into any forms of education, development of cognition and skills are beneficial for the earnings (Marvel et al., 2016; Mura et al., 2022). Growing number of studies have examined the relation between human capital theory, vs business success and entrepreneurial achievement, plus how enterpreneurial education influences the formation and contribution to human capital progress. Gruber and his colleagues in their study illustrated the tight link between human capital and entrepreunial performance, more exactly the cause-causality impact of knowledge on business outcomes (M. Gruber, I. C. MacMillan and J. D. Thompson, 2012; Mura et al., 2022). Marvel and his colleagues, in a literature review on the domain of human capital and entreprenurship, summarized that the cognitive part, the expanded knowledge had significant impact on entrepreunial behaviour and competencies like identifying business opportunities, recognizing access to financial resources, and seting up new ventures (Marvel et al., 2016; Remsei et al., 2024; Módosné et al., 2025).

Relevant Frameworks: The dynamic capabilities framework explains how MSMEs adapt competencies over time, aligning with observed patterns of financial literacy evolving alongside

business maturity. Pereira and Bamel (2021) advocate a multidimensional approach, combining cognitive, behavioural, and attitudinal elements.

Integration with Entrepreneurial Competence Theory: Empirical evidence suggests that FL supports opportunity recognition, resource mobilisation, and strategic decision-making, reinforcing the necessity of embedding entrepreneurial competencies within financial literacy assessment.

2.3. Empirical

Key Studies: *Lusardi & Mitchell's* 'Big Three' framework (2008) established foundational measures for financial literacy. *OECD/INFE's MSME toolkit* (2015–2022) adapted these to enterprise contexts, though gaps remain in capturing entrepreneurial/small business realities.
Notable Findings:

S. Ambuehl examined the effectiveness of financial education programs and their influence on financial decision-making, contributing to the understanding of how financial literacy affects economic outcomes (S. Ambuehl, B. D. Bernheim, A. Lusardi, 2014.)
Banco de España (Anghel et al., 2021) found higher financial literacy in larger/more mature MSMEs, with experience positively correlated to competency.
Muñoz-Céspedes et al. (2024) reported higher financial knowledge among self-employed individuals compared to salaried workers, with risk attitudes influenced by employee responsibilities.
Trombetta (2023) showed that "conservative" financial management—high basic financial literacy, low advanced accounting literacy—correlates with business survival.
Implications: MSME financial literacy is uneven, shaped by firm size, age, and owner experience.
Newer trends: Integration of digital financial skills, post-COVID financial resilience, and policy interest in MSME-focused financial education.

2.4. Epitome & Hypotheses

The referenced literature confirms that financial literacy is a multidimensional construct, but for MSMEs it requires a special configuration. While individual/household-oriented surveys emphasise numeracy and basic knowledge of products and services, entrepreneurs must combine this with operational finance, decision-making, and business-specific competencies. Prior studies showed that size and maturity of enterprises often influence financial practices, but results are uneven, and conceptual frameworks still lack adaptation to the realities of small businesses. It outlined the research gap: focusing on the exploration of characteristics of small, evolving firms' , FL needs and correlation with entrepreneurial competencies. This study addresses the gap by introducing an expanded construct of FL: separating Financial Knowledge into two dimensions (A: products and services; B: operational), while keeping Behaviour and Attitudes aligned with entrepreneurial competencies. This ensures that both theoretical and practical knowledge, as well as behavioural routines and underlying attitudes, are captured in the analysis. Building on this framework, the research is guided by three questions and corresponding hypotheses:

RQ1. What is the current state and level of financial literacy in small businesses, including financial knowledge, financial behaviour, and financial attitudes, among Hungarian MSMEs and self-employed

individuals?
H1. The mean and median total scores in each subcategory reach the "good level" (above 80%).

RQ2. Do firm size (legal type and headcount) and firm age significantly influence financial literacy?
H2/A. Firm size has a significant influence on financial literacy.
H2/B. Firm age has a significant influence on financial literacy.

RQ3. What are the levels of key financial competencies and financial attitudes at subsequent stages of business development?
H3/A. Significant differences exist between age-based subgroups regarding competencies (financial planning, financial discipline, risk management, entrepreneurial mindset).
H3/B. Significant differences exist between age-based subgroups regarding attitudes (long-term view, responsibility, debt management (financial tool), growth evaluation).

Table 1: Research Questions, Hypotheses, and Verification of Results

Research Question	Hypothesis	Sub-dimension(s)	Result
RQ1: *What is the current state and level of financial literacy in MSMEs and self-employed individuals in Hungary?*	**H1: The mean and median scores belong to the good level (>80%)**	A. Total Financial Literacy	70% ✕ False
		B. Total Financial Knowledge	58% ✕ False
		C. Total Financial Behaviour	74% ✕ False
		D. Total Financial Attitude	81% ☑ True
		E. Financial Knowledge / Products & Services	52% ✕ False
		F. Financial Knowledge / Operation	64% ✕ False
Conclusion H1	–	–	Overall ✕ **False**
RQ2: *Do business-specific factors (firm size, firm age) significantly influence financial literacy?*	**H2A: Firm Size has significant influence**	Legal Entity; Headcount	☑ True

Research Question	Hypothesis	Sub-dimension(s)	Result
	H2B: Firm Age has significant influence	Age categories (0–2, 3–5, …, 31+)	✕ False
RQ3: *What are the levels of the main financial competencies and financial attitudes used by entrepreneurs at subsequent stages of business growth (above 80%)?*	**H3A: There is a significant difference between enterprise age groups in financial competencies (planning, discipline, risk mgmt, entrepreneurial mindset).**		✕ False (average 74%, no significant difference, only Financial Discipline above 80%)
	H3/B: There is a significant difference between enterprise age groups in financial attitudes (long-term view, responsibility, debt mgmt, growth evaluation).	–	✕ False (average 77%, Responsibility & Debt Management good; Long-term View near 80%; Growth Opportunities very low)

H3/A – Financial Competencies Individually by Age Groups

Competency	Average %	Result
Financial Planning	68%	✕ Low
Financial Discipline	85%	☑ Good (above 80%)
Risk Management & Mitigation	71%	✕ Low
Entrepreneurial Mindset	76%	✕ Borderline (just below good)
Innovation / Future-Oriented Mindset	72%	✕ Low

Conclusion H3/A: 68–76%. Levels of main financial competencies are moderate Only Financial Discipline is good, 85%. No significant difference in age groups in the level of each competency.

H3/B – Financial Attitudes by Age Groups

Attitude	Average in %	Result
Long-term View	79%	✕ Almost good, but below 80%
Responsibility in Money Management	86%	☑ Good
Debt Management (as a financial tool)	89%	☑ Good (may reflect repayment moral, not financing tool use)
Evaluation of Growth Opportunities	56%	✕ Very Low

Conclusion H3/B: Mixed (two strong, one borderline, one weak). Hypothesis not supported.

Conclusion by age group: No significant difference between the groups, except at the "Evaluation Growth Opportunity" attitude between the early start-up and scaling-up phase.

3. Research Methodology

Methodology Introduction

The methodological framework defines the structural logic of the study, linking conceptual foundations with empirical testing. The applied design was shaped by the specificities of MSMEs and sole proprietors, requiring a tool that could capture financial literacy as a multidimensional construct. Accordingly, the methodology clarifies: (1) the classification and sampling principles guiding the population, (2) the instrument and its internal structure, and (3) the statistical techniques applied to evaluate relations between financial literacy components and enterprise characteristics. This section thereby establishes the transparency, coherence, and analytical validity of the research process.

3.1. Research Materials

Research was a Primary research conducted and completed by the author herself.

3.1.1 Classification of MSMEs

Size Cathegory: In line with EU Recommendation 2003/361/EC, MSMEs are classified by both employee headcount and annual turnover:

Entreprize size	No of Employees	Annual turnover	Annual balance sheet
Medium entreprise	50 – 249	< 50 mil. €	< 50 mil. €
Small entreprise	25 – 49	< 10 mil. €	< 10 mil. €
	10 – 24	< 10 mil. €	< 10 mil. €
Micro entreprize	1 – 9	< 2 mil. €	< 2 mil. €

Source: https://single-market-economy.ec.europa.eu/smes/sme-fundamentals/sme-definition_en

2.Classification of this study

Enterprize size	No of Employees
Self-Employed	1 person
Micro E.	2 - 9
Small / A	10 – 24
Small / B	25 – 49
Medium	50 +

Sole proprietors/self-employed individuals was a separate cathegory: Definition „ any person who has registered him/herself as an individual entrepreneur and exercises economic activity only in the

framework in the registered scope of activities (2009.évi CXV.törvény az egyéni vállalkozóról és az egyéni cégről*).

This classification guided sampling and comparative analysis..
Age cathegory: referring to the firms age, the applied cathegories are align with international context and the referenced literature

3.1.2. Data Collection & Sample

- **Sampling method:** Respondents were Micro, Small, Medium-sized enterprizes and self-employed individuals, across several sectors, operating across the country.
- **Recruitment channels:** Business associations, business clients, professional networks,
- **Period:** cca. 10 weeks in early 2025.
- **Screening:** Only respondents meeting EU MSME cathegory definition included.
- **Final sample:** Non-representative mix of micro, small, and medium-sized firms and individul entrepreneurs, with diversity in age, sector, and owners' experience.
- **Sample size**: 99 respondents.
- **Data collection methods:** Interviews, Focus-group, Questionnaire-based online survey
- **Data collection**: occurred over a 10-week period in early 2025.
- **Data processing method and Analysis:** Data processing utility as a processing tool the Excell was used.

3.1.3. Questionnaire Structure

The questionnaire consisted of **67 items** and
Financial Knowledge Total: 26
Financial Knowledge /A (Products & Services): 15
Financial Knowledge /B (Operation): 11
Financial Behaviour: 21
Financial Attitudes: 20

3.1.4. Scoring

Knowledge items: Scored as correct/incorrect according to legal, financial, and banking definitions.

Behaviour & Attitude items: Scored on Agrre / Disagree according to "ideal" or textbook-based approaches (e.g., regular budgeting, proactive planning).

Foundation: Entrepreneurial/financial competencies. Competencies are **not** a separately measured dimension, they are the conceptual base from which Behaviour and Attitudes are derived.

3.2. Methods and analysis

Research Design

For he Primary research an anonim, online custom-tailored questionnaire-based survey was completed. A quantitative, cross-sectional approach was applied to measure FLof Hungarian MSME owners and self-employed individuals. The survey based on the OECD/INFE MSME Toolkit and its model, but it was extended an extra subdimension, and with relevance to the Hungarian entrepreneurial context. The instrument covered:

Financial Knowledge – split into:

A) Knowledge of financial products & services

B) Knowledge of operational finance in day-to-day business

Financial Behaviour – based ont he most importanat financial competencies defined by the auther (budgeting, financil planning, diversification, cash-flow management
Financial Attitudes –based on the most important financial and entreprenurial competencies defined by the auther (long-term view, risk tolerance, growth orientation)

3.2.1. Methods

Assessing FL among MSMEs and self-employed persons and analysing the findings, involves employing various statistical methods to capture the relationships between FL (and its components) and different factors such as business performance, access to finance, and socio-demographic characteristics. The analysis of the study mainly applied descriptive analysis

Descriptive Statistics: Summarizing data through measures like mean, median, and standard deviation to understand the central tendency and variability of financial knowledge within a population. Since the study examines financial literacy in MSMEs with a focus on financial knowledge**,** financial behavior and financial attitude, this statistical method, **descriptive analysis** should summarize these key variables while also exploring their relations with business **age** and **size.**

1) Measures of Central Tendency (for Continuous Variables)

- **Mean**: Average value (e.g., average financial knowledge score).
- **Median**: Middle value (useful if the data is skewed, distorted).

2) Measures of Dispersion (for Continuous Variables)

- **Standard Deviation**: Measures variability (how much financial literacy and its three components scores vary on the basis of assessment criteria).
- **Range**: Difference between maximum and minimum values.

3) Frequency Distribution (for Categorical Variables)

- **Percentage** of businesses by industries
- **Proportion** of MSMEs in different size categories (self-employed, micro, small A, small B, medium).

4) Graphical Representations

- *Graphs / Bar Charts* (to compare the scores within each category - financial literacy, financial knowledge, financial behavior and financial attitude – from different points, firm age, firm size)
- *Pie Charts* to illustrate frequency
- *Sheets* to demonstrate simple data and tendencies

Welch t-test

Welch t-tests were applied to check recognizable group differences from average scores during the analysis, only from the 'age' perspective. The focus was on patterns in means and deviations—especially weaker Financial Knowledge /B and Financial Behaviour in certain age groups. Detailed explanation is provided in the Results section.

4. Results

Introduction

This section presents the empirical results of the survey among Hungarian MSMEs and self-employed respondents. It shows the outputs of the primary research and conclusions that can be drawn from the obtained data. Financial Literacy as a complex construct, including its components (Financial Knowledge /A and /B, Financial Behaviour, Financial Attitudes), was examined from three perspectives: (1) legal entity, (2) firm size (headcount), and (3) firm age (years of operation). Results of the key univariate statistics (mean, median, deviation) are demonstrated, together with frequency distributions and visualisations (histograms). These descriptive patterns form the basis for hypothesis testing.

4.1. Descriptive and Univariate Statistics

4.1.1 Descriptive Statistics: Mean, Median, Deviation

The key findings by the main variables are shown.

Measures of Central Tendency (Total scores first)

1) Summarised Total Financial Literacy Result
The **total average FL value is 70%**.
The total means separately, by types, are: 70% /by Legal types; 69% /by Age; 71% /by Size. All together – the three test criteria – the summarized total average value is 70% (mean). Consequently, that value is far below from the expected good level (below 80%).

Component of FL means (for context):

- **Financial Knowledge /A (**Products, Services): = **54.53%**, below good level
- **Financial Knowledge /B (**Operation): 7.24 / 11 = **65.81%**, also below good level.
- **Financial Knowledge (Total):** 15.42 / 26 = **59.3%**.
- **Financial Behaviour:** 15.37 / 21 ≈ **73%**. (moderate)
- **Financial Attitudes:** 16.13 / 20 ≈ **80.64%** (just crosses the "good" threshold).

M**edian** total score: **48 /67 ~72%**, slightly above the mean. It does not change the main picture.

2) Financial Literacy Total Scores by Legal Entity

M**edian** was **47.8 / 67 = 71.34%**, akin to the mean, indicating a fairly homogeneous dataset. Here, the median added little extra insight; mean provided a better reflection of total values.
Deviation analysis revealed significant differences: large legal forms (e.g., Zrt) showed homogeneous and predictable outcomes, whereas self-employed responses were heterogeneous. This underlines that self-employed participants are the most diverse group, while large company respondents gave more stable answers.

Regarding **Financial Knowledge** components, the lowest mean was for **Products & Services** (FK/A) = **54.53%**, far below the good level. For **Operational** (FK/B), Mean was = **65.81%**, still below good.

The **total FK Mean** was **= 59.3%**. Across all three, **Hypothesis 1 is false** regarding total financial literacy by **legal type**.

Financial Behaviour, the mean was = **73%**, below the good level. Here, differences between legal types emerged, for example, Bt. firms (Betéti Társaság) showing lower values, perhaps reflecting their older, often family-based structures with owners not prioritising further growth.
Financial Attitudes reached = **80.64%**, just crossing into the good category. Thus, **Hypothesis 1 was true only for Attitudes**, though this result may partly reflect "good impression" bias.
Taken together, the legal entity analysis shows that only Attitudes reached the good threshold. Financial Knowledge (both FK/A, FK/B) and Financial Behaviour remain underdeveloped, confirming that problems lie primarily in knowledge rather than in attitudes or engagement.

3) Results by Firm Size (Headcount groups)

The second perspective of analysis was **firm size measured by headcount**, which offers another lens to test Hypothesis 1.

The **Financial Literacy total mean** by headcount groups shows a clear upward tendency:

- **Self-employed**: = **65%**
- **Micro (2–9 persons)**: ≈ **69%**
- **Small A (10–24)**: ≈ **70%**
- **Small B (25–49)**: **= 75.7%**
- **Medium (50+)**:**= 75.5%**

Thus, the **total mean** rises with headcount, confirming that larger firms reach higher financial literacy scores. The summarized average across headcount groups was **71%**, still below the "good" 80% threshold. **Hypothesis 1** is therefore **true in terms of firm size tendency**, but **false in terms of absolute level**.
M**edian** values mirrored this progression, with the self-employed clustering at lower scores and larger firms reaching higher middle values. Deviation was **highest in the micro categories**, indicating large differences between individuals and micro firms, and larger firms. In contrast, the medium group showed more compact results.
In the **Financial Knowledge /A (Products & Services)** dimension, means were lowest for **Small A (10–24)** at 43%, while medium firms performed best (60%). In **Knowledge /B (Operation)**, scores averaged 62%, with Small A lowest (57%) and larger firms higher. The **Total Knowledge mean** was 56%, particularly low in small firms, but improving with size.

Financial Behaviour averaged 76%, increasing steadily with staff numbers: self-employed (68%), Small B (88%). This confirms that larger firms develop more structured behavioural practices.

Financial Attitudes followed a similar pattern, with larger firms showing slightly higher means, though differences were less striking than in knowledge or behaviour.
Summary: Firm size measured by headcount shows a clear positive relationship with financial literacy scores, though all remain under the 80% benchmark. Knowledge scores are particularly weak in smaller firms, while behaviour improves most strongly with size

2–3) Overall Size Results (Legal Entity + Headcount)

When combining the two size-related lenses (legal entity and headcount) the findings are consistent. Larger and more formal organisational forms (Zrt., larger Kft.,) consistently score higher FL points than smaller firms (self-employed, Bt, micro firms).
This confirms that **firm size is a significant factor influencing financial literacy**:
Both **legal type** and **headcount** show upward tendencies with size. However, absolute levels remain below the 80% good threshold, except for Attitudes.

Hypothesis 1 is **true in its relative form** (bigger firms score better) but **false in its absolute form** (even bigger firms are not yet "good").
Thus, the "size effect" is robust, but the **systemic gap** remains: MSMEs in Hungary still fall short of the expected financial literacy benchmark.

4) Results by Firm Age (Years of Operation)

The third perspective of analysis was **firm age**, measured by years of operation. This lens allowed testing Hypothesis 2/B.

The **Financial Literacy total means** by **age** groups were:

- **0–2 years: 69%**
- **3–5 years: ≈ 69%**
- **6–10 years: ≈ 70%**
- **11–20 years:** = **65%**
- **21–29 years: ≈ 69%**
- **30+ years:** =**70%**

There is no clear monotonic trend. Younger firms (0–10 years) do not consistently score lower, nor do older firms always score higher. The overall average by age is **69%**, again under the 80% benchmark. Thus, **Hypothesis 2/B** — that older firms show stronger financial literacy — is **not supported for total scores**.
However, when examining **deviation and dispersion**, important patterns emerged. The **highest deviation** occurred in the **21–30 year** and **30+ year groups**, meaning that older firms were much more heterogeneous: some highly literate, some very weak. In contrast, beginner groups (0–2 years, 3–5 years) were more compact. This suggests that experience alone does not guarantee higher literacy, instead, diversity grows with age (causes were not amalysed). **Components**:
Financial Knowledge /B (Operational) was relatively stronger in more mature firms, supporting the idea that entrepreneurial experience develops practical finance knowledge
Financial Behaviour showed notable differences, with younger firms weaker in financial planning and risk management.
Financial Attitudes were relatively stable across age groups, with consistently high scores in "responsibility" (≈86%) and "debt management attitude" (≈89%). However, the **"growth opportunity evaluation"** sub-dimension averaged only 56%, and it declined after about 10 years, suggesting a slowdown in growth mindset among older firms.
Summary: Firm age does not produce a linear effect on financial literacy total scores. Instead, it highlights the heterogeneity of matured firms, with some strong and others weak. **Knowledge /B and Behaviour** show the clearest links with age, while **Attitudes** are stable but reveal a weakness in long-term growth orientation.

Conclusion for Age: ~86–89%). Attitudes were stable across age groups, responsibility and debt avoidance stayed high, but in the item about 'evaluating growth opportunities' score was only around 56%, and, in older firms it was not higher, sometimes even lower. Stronger operation knowledge appears with maturity. In genaral, no linear age effect in the Total score; heterogeneity increases in older groups, with age. Strength appears in FK/B (operation) and behaviour/decision making with maturity; attitudes are generally high, with growth-opportunity evaluation staying the weak point.
Important note: Attitude is critical in entrepreneurship**.** These are not cosmetic answers; the high values on responsibility and money management matter for real decisions, attitudes form the base that supports behaviour and anchors how knowledge is actually used in practice.

4.2 Hypothesis Testing

4.2.1 Welch t-test for Age Groups (unequal variances)

The t-test analysis was applied only for the **Age dimension**, because the research goal was to explore whether longer entrepreneurial experience influences the level of financial literacy. For this purpose, the **Welch t-test** was used, since the sample sizes of the age groups were not equal and the variances were not homogeneous. All tests were conducted at **α = 0.05 significance level**.
Groups were divided into six categories: **0–2 years, 3–5 years, 6–10 years, 11–20 years, 21–29 years, and 30+ years of operation**. Welch-test was applied to compare means between selected groups, especially between the younger and the older categories. **Results:** For the **Total FL scores**, Welch test did not confirm significant differences between the younger and the older groups. This supports the descriptive finding that the overall level fluctuates around 69–70% across all age groups, and there is no linear trend of "older firms performing better."
Hypothesis 2/B is therefore **not supported** in the case of total scores.

For **Financial Knowledge /B (Operation)**, significant differences were observed between the **youngest (0–2 years)** and the **older (30+ years)** groups. The older firms score higher, which suggests that entrepreneurial experience contributes to better understanding of financial operations. **Results:** the Mean for 0–2 yrs ≈ **57%**, mean for 30+ yrs ≈ **66%**.
Hypothesis 2/B is supported but not significantly.

For **Financial Behaviour**, the Welch test also showed differences between the younger (0–5 years) and more established firms (over 10 years). **Results:** 0–5 yrs ≈ **69%**, 10+ yrs groups ≈ **74–77%**. The older groups had higher means, reflecting that with time, business routines and financial decision-making processes become more structured and consistent.
Hypothesis 2/B is therefore supported in the Behaviour dimension**.**

Conclusion
The Welch t-test confirmed that age itself does not raise the total Financial Literacy score. But what is much more important: the test results clearly showed where the real differences are. **Financial Knowledge /B (Operational)** and **Financial Behaviour** are the categories where experience matters, and these dimensions are also the ones that really describe entrepreneurial financial knowledge and practice. This is consistent with the original concept of the research. For small businesses, only theoretical financial-based "financial literacy" score has limited or misleading meaning**.** Entrepreneurs rarely can operate on textbook-style financial theories. What matters such complex competencies that blend entrepreneurial skills with practical financial routines, especially iat the beginning of their operation.

That is why th study the **FK/B (Operational Knowledge)** category was separated. It reflects the inseparable unit of entrepreneurial and financial knowledge that business owners actually use in their everyday practice. The findings here are clear:
Financial Knowledge /A (theoretical) result remains weak (level of the theoretical knowledge, information is moderate-low).
Financial Knowledge /B (operational) is stronger in mature firms, and it captures what they really need.
Financial Behaviour is also higher in more experienced firms. It shows how entrepreneurs turn knowledge into action.
The main message is: entrepreneurs need complex competencies - FL for small businesses and entrepreneurial competencies jointly - this is what the research could demostrate with the help of the t-test, and what established /matured small businesses' results indicate. However after a certain size and age - cca 20-30 years depending on business - firms' behaviour are turning into a 'large organisation style' very slowly.

This is the **unique contribution** of the research — it's not just "measuring financial literacy," it's **redefining which dimension actually matters** for MSMEs. Measuring only theoretical finance knowledge fails to reflect entrepreneurial financial practice.

4.3. Answers to Research Questions and their Hypotheses

1. Main Research Question: What is the current state and level of financial literacy in small businesses regarding to and including financial knowledge, financial behaviour and financial attitude, among Hungarian Micro- Small and Medium-sized Entreprises and Self -employed individuals?

***Hypothesis 1*:** The mean and the medien total score in total and separately in each sub-category belongs into the good level, above 80%, from the total score of 67.

Final Conclusion: Financial Literacy (in all) is 70%, (H1/A) is moderate, well below the expected level. This means **Hypothesis 1 is False**. Every dimension is below the expected 80%. (referring to all subcategories except one). (Table 2.)

Answer to main RQ: The level of FL is moderate (almost low). The level of its components, financial knowledge, financial behavior, financial attitude are on the same level - but to varying degrees - based upon the Mean and the Median scores. Median values showed similar tendency to the Mean values in each dimension of Financial Literacy. Results are consistent with results of studies, referenced in the Literature.

2. Research Question

RQ2: These two main business-specific factors - **firm size**, (headcount numbers and legal entity, including level of organizational structuring) and **firm age** (also considering the level of organizational structuring) – does significantly influence **financial literacy**?
For testing it two hypotheses were drafted.

Hypothesis2 /A: Firm **Size** (measured by headcount numbers and legal entity) has significant influence on the level of financial literacy of MSMEs
Financial Literacy (by legal entity) is **70%.**
Financial Literacy (headcount) is **71%**.
Data shows an increasing tendency in average **FL** scores by groups – both in headcount and legal type.
Examining the relation between Firm Size and FL it seem to support the Hypothesis

Hypothesis 2/A is TRUE, *firm size has significant influence on the level of Financial Literacy*.

Hypothesis 2/B: Firm **age** (measured by years of operation) of the enterprise has significant influence on the level of FL of MSMEs

Based on obtained data of the average FL scores by age groups, *Hypothesis 2B is not supported* (Table 1) According to this, firm age does not have influence or positive effect on FL, with the years of operation, enterprizes do not become 'wiser'. This conclusion did not correspond to usual experience, so more in-depth analysis was required to learn the reasons behind this finding. Completed deeper analysis in each components separately, reasons were found. There was a notable difference in FK/A (Operation) subdimension, much weaker performance in two subgroups; in the Early start-up and, in the Established groups. That was the reason of applying the Welch T-test to interprete the results.
Results can proof: the Business Development Model behind this research. It also indicates the necessity of a new evaluation method to assess FL in small businesses more properly, in early operating phases.

Hypothesis 2/B. 'Firm Age has significant influence on the level of financial literacy of MSMEs', is **False** (based on descriptiv analysis).

Table 2: Research Questions, Hypotheses, Sub-dimensions and Results

Research Question	Hypothesis	Sub-dimension(s)	Result
RQ1: *What is the current state and level of financial literacy in MSMEs and self-employed individuals in Hungary?*	**H1:** The mean and median scores belong to the good level (>80%)	**A.** Total Financial Literacy	70% ✕ False
		B. Total Financial Knowledge	58% ✕ False
		C. Total Financial Behaviour	74% ✕ False
		D. Total Financial Attitude	81% ☑ True
		E. Financial Knowledge / Products & Services	52% ✕ False
		F. Financial Knowledge / Operation	64% ✕ False
ConclusionH1 (total)		–	Overall ✕ False
RQ2: *Do business-specific factors (firm size, firm age)*	**H2/A:** Firm **Size** has significant influence	Legal Entity; Headcount	☑ True

Research Question	Hypothesis	Sub-dimension(s)	Result
significantly influence financial literacy?			
	H2/B: Firm **Age** has has significant influence	Age categories (0–2, 3–5, …, 31+)	✕ False

3. Research Question: What are the levels of the main **financial competencies and financial attitudes** at the subsequent stages of business growth. (Above 80 %)

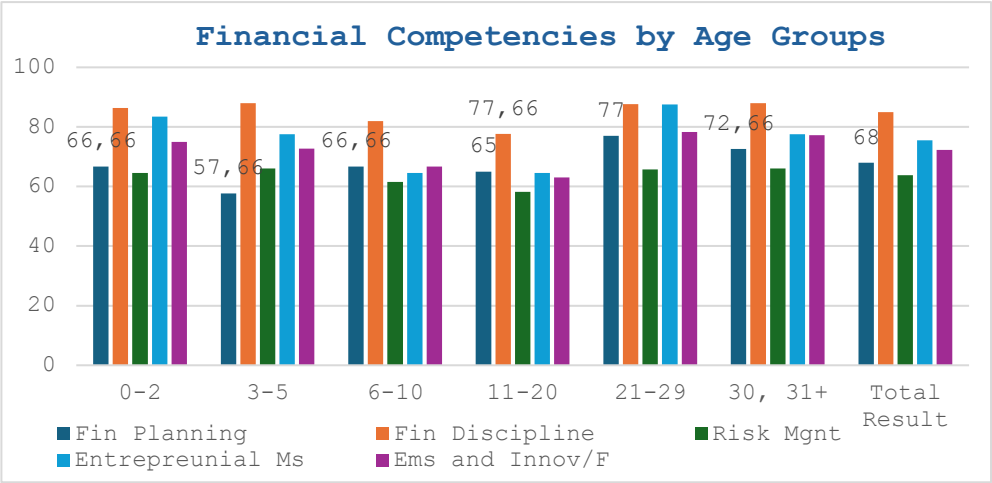
Hypothesis 3/A - There is a significant diffference by subgroups of enterprises (**by age**) relating to the different **financial competences** particularly reflecting to: Financial planning, Financial discipline, Risk management and mitigation, Entrepreneurial mindset.

Hypothesis 3/B - There is a significant diffference by subgroups of enterprises (**by age**) relating to the different **financial attitudes** with special attention: „Long-term view", Responsibility in money management, Debt management (as financing tool), 'Evaluation Growth Opportunities'.

Financial Competencies

Analysing the results, and only one competency belongs to good category, Financial discipline is 85% - average values are below 80% in every groups.
Result for H3/A At 'Financial Planning' competency there were difference between groups, especially between early start-up and the establised group. There is also significant discrepancy between the two 'passionate' groups (Seed, Established) and the early operating groups (Start-ups) in the 'Entrepreneurial mindset' competency. (in the process of businesses enlargement there is no opportunity to be passionate or venturesome). 'Financial Planning' and 'Risk Management' there are no significant variation between the separate groups' scores.

Answer to RQ 3. (referring to competencies): Levels of the main financial competencies are moderate between 68 -75 %. Financial discipline, is on good level 85%. There are uneven discrepancy in age groups in the levels of each competencies.

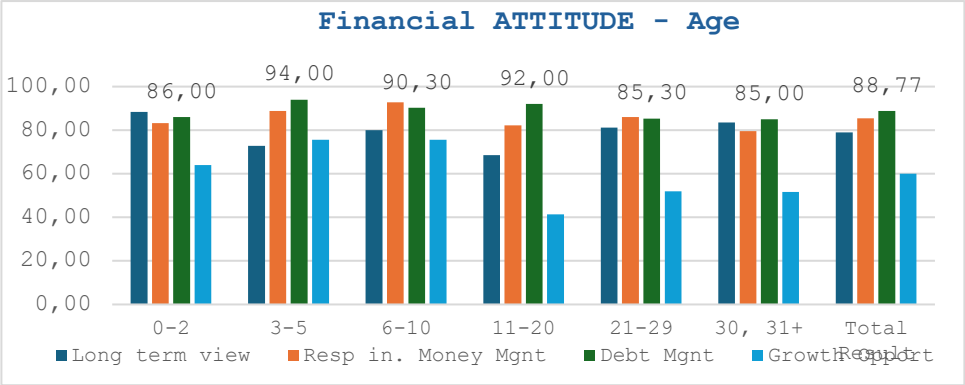


1. Figure, Average Financial Competency scores by Age groups (source : own research)

Financial Attitudes

***Result for H3/B**:* The most striking caracteristic of the results that each age group scores were fairly high (comparing to other FL components' scores), and three attitudes belonged to 'good' level, above 80%. The 'Growth Opportrunity' was particularly low level.

Answer to *Hypotehis 3/B*. There is signicant difference between age groups (Start-up and Scaling up) at „Growth opportunity" attitud. There are discrepancies in elderly groups, not significant. Other attitudes show no difference by age groups. Hypothesis 3/B is partly true.



2. figure. Financial Attitud by Age group (source: own research)

Table 3 Summary for RQ3

Research Question	Hypothesis	Result
RQ3: *What are the levels of the main financial competencies and financial attitudes used by entrepreneurs at subsequent stages of business growth (above 80%)?*	**H3/A:** There is a significant difference between enterprise age groups in financial competencies (planning, discipline, risk mgmt, entrepreneurial mindset).	✕ False (avarage 74%, no significant only in Financial discipline)
	H3/B: There is a significant difference between enterprise age groups in financial attitudes (long-term view, responsibility, debt mgmt, growth evaluation).	✕ False 77 % (Responsibility & Debt Management good; Long-term Planning near 80%; Identification Growth Opprtunities very low)

H3/A – Financial Competencies by Age Groups

Competency	Average %	Result
Financial Planning	68%	✕ Low
Financial Discipline	85%	☑ Good (above 80%)
Risk Management & Mitigation	71%	✕ Low

Competency	Average %	Result
Entrepreneurial Mindset	76%	✕ Borderline (just below good)
Innovation / Future-Oriented Mindset	72%	✕ Low
Conclusion H3/A	68–76%	✕ False

H3/B – Financial Attitudes by Age Groups

Attitude	Average %	Result
Long-term view	79%	✕ Almost good , but below 80%
Responsibility in Money Management	86%	☑ Good
Debt Management	89%	☑ Good (may reflect repayment moral, not financing tool use)
Evaluation of Growth Opportunities	56%	✕ Very Low
Conclusion H3/B	Mixed (two strong, one borderline, one weak)	✕ Hypothesis not supported

5. Discussion

Empirical findings of this study provide evidence that FL in Hungarian MSMEs is unevenly developed and differs from individul/household-oriented FL frameworks. While the OECD three-dimensional model (knowledge, behaviour, attitudes) has been widely applied, based on my work experience with small businesses, this approach is not complete. Introduction the FK/B (Operational Financial Knowledge) category seemed essential, it captured such a knowledge that is necessary for enterpreneurs.

Hypothesis 1 was not supported: the overall level of FL remained around **70%**, far below the 80% "good" threshold. Only Attitudes crossed into the "good" category (81%). This shows that Hungarian MSMEs, while motivated and responsible in money matters, still need significant improvement in financial knowledge and financial behavioural (decision making) routines.

Hypothesis 2/A (firm size) was supported: larger and more structured firms scored higher, especially in operational knowledge and behaviour. Hypothesis 2/B (firm age) was not supported for the total score, though certain sub-dimensions (operational knowledge, behaviour) improved with maturity. This reflects that experiences shape practice, but does not automatically guarantee higher financial literacy in text-book meaning. However small business practitioners need something else, complex competencies, financial and entrepreneurial literacy all together.

Hypothesis 3 was not supported in full: only **f**inancial discipline among competencies scored above 80%, while risk management, financial planning, and entrepreneurial mindset remained weak. In attitudes, responsibility and debt management scored high, but evaluation of growth opportunities was consistently low, even in mature firms. Although the questionnaire provided competency definition, probably ’dept management’ was interpreted not as a finacial tool, rather a disciplined behaviour.

These findings confirm the **original concept of the study**: textbook-style financial literacy does not reflect entrepreneurial realities. Instead, MSMEs require a **complex, unified competency model**, blending entrepreneurial competencies with applied financial knowledge. This is the unique contribution of the research, expanding both theory and practice in MSME studies.

6. Conclusion

This study examined financial literacy in Hungarian MSMEs and self-employed individuals through an expanded construct, separating theoretical and operational financial knowledge, and integrating behaviour and attitudes with entrepreneurial competencies.
The main findings are:
Overall financial literacy is very moderate (70%), financial knowledge particularly weak.
Attitudes are good (81%), but might be a good imporession effect. What is important from business perspective, growth opportunity evaluation level very low..
Firm size significantly influences finalcial literacy, in all. Larger firms showing stronger financial knowledge.
Firm age shows heterogeneous effects: experience improves certain areas, but does not ensure uniformly higher literacy resulkt in this sample.
Competency gaps are clear in risk management, financial planning, and opportunity evaluation. Debt management coul be misinterpreted.

The study contributes by redefining financial literacy for small businesses as a **complex entrepreneurial-financial competency** rather than a finance knowledge-heavy and numeracy focused literacy. For policymakers and educators, the findings underline the need for **business-oriented financial education combining with entrepreneurial education**, focused on applied financial knowledge and decision-making routines rather than theoretical financial content relevant for large orghanisations.

7. Recommendation

Limitations and Future Research

The study was limited to Hungarian MSMEs and self-employed respondents, and data were collected via self-reported questionnaires, which may involve bias. Future research should expand to other contexts, apply longitudinal designs, and explore the **causal links between competencies and business performance.**

The core limitation of the research was the sample, sample size small and non-representative. For more accurate results it is necessary to conduct research on a wider scale on a bigger sample.

In sum, the study shows that entrepreneurial success – here and now/ in the past, in Hungary - depends less on textbook knowledge and more on operational, applied finance and business competencies. By highlighting FK/B and financial behaviour as the key drivers, it provides a new foundation for both research and practice in MSME development.

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