

Financial Knowledge in Undergraduate Students: Impacts on Financial Behavior and Implications for Higher Education

Conhecimento Financeiro em Estudantes de Graduação: Impactos no Comportamento Financeiro e Implicações para a Educação Superior


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ABSTRACT


The financial knowledge of young Brazilians is below the global reality. However, it is not known how this knowledge affects the behavior of these young people, especially in early adulthood.. So, this paper aims to identify the financial knowledge's influence on these students' financial behavior. This research adopts a quantitative methodology, approaching undergraduate students from three educational groups in Brazil. The results reinforce the low performance of these students in financial knowledge and confirm that greater knowledge in personal finance can indeed influence the behavior of these young people in higher education. These findings highlight the importance of revisiting and updating Financial Education policies in Brazil. We believe that it is also crucial for Higher Education Institutions (HEIs) to adopt the theme of Financial Education as "Transversal Themes" (TT) in their curricular units. Thus, this research has theoretical and practical contributions. First, it contributes theoretically by bringing insights from the Brazilian context to the global debate on financial education. Secondly, it has a practical contribution by emphasizing the impact of financial knowledge on decision-making and indicating the fragility of the topic in undergraduate courses, demanding more assertive public policies.


Keywords: financial knowledge; financial behavior; University education.

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RESUMO

O conhecimento financeiro de jovens brasileiros mostra-se aquém da realidade mundial. No entanto, não se sabe como esses conhecimentos reverberam o comportamento desses jovens principalmente no início da vida adulta. Diante disso, esse estudo tem o objetivo de identificar a influência do conhecimento financeiro no comportamento financeiro de alunos de graduação. Para tanto, adotou-se uma metodologia quantitativa, abordando alunos de graduação de três grupos educacionais de abrangência estadual e nacional no Brasil. Os resultados reforçam o baixo desempenho desses alunos em conhecimento financeiro e confirmam que o maior conhecimento em finanças pessoais pode sim influenciar no comportamento desses jovens no ensino superior. Essas constatações ressaltam a importância de revisitar e atualizar as políticas de Educação Financeira no Brasil. Acreditamos que também seja importante que as Instituições de Ensino Superior (IES) adotem a temática da Educação Financeira como “Temas Transversais” (TT) em suas unidades curriculares. Assim, esta pesquisa contribui teoricamente ao trazer *insights* do contexto brasileiro para o debate global sobre educação financeira. Apresenta também uma contribuição prática ao enfatizar a influência dos conhecimentos financeiros na tomada de decisão, e também indicar a fragilidade da temática em cursos de graduação, demandando por políticas públicas mais assertivas.

Palavras-chave: conhecimento financeiro; comportamento financeiro; ensino superior.

Introduction

Financial knowledge is understood as human capital that is acquired throughout a lifetime. It encompasses topics such as resource management, including income, spending, and saving (DELAVANDE; ROHWEDDER; WILLIS, 2008). It also refers to an individual’s ability to understand and process financial information (HUSTON, 2010). This knowledge can be acquired throughout the educational pathway, e.g., in elementary, secondary, and higher education.

The literature on financial literacy and education is rich, but comes to different conclusions (ZHANG; LU; XIAO, 2023). For example, while Fernandes, Lynch, and Netemeyer (2014) conclude that financial education has only a limited impact on financial behavior, Ghafoori, Ip, and Kabátek (2021) and Kaiser et al. (2022) show that it can significantly improve financial knowledge and behavior. Moreover, most debates are based on data from developed countries (ZHANG; LU; XIAO, 2023). In

developing countries, such as Brazil, education and financial literacy are still emerging topics in academic literature (RIBEIRO; SOUZA; VIEIRA; MOTA, 2021), which makes their study even more inviting and necessary.

Although topics related to financial literacy have been officially discussed in Brazil, the results in international rankings could be more satisfactory. It appears that financial literacy is not sufficiently addressed in primary and secondary education, resulting in 15-year-old students, for example, performing worse than in other countries. To give an idea, Brazil performed the worst in the “Program for International Student Assessment” [PISA] (Organization for Economic Co-operation and Development - OECD, 2018). This assessment has shown that only 3% of the Brazilian population has mastered the concepts related to personal finance, while in other countries this percentage is around 12% (OECD, 2018). Therefore, it is necessary to investigate how this reality is reflected in students, as they carry the foundations of financial knowledge acquired throughout their lives. As they enter adulthood, many realize the importance of these skills and recognize their shortcomings. Degree programs could, therefore, be an opportunity to teach this financial knowledge, but they often fail to do so because they focus on their specific areas.

This study, therefore, aims to answer the following research question: Does financial knowledge influence undergraduate students’ financial behavior? Therefore, the thesis aims to determine the influence of financial knowledge on students’ financial behavior. This study applies a quantitative methodology targeting students from three major educational institutions in Brazil.

The results highlight the low performance of these students in terms of financial knowledge and confirm that greater knowledge of personal finance can influence the behavior of young people in higher education in developing countries such as Brazil. These results highlight the importance of rethinking and updating financial education policies in Brazil. Although financial education is addressed in public policy discussions and formulations, it does not appear in the National Curricular Guidelines [DCN] (CORDEIRO; COSTA; SILVA, 2018). These guidelines play a crucial role in the design of degree programs, defining the profile of graduates, competencies, skills, curriculum structure, and assessment systems (PORTAL MEC, 2023). In addition, we consider it important that HEIs include financial education as

a “transversal theme” [TT] in their curriculum units even before reformulating DCNs. This is important as this education is insufficient in primary and secondary education in Brazil (OECD, 2020), and it is a subject that is considered crucial for sustaining the economic growth of nations (VIEIRA; MOREIRA JUNIOR; POTRICH, 2019; KAISER et al., 2022; ZHANG; LU; XIAO, 2023).

This study thus makes a theoretical and practical contribution. First, it makes a theoretical contribution by establishing and testing relationships between financial knowledge and financial behavior, two concepts that are treated in isolation in the literature, but whose results show correlations between them. Second, it makes a practical contribution by highlighting the influence of financial knowledge on decision-making and pointing out the topic’s fragility in undergraduate courses, which calls for more assertive public policies.

The following sections of this article outline the theoretical framework, focusing on knowledge and financial behavior, which form the basis for all the analyses conducted. The guiding hypotheses of this study are also presented in this context. The methodology section then explains the procedures and approaches used to develop the study and outlines how the data was collected and analyzed. In the results analysis section, the data is comprehensively examined, including respondent characterization, descriptive analysis, and an evaluation of the regressions performed. This section explains the relationships and dynamics highlighted in the study’s hypotheses. The discussion section proposes a dialog between the results found and the theoretical framework, allowing us to reflect and conclude on the implications and relevance of the findings. Moreover, finally, the concluding reflections return to the main points discussed throughout the text, consolidating the research contributions and suggesting avenues for future work in this area.

Theoretical Reference

The theoretical framework of this study is located at the interface between the topics of financial knowledge and financial behavior. To develop an understanding of these topics, general concepts are addressed first and then focus on more specific issues, culminating in an argument that supports the proposed hypotheses.

FINANCIAL KNOWLEDGE

Despite more than a decade of research, financial knowledge and financial education concepts remain underdeveloped (WARMATH; ZIMMERMAN, 2019; VIEIRA; MOREIRA JUNIOR; POTRICH, 2019). These terms are treated as synonyms in several texts and used interchangeably (MESSY; MONTICONE, 2016; FERNANDES; LYNCH; NETEMEYER, 2014). However, education encompasses more than explicit knowledge (WARMATH; ZIMMERMAN, 2019).

Financial education can be defined as the process by which individuals receive instruction that improves their understanding of financial products, concepts, and risks (JIN; CHEN, 2020). Based on this better understanding, individuals develop the skills and confidence to become more aware of financial risks and opportunities, make informed decisions, know where to seek help, and take other effective actions to improve their financial well-being (JIN; CHEN, 2020). It is, therefore, about understanding financial concepts and the practical application of these concepts in everyday life (WARMATH; ZIMMERMAN, 2019).

Financial literacy is the understanding and knowledge of financial terms, concepts, and products. Therefore, it can be considered a component of financial education. Financial literacy is essential for understanding investment options, insurance products, taxes, and other related topics (WARMATH; ZIMMERMAN, 2019).

This study does not focus on financial literacy but on the concept of financial knowledge, which can encompass a range of topics, including understanding personal finance, knowledge of how financial markets work, appreciation of the risks and returns associated with different types of investments, and awareness of consumer rights and responsibilities about financial products and services (DELGADILLO; LEE, 2021).

The importance of financial literacy has become even more apparent in light of the recent global financial crises. A lack of understanding of basic financial concepts can lead to inappropriate financial decisions, resulting in high debt levels, defaults, and even bankruptcies (ZHU; XIAO, 2022). On the other hand, a solid understanding of financial principles can equip individuals with the necessary tools to navigate the complex financial world, leading to greater financial security and prosperity (WATANAPONGVANICH; KHAN; PUTTHINUN; ONO; KADOYA, 2021).

FINANCIAL BEHAVIOR

Several studies have already documented, to some extent, the positive influence of financial knowledge on financial behavior (KAISER et al., 2022). Financial behavior refers to a person's decisions, attitudes, and actions related to money and the management of financial resources. In this area of financial behavior, assertive financial decisions emerge, i.e., those that help individuals achieve their long-term financial goals. These decisions include, for example, the development of individual savings (BERRY, KARLAN; PRADHAN, 2018) and retirement planning (SMITH, 2016; LUSARDI; MITCHELL, 2011).

For example, Grinstein-Weiss et al. (2015) have established a link between financial education and savings. The authors find that participants in individual development programs who have met financial literacy requirements have higher average monthly savings and a higher savings-to-income ratio and save more frequently than their peers who have not met financial literacy requirements.

Ghafoori, Ip, and Kabátek (2021) show that participation in financial education seminars positively affects employees' expected behavior. Over two years, participants in these seminars made additional voluntary contributions of 6% to pension funds. In addition, seminar participants are more likely to use more complex investment portfolio construction strategies to reduce risk as they approach retirement.

Although the literature already points to the relationship between education and financial knowledge and variables related to savings accumulation (GRINSTEIN-WEISS et al., 2015; BERRY, KARLAN; PRADHAN, 2018) and retirement planning (SMITH, 2016; LUSARDI; MITCHELL, 2011; GHAFOORI; IP; KABÁTEK, 2021), no research was found that links financial knowledge to specific emergency reserves. Building emergency reserves is an important aspect of good financial management. Financial reserves can be understood as funds set aside to cover unforeseen expenses or to weather periods of financial instability, such as unemployment or economic recession. They provide a financial buffer that allows individuals to deal with unforeseen events without taking on debt or selling valuable assets (WATANAPONGVANICH et al., 2021).

It is therefore assumed that financial knowledge, as it relates to savings and retirement planning, also influences the formation of an emergency reserve, which leads to the first hypothesis of this study:

H1: Greater financial knowledge leads to the decision to build up financial reserves for emergencies.

In addition to the decision to accumulate savings and plan for retirement, the literature has also shown that financial education can lead to decisions related to controlling spending, such as the preparation of a family budget (RIBEIRO; SOUZA; VIEIRA; MOTA, 2021), prudent debt management (PORTO; XIAO, 2019; LOPEZ-AGUDO; MARCENARO-GUTIERREZ, 2023), the need for counseling to better allocate insurance expenses (PORTO; XIAO, 2019).

This study assumes that controlling spending means tracking, evaluating, and modifying personal spending to ensure individuals live within their means and approach their financial goals. In this sense, it can include creating a budget, reducing unnecessary spending, and prioritizing spending based on personal financial goals (ZHU; XIAO, 2022; LOPEZ-AGUDO; MARCENARO-GUTIERREZ, 2023).

Thus, it is also clear that financial knowledge increases the ability to control personal spending, which is reflected in the decision to incorporate this practice into your financial behavior, which postulates the second hypothesis of this study:

H2: Greater financial knowledge leads to the decision to control spending.

Furthermore, we hypothesize that these two decisions (building emergency reserves and controlling spending) can be made together, as an individual's financial knowledge influences them. Therefore, we put forward the following third hypothesis:

H3: Greater financial knowledge leads to the decision to have financial reserves for emergencies and to control spending.

The assumption underlying these hypotheses is that financial knowledge equips individuals with guidance that creates the confidence needed to make confident financial decisions (MESSY; MONTICONE, 2016; VIEIRA; MOREIRA JUNIOR; POTRICH, 2019; KAISER et al., 2022), such as creating an emergency fund and controlling spending.

Material and Methods

Based on the established objective, the research followed a quantitative approach that emphasized data collection and numerical analysis, as discussed by Sampieri, Collado, and Lucio (2013) and Creswell and Creswell (2021). A quantitative, non-experimental, cross-sectional approach was taken, using the survey method to analyze the characteristics and behaviors of a sample over a period with no future replications.

The study examined students at three colleges: one statewide and two nationwide. Respondents were enrolled and attending courses such as: Administration, Production Engineering, Systems Analysis and Development, Advanced Technology Program in Financial Management, Advanced Technology Program in Human Resources, Data Science, and Mechanical Engineering. Since the subject of the study is the students and their financial knowledge, it was decided to include students from these different majors and fields.

Random sampling was considered when the probability that some or all population elements belong to the sample is unknown (FÁVERO; BELFIORE, 2022). This type of sampling was chosen because the universities where the study took place were very limited, so stratified access to Brazilian students was not possible. For this reason, according to Fávero and Belfiore (2022), the sampling method does not guarantee that the sample is representative of the population, which is an obvious limitation of the chosen method. Fávero and Belfiore (2022) point out that random sampling is used when participation is voluntary, or the sample items are selected for convenience or simplicity.

A self-response questionnaire available via Google Forms was used to collect data. The questionnaire was divided into four sections, the first containing the Free and Informed Consent Form [TCLE]. The second section dealt with respondent characterization questions. The third section dealt with financial behavior questions and sought to understand the respondents' characteristics about this aspect. The fourth session dealt with questions related to respondents' financial knowledge.

The authors prepared the construction of the questions in sessions 2 and 3 based on the references used in this research and the intended objective. The

questions asked in session four were taken from a scale proposed by Vieira, Moreira Junior, and Potrich (2019), which makes it possible to capture the respondents' level of financial knowledge (Table 1 shows the bases used). The questionnaire could be completed between 04/01/2023 and 09/01/2023. Two hundred ninety-nine responses were received, forming the sample for the analysis of this study.

Table 1. Questionnaire questions

| Session | Theoretical foundation |
|------------------------------------|---|
| 2. Characterization of respondents | Questões construídas pelos autores |
| 3. Financial behavior | Built based on: KAISER et al., 2022; BERRY, KARLAN; PRADHAN, 2018; SMITH, 2016; LUSARDI; MITCHELL, 2011; GRINSTEIN-WEISS et al., 2015; GHAFoori; IP; KABÁTEK, 2021. |
| 4. Financial knowledge | Scale built by:VIEIRA; MOREIRA JUNIOR; POTRICH, 2019. |

Source: Prepared by the authors.

The data analysis was first carried out using Microsoft Excel for data processing. The data was then entered into the statistical software Stata® to analyze descriptive statistics and regressions.

CHARACTERIZATION OF THE SAMPLE

The research results represent the responses of students from the undergraduate courses involved in the research, namely: Human Resources Management (47.5%), Financial Management (19.1%), Systems Analysis and Development (13.0%), Production Engineering (11.0%), Administration (7.7%), Data Science (1.3%) and Mechanical Engineering (0.3%). Most respondents attended primary (78.6%) and secondary education (84.6%) in a public school and have monthly family incomes between R\$ 2,641.00 and 3,960.00 (29.1%); R\$ 1,321.00 to R\$ 2,640.00 (24.4%); from R\$3,961.00 to R\$6,600.00 (16.4%); from R\$6,601.00 to R\$13,200.00 (15.4%), these being the main income ranges indicated.

Most respondents are pursuing their first degree (90.0%), while 10.0% are pursuing their second degree. They also mentioned not having dependents (83.6%), demonstrating consistency with the most frequent age group, where respondents are, on average, 24 years old. When considering gender, 59.2% are women and 40.8% are men. The family's source of income comes, to a large extent, from salary (87.3%), with 69.9% indicating that they are salaried employees.

An essential element raised in the research refers to the parents' education, as this may impact the respondents' level of financial knowledge (OECD, 2020). When considering parents' education, respondents indicated that 36.1% of fathers and 33.1% of mothers had completed primary education, while 36.5% of fathers and 40.1% of mothers had completed secondary education. Furthermore, 8.4% of fathers and 5.0% of mothers have no education.

Regarding responsibility for providing resources to pay family bills, 38.8% indicated that parents are responsible for providing resources, while 31.4% were responsible with other family members.

OPERATIONALIZATION OF HYPOTHESES

All three hypotheses consider that the independent variable is “greater financial knowledge” (code: “knowledge”). We applied a questionnaire to operationalize this variable. The questionnaire is based on Vieira, Moreira Junior, and Potrich (2019) and has 13 basic personal finance knowledge questions. In this way, a more significant number of correct answers constitutes “greater financial knowledge”. The scale by Vieira, Moreira Junior, and Potrich (2019) was chosen because it is a scale validated in the national territory and, therefore, more suitable for this work.

In hypothesis 1, the dependent variable is the “decision to have financial reserves for emergencies” (code: “emergency_reserve”). To operationalize this variable, the following question was asked in the questionnaire: “Do you have any emergency reserves?”, with the possible answers being “yes” or “no”, configuring a dummy variable. The question also accompanied the specification of the concept of emergency reserve: “funds set aside to cover unforeseen expenses or to help withstand periods of financial instability, such as unemployment or economic recession”.

In hypothesis 2, the dependent variable is the “decision to control expenses” (code: “controle_expenses”). To operationalize this variable, the following question is

asked in the questionnaire: “Do you carry out any type of control over your monthly expenses? “with the possible answers being “yes” or “no”, again configuring a dummy variable. Again, the question also followed the specification of the concept: “involves monitoring, evaluating and modifying personal expenses to ensure that individuals are living within their means and moving toward their financial goals.”

In hypothesis 3, the dependent variable is the “decision to have financial reserves for emergencies and control expenses” (control_reserve). To operationalize this variable, the following was considered: “yes” for those who answered “yes” to the two questions above and “no” for those who answered “no” to at least one of the questions above.

The control variables are presented in Table 2.

Table 2. Relação de variáveis de controle

| Question | Code | Possible answers | Type |
|---|----------------------|---|---------|
| You attended high school in: | educational_pub_priv | - Private school - Public school | Dummy |
| Who is responsible for providing resources to pay the bills in your family? | Family_responsible | - you or you included (Just you, or You and your Partner, or You and another person). - you not included (Your partner, or Your parents, or Someone else.) | Dummy |
| How old are you? | age | Number | Numeric |
| Do you have an income-generating job? | work_with_income | - Yes - No | Dummy |
| Have you ever attended a personal financial education subject (elementary school, high school, or higher education) | disc_finan_pessoais | - Yes - No | Dummy |

Source: Prepared by the authors.

When the dependent variable is a dummy, the most appropriate regression to be used is logistic regression (HAIR; BLACK; BABIN; ANDERSON; TATHAM, 2009). For this reason, this statistical strategy was chosen. Furthermore, to ensure the reliability and validity of the results obtained, multicollinearity was checked between the independent variables, as Hair et al. (2009) recommended. Initially, the correlation matrix between the variables was examined, including 'educational_pub_priv', 'family_responsible', 'age', 'work_with_income' and 'disc_finan_pessoais', to identify possible high correlations. Subsequently, the Variance Inflation Factor (VIF) was calculated for each predictor variable. The obtained VIF values were well below the critical threshold of 5, suggesting the absence of significant multicollinearity between the variables. This procedure ensured that each predictor variable maintained its statistical individuality in the model, allowing a more precise and reliable interpretation of the relationships between the dependent variables 'emergency_reserve', 'control_spending' and 'control_reserve' and the control variables used in the research.

Results

The results presented in this session are arranged in two stages: (1) Perceptions regarding financial education, investment, and financing; and (2) Analysis of regressions.

DESCRIPTIVE ANALYSIS

When talking about personal finances, a financially educated person is considered to be someone who can spend less than they earn and who has the necessary knowledge to make decisions regarding resource management, mainly about income, expenses, and savings (DELAVANDE; ROHWEDDER; WILLIS, 2008; HUSTON, 2010). From this perspective, 38.8% of respondents spend exactly what they receive from their monthly income, while 36.8% spend less than they receive, and 24.4% spend more. This characteristic indicates that almost a third of the analyzed sample is potentially indebted and vulnerable to financial solutions that lead them to financing actions or taking money at higher costs, incurring financial expenses

(interest). Furthermore, just over a third, represented by those who spend exactly what they earn, are not able to create savings considering the lifestyle they indicate they have.

The majority (52.5%) indicated no emergency reserves, represented by amounts invested and destined for unexpected events. Generally, this reserve precedes long-term investments or those with more significant risks. This leads to greater vulnerability concerning unforeseen events that may arise from a financial point of view, such as consequences, for example, job loss or health and personal problems whose solution requires financial resources. Therefore, the emergency reserve makes it possible to minimize or even avoid taking out loans with high-interest rates (LEAL; NASCIMENTO, 2011).

In a way, these characteristics demonstrate a lack of financial knowledge throughout life. The majority of respondents (83.9%) indicated that they did not have, throughout their primary and secondary education, subjects that addressed financial knowledge or related subjects, which shows the need for policies such as decree nº 10,393, June 9, 2020 (BRAZIL, 2020). This lack, which has proven to be a Brazilian reality, leaves people vulnerable to financial knowledge obtained within the family, which becomes a vicious cycle when, from the interviewees' responses, it is clear that parents, who are mainly responsible for this education in the family nucleus, they have qualifications and training that are also lacking in this sense, as pointed out by the educational characteristics of parents presented in the previous subsection, where 36.1% of fathers and 33.1% of mothers have primary education, and, 36, 5% of fathers and 40.1% of mothers have secondary education, with 8.4% of fathers and 5.0% of mothers not even having schooling.

Respondents also indicated that they carry out some control over monthly expenses (77.9% do), while 22.1% do not carry out any type of control. The development of controls, however simple they may be, is the initial step towards a healthy financial life. Therefore, controlling financial life involves acquiring information regarding personal finances and operational transactions (Huston, 2010). In this regard, 50.8% of respondents indicated that they seek information about financial education in videos on YouTube or other social networks, 41.8% of them seek family advice on this topic, and 16.4% have already taken a finance course, whether online or in person. However, 24% indicated they were not interested in the topic.

In order to verify the proficiency in financial knowledge presented by the students, 13 questions were raised, with different levels of difficulty, according to items proposed by Vieira, Moreira Junior, and Potrich (2019). Items 1, 2, 3, 4, 8, 9, 10, and 11 refer to topics such as basic financial knowledge involving common aspects such as simple and compound interest rates, time value of money, and simple mathematical operations, while items 5, 6, 7, 12 and 13 addressed aspects related to advanced financial knowledge, involving more complete financial instruments (VIEIRA; MOREIRA JUNIOR; POTRICH, 2019). Table 3 details the results achieved.

Table 3. Frequencies related to financial education

| Item | Questions | Alternatives | Freq. | (%) |
|------|---|------------------------|-------|--------|
| 1 | Suppose you have R\$100.00 in a savings account at an interest rate of 10% per year. After five years, how much money will you have in savings? Assume that no money has been deposited or withdrawn | *More than R\$150.00. | 119 | 39,80% |
| | | Exactly R\$ 150.00. | 132 | 44,10% |
| | | Less than R\$150.00. | 25 | 8,40% |
| | | I don't know. | 23 | 7,70% |
| 2 | Suppose that José inherits R\$10,000.00 today and Pedro inherits R\$10,000.00 in 3 years. Because of inheritance, who will be richer? | *José. | 130 | 43,50% |
| | | Pedro. | 76 | 25,40% |
| | | They are equally rich. | 65 | 21,7% |
| | | I don't know. | 28 | 9,40% |
| 3 | Imagine that the interest rate on your savings account is 6% per year and the inflation rate is 10% per year. After 1 year, how much will you be able to buy with the money in this account? Assume that no money has been deposited or withdrawn | More than today. | 48 | 16,10% |
| | | Exactly the same. | 25 | 8,40% |
| | | * Less than today. | 141 | 47,20% |
| | | I don't know. | 85 | 28,40% |

| | | | | |
|----|---|--------------------|-----|--------|
| 4 | Suppose that in the year 2014 your income will double and the prices of all goods will also double. In 2014, how much will you be able to buy with your income? | More than today. | 67 | 22,40% |
| | | *Exactly the same. | 161 | 53,80% |
| | | Less than today. | 40 | 13,40% |
| | | I don't know. | 31 | 10,40% |
| 5 | Considering a long period of time (e.g. 10 years), which asset typically offers the highest return? | Savings. | 44 | 14,70% |
| | | * Actions. | 151 | 50,50% |
| | | Public titles. | 75 | 25,10% |
| | | I don't know. | 29 | 9,70% |
| 6 | Typically, which asset shows the biggest fluctuations over time? | Savings. | 19 | 6,40% |
| | | * Actions. | 223 | 74,60% |
| | | Public titles. | 25 | 8,40% |
| | | I don't know. | 32 | 10,70% |
| 7 | When an investor distributes his investment between different assets, the risk of losing money: | Increase. | 60 | 20,10% |
| | | *Decreases. | 181 | 60,50% |
| | | Remains unchanged. | 28 | 9,40% |
| | | I don't know. | 30 | 10,0% |
| 8 | A 15-year loan typically requires higher monthly payments than a 30-year loan, but the total interest paid at the end of the loan will be less. That statement is: | *True. | 148 | 49,50% |
| | | False. | 90 | 30,10% |
| | | I don't know. | 61 | 20,40% |
| 9 | Suppose you took out a loan of R\$10,000.00 to be paid after one year and the total interest cost is R\$600.00. The interest rate you will pay on this loan is: | 0,3%. | 11 | 3,70% |
| | | 0,6%. | 54 | 18,10% |
| | | 3%. | 22 | 7,40% |
| | | *6%. | 160 | 53,50% |
| | | I don't know. | 52 | 17,40% |
| 10 | Suppose you saw the same television in two different stores for the starting price of R\$1,000.00. Store A offers a discount of R\$150.00, while store B offers a 10% discount. What is the best alternative? | * Buy at store A. | 251 | 83,90% |
| | | Buy at store B. | 24 | 8,00% |
| | | I don't know. | 24 | 8,00% |

| | | | | |
|----|--|---------------|-----|--------|
| 11 | Imagine that five friends receive a donation of R\$1,000.00 and need to divide the money equally between them. How much will each one get? | 100. | 9 | 3,00% |
| | | *200. | 258 | 86,30% |
| | | 1000. | 14 | 4,70% |
| | | 5000. | 5 | 1,70% |
| | | I don't know. | 13 | 4,30% |
| 12 | An investment with a high rate of return will have a high rate of risk. That statement is: | *True | 221 | 73,90% |
| | | False. | 38 | 12,70% |
| | | I don't know. | 40 | 13,40% |
| 13 | When inflation rises, the cost of living rises. That statement is: | *True | 258 | 86,30% |
| | | False. | 27 | 9,00% |
| | | I don't know. | 14 | 4,70% |

Source: Original survey results.

Note: Alternatives indicated with * are those considered “correct” by the scale developed by Vieira, Moreira Junior and Potrich (2019).

Observing the results presented in Table 2, it is possible to understand more about the level of financial knowledge presented by the respondents. In general, the level of success concerning the items is within a standard, with rates around 50% or less in many of them. Specifically, when considering the items that addressed basic financial knowledge, covering issues related to simple and compound interest rates, the time value of money, and simple mathematical operations, it was possible to observe only two items with a high rate of correct answers (above 80 %). This result was in line with those found by Vieira, Moreira Junior, and Potrich (2019) in their efforts to construct the scale used, as they also identified only two items with percentages of correct answers above the percentage mentioned, and the results found in the research present-lower than those found by Vieira, Moreira Junior, and Potrich (2019) for the set of basic questions.

When considering the items related to advanced financial knowledge, which sought to analyze the respondents’ proficiency concerning more complex financial instruments, only one item was observed with a high rate of correct answers (above 80%), which discusses inflation and its impacts on the cost of living. Two other items also presented high rates, as with questions involving the risk-return relationship (73.80% correct answers) and the behavior of shares over

time (74.60% correct answers). Compared to the results found by Vieira, Moreira Junior, and Potrich (2019), the percentages of correct answers in the analyzed sample were lower for almost all items, which indicates a substandard financial knowledge index.

REGRESSION ANALYSIS

In this subsection, the results of the regressions that complete the hypothesis tests are discussed.

Relationship between financial knowledge and the decision to have financial reserves for emergencies.

According to Table 4, the logistic regression results show that hypothesis 1 is accepted. With a coefficient of 0.3855 and a p-value less than 0.01, the “knowledge” variable is significant at the 1% level. This suggests that a unit increase in this variable increases the logarithmic probability of the decision to have emergency reserves occurring. This is consistent with the literature, indicating that greater financial knowledge serves as input for better decisions, such as a “liquidity cushion” in times of crisis (WATANAPONGVANICH et al., 2021).

Likewise, the variable “educational_pub_priv” (if you studied in private (1) or public (0) education) is also significantly associated with the dependent variable, showing that the type of education received (public or private) influences the probability of having an emergency reserve, with a coefficient of 0.9936 and $p < 0.05$. This result highlights the potential discrepancies between types of education in terms of preparation for financial knowledge, highlighting the importance of public policies more targeted at public education.

On the other hand, being the “family_responsible” (whether or not the individual is responsible for family accounts) does not prove to be a significant predictor of the probability of having an emergency fund since the p-value associated with this variable is 0.802, very above the conventional threshold of 0.05. Similarly, the variable “age” and the variable “work_with_income” also do not present significant associations with the dependent variable, demonstrating p-values of 0.930 and 0.571, respectively, which indicates that these variables, in the context of this model, are not significant determinants for holding an emergency reserve.

However, the variable “disc_finan_pessoais” (which indicates whether the individual had any personal finance discipline) presents a positive relationship with the dependent variable at a significance level of 10%, indicating that, even if marginally, there is evidence that studying this discipline can influence the formation of emergency reserves.

The model as a whole, represented by the Chi-square value of 44.78 and a p-value of 0.002, is statistically significant, suggesting that the variables included in the model can explain the variation in the probability of having an emergency fund. Furthermore, the Pseudo R-squared of 0.108 indicates that approximately 10.8% of the variation in emergency_reserve can be explained by the independent variables included in the model.

Table 4. Logistic Regression for hypothesis 1

| Emergency_reserve | Coef. | St.Err. | t-value | p-value | [95% Conf Interval] | Sig |
|----------------------|---------|---------|----------------------|---------|---------------------|-----|
| Knowledge | 0.3855 | 0.072 | 5.32 | 0.001 | 0.2434 0.5274 | ** |
| educational_pub_priv | 0.9936 | 0.383 | 2.59 | 0.015 | 0.2417 1.7455 | ** |
| Family_responsible | 0.0687 | 0.274 | 0.25 | 0.802 | -0.4693 0.6068 | |
| Age | 0.0017 | 0.020 | 0.09 | 0.930 | -0.0383 0.0416 | |
| work_with_income | -0.2680 | 0.473 | -0.57 | 0.571 | -1.1940 0.6580 | |
| disc_finan_pessoais | 0.5155 | 0.349 | 1.47 | 0.098 | -0.1695 1.2005 | ** |
| constant | -2.8110 | 0.647 | -4.34 | 0.000 | -4.0802 -1.5418 | *** |
| Mean dependent var | | 0.475 | SD dependent var | | 0.500 | |
| Pseudo r-squared | | 0.108 | Number of obs | | 299 | |
| Chi-square | | 44.78 | Prob > chi2 | | 0.002 | |
| Akaike crit. (AIC) | | 380.97 | Bayesian crit. (BIC) | | 403.172 | |

*** p<.01, ** p<.05, * p<.1

Relationship between financial knowledge and the decision to control expenses

Table 5 presents the results of a regression analysis that explores the relationships between the independent variables and the dependent variable “control_spending”. The variable “knowledge” has a coefficient of 0.241 and is significant at a level of 0.01, indicating a positive and significant relationship with the decision to

control expenses. This suggests that increases in knowledge are associated with implementing expense controls, holding all other variables constant. This reinforces the importance of knowledge in promoting more responsible consumption habits and effective management of personal finances.

The other variables in the model, “educational_pub_priv”, “family_responsible”, “age”, “work_with_income”, and “disc_finan_pessoais”, are not significantly associated with expense control, with p-values substantially above the threshold of 0.05. This implies that, in the context of this model, these variables are not significant indicators of spending control.

It is interesting to note that, despite the statistical significance of the knowledge variable, the model as a whole has a relatively low Pseudo R-squared of 0.036. This suggests that the variables included in the model explain only a small part of the variation in expense control, and there may be other factors not considered in the model that have a significant influence on expense control.

Additionally, the model has a Chi-square value of 11.332 with a p-value of 0.045, which indicates that the model is significant overall. However, the Pseudo R-squared value indicates that the model’s ability to explain variation in the dependent variable is limited, and future research may seek to include other potentially relevant variables to improve understanding of expense control.

In short, among the variables considered, only knowledge proved to be a significant predictor of spending control, emphasizing educational interventions and initiatives to improve individuals’ financial knowledge to promote more sustainable and responsible consumption habits. Therefore, according to this model, hypothesis 2 of this study can be affirmed.

Tabela 5. Logistic Regression for hypothesis 2

| expense_control | Coef. | St.Err. | t-value | p-value | [95% Conf Interval] | Sig |
|----------------------|--------|---------|---------|---------|---------------------|-----|
| Knowledge | 0.241 | 0.073 | 3.30 | 0.001 | 0.097 0.384 | *** |
| educational_pub_priv | 0.048 | 0.417 | 0.11 | 0.909 | -0.770 0.866 | |
| Family_responsible | 0.037 | 0.316 | 0.12 | 0.907 | -0.581 0.655 | |
| Age | 0.003 | 0.024 | 0.11 | 0.913 | -0.044 0.05 | |
| work_with_income | -0.131 | 0.516 | -0.25 | 0.799 | -1.144 0.881 | |

| | | | | | | |
|---------------------|--------|---------|----------------------|-------|--------|---------|
| disc_finan_pessoais | -0.105 | 0.390 | -0.27 | 0.789 | -0.870 | 0.660 |
| Constant | -0.239 | 0.698 | -0.34 | 0.732 | -1.607 | 1.129 |
| Mean dependent var | | 0.779 | SD dependent var | | | 0.415 |
| Pseudo r-squared | | 0.036 | Number of obs | | | 299 |
| Chi-square | | 11.332 | Prob > chi2 | | | 0.045 |
| Akaike crit. (AIC) | | 316.314 | Bayesian crit. (BIC) | | | 338.517 |

*** p<.01, ** p<.05, * p<.1

Relationship between financial knowledge and the decision to have financial reserves for emergencies and control expenses.

The logistic regression analysis shown in Table 6 suggests that the level of knowledge and the type of education (public or private) are significant variables when considering the ability of individuals to maintain an emergency fund and control expenses, with the coefficients of 0.386 and 0.750, respectively. Notably, an increase in the level of knowledge is associated with a greater likelihood of maintaining an emergency fund and controlling expenses, emphasizing the importance of financial knowledge for more responsible behavior. Additionally, attending private schools seems to favor the probability of carrying out such behavior, in contrast to public schools.

On the other hand, variables such as responsibility for the family, age, having a job with income and personal financial discipline did not have a significant impact in this analysis, denoting that such factors do not considerably influence the probability of maintaining a control reserve in this specific model.

The model constant is significantly different from zero, with a coefficient of -3.227, representing the log-odds of maintaining a control reserve when all explanatory variables are considered null.

The model, although significant with a Chi-square value of 42.241 and a p-value below 0.001, explains approximately 10.4% of the variability of the response variable, as indicated by the Pseudo R-squared of 0.104, signaling that other factors not included in the model can contribute to the explanation of variability in control_reserve.

These insights reinforce the relevance of educational and knowledge promotion policies as means to foster more solid and conscious financial practices, and shed light on the importance of considering the educational context when examining financial behaviors.

Table 6. Logistic Regression for hypothesis 3

| control_reserve | Coef. | St.Err. | t-value | p-value | [95% Conf Interval] | Sig |
|----------------------|--------|---------|----------------------|---------|---------------------|-----|
| Knowledge | 0.386 | 0.074 | 5.25 | 0.003 | 0.242 0.530 | *** |
| educational_pub_priv | 0.750 | 0.368 | 2.04 | 0.042 | 0.028 1.472 | ** |
| family_responsible | -0.083 | 0.276 | -0.30 | 0.764 | -0.625 0.459 | |
| Age | 0.014 | 0.020 | 0.68 | 0.497 | -0.026 0.054 | |
| work_with_income | -0.377 | 0.486 | -0.78 | 0.437 | -1.329 0.574 | |
| disc_finan_pessoais | 0.476 | 0.345 | 1.38 | 0.168 | -0.200 1.152 | |
| Constant | -3.227 | 0.665 | -4.85 | 0.001 | -4.531 -1.924 | *** |
| Mean dependent var | | 0.421 | SD dependent var | | 0.495 | |
| Pseudo r-squared | | 0.104 | Number of obs | | 299 | |
| Chi-square | | 42.241 | Prob > chi2 | | 0.000 | |
| Akaike crit. (AIC) | | 376.842 | Bayesian crit. (BIC) | | 399.045 | |

*** p<.01, ** p<.05, * p<.1

Discussion

The need to include personal finance content in higher education becomes more evident in light of recent studies and empirical data. A questionnaire proposed by Vieira, Moreira Junior, and Potrich (2019), consisting of 13 questions on a financial knowledge scale, was applied to 299 undergraduate students, revealing unsatisfactory performance regarding financial knowledge. This result corroborates previous findings, such as those evidenced by PISA carried out by the OECD, consolidating a worrying finding of a deficit in financial knowledge.

The results of the regressions emphasize that greater knowledge, measured by the aforementioned scale, is intrinsically linked to more assertive and responsible behaviors, such as implementing spending controls and maintaining emergency reserves. Additionally, the hypothesis tests reinforce that prior exposure to personal finance subjects leads to more considered and conscious decisions.

These results not only reinforce the low performance of students in financial knowledge, but also highlight how deepening personal finance can substantially impact the behavior of young people in higher education, even in developing coun-

tries, such as Brazil. This context highlights the crucial need to review and update financial education policies and strategies in the national territory.

Despite the growing discussions about financial education and its relevance being recognized in the formulation of public policies, the National Curricular Guidelines (DCN), according to Cordeiro, Costa, and Silva (2018), still do not incorporate this vital component. Given the importance of DCNs in defining profiles, competencies, skills, curricular structures, and assessment systems in undergraduate courses, including financial education as a pillar in these documents becomes imperative.

Furthermore, an alternative would be for Higher Education Institutions (HEIs) to internalize the topic of Financial Knowledge as “Transversal Themes” (TT) in their curricular units. This strategy proves vital, especially when considering the gaps in training students in primary and secondary education in Brazil (OECD, 2020). The lack of financial knowledge is an obstacle not only to individual development but is also a critical element in sustaining the economic growth of nations (VIEIRA; MOREIRA JUNIOR; POTRICH, 2019); KAISER et al., 2022; ZHANG; LU; XIAO, 2023). In this sense, the role of universities is pivotal, serving as drivers of change and promoting solid financial knowledge, which enables individuals to make informed and responsible financial decisions.

Conclusion

This study aimed to identify the influence of financial knowledge on the financial behavior of undergraduate students. The study is justified by the cruciality of this topic in the economic development of nations. Additionally, it was identified that the literature has divergent results (ZHANG; LU; XIAO, 2023) and focuses on developed countries (ZHANG; LU; XIAO, 2023), making a complementary study in a developing country such as Brazil imperative (RIBEIRO; SOUZA; VIEIRA; MOTA, 2021).

Three hypotheses were tested. The first is that greater financial knowledge leads to the decision to have financial reserves for emergencies (H1); the second is that greater financial knowledge leads to the decision to control expenses (H2); and the third is that financial knowledge impacts both decisions together (H3). The

results show that students with more financial knowledge tend to make better financial choices, corroborating other similar international studies (DELGADILLO; LEE, 2021; GHAFORI; IP; KABÁTEK, 2021; BERRY, KARLAN; PRADHAN, 2018, SMITH, 2016; WATANAPONGVANICH et al., 2021; PORTO; XIAO, 2019; LOPEZ-AGUDO; MARCENARO-GUTIERREZ, 2023).

These findings make important contributions, both theoretical and practical. Theoretically, the study established and verified relationships between financial knowledge and financial behavior, two concepts addressed in the literature in isolation but whose results demonstrated correlations between them. At a practical level, the findings highlight the need for more comprehensive public policies and the inclusion of financial knowledge in undergraduate curricula.

However, it is important to consider the limitations of the study. Convenience sampling was used, which, according to Fávero and Belfiore (2022), does not guarantee a complete representation of the population of undergraduate students in Brazil. For future studies, it is suggested to explore the relationship between financial knowledge and other aspects of financial behavior, such as investments in risky financial assets and allocation of insurance expenses, elements already highlighted by Zhu and Xiao (2021) and Porto and Xiao (2019) in other countries. Furthermore, as a suggestion for future studies, a more detailed investigation into how to effectively insert financial education into undergraduate curricula can help develop more effective strategies to improve financial knowledge among young people.

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