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FINANCIAL LITERACY OF ESTONIAN AND ITALIAN STUDENTS:  
A COMPARATIVE ANALYSIS

Master Thesis

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Tartu 2024

## FIN. LIT. OF EST & ITA STUD: A COMPARATIVE ANALYSIS

I have written this research paper independently. Any ideas or data taken from other authors or other sources have been fully referenced.

# FIN. LIT. OF EST & ITA STUD: A COMPARATIVE ANALYSIS

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## Introduction

Financial literacy is recognized globally as a critical life skill essential for managing the complexities of personal finance. As the global economy evolves and innovations in digital financial products expand, the ability of individuals, especially students, to make informed financial decisions becomes increasingly crucial as well. According to the Organization for Economic Co-operation and Development (OECD) (2018), financial literacy involves possessing the knowledge and understanding of financial concepts and risks. It also includes having the skills, motivation, and confidence to use this knowledge effectively in various financial situations to enhance both personal and societal financial well-being, as well as to engage in economic activities. This definition suggests that financial literacy is not just about having knowledge about finance, but also about possessing the skills and attitude required in using that knowledge for a lifetime financial well-being.

Young people face unique challenges in navigating the complexities of modern finance. The digitalization of financial services, the prevalence of student loans, and the evolving landscape of employment contracts require young individuals to possess a robust set of financial skills. However, studies consistently reveal a concerning trend of low financial literacy among youth globally (OECD, 2020; Mandell & Klein, 2009). For instance, only 27% of young adults demonstrate basic knowledge of financial concepts such as interest rates, inflation, and risk diversification (Lusardi et al, 2010). The consequences of insufficient financial knowledge at this stage of life can lead to long-term financial difficulties, hindering the accumulation of wealth and the achievement of financial goals. Additionally, young people often lack the confidence to manage financial tasks, making them vulnerable to financial scams and poor financial decisions (Silinskas et al, 2021).

Despite the acknowledged importance of financial literacy, studies suggest that significant disparities in financial knowledge exist among students worldwide (OECD, 2020). Studies have shown that these disparities are observed across genders (Bottazzi & Lusardi, 2016; Rinaldi et al., 2022), age groups (Mejía et al., 2022; Mishra et al., 2021), and countries (Dundure & Sloka, 2021; Ergün, 2018). Comparative studies between two countries, such as the one conducted by Ramon-Hernandez et al (2020) between Mexico and Colombia, highlight some of these differences and emphasize the need for targeted financial education policies.

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In the European context, Estonia and Italy present intriguing cases for study due to their differing economic structures, educational systems, and cultural backgrounds. Despite both countries lacking a formal financial literacy curriculum, there are significant differences in their financial literacy levels. Estonia consistently ranks high in financial literacy assessments, such as those conducted by Programme for International Student Assessment (PISA), whereas Italy, despite over a decade of concerted efforts to enhance financial literacy through school programs, continues to show less than optimal results. This discrepancy provides a strong basis for a comparative study, raising important questions about the effectiveness of formal versus informal financial education methods and the influence of wider socio-cultural and economic factors on financial literacy.

Additionally, the significant gender and immigration status differences in financial literacy between the two countries further underscore the need for this study (Bottazzi & Lusardi, 2016). In Italy, large gender disparities exist with males generally exhibiting higher financial literacy than females—a trend that is notably less pronounced in Estonia. Similarly, while immigrants in Estonia show higher financial literacy compared to their native counterparts, the opposite is true in Italy. These variances suggest that factors beyond the presence or absence of a formal curriculum might influence financial literacy outcomes. Cultural attitudes towards gender roles, economic integration policies, educational methodologies, and perhaps deeper societal values towards education and financial responsibility could be influencing these outcomes.

The empirical literature on financial literacy across countries, including Estonia and Italy, reveals gaps due to variations in measurement tools and methodologies, highlighting the need for standardized measures to enable meaningful cross-country comparisons. Additionally, there is a lack of comparative analysis of the determinants affecting financial literacy levels among students in Estonia and Italy, necessitating research to understand the unique influences in each country.

Understanding these underlying factors is crucial not only for academic purposes but also for informing policy-making. As both Estonia and Italy continue to evolve their educational strategies to include or enhance financial literacy education, insights from this study could help tailor interventions that are culturally and contextually appropriate. This could lead to more effective educational practices that enhance financial literacy across diverse populations, thereby

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improving economic decision-making and financial well-being at the individual and national levels.

This study aims to bridge the understanding of financial literacy levels through a cross-country comparative approach, focusing on Estonia and Italy. By examining factors such as educational curriculum differences, family impact, gender norms, and the availability of financial education resources, the research will provide a nuanced understanding of the determinants of financial literacy. The study addresses two key research questions: how financial literacy levels among students in Estonia compare with those in Italy, and what major factors influence the observed differences in financial literacy levels between students in both countries.

The study conducts a comprehensive comparative analysis exploring various factors contributing to differences among students in both countries using the Programme for International Student Assessment (PISA) 2018 data. This research investigates economic and socio-cultural influences, gender disparities, familiarity with financial concepts, confidence in financial matters (both generally and with digital devices), the impact of financial education in school lessons, and parental involvement in financial matters. The analysis employs multiple regression analysis and Blinder-Oaxaca decomposition to examine these influences, providing an in-depth understanding of the observed differences in financial literacy levels between Estonia and Italy.

A comparative analysis between Estonia and Italy illuminates the significant impact of non-curricular factors on financial literacy, providing robust evidence for policy adjustments. By identifying similarities, differences, and transferable lessons between the two countries, this research contributes to the development of more targeted and effective strategies for promoting financial literacy and improving financial well-being among youth populations. This research serves as a blueprint for other nations with similar disparities and educational ambitions, ensuring that policy shifts in financial education are well-informed and optimally structured to address the specific needs of different demographic groups.

This study highlights significant differences and determinants influencing financial literacy among students in Estonia and Italy. National factors, represented by the country-level estimator, significantly impact financial literacy, underscoring the importance of national educational policies, economic conditions, and cultural norms. The positive correlation of socio-economic status across all models further confirms its crucial role in enhancing financial literacy, with

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higher socio-economic status linked to better access to educational and financial resources. However, challenges in the educational delivery of financial literacy were identified, particularly with the inverse relationship of the financial education in schools, suggesting that current methods of financial education in schools might need re-evaluation to better align with effective learning outcomes.

**Keywords:** Financial Literacy, Financial education, Digital Financial literacy, Gender Disparities, Socio-Economic Status

**Research classification Code:** S180

# 1. LITERATURE REVIEW

## 1.1 Theoretical Foundations of Financial Literacy

Financial literacy is a multifaceted construct that encompasses various components, including knowledge, skills, and attitudes, crucial for making informed financial decisions (Bottazzi & Oggero, 2023). In this chapter, the study reviews and discusses the existing conceptual, theoretical, and empirical literature on financial literacy and the factors that contribute to differences in its levels across countries. The goal is to offer a comprehensive and clear understanding of the current state of knowledge on financial literacy, with a focus on Estonia and Italy. This literature review aims to lay the foundation for developing hypotheses and a theoretical framework for the study's empirical analysis.

The definitions and conceptualizations of financial literacy vary across scholars, reflecting the complexity of the concept (Świecka, 2019). One of the earliest definitions of the term financial literacy was in the United Kingdom by the National Foundation for Education Research in 1992. They defined financial literacy as “the ability to make informed judgments and take effective decisions regarding the use and management of money” (Noctor, Stoney, Stradling, 1992). Later in 1997, financial literacy was introduced as a theoretical concept in a study by the Jump\$tart Coalition for Personal Financial Literacy in USA, where financial literacy was defined as “the ability to use knowledge and skills to manage one’s financial resources effectively for lifetime financial security.” (Chen and Volpe, 1998). These definitions emphasize the practical application of financial knowledge and skills throughout an individual's life.

Hastings and Mitchell (2011) further contribute to this definition by indicating three key components of financial literacy: knowledge, skills, and attitudes. They posit that financial literacy encompasses understanding financial concepts (knowledge), applying the knowledge to practical situations (skills), and developing positive attitudes and behaviors toward money management, risk, and financial planning. According to the International Network for Financial Education, financial literacy is "a combination of awareness, knowledge, skill, attitude, and behaviour necessary to make sound financial decisions and ultimately achieve individual financial well-being" (Atkinson and Messy, 2012). Lusardi and Mitchell (2014) also expands on this definition further, defining financial literacy as “an individual's ability to process economic information and make informed decisions about financial planning, wealth accumulation, debt,



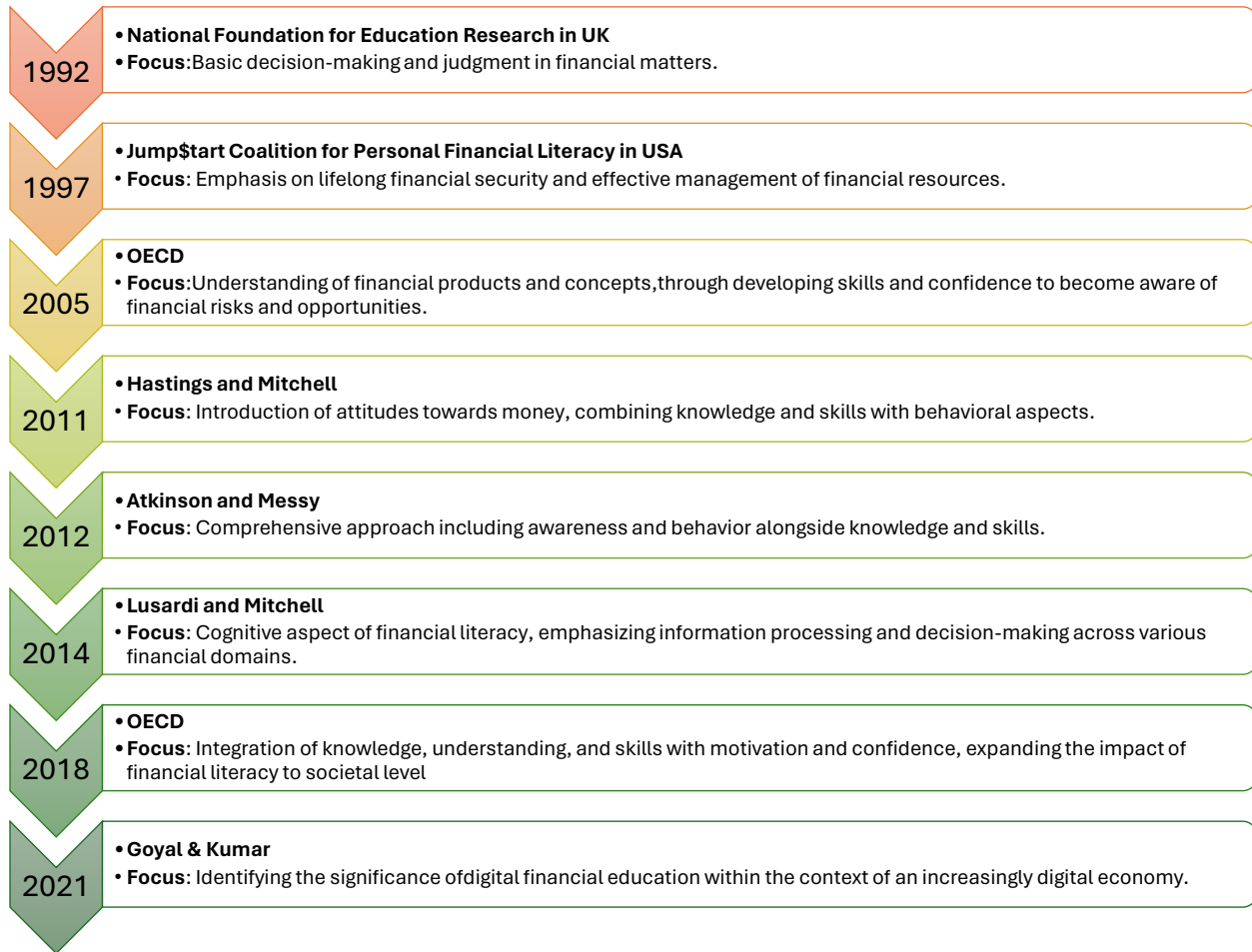
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and pensions". This broader definition incorporates not only the management of financial resources but also decision-making in various financial aspects. It introduces the idea of information processing, thereby highlighting the cognitive aspect of financial literacy. In this view, being financially literate is not just about knowing but also about the cognitive ability to apply that knowledge to navigate complex financial choices.

According to the OECD (2020), financial literacy encompasses the knowledge and comprehension of financial concepts and risks, along with the skills, motivation, and confidence to apply this understanding to make effective decisions in various financial situations. This competency aims to enhance both individual and societal financial well-being and to facilitate active participation in economic activities. Bibliometric studies by researchers like Goyal & Kumar (2021) have identified trends in the field, including the significance of digital financial education, indicating a shift towards understanding financial literacy within the context of an increasingly digital economy.

Figure 1 illustrates the evolution of the concept of financial literacy from 1992 to 2021, tracing its development through various scholarly definitions and frameworks that have shaped our understanding over the decades. This figure is crucial as it visually encapsulates how financial literacy has expanded beyond basic monetary management to include a complex blend of knowledge, skills, attitudes, and behaviors, highlighting its relevance in today's digital and economically diverse society.

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**Figure 1.** Evolution of the concept of financial Literacy

Source: Author's own study based on: OECD (2018); Świecka (2019); Lusardi and Mitchell (2014)

These definitions underscore the complex and dynamic nature of financial decision-making. Financial literacy is not just about possessing knowledge, as the term 'literacy' denotes, but also about possessing the skills and attitude required in utilizing that knowledge for ongoing financial well-being. Financial literacy has also been operationalized in various contexts in different studies, such as knowledge of financial products (e.g., what is a stock vs. a bond; the difference between a fixed vs. an adjustable rate mortgage), knowledge of financial concepts (inflation, compounding, diversification, credit scores), having the mathematical skills or numeracy necessary for effective financial decision-making, and being engaged in certain activities such as financial planning (Świecka, 2019).

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In this study, the definition and measurement of financial literacy by OECD is adopted. This is because the definition is simple and concise, providing a working acknowledgement of the concepts and a simplified index to measure and compare financial literacy levels between different countries. As (Świecka, 2019) rightly noted, the definition of financial literacy by OECD (2020) can be broken down into two parts. The first refers to the cognitive and behavioral characteristic aspect, while the second part emphasizes the importance of acquiring certain knowledge and skills. In other words, OECD views “literacy” not only as the capacity of 15-years-old students to apply knowledge and skills in a key subject but also as the students’ ability to analyze, reason and communicate as they pose, solve, and interpret problems in a variety of situations (OECD, 2020).

Financial literacy is a broad and complex concept, as such its study cuts across various disciplines including finance, education, behavioral economics, public policy, psychology, social works, and information systems. Scholars in all these fields view financial literacy from different perspectives, but collectively contribute to the comprehensive understanding of the topic, considering its economic, educational, psychological, and societal dimensions. Moreover, these fields have also generated several theories to explain the factors that determine financial literacy and contribute to observed differences in its levels across countries. In this section, some of these theories will be reviewed. The goal here is to develop a comprehensive theoretical framework for analyzing and comparing the determinants of financial literacy levels between Italy and Estonia.

### **Theory of Planned Behavior (TPB)**

The Theory of Planned Behavior (TPB), developed by Ajzen (1991), provides a framework for understanding financial decision-making, positing that behaviors are influenced by intentions, which are shaped by attitudes, subjective norms, and perceived behavioral control. In financial contexts, such as saving, TPB highlights how education enhances saving intentions by raising awareness, crucially moderating the relationship between financial literacy, and saving behaviors.

Attitudes towards financial behaviors are influenced by financial literacy. Financial education molds attitudes by providing the necessary knowledge and skills for effective financial decision-making. Subjective norms, reflecting the social pressures and expectations from one’s

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environment, also affect financial behaviors. The influence of these norms is evident in how family and societal expectations shape an individual's financial actions, particularly in saving and spending (Zait & Berteau, 2014; Gutter & Copur, 2011; Samadi, 2018; Salem & Chaichi, 2018)

Perceived behavioral control, enhanced by financial literacy, affects an individual's perceived ease of managing financial tasks, thus impacting financial behaviors directly. This interplay of knowledge, societal influences, and confidence in financial capabilities underscores the TPB's relevance in analyzing financial literacy's effects on financial behavior.

### **Social Learning Theory**

Originating from Bandura (1977), Social Learning Theory posits that individuals learn behaviors by observing and imitating others within their social environments. This theory is particularly relevant in understanding how financial literacy is acquired through social interactions, such as family influences and peer groups (Engström & McKelvie, 2017; Rahim & Ali, 2022) .

Parents are pivotal in this learning process, often serving as the primary role models in shaping their children's financial behaviors, including attitudes towards money, saving, and budgeting (Kassim, 2020). For instance, children observing parents who engage in prudent budgeting and saving are likely to emulate these financial behaviors. This form of observational learning is crucial, as it establishes foundational financial habits early in life. Additionally, peer influences play a significant role, where financial habits and attitudes can be strongly influenced by an individual's peer group, reinforcing or challenging the lessons learned at home (Md Kassim et al., 2018).

The significance of structured financial education is also highlighted by Masnan & Curugan (2016), which discusses how school-based financial education programs can leverage social learning by integrating real-life examples, testimonials, and role models into the curriculum. These programs are designed to enhance observational learning opportunities beyond the family setting, providing students with diverse examples of financial management and decision-making. Moreover, parental involvement in financial literacy, as examined in the study, shows how parents' engagement in discussing and managing financial matters can significantly enhance the effectiveness of these educational programs. By actively participating in their children's financial education, parents reinforce the financial norms and behaviors that the children observe and learn from within the classroom and their social circles.

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These connections demonstrate the multidimensional impact of social learning on financial literacy, encompassing the influences from home, school, and broader social interactions. They underscore the importance of comprehensive financial education programs that incorporate both formal instruction and the powerful tool of observational learning within various social contexts.

Building on the theoretical foundations of financial literacy, human capital theory posits that the prosperity of a society relies not only on traditional assets such as financial capital and labor, but also critically on the knowledge and skills of its population, with education being the primary mechanism for their development (Marginson, 2019; Lucas, 1990; Nafukho et al., 2004).

Research underscores the importance of integrating financial education early in life to improve economic outcomes, highlighting the role of knowledge and skills in enhancing individual and societal prosperity (Sherraden et al., 2011; Holden, 2009). Additionally, cultural capital theory, as introduced by Bourdieu (1977), illustrates how cultural knowledge, acquired through education and socialization, influences financial literacy by shaping individuals' access to financial education and practices within families and communities, leading to disparities in financial literacy across different cultural contexts (Chen & Volpe, 1998; Lusardi & Mitchell, 2008).

Together, these theories emphasize the significant influence of educational and cultural factors in developing financial knowledge and skills, stressing the necessity of embedding financial education within curricula and recognizing how cultural capital impacts financial behaviors and access to economic opportunities.

### **1.2 Components and Determinants of Financial Literacy**

The OECD framework for financial literacy provides a foundation for understanding the essential elements needed to develop sound financial capabilities in individuals, which are elaborated upon in the following sections on financial knowledge, skills, attitude, and behavior.

Financial knowledge forms the bedrock of financial literacy. It denotes an individual's awareness and comprehension of financial concepts (Huston, 2010). This includes understanding basic economic principles, financial products, and the ability to interpret financial information such as statements, investment options, and risks. For instance, a financially literate individual should be able to differentiate between various types of loans, comprehend the impact of interest rates, and interpret financial statements (Lusardi & Mitchell, 2007). Without a solid foundation of financial

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knowledge, individuals may struggle to make informed decisions about their finances, leading to potential pitfalls such as debt accumulation or suboptimal investment choices.

Financial skills involve the practical application of financial knowledge in real-life situations (Huston, 2010). Possessing knowledge alone is insufficient; individuals must be adept at budgeting, saving, investing, and making financial decisions that align with their goals. For example, having the skill to create and manage a budget allows individuals to allocate their resources effectively, while investment skills enable them to navigate the complexities of the financial markets (Fernandes et al., 2014). Financial skills bridge the gap between theoretical understanding and practical implementation, thereby empowering individuals to take control of their financial well-being and security.

Financial attitude encompasses an individual's beliefs, values, and emotional responses toward money and financial decisions (Huston, 2010). Positive financial attitudes, such as a willingness to save, a prudent approach to debt, and a proactive stance toward financial planning, contribute to responsible financial behaviour (Fernandes et al., 2014). On the other hand, negative attitudes, such as impulsivity or a reluctance to engage with financial matters, can impede sound decision-making. Understanding one's financial attitude is crucial as it shapes the lens through which individuals perceive and interact with financial opportunities and challenges.

Financial behavior refers to the actions individuals take in managing their finances (Fernandes et al., 2014). It is the tangible manifestation of financial literacy, reflecting how individuals apply their knowledge, skills, and attitudes in real-world scenarios. For instance, responsible spending habits, consistent savings, and adherence to a budget are indicative of positive financial behavior. On the contrary, impulsive spending, accumulating high levels of debt, or avoiding financial planning may suggest areas where individuals need to enhance their financial literacy (Lusardi & Mitchell, 2007). Observing financial behavior provides valuable insights into the practical implications of financial literacy and highlights areas for improvement in attitude or further education.

Building upon the foundational aspects of financial literacy discussed, this study explores the empirical research that explores how these elements—knowledge, skills, attitudes, and behaviors—are manifested and influenced by various behavioral factors and societal norms in different cultural and economic contexts. There is a plethora of studies that examine the factors

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that determine financial literacy and various financial behaviors among different populations. Widjaja et al. (2020) explore the relationship between financial literacy, subjective norms, and savings behavior among young workers in Jakarta. Their study employs structural equation modeling to demonstrate that financial literacy directly and indirectly influences savings behavior through saving intention and attitude toward savings, emphasizing the importance of financial literacy in promoting prudent financial behaviors. Using the same approach as Widjaja (2020), Jati et al. (2022) also investigates the impact of subjective norms, academic ability, and working experience on financial literacy and behavior among university students in Indonesia during the COVID-19 pandemic. Their structural model analysis reveals positive effects of academic ability, working experience, and financial literacy on financial behavior. Frisancho (2023) contributes to this literature by examining the spillover effects of school-based financial education on parental financial behavior in Peru. Leveraging data from a large-scale experiment, they find significant effects on parental financial decisions, particularly among disadvantaged households.

Besides the behavioral factors that determine financial literacy, some studies have explored the social, demographic and institutional factors that affect financial literacy, particularly among young adults and students. Cole & Shastry (2018) find that education has a large effect on financial market participation, indicating that individuals with higher levels of education tend to exhibit greater financial literacy. Additionally, Tanuwijaya & Setyawan (2021) and Jati et al. (2022) demonstrate that academic ability positively influences financial literacy among college students. Mandmaa (2019) reveals that financial literacy among students in Estonia is influenced by gender, nationality, age, and academic discipline, suggesting that demographic factors play a role in shaping financial knowledge. Bottazi & Lusardi (2016) and Azeez & Akhtar (2020) find gender disparities in financial literacy, with males generally exhibiting higher levels of financial knowledge than females. Lusardi & Lopez (2016) show that socioeconomic characteristics strongly predict financial literacy among high school students, suggesting that individuals from wealthier backgrounds tend to have higher levels of financial literacy.

In addition to the behavioral aspects, the efficacy of financial education programs in enhancing financial literacy has also been investigated by some studies. Kaiser et al. (2022) and Klapper & Lusardi (2019) find that while financial education programs generally improve financial literacy and behavior, their effectiveness varies significantly with the income level of the participants and

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the economic context in which they are delivered. This variation suggests that individuals from lower-income backgrounds may not benefit as much from such programs compared to their higher-income counterparts.

These findings indicate the importance of understanding the factors contributing to this gap and devising strategies to address it. The implications of gender differences in financial literacy are significant, as they can exacerbate financial inequalities and hinder financial well-being. Lusardi (2008) highlights the consequences of financial illiteracy, particularly among specific demographic groups such as women. Moreover, low levels of financial literacy may affect long-term financial planning and retirement security among women, as they may lack the knowledge and skills necessary to make informed financial decisions (Lusardi, et al., 2010). Addressing differences in financial literacy is thus crucial for promoting financial inclusion and empowerment among segments of the population.

### **1.3 Comparison of Results from Previous Studies In Estonia and Italy**

There are handful of empirical studies that have been devoted to specifically examine the financial literacy in Estonia. Mandmaa (2019) for instance, examines the financial literacy of students in Estonia. The study revealed that despite a generally high level of education in Estonia, there is a low level of financial literacy among students. Only a small percentage of respondents demonstrate interest in long-term financial planning. The result is in stark contrast with findings from PISA (2018), which showed that Estonia students rank highest among the OECD countries included in the survey. In the same period, Riitsalu & Murakas (2019) investigate the factors influencing financial well-being in Estonia, highlighting the importance of subjective knowledge, financial behavior, and socio-economic status. The study finds that subjective knowledge has a stronger relationship with financial well-being than objective knowledge, emphasizing the significance of individuals' perceptions and behaviors in managing personal finances.

Dundure & Sloka (2021) in their study focus on factors influencing the level of financial literacy in Estonia, along with Latvia and Lithuania. The study identifies numeracy knowledge as a key factor affecting financial literacy, with a strong correlation between mathematics performance and financial literacy levels. Furthermore, Salas-Velasco, et al. (2021) assesses the effectiveness of financial education provision in Estonia, among other countries. The study finds a positive



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correlation between the delivery of financial education and students' financial literacy scores, particularly when integrated into specific subjects such as business, economics, or mathematics. This underscores the importance of well-designed financial education programs in improving financial literacy outcomes.

The studies on Estonia have pointed out some of the challenges and opportunities related to financial literacy in the country. However, factors such as numeracy knowledge, access to financial services, subjective financial knowledge, and effective financial education programs play crucial roles in shaping financial literacy outcomes in the country.

In the same vein, there are several studies carried out to assess financial literacy in Italy. One of the earliest studies on the country is by Fornero & Monticone (2011). The study explored the impact of pension reforms on financial literacy in Italy and revealed a lack of basic financial knowledge among most individuals. The study identifies gender, education level, and geographical location as factors influencing financial literacy, with men, the more educated, and residents in the Centre-North demonstrating higher levels of financial literacy. Furthermore, financial literacy positively correlates with the probability of pension plan participation, indicating its importance in retirement planning decisions.

Baglioni, et al. (2018) provide a comprehensive analysis of the association between individual characteristics and financial competence and behavior among the Italian population. The study identifies gender and education level as key factors influencing familiarity with the financial environment. It underscores the importance of targeted interventions to address disparities in financial literacy and promote wise financial behavior. Bottazzi & Lusardi (2016) explore financial literacy among high school students in Italy, revealing not only low scores but also significant gender differences. The study emphasizes the influence of family background, particularly the role of mothers, and the socio-cultural environment in shaping financial knowledge. Historical factors, such as medieval commercial hubs, are also identified as contributors to regional disparities in financial literacy. Bottazzi & Lusardi (2021) further investigate gender differences in financial literacy among Italian high school students, highlighting the significant gap favoring boys. The study underscores the role of parental background, especially the influence of mothers, in shaping girls' financial knowledge.

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Additionally, the socio-cultural environment is identified as a crucial determinant of gender disparities in financial literacy.

Stella, et al. (2021) assess the effectiveness of financial education programs in Italy, finding that participation in such programs correlates with higher levels of financial literacy. The study suggests that targeted interventions can improve financial knowledge among Italian adults and emphasize the role of education in enhancing financial literacy outcomes. D'Alessio, et al. (2021) contributes to extant literature in Italy, by focusing on the financial literacy of Italian adults. Their findings suggest that financial literacy among Italian adults remains low compared to international standards. Despite improvements in financial knowledge, behaviors, and attitudes, significant disparities exist based on education levels, gender, age, and geographical location. A similar study by Magistro (2022) analyses survey data on financial literacy among Italian adults and find a positive relationship between financial and economic literacy and individuals' preferences on various policy issues. The study stresses the need for financial and economic literacy in shaping individuals' attitudes and decision-making processes and indicated that such knowledge has distinct features compared to general education. A recent study by Bottazzi & Oggero (2023) investigate financial literacy and resilience in Italy. The study also reveals low financial literacy levels among the young, women, and less educated individuals. Regional disparities in financial knowledge were also observed, with Southern Italy performing worse. The study confirms the positive relationship between financial literacy and resilience, suggesting that improving financial literacy could enhance individuals' ability to cope with financial shocks.

The empirical literature on financial literacy in Italy highlights several key findings and insights. First, there are persistent gender differences in financial literacy, with studies consistently showing that boys outperform girls (Salmieri et al., 2022). The influence of parental background, particularly the role of mothers, is significant in shaping financial knowledge among Italian youth (Bottazzi & Lusardi, 2021; Kassim, 2020; Longobardi et al., 2017). Second, socio-economic factors such as education level and regional disparities play crucial roles in determining financial literacy levels among Italian adults (Bottazzi & Lusardi, 2021). Despite improvements in financial knowledge, significant challenges remain in promoting overall financial literacy nationwide (Salmieri et al., 2022). Furthermore, there is a clear link between financial literacy and financial resilience, with low levels of financial knowledge increasing the vulnerability of individuals to financial shocks. Enhancing financial education and promoting

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wise financial behavior are essential strategies to improve financial resilience among Italians (Klapper & Lusardi, 2019).

When comparing the studies from Estonia with those from Italy regarding financial literacy levels, determinants, and effects, there are certain similarities and differences in the findings. For instance, in both countries, there is a recognition of low financial literacy levels among certain demographics, such as students from specific regional populations (Mandmaa's, 2019; Bottazzi & Oggero's, 2023). Furthermore, studies in both countries emphasize the importance of factors like access to financial services, numeracy skills, and effective financial education programs in shaping financial literacy outcomes. Also, factors such as gender, nationality, and academic discipline are found to have significant influence on financial literacy in Estonia and Italy. However, some studies in Italy, such as Fornero & Monticone (2011) and D'Alessio et al. (2021) confirm the impact of socio-economic status and education on financial literacy, which may not be explicitly emphasized in some studies from Estonia.

The differences in the effectiveness of financial education interventions between the two countries is also worth noting. Salas-Velasco et al. (2021) find positive correlations between certain approaches to financial education delivery and students' financial literacy scores in Estonia, whereas Stella et al. (2020) in Italy indicated that effectiveness of financial education programs in improving financial literacy is more pronounced among adults. However, while both Estonia and Italy face challenges in promoting financial literacy, the specific determinants and effects may differ due to varying socio-economic contexts, educational systems, and policy interventions in each country.

The empirical literature on financial literacy across different countries, including Estonia and Italy suffers some drawbacks and reveals several gaps that warrant further research on the subject. One gap is the need for more comprehensive and standardized measures of financial literacy that can facilitate meaningful cross-country comparisons. While studies like Klapper & Lusardi (2019) provide valuable insights into the prevalence of financial literacy worldwide, variations in measurement tools and methodologies make it challenging to draw robust conclusions about the extent and nature of financial literacy disparities between countries. Therefore, there is a need for more standardized approaches to measure financial literacy, such as

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those proposed by Baglioni et al. (2018) and Salmieri et al. (2022), which could enhance the comparability and reliability of findings across different contexts.

A significant research gap that this study seeks to address is the comparative analysis of the determinants affecting financial literacy levels among students in Estonia and Italy. While individual studies like those by Mandmaa (2019) and Salmieri et al. (2022) shed light on the factors influencing financial literacy in these countries respectively, comprehensive research that pits these factors against each other in a direct comparison is lacking. A comparative analysis is essential to understand the unique socio-cultural, economic, and educational influences in each country that shape financial literacy among students.

## **2. DATA AND METHODOLOGY**

### **2.1 Data**

The primary source of data for this investigation is the PISA (2018) survey, administered by the Organization for Economic Co-operation and Development (OECD). PISA 2018 serves as a globally standardized evaluation, designed to assess the competencies of 15-year-old students across different countries. This survey includes a diverse array of subjects such as mathematics, science, and reading, with a specialized emphasis on evaluating students' ability to apply knowledge practically in real-life situations. Employing a meticulous sampling methodology, PISA ensures that the samples are representative of each participating country, thus facilitating valid cross-country comparisons. This dataset forms the primary basis for analyzing and comparing the financial literacy levels among students in Estonia and Italy.

In 2018, the PISA study included 79 countries, comprising 37 OECD member countries and 42 partner countries and economies. However, only 19 countries participated in the PISA 2018 financial literacy assessment. The sample consisted of 9,182 participants from Italy and 4,167 from Estonia, selected through a stratified sampling process. This process involved randomly selecting schools and then randomly selecting students within those schools. Eligible students were those aged between 15 years and 3 months and 16 years and 4 months. In Estonia, the gender distribution was evenly split, with 50% male and 50% female participants, while in Italy, it was 48.7% male and 51.3% female, representative of the student populations in these countries.

### **Description of Variables**

#### **Dependent Variable – Plausible Value of Financial Literacy**

The final score for the PISA 2018 financial literacy assessment was provided as 10 plausible values for each student. Plausible values are random draws from the estimated ability distribution, representing the range of abilities a student might reasonably possess. All 10 plausible values must be considered in analyses to avoid bias and inefficiency (Silinskas et al., 2023). These statistically derived estimates account for variability in student abilities and measurement errors common in complex assessments like financial literacy. By using multiple plausible values instead of a single score, the analysis acknowledges the complexity and

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uncertainty in capturing a student's true financial literacy skills. Plausible values are calculated using multivariate latent regression models that incorporate cognitive data from various domains and background data such as gender and educational practices. This methodology draws from posterior distributions, allowing for multiple imputations that enhance analysis accuracy and account for measurement errors in relating proficiency distributions to background characteristics (OECD, 2018).

### Independent Variables

#### Family background variables

1. **Index of economic, social and cultural status (ESCS):** The Index of Economic, Social, and Cultural Status, quantifies a student's socio-economic standing by incorporating available financial, social, cultural, and human-capital resources within their family (Cowan et al., 2012). PISA uses this index to summarize a student's socio-economic status based on several self-reported details regarding the family's background. It is composed of three primary factors: the education levels of the parents, their occupational statuses, and the family's household possessions, which are indicative of material wealth and cultural capital. Such possessions may include a vehicle, a dedicated study area, internet access, and the quantity of books available at home.

The ESCS index is normalized with an average mean of 0 and a standard deviation of 1 across OECD countries. It includes specific components such as the highest educational attainment of the parents (PARED), the highest occupational status achieved by the parents (HISEI), and household possessions (HOMEPOS), which collectively assess the family's economic and cultural resources. Here, PARED and HISEI are basic indices previously mentioned, while HOMEPOS acts as a proxy for gauging family wealth.

2. **Parental involvement about financial matters (FLFAMILY):**

The index of parental involvement in financial literacy was formulated using responses from students to a newly developed question in PISA 2018 which resulted in a continuous variable ranging from -2.042 to 2.452. Students were asked to indicate the frequency ("never or hardly ever," "once or twice a month," "once or twice a week," "almost every day") at which they discussed various financial topics with their parents, guardians, or relatives. These topics included their spending and savings decisions, the family budget,

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purchasing desires, and current financial or economic news. Positive scores on this index suggest that students reported higher levels of parental engagement in their financial literacy compared to the average student across OECD countries/economies.

- 3. Country (CNT): Italy or Estonia:** In the PISA assessment, students were identified by their country of residence, specifically whether they are from Italy or Estonia. This variable, known as the country index, classifies students based on their geographic location. An index, known as the country level estimator (CNT\_EST), was developed to measure the differential effect on financial literacy when Italy is used as the reference country in the regression analysis. This results in a binary variable, where the impact of being from Estonia relative to Italy is quantified.
- 4. Gender (Male or Female)**

### Individual level variables

- 1. Familiarity with concepts of finance (FCFMLRTY):**

In the PISA assessment, students were evaluated on their retention and understanding of 18 specific financial and economic terms over the previous 12 months. The terms reviewed included "interest payment," "compound interest," "exchange rate," "depreciation," "shares/stocks," "return on investment," "dividend," "diversification," "debit card," "bank loan," "pension plan," "budget," "wage," "entrepreneur," "central bank," "income tax," "credit default swap," and "call option." An index, known as the familiarity with finance concepts index, was developed to measure the extent of their knowledge, the result was a discrete variable which could vary from 0 to 18 depending on how many terms the students reported they had learned and could still define.

- 2. Confidence about financial matters in general (FLCONFIN):**

The index of confidence in handling financial matters was established from student responses to a novel question introduced in the 2018 PISA survey. Students rated their confidence levels—ranging from "not at all confident" to "very confident"—in performing specific financial activities. These activities included making money transfers (such as paying a bill), completing forms at a bank, interpreting bank statements, understanding sales contracts, tracking their account balance, and budgeting based on their current financial situation. Positive scores on this index indicate a higher confidence

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in managing financial matters compared to the average student in OECD countries. The index is a continuous variable ranging from -2.184 to 2.315.

- 3. Confidence about financial matters using digital devices (FLCONICT):** The confidence index in using digital financial services was formulated based on students' answers to a newly introduced question in the PISA 2018 survey resulting in a continuous variable ranging from -2.158 to 2.078. Students assessed their confidence level—ranging from "not at all confident" to "very confident"—in performing various activities using digital or electronic devices outside of a bank setting, such as at home or in stores. These activities included transferring money, monitoring their account balance, using a debit card instead of cash, making payments with a mobile device like a phone or tablet instead of cash, and ensuring the security of sensitive information during electronic payments or online banking. Positive scores on this scale indicate that students reported greater confidence in using digital financial services compared to the average student across OECD countries/economies.

### School context variables

- 1. Financial education in school lessons (FLSCHOOL):**

The financial education in school lessons index was developed from students' feedback to a new query included in the PISA 2018. Students described how frequently ("never," "sometimes," "often") they engaged with certain types of tasks or activities in their school lessons in the year before taking the PISA assessment. These activities involved understanding the purposes and uses of money, distinguishing between essential and discretionary spending, devising strategies for future expenses, discussing consumer rights in financial dealings, examining how investments fluctuate in the stock market, and analyzing advertisements to discern their persuasive techniques. A positive score on this index indicates that students experienced more financial education in their school lessons compared to the average student across OECD countries/economies. The index is a continuous variable ranging from -1.563 to 2.317.



## 2.2 Methods

Both descriptive and inferential statistical techniques are employed in this study to analyze the dataset. Descriptive statistics, including means, medians, and standard deviations, will be utilized to provide an overview of financial literacy levels in Estonia and Italy. Lusardi (2015) similarly applied descriptive statistics to explore financial literacy levels among high school students globally, analyzing means and standard deviations to summarize the data and offer a comparative overview across different nations. This approach enhances the understanding of how financial literacy varies internationally.

For inferential statistics, both non-parametric and parametric techniques will be used to ensure the analysis is robust enough to inform accurate policy prescriptions. The Blinder-Oaxaca decomposition, a non-parametric technique, will be employed. Riitsalu and Kaire (2016) utilized this technique to analyze differences in financial literacy scores between Estonian- and Russian-language schools in Estonia. This method helped identify factors contributing to the observed differences in financial literacy, distinguishing between explained and unexplained components.

Further, multiple regression analysis, a parametric technique, will be used to identify and compare the key factors influencing financial literacy levels in Estonia and Italy. Lusardi et al. (2010) used this approach to explore factors influencing financial literacy among the young, applying descriptive statistics for a preliminary overview and then delving deeper into the relationships between financial literacy and various socio-demographic and school-related variables. Similarly, Lusardi and Lopez (2016) employed multivariate regression analysis to investigate the role of student characteristics, socioeconomic status, and school characteristics in explaining differences in financial literacy scores. These methodologies collectively provide a comprehensive framework for understanding the dynamics of financial literacy across different contexts.

### Descriptive Statistics

Descriptive statistics is used in this study to carry out preliminary exploration of financial literacy levels among Estonian and Italian students. Measures such as the mean financial literacy score and its standard deviation will provide a snapshot of the overall proficiency and variability within each country. It will also be applied to describe and compare the distribution of the independent variables between both countries. This preliminary analysis is expected to provide

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insights about the statistical properties of the dataset used before delving into the more technical analysis.

### Multiple Regression Analysis

Multiple Regression Analysis is a statistical technique that assesses the relationship between a dependent variable and multiple independent variables. It is applied in the context of this study to model the determinants of financial literacy levels among Estonian and Italian students. By including variables related to educational background, parental influence, socioeconomic status, access to financial resources, cultural context, digital skills, attitudes and behaviors, and exposure to financial education, the analysis can quantify the relative importance of each factor. This analysis will help to understanding of the factors that significantly contribute to differences in financial literacy level among the students and across country. For this study, the multiple regression model could be specified using equation 1.

$$FinLit_i = \beta_0 + \beta_1 ESCS_i + \beta_2 Gender_i + \beta_3 FCFMLRTY_i + \beta_4 FLCONFIN_i + \beta_5 FLCONICT_i + \beta_6 FLSCHOOL_i + \beta_7 FLFAMILY_i + \beta_8 CNT_i + \varepsilon_i \quad (1)$$

Where,  $FinLit_i$  is the financial literacy score for student  $i$ .  $\beta_0$  is the intercept.  $\beta_1, \beta_2, \dots, \beta_8$  are the coefficients for each independent variable.  $ESCS_i$  (Index of economic, social and cultural status),  $Gender_i, \dots, CNT_i$  (Country) are the values of the respective independent variables for student  $i$  and  $\varepsilon_i$  is the error term.

Riitsalu & Poder (2016) used multiple regression analysis to explore the relationship between financial literacy and various factors, while Lusardi (2015) applied this method to examine the influence of socioeconomic status, family background, and gender differences on financial literacy. Both studies revealed significant predictors of financial literacy, helping to identify key areas for policy intervention.

In this study, the model will be estimated using the Ordinary Least Squares (OLS) estimator. OLS is a well-established and widely used method for linear regression analysis, offering several advantages. Firstly, OLS provides unbiased estimates of the regression coefficients, assuming the model's assumptions—such as linearity, independence of errors, and homoscedasticity—are met. Secondly, it is computationally efficient, making it feasible for large datasets like those derived from the PISA 2018 survey. Given the linear nature of the regression model in this study, OLS

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offers a robust and interpretable method for quantifying the relationships between financial literacy and various determinants.

To accommodate the uncertainty in relationship estimates, regression analysis will be performed separately on each plausible value. The results will then be combined to represent the spectrum of possible outcomes. This method ensures that the analysis incorporates the complexity and variability inherent in the plausible values, providing a more accurate and robust understanding of the factors influencing financial literacy levels among students in Estonia and Italy.

### **Blinder-Oaxaca Decomposition**

The Blinder-Oaxaca decomposition, originally developed by Oaxaca (1973) and Blinder (1973), is a method used to decompose the observed difference in an outcome variable between two groups into two components: the explained component and the unexplained component. The technique is particularly employed to analyze disparities or differences in outcomes between distinct groups (Jane, 2008). In the context of financial literacy levels between Estonian and Italian students, Blinder-Oaxaca Decomposition can help identify the factors contributing to the observed differences, distinguishing between those that are explained by measurable characteristics and those that remain unexplained. The decomposition model is often expressed in equation 2.

$$\Delta Y = \sum (\bar{X}_1 - \bar{X}_0) \beta_1 + \sum \beta_1 (X_{1i} - \bar{X}_0) - \sum \beta_0 (X_{0i} - \bar{X}_0) \quad (2)$$

Where,  $\Delta Y$  is the observed difference in the outcome variable (financial literacy).

$\bar{X}_1$  and  $\bar{X}_0$  are the means of the independent variables for Group 1 (Estonian students) and Group 0 (Italian students), respectively.

$\beta_1$  represents the coefficients for the independent variables in Group 1.

$\beta_0$  represents the coefficients for the independent variables in Group 0.

$X_{1i}$  and  $X_{0i}$  are the values of the independent variables for individual  $i$  in Group 1 and Group 0, respectively.

If the overall difference in financial literacy scores between Estonian and Italian students is  $\Delta Y$ , the decomposition helps determine the portion of this difference attributed to measurable factors

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(explained) and the part that remains unexplained. For instance, the model might reveal that a certain percentage of the difference is due to variations in educational background  $(\sum(\bar{X}_1 - \bar{X}_0)\beta_1)$  while another portion can be attributed to unobservable factors  $(\sum\beta_1(X_{1i} - \bar{X}_0) - \sum\beta_0(X_{0i} - \bar{X}_0))$ . This decomposition provides insights into the specific determinants driving disparities in financial literacy between the two student groups.

### 3. RESULTS AND DISCUSSIONS

#### 3.1 Results

##### 3.1.1 Plausible Values

In our analysis, we considered the ten plausible values of financial literacy scores along with the 80 specific weights to ensure a comprehensive evaluation. This methodological approach allowed for a robust statistical analysis, capturing variations and trends more accurately across different data points. By integrating multiple plausible values, we aimed to mitigate any biases that might arise from the reliance on a single estimate, thereby enhancing the reliability of our findings.

**Table 1.** Plausible values of financial literacy for PISA 2018 Assessment

		<i>Plausible Value 1</i>	<i>Plausible Value 2</i>	<i>Plausible Value 3</i>	<i>Plausible Value 4</i>	<i>Plausible Value 5</i>	<i>Plausible Value 6</i>	<i>Plausible Value 7</i>	<i>Plausible Value 8</i>	<i>Plausible Value 9</i>	<i>Plausible Value 10</i>
<i>Estonia</i>	Mean	547.6	548.9	547.2	547.4	546.8	547.1	547.7	548.2	547.2	547.4
	Std. Dev.	87.0	87.5	86.3	87.6	87.7	86.8	86.3	87.2	86.9	87.6
<i>Italy</i>	Mean	481.2	481.4	482.1	480.8	479.6	480.8	479.1	479.8	480.5	481.7
	Std. Dev.	88.3	88.2	88.8	87.3	88.0	87.6	87.7	88.6	88.9	87.7

Source: Compiled by the author

From Table 1, Estonian students consistently outperformed Italian students in financial literacy across various measures. For instance, in the first plausible value measure, the average score for Estonian students was 547.67, compared to 481.25 for Italian students. This pattern of higher scores for Estonian students persisted across all the measures, indicating a significant and consistent difference in financial literacy levels between the two groups.

The standard deviation, which measures the variability of scores within each country, was similar for both Estonian and Italian students, ranging from approximately 86 to 88. This similarity suggests that while the average scores differed, the spread of scores around the mean was quite comparable in both countries, indicating consistent variation in financial literacy scores among students within each country.

##### Independent Sample T-Test

An independent T-test was conducted to compare the financial literacy of students in Estonia and Italy for statistical significance. A Bonferroni correction was then applied to adjust for multiple

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comparisons, ensuring statistical validity and preventing Type I errors in repeated t-tests. The results are shown in Table A1.

The results of the t-tests and the fact that both the original and Bonferroni-adjusted P-values indicate significant differences, we can conclude that there is a statistically significant difference in the financial literacy scores between students in Estonia and Italy. The high T-values across all ten plausible values strongly suggest that students in Estonia consistently outperforms the students in Italy.

Table 3 highlights the descriptive statistics of various variables impacting financial literacy among students in Estonia and Italy, drawing from the PISA 2018 dataset. Estonian students exhibit a higher socio-economic status on average compared to their Italian counterparts, as suggested by their slightly positive mean Economic, Social, and Cultural Status (ESCS) value. Both countries show nearly equal gender distribution in their samples, indicating minimal gender bias. Estonian students also report greater familiarity with financial concepts and higher confidence in managing financial matters and using ICT for financial tasks than Italian students, who display notably lower confidence levels. Additionally, both countries perceive a deficiency in financial education provided through school lessons, with Italy showing a greater deficit. Interestingly, Italian students report slightly more parental involvement in financial discussions than Estonian students, suggesting differing familial engagement in financial literacy across the two countries. These findings illuminate significant disparities in financial literacy influences between the students of these two distinct cultural and educational backgrounds.

Correlations were calculated between chosen variables and financial literacy scores, averaging estimates across all plausible values. This method provides a comprehensive view of how each variable is related to financial literacy levels among students. The results of these correlations are detailed in Table 4. This table includes the correlation coefficients, which measure the strength and direction of the relationship between financial literacy and each of the variables under consideration.

Given the context and results, we will go ahead to investigate the specific educational strategies, curricular content or other factors that contribute to these differences in financial literacy outcomes.

### 3.1.2 Multiple Regression Analysis

Table 6 presents the regression results. We regressed the plausible financial literacy score on a set of independent variables listed earlier. Each column corresponds to one of these plausible values, indicating how these predictors relate to financial literacy across different measurements.

The regression analysis provides a comprehensive overview of the factors influencing financial literacy across different models. Firstly, the CNT\_EST coefficients are significantly positive across all ten models, indicating a robust positive effect of this country-level estimator on financial literacy scores. Similarly, the ESCS (Economic, Social, and Cultural Status) variable shows a consistently positive and significant relationship with financial literacy in all models, suggesting that individuals with higher socio-economic status tend to exhibit greater financial literacy.

Gender also plays a significant role, with consistently positive effects across all plausible values, which implies that males generally have higher financial literacy scores. Additionally, the FCFMLRTY variable, which measures familiarity with concepts of finance, is positively correlated with financial literacy across all models, underscoring the importance of knowledge of financial concepts in achieving higher literacy levels.

The FLCONFIN (Confidence about Financial Matters in General) variable displays varied significance across models. Where significant, it suggests that greater confidence in financial matters may be linked to higher financial literacy, although this relationship is not uniformly observed across all models. In contrast, FLCONICT (Confidence in using ICT for Financial Matters) consistently shows a positive and significant relationship in all models, highlighting the strong link between confidence in using digital financial tools and higher financial literacy.

However, FLSCHOOL (Financial Education in School Lessons) exhibits a negative and significant relationship across all models, suggesting an inverse correlation between the frequency of financial education in schools and financial literacy. This could potentially reflect unmeasured variable biases or the complex impact of financial education. Lastly, FLFAMILY (Parental Involvement in Financial Matters) shows generally non-significant or mixed effects, with some models indicating a negative correlation. This suggests that increased parental involvement in financial matters does not necessarily correlate with higher financial literacy and may sometimes be inversely related.

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**Table 3.** Descriptive statistics of the selected variables

	<i>Estonia (n= 4167)</i>				<i>Italy (n= 9182)</i>			
	Mean	Standard Deviation	Min	Max	Mean	Standard Deviation	Min	Max
<i>ESCS</i>	0.09	0.78	-4.63	3.03	-0.22	0.88	-7.39	2.84
<i>Gender</i>	0.49	0.50			0.51	0.49		
<i>FCFMLRTY</i>	7.66	5.01	0.00	18.00	6.32	4.98	0.00	18.00
<i>FLCONFIN</i>	0.20	0.90	-2.18	2.31	-0.37	0.99	-2.19	2.32
<i>FLCONICT</i>	0.08	0.94	-2.16	2.07	-0.52	0.92	-2.15	2.08
<i>FLSCHOOL</i>	0.07	0.86	-1.56	2.31	-0.29	0.96	-1.56	2.32
<i>FLFAMILY</i>	-0.15	0.93	-2.04	2.45	0.007	0.99	-2.04	2.40

*Note:* Warm's mean weighted likelihood estimates (WLEs) are computed for the PISA indices used in our study. These values are drawn from the PISA data repository. The WLE values are standardized across OECD countries and have a mean of zero and a standard deviation of one (Silinska et al, 2023).

Source: Compiled by the author

**Table 4.** Correlations between all study variables

	<b>Financial Literacy<sup>1</sup></b>	<b>ESCS</b>	<b>Gender</b>	<b>FCFMLRTY</b>	<b>FLCONFIN</b>	<b>FLCONFIN</b>	<b>FLSCHOOL</b>
1	Financial Literacy <sup>1</sup>						
2	ESCS	0.31***					
3	Gender	0.04***	0.03**				
4	FCFMLRTY	0.26***	0.11***	0.05***			
5	FLCONFIN	0.20***	0.08***	0.17***	0.28***		
6	FLCONICT	0.23***	0.10***	0.16***	0.25***	0.68***	
7	FLSCHOOL	-0.0***	-0.02*	0.09***	0.27***	0.24***	0.21***
8	FLFAMILY	-0.02	0.03***	-0.01	0.14***	0.15***	0.15***

<sup>1</sup>Correlations with financial literacy were estimates over average plausible values

\* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$

Source: Compiled by the author



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**Table 6.** Regression results on Plausible Values of Financial Literacy

	<i>Dependent variable:</i>									
	<b>Plausible Value 1</b>	<b>Plausible Value 2</b>	<b>Plausible Value 3</b>	<b>Plausible Value 4</b>	<b>Plausible Value 5</b>	<b>Plausible Value 6</b>	<b>Plausible Value 7</b>	<b>Plausible Value 8</b>	<b>Plausible Value 9</b>	<b>Plausible Value 10</b>
<i>CNT_EST</i>	53.256*** (1.741)	53.943*** (1.743)	49.834*** (1.746)	52.701*** (1.743)	53.344*** (1.740)	53.189*** (1.734)	54.427*** (1.735)	54.448*** (1.758)	52.514*** (1.752)	50.880*** (1.746)
<i>ESCS</i>	20.667*** (0.907)	21.664*** (0.908)	21.374*** (0.909)	21.160*** (0.908)	22.258*** (0.906)	20.895*** (0.903)	21.752*** (0.903)	21.894*** (0.916)	20.841*** (0.913)	20.629*** (0.909)
<i>Gender</i>	7.632*** (1.549)	6.806*** (1.552)	6.372*** (1.554)	7.941*** (1.551)	7.155*** (1.549)	8.105*** (1.543)	7.797*** (1.544)	7.673*** (1.565)	8.871*** (1.560)	7.581*** (1.554)
<i>FCFMLRTY</i>	3.372*** (0.162)	3.602*** (0.162)	3.472*** (0.162)	3.150*** (0.162)	3.357*** (0.162)	3.412*** (0.161)	3.203*** (0.161)	3.150*** (0.164)	3.455*** (0.163)	3.280*** (0.162)
<i>FLCONFIN</i>	0.712 (1.052)	1.973* (1.054)	2.155** (1.055)	3.062*** (1.054)	1.360 (1.052)	1.807* (1.048)	2.088** (1.049)	2.712** (1.063)	1.626 (1.059)	1.837* (1.055)
<i>FLCONICT</i>	8.434*** (1.089)	7.905*** (1.090)	8.066*** (1.092)	8.546*** (1.090)	8.967*** (1.088)	8.508*** (1.084)	7.616*** (1.085)	7.917*** (1.100)	8.054*** (1.096)	8.960*** (1.092)
<i>FLSCHOOL</i>	-17.684*** (0.862)	-17.118*** (0.864)	-16.506*** (0.865)	-17.721*** (0.863)	-17.947*** (0.862)	-17.192*** (0.859)	-16.818*** (0.859)	-16.482*** (0.871)	-16.974*** (0.868)	-15.639*** (0.865)
<i>FLFAMILY</i>	-0.861 (0.808)	-0.641 (0.809)	-1.816** (0.810)	-1.560* (0.809)	-0.757 (0.808)	-0.055 (0.805)	-1.257 (0.805)	-0.100 (0.816)	-1.121 (0.814)	-1.366* (0.810)
<i>Constant</i>	460.279*** (2.923)	459.975*** (2.927)	463.714*** (2.931)	460.862*** (2.926)	459.502*** (2.921)	458.759*** (2.911)	459.485*** (2.912)	460.655*** (2.952)	457.529*** (2.942)	462.356*** (2.931)
<i>Observations</i>	11,002	11,002	11,002	11,002	11,002	11,002	11,002	11,002	11,002	11,002
<i>R2</i>	0.224	0.235	0.220	0.228	0.235	0.230	0.230	0.228	0.223	0.218
<i>Adjusted R2</i>	0.223	0.234	0.220	0.228	0.234	0.230	0.230	0.227	0.223	0.218
<i>Residual Std. Error (df = 10993)</i>	79.355	79.483	79.584	79.456	79.311	79.031	79.079	80.163	79.884	79.582
<i>F Statistic (df = 8; 10993)</i>	396.564***	421.860***	388.648***	406.566***	421.338***	410.951***	411.329***	405.181***	395.271***	383.981***
<i>Note:</i>								*p<0.1	**p<0.05	***p<0.01

Source: Compiled by the author

### 3.1.3 Blinder-Oaxaca Decomposition

The Blinder-Oaxaca decomposition provides a sophisticated analytical framework to explore the differential impacts of various factors on financial literacy between two distinct groups, specifically students from Italy and Estonia, within the PISA study context. This method allows for the decomposition of the differences in financial literacy into parts that are explained by observable variables and those that are not, thereby identifying the roles of both measured attributes and underlying, potentially unmeasured influences. By examining both the regression coefficients and the twofold variable decomposition, this analysis sheds light on how socio-economic, educational, and personal factors contribute uniquely to the observed disparities in financial literacy outcomes between these two countries.

**Table 7.** Decomposed Regression Coefficient differences in Italy and Estonia

	<i>Beta A</i> (Italy)	<i>Beta B</i> (Estonia)	<i>Beta</i> <i>difference</i>
<i>(Intercept)</i>	453.486	519.078	-65.592
<i>ESCS</i>	19.962	23.601	-3.638
<i>Gender</i>	11.530	0.197	11.333
<i>FCFMLRTY</i>	3.134	3.642	-0.507
<i>FLCONFIN</i>	0.574	6.190	-5.616
<i>FLCONICT</i>	6.846	8.747	-1.900
<i>FLSCHOOL</i>	-19.448	-10.237	-9.211
<i>FLFAMILY</i>	2.325	-8.339	10.664

Source: Compiled by the author

Table 7 presents the Blinder-Oaxaca decomposition results, which include the regression coefficients for two distinct groups—Italy (Beta A) and Estonia (Beta B). These coefficients quantify the impact of various variables on financial literacy within each group. Additionally, the table features the  $\beta_{diff}$ , which measures the difference in coefficients between the two groups. A positive value in  $\beta_{diff}$  indicates that the effect of a particular variable is more substantial in the Estonia group compared to Italy, while a negative value suggests a greater impact in the Italy group compared to Estonia. This setup allows for a direct comparison of how different variables influence financial literacy outcomes in each country.

In Table 8, the specific variables in the Blinder-Oaxaca decomposition reveal nuanced contributions to the differences between the groups. The intercept shows a substantial unexplained difference of -65.59 with a standard error of 5.41, indicating a significant baseline difference that is not captured by the included predictors, suggesting inherent disparities between

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the groups. The Economic, Social, and Cultural Status (ESCS) variable presents a negative explained effect alongside a small positive unexplained effect, which implies that not all the outcome differences attributable to socio-economic status are explained through observable measures captured by the model. Similarly, the variable Gender shows only a minimal explained effect but a notable unexplained effect, suggesting its influence on the gap largely stems from unmeasured or structural factors beyond observable differences.

**Table 8.** Explained and Unexplained Differences in Financial Literacy in Italy and Estonia

	<i>Coef.</i> <i>(explained)</i>	<i>Std. Err.</i> <i>(explained)</i>	<i>Coef.</i> <i>(Unexplained)</i>	<i>Std. Err.</i> <i>(Unexplained)</i>	<i>Coef.</i> <i>(unexplained Italy)</i>	<i>Std. Err.</i> <i>(unexplained Italy)</i>
<i>(Intercept)</i>	0.000	0.00	-65.59	5.653	-65.59	5.653
<i>ESCS</i>	-6.766	0.620	0.662	0.244	0.662	0.244
<i>Gender</i>	0.004	0.026	17.131	4.535	17.131	4.535
<i>FCFMLRTY</i>	-4.633	0.459	-3.286	2.005	-3.286	2.005
<i>FLCONFIN</i>	-3.628	1.184	2.124	0.851	2.124	0.851
<i>FLCONICT</i>	-5.397	1.112	0.995	1.213	0.995	1.213
<i>FLSCHOOL</i>	3.623	0.598	2.517	0.525	2.517	0.525
<i>FLFAMILY</i>	-1.372	0.274	0.164	0.129	0.164	0.129

Source: Compiled by the author

For the variables FCFMLRTY, FLCONFIN, FLCONICT, FLSCHOOL, and FLFAMILY, each display both explained and unexplained components. These findings indicate that while part of their impact on the differences between groups can be quantified through observable data, a significant portion also arises from factors not captured by the model. This includes potential biases, structural disparities, or other unmeasured influences that these variables exert on the outcomes.

### 3.2 Discussion of Results

#### 3.2.1 Socio-Economic Factors and National Context in Financial Literacy Outcome

The regression models show that the country-level estimator (CNT\_EST) has a significant positive impact on financial literacy scores across all models, highlighting the strong influence of national contexts on financial education outcomes. This influence also suggests that financial literacy extends beyond individual or familial traits to broader national contexts, including educational policies, economic conditions, cultural norms about finance, and the availability of financial education resources. For example, countries with well-developed financial markets and

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comprehensive financial regulations often provide enhanced opportunities for financial learning and engagement. The study by Salas-Velasco et al. (2021) reinforces this idea, highlighting how the integration of financial education into school curricula and the focus on practical financial skills by different educational systems markedly influence financial literacy outcomes. This points to the need for policy interventions that consider structural adjustments at national and regional levels to effectively enhance financial literacy.

The consistent significance of the ESCS (Economic, Social, and Cultural Status) variable across all models strongly underlines the fundamental link between socio-economic status and financial literacy, a finding supported by research from Fornero & Monticone (2011) and Lusardi (2015). These studies show that higher socio-economic status generally correlates with better access to financial education and resources, increased opportunities for financial socialization, and higher educational attainment, all of which significantly enhance financial literacy. Additionally, socio-economic status encompasses not just financial wealth but also educational and cultural dimensions, where higher status typically means better-quality education and exposure to complex financial concepts that improve an individual's financial decision-making capabilities. Moreover, individuals from more affluent backgrounds often benefit from networks that provide informal financial education, such as through family businesses and investment discussions.

However, findings from the Blinder-Oaxaca decomposition reveal nuanced differences in how ESCS impacts financial literacy between Estonian and Italian students. Specifically, ESCS shows a stronger positive impact on Estonian students (23.60) compared to Italian students (19.96). The decomposition also reveals a slight negative difference (-3.64) in the impact of socio-economic status on Estonian students relative to their Italian counterparts, suggesting that the benefits of higher socio-economic status are slightly less pronounced in Estonia. Additionally, the twofold decomposition indicates a negative explained effect and a small positive unexplained effect, suggesting that some differences in outcomes related to ESCS are not fully captured by the model.

This deeper insight into the role of socio-economic factors implies that efforts to improve financial literacy must address underlying socio-economic inequalities. Educational programs and financial literacy initiatives should be specifically tailored to effectively reach and resonate with lower socio-economic groups, potentially incorporating community-based approaches that align with the specific needs and circumstances of these groups. By ensuring that financial

education is not only accessible but also relevant and impactful, these tailored strategies can help bridge the socio-economic gap in financial literacy, fostering equitable financial knowledge across diverse landscapes. This approach is crucial for making financial literacy programs more effective and for ensuring that all individuals, regardless of their socio-economic status, can enhance their financial literacy.

### **3.2.2 Gender and Socio-Demographic Factors**

The consistent positive correlation of the gender variable across various models in financial literacy studies indicates a significant gender disparity, with males generally exhibiting higher levels of financial literacy than females. This aligns with research by Fornero & Monticone (2011) and Bottazzi & Lusardi (2016), which highlights the critical role of gender in financial knowledge acquisition. The persistence of this gap underscores the influence of socio-cultural norms and educational practices that shape gender-specific financial experiences differently.

Traditionally, societal norms have often led men to engage more frequently in financial discussions and decision-making from a young age, fostering higher confidence and competence in financial matters. In contrast, women have historically faced restricted opportunities for financial education and engagement, a situation only beginning to change. This gender gap is also perpetuated by educational systems that may not use gender-sensitive approaches, often benefiting men over women. For instance, men might thrive in competitive or individualistic learning settings common in financial education, whereas women might benefit more from collaborative and discussion-based educational interventions.

From the Blinder-Oaxaca decomposition analysis, the gender variable shows a negligible effect in Estonian students (0.20) compared to a more substantial positive effect in Italian students (11.53). The large positive difference (11.33) revealed by the beta difference suggests that gender has a considerably more positive impact on financial literacy in Italian students compared to Estonian students. This substantial disparity implies that in Italy, gender differences in financial literacy are more pronounced, driven not just by observable differences but also by unmeasured or structural factors such as cultural attitudes and educational opportunities.

Addressing these disparities necessitates targeted financial education efforts tailored to bridge the gender gap. Such initiatives should foster learning environments that are inclusive and supportive of women, incorporating pedagogical strategies that account for gender differences in

learning and financial behavior. Additionally, challenging societal norms that confine financial discussions to male-dominated spaces is crucial, empowering women to participate equally in financial decision-making.

By implementing these tailored educational strategies and advocating for broader socio-cultural reforms, financial literacy programs can effectively reduce the gender gap in financial literacy. This not only promotes gender equality but also enhances the overall economic well-being of societies by ensuring that all individuals, regardless of gender, possess the necessary knowledge and skills to manage financial resources effectively. This approach is particularly essential in countries like Italy, where the gender impact on financial literacy is significantly more pronounced, underscoring the need for interventions that specifically address the unique challenges faced by women in these contexts.

### **3.2.3 Contrast and Confirmation with Subjective Financial Knowledge**

The study enriches this discourse by demonstrating the variable impact of knowledge on financial literacy, as evidenced in the Blinder-Oaxaca decomposition results for the variable FLCONFIN (Confidence about Financial Matters in General). This variable serves as a proxy for financial knowledge. The decomposition results indicate that FLCONFIN's effect varies significantly across different models, suggesting that the confidence individuals have in their financial abilities does not consistently correspond to their actual financial literacy. This discrepancy highlights a critical gap between perception and reality, where confidence does not always equate to competence. Research by Riitsalu and Murakas (2019) highlights the profound impact of subjective knowledge, arguing that individuals' perceptions of their financial understanding can significantly influence their financial well-being, often more so than their actual financial knowledge. This is because subjective perceptions frequently dictate financial behaviors—individuals who perceive themselves as knowledgeable are more likely to engage with financial products and make decisions they believe are informed.

The distinction between subjective and objective financial knowledge plays a pivotal role in understanding financial behavior. Subjective financial knowledge encompasses individuals' self-assessed understanding and confidence in their financial capabilities, whereas objective financial knowledge is measured through testing or other evaluative methods.

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The variability in FLCONFIN's impact is particularly pronounced between Estonian and Italian students. In the models, FLCONFIN shows a significantly stronger effect in Estonian students (6.19) compared to Italian students (0.57). Additionally, the  $\beta_{diff}$  reveals a considerable negative difference (-5.62), indicating a much less impact of confidence in financial matters among Italian students. This suggests that while Estonian students' confidence may be more aligned with their financial literacy, Italian students' confidence does not reliably indicate their financial literacy levels.

Moreover, the twofold decomposition of FLCONFIN shows both explained and unexplained effects, which may include psychological factors such as overconfidence or the Dunning-Kruger effect, where individuals with limited knowledge overestimate their competence, as well as environmental influences that affect self-perception without corresponding increases in actual knowledge.

This nuanced understanding underscores the necessity for financial education programs to address both subjective and objective aspects of financial literacy comprehensively. Programs must not only enhance actual knowledge and skills but also align individuals' confidence with their genuine financial capabilities. This approach can mitigate overconfidence and ensure that confidence in financial decision-making is built on a robust foundation of real understanding and competence. By doing so, financial literacy programs can bridge the perceptual gaps and foster more accurate self-assessments among learners, enhancing both individual financial well-being and broader economic stability.

### **3.2.4 Financial Education and Behavioral Aspects**

The relationship between financial education and financial literacy is nuanced, as highlighted by the differential impacts of key variables like FCFMLRTY (Familiarity with Concepts of Finance) and FLCONICT (Confidence in using ICT for Financial Matters). These variables demonstrate the importance of both a strong grasp of financial concepts and the confidence to utilize these concepts via digital tools, corroborating findings from Salas-Velasco et al. (2021), which underscore the positive effects of financial education. Particularly, individuals who possess both knowledge and confidence are better equipped to navigate the financial landscape effectively.

However, challenges emerge with the variable FLSCHOOL (Financial Education in School Lessons), which shows an inverse relationship with financial literacy, suggesting issues with how

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financial education is structured or delivered in schools. This counterintuitive finding aligns with critiques by Fernandes et al. (2014), who argue that financial education programs often fail to meet their intended outcomes without careful design that resonates with real-world applications and learner needs. This might indicate that the programs are overly generic, lack engagement, or do not align with practical financial experiences.

The Blinder-Oaxaca decomposition sheds further light on these dynamics, revealing slight disparities between Estonian and Italian students in their reception of financial education. For instance, Estonian students exhibit slightly higher familiarity with financial concepts (FCFMLRTY at 3.64) compared to Italian students (3.13), and significantly greater confidence in using digital financial tools (FLCONICT at 8.75 compared to 6.85 for Italians). Conversely, the negative impact of financial education in schools (FLSCHOOL) is less severe in Estonia (-10.24) than in Italy (-19.45), suggesting differences in educational effectiveness across these contexts. These findings indicate not only the gap in financial literacy between the two groups but also the variable effectiveness of educational approaches in different national contexts.

To effectively tackle these disparities, it is crucial for policymakers and curriculum designers to reevaluate and enhance the financial education strategies deployed in schools. This includes ensuring the curriculum is relevant, applicable, and engaging by incorporating practical financial activities and using contemporary technology-based learning tools. Additionally, educators require adequate training and resources to deliver financial concepts in ways that resonate with the students' actual financial landscapes. By addressing these challenges, financial education can move beyond mere literacy to develop comprehensive financial proficiency, ensuring students are not only knowledgeable but also capable of applying this knowledge in real-world financial situations effectively.

The analysis underscores the significant impact of national contexts and socio-economic status on financial literacy, highlighted by the positive influence of country-level variables and socio-economic status across models, suggesting that financial literacy is shaped by broader national policies and individual socio-economic conditions. However, disparities are noted in the effectiveness of financial education, with an inverse relationship observed between school financial education and financial literacy, pointing to possible issues in how financial education is structured or delivered. The Blinder-Oaxaca decomposition reveals differences in how socio-economic status impacts financial literacy between Estonian and Italian students, with Estonian



students showing slightly higher impacts. This comprehensive analysis calls for tailored financial education strategies that address socio-economic inequalities and are adapted to local contexts to effectively improve financial literacy across different demographics, ensuring that financial education not only enhances knowledge but also equips individuals with practical skills for sound financial decision-making.

### **3.3 Theoretical and Practical Implications**

The study highlights a significant challenge with the variable FLSCHOOL (Financial Education in School Lessons), which shows an inverse relationship with financial literacy, suggesting issues with how financial education is structured or delivered in schools. To address this, it is recommended to embed contextual and practical financial education within school curricula from a young age, especially in Italy where literacy levels are notably lower. Drawing inspiration from Estonia, where the integration of practical financial education has significantly enhanced financial literacy scores, implementing a similar model could be beneficial. This is supported by Salas-Velasco et al. (2021), who found a positive correlation between the delivery of financial education and students' financial literacy scores. Educators should employ real-life financial scenarios to improve understanding and retention of financial concepts, as suggested by Bottazzi & Lusardi (2016), who emphasized the importance of context and practical application in learning financial concepts. This approach not only aids learning but also ensures students can apply their knowledge effectively. Additionally, the curriculum should remain dynamic and adaptable, reflecting current financial realities and tools to equip students for a financially intricate world.

As financial services become increasingly digitized, a strong focus on digital financial literacy is essential. The study finds that FLCONICT (Confidence in using ICT for Financial Matters) consistently shows a positive and significant relationship with higher financial literacy, highlighting the strong link between confidence in using digital financial tools and enhanced financial literacy. Young individuals should be well-versed not only in basic financial concepts but also in navigating digital financial platforms. Therefore, educational systems must broadly incorporate digital financial literacy, preparing students for future financial environments dominated by digital transactions and fintech innovations. This aligns with Koskelainen et al. (2023), who emphasize the necessity of digital competence in modern financial education. Practical exercises that familiarize students with digital financial tools and platforms are crucial,

enabling them to tackle modern financial challenges effectively, as highlighted by Moreno-Herrero et al. (2018), who stress the importance of developing digital financial skills for the younger generation.

Policy interventions are crucial and should ensure financial education is a mandatory component of the national curriculum, backed by national standards to guarantee uniformity and thoroughness across all regions. This strategy aims to close the financial education gap, particularly in less privileged areas, by ensuring all students have equitable access to financial knowledge, supported by findings from Lusardi and Lopez (2016) who found socioeconomic disparities in financial literacy. Moreover, fostering partnerships with financial institutions and technology firms can help develop innovative and pertinent financial education content, reflecting modern economic realities such as cryptocurrency and digital asset investment, similar to the innovative approaches discussed in the study by Stella et al. (2021) on the effectiveness of targeted financial education.

Additionally, the influence of cultural and familial factors on financial literacy cannot be ignored. Future research should investigate how cultural norms and parental involvement in finance influence children's financial behaviors and literacy levels. This insight will enable the tailoring of financial education programs to be culturally sensitive and inclusive, effectively engaging a diverse student population. Further exploration into the long-term effects of financial education on students' financial decisions can offer deeper insights into the efficacy of various teaching methods, informing improvements in educational strategies and policies, as suggested by Magistro (2022) who found that financial literacy impacts policy preferences and decision-making. This holistic approach ensures that financial literacy education not only equips students with necessary skills but also cultivates responsible and informed financial citizens.

### **3.4 Limitations of the Study**

Our study is subject to several limitations that should be considered before generalizing the findings. Firstly, we employed cross-sectional data from PISA assessments, which only allow for the identification of correlational relationships, not causal ones. For example, while we observed that confidence might enhance skills, it's equally plausible that a lack of skills could diminish confidence, as suggested by Morris et al. (2022). Secondly, our comparative analysis of Estonia and Italy provides valuable insights but complicates the task of isolating the effects of

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educational programs or cultural norms on financial literacy. The social attitudes towards education and financial management in these countries could influence the effectiveness of formal financial education in ways that our study could not fully capture. Additionally, there is a potential for confounding between variables, which could obscure the true relationships and impacts among the factors studied.

Furthermore, focusing on the unique national contexts of Estonia and Italy limits the generalizability of our findings to other nations with different educational systems, economic structures, or financial cultural norms. The distinct economic histories and educational philosophies of Estonia and Italy mean that simply transplanting Estonia's educational practices into other contexts may not necessarily yield improvements in financial literacy. Thus, caution should be exercised in generalizing these findings without considering local variations. While our results suggest a correlation between Estonia's financial literacy curriculum and higher financial literacy scores, this does not imply that the same approach would be effective in Italy or other countries without adaptations to local educational and cultural specifics. As Smith (2005) emphasizes, it is crucial to contextualize educational initiatives within each country's unique cultural and socioeconomic framework to ensure their relevance and effectiveness.

## Conclusion

This study conducted a comprehensive analysis of financial literacy levels and their determinants among students in Estonia and Italy, utilizing data from the PISA 2018 assessments. The primary objectives were to evaluate the differences in financial literacy between these two countries and identify the key factors influencing these differences. The study found significant differences in financial literacy levels between students in Estonia and Italy. The findings also revealed significant influences from national contexts and socio-economic status. The country-level estimator (CNT\_EST) positively affected financial literacy across all models, emphasizing the crucial role of national educational policies, economic conditions, and cultural norms in shaping financial literacy outcomes. Additionally, socio-economic status (ESCS) consistently showed a positive correlation with financial literacy, suggesting that higher socio-economic status, which often correlates with better access to education and financial resources, significantly enhances financial literacy. The Blinder-Oaxaca decomposition further highlighted subtle differences in the impact of socio-economic factors between Estonian and Italian students, indicating slightly less influence of these factors in Estonia despite higher overall ESCS values.

Challenges within educational systems were uncovered, particularly with the variable representing financial education in schools, which demonstrated an inverse relationship with financial literacy. This counterintuitive finding suggests potential misalignments in how financial education is implemented in school curricula. This aligns with critiques by Fernandes et al. (2014), who argue that financial education programs often fail to meet their intended outcomes without careful design that resonates with real-world applications and learner needs. The programs may be overly generic, lack engagement, or not align with practical financial experiences. Conversely, the negative impact of financial education in schools is less severe in Estonia than in Italy, suggesting differences in educational effectiveness across these contexts. These findings highlight not only the gap in financial literacy between the two groups but also the variable effectiveness of educational approaches in different national contexts.

Gender disparities were also evident, with males typically displaying higher levels of financial literacy, pointing to the need for targeted educational efforts to address this imbalance. Moreover, the study explored the discrepancy between subjective and objective financial knowledge, noting that confidence in financial matters (FLCONFIN) did not consistently translate into actual financial literacy, exposing a gap between perceived and actual financial capabilities. Behavioral

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aspects such as familiarity with financial concepts (FCFMLRTY) and confidence in using ICT for financial matters (FLCONICT) were important for enhancing financial literacy, though the effectiveness of educational delivery was questioned.

Overall, the approaches that improving financial literacy requires more than just traditional educational approaches; it necessitates carefully designed interventions that are inclusive, practical, and aligned with the specific needs and contexts of students across different socio-economic and gender backgrounds. The observed disparities call for a re-evaluation of financial education frameworks to ensure they effectively equip students with both the knowledge and the skills necessary for sound financial decision-making.

In summary, this study highlights significant differences and determinants influencing financial literacy among students in Estonia and Italy. National factors, represented by the country-level estimator (CNT\_EST), significantly impact financial literacy, underscoring the importance of national educational policies, economic conditions, and cultural norms. The positive correlation of socio-economic status (ESCS) across all models further confirms its crucial role in enhancing financial literacy, with higher socio-economic status linked to better access to educational and financial resources. However, challenges in the educational delivery of financial literacy were identified, particularly with the inverse relationship of the FLSCHOOL variable, suggesting that current methods of financial education in schools might need re-evaluation to better align with effective learning outcomes.

To advance future research, this study recommends integrating mixed-method approaches to enhance methodological robustness. While this study primarily relied on quantitative data from the PISA dataset, incorporating qualitative methods like interviews or focus groups could provide deeper insights into students' perceptions and practical challenges in financial education. Additionally, as financial markets evolve with digitalization, investigating the impact of digital financial tools on students' financial literacy and decision-making could provide valuable insights into the changing landscape of financial behaviors and knowledge, addressing an existing gap in the literature and aligning with current trends in financial services.

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## Appendices

### Appendix A - Results

**Table A1.** Independent T-test with Bonferroni correction

<b><i>Variable</i></b>	<b><i>T_Value</i></b>	<b><i>DF</i></b>	<b><i>P_Adjusted</i></b>
<i>Plausible Value 1</i>	40.65	8159.85	p < .01
<i>Plausible Value 2</i>	41.16	8105.63	p < .01
<i>Plausible Value 3</i>	40.02	8265.14	p < .01
<i>Plausible Value 4</i>	40.70	8024.47	p < .01
<i>Plausible Value 5</i>	40.92	8075.48	p < .01
<i>Plausible Value 6</i>	40.71	8115.20	p < .01
<i>Plausible Value 7</i>	42.29	8177.29	p < .01
<i>Plausible Value 8</i>	41.76	8164.89	p < .01
<i>Plausible Value 9</i>	40.73	8214.69	p < .01
<i>Plausible Value 10</i>	40.08	8056.87	p < .01

Source: Compiled by the author

## Resümee

EESTI JA ITAALIA ÕPILASTE FINANTSKIRJAOSKUS: VÖRDLEV ANALÜÜS

OBI IHEANACHOR VITUS

Finantskirjaoskust peetakse oluliseks eluks vajalikuks oskuseks, eriti noorte jaoks, kes seisavad silmitsi ainulaadsete väljakutsetega kaasaegses finantsmaailmas navigeerimisel. Finantsteenuste digitaliseerimine, õppelaenude populaarsus ja töölepingute muutuv maastik nõuavad noortelt tugevaid finantsoskusi. Hoolimata üldiselt aktsepteeritud arusaamast finantskirjaoskuse tähtsuse kohta, on erinevates riikides endiselt märkimisväärseid lünki seda määravate tegurite mõistmises. Käesoleva uuringu eesmärk on uurida finantskirjaoskuse erinevusi 15-aastaste õpilaste seas Eestis ja Itaalias ning tuvastada peamised tegurid, mis mõjutavad neid erinevusi. Andmed 15-aastaste Itaalia ja Eesti õpilaste kohta pärinevad PISA rahvusvahelisest õpilaste hindamisprogrammist 2018. aastal. Finantskirjaoskust mõjutavate tegurite uurimiseks kasutati mitmekordset regressioonanalüüsi ja Blinder-Oaxaca dekompositsiooni. Uuringu tulemuste kohaselt mõjutavad riiklikud tegurid, mis pärinevad riikliku tasandi hinnangust, oluliselt finantskirjaoskust, tuues esile riikliku hariduspoliitika, majandustingimuste ja kultuurinormide tähtsust. See mõju viitab sellele, et finantskirjaoskus ulatub kaugemale individuaalsetest või perekondlikest omadustest, hõlmates laiemat riiklikku konteksti. Kõrgem sotsiaalmajanduslik staatus korreleerub üldiselt parema juurdepääsuga finantsharidusele ja ressurssidele, mis loob suuremad võimalused finantssotsialiseerumiseks ja kõrgema hariduse omastamiseks, mis kõik oluliselt suurendab finantskirjaoskust. Haridussüsteemides tuvastati puudujääke, eriti koolide finantshariduses, mis oli pöördvõrdelises seoses finantskirjaoskusega, viidates võimalikele kõrvalekalletele finantshariduse rakendamises kooli õppekavades. Lisaks oli meestel üldiselt kõrgem finantskirjaoskuse tase kui naistel. Selle lõhe püsivus toob esile sotsiaalsete ja kultuuriliste normide ja hariduspraktikate mõju, mis kujundavad erinevaid soopõhiseid finantskogemusi. Samuti esines lahknevus finantsküsimumustes enesekindluse ja tegeliku finantskirjaoskuse vahel, paljastades lõhe tajutud ja tegelike finantsvõimete vahel. Finantsküsimumuste enesekindluse mõju erinevates mudelites viitab sellele, et enesekindlus finantsvõimekuses ei vasta alati tegelikule finantskirjaoskusele, tuues esile kriitilise lõhe, kus subjektiivne teadmine ei võrdu alati objektiivse teadmiselega. Uuringus arutletakse ka vajalike muudatuste üle, et vähendada finantsteadmiste lõhet noorte seas, rõhutades vajadust tõhusamate ja kontekstitundlikumate finantshariduse raamistike järele.

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**21/05/2024**