Financial Literacy in SMEs:

A systematic literature review and a framework for further inquiry

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Abstract:

It has been suggested that financial literacy plays a crucial role in the understanding of the overall performance of small and medium-sized enterprises (SMEs). Nonetheless, its impact remains underexplored, and the few existing findings are fragmented. This study conducts a systematic literature review focused on the antecedents and consequences of financial literacy in SMEs. The findings show that some educational, cultural, and specific contextual factors are antecedents of financial literacy; in turn, financial literacy influences the financial attitudes, financial behaviors, organizational capabilities, and performance of SMEs. Further research should analyze the uncovered lines of study suggested in our research agenda to consolidate the conceptualization of financial literacy in the context of SMEs, overcome the limitations of the current methodology, extend the current evidence about the antecedents and consequences of financial literacy in SMEs and analyze these relationships from behavioral economics and decision-making perspectives.

Keywords: *Financial literacy, small and medium-sized enterprises, systematic literature review*

1. Introduction

The antecedents and consequences of financial literacy (hereafter FL) remain underexplored in the context of small and medium-sized enterprises (SMEs), although its positive impact in the context of managing personal finance has been largely shown (Lusardi & Mitchell, 2014). In this latter setting, FL has been defined as an individual's understanding of key financial terms and the application of this knowledge to manage his or her finances (Huston, 2010; Remund, 2010). However, there is no agreement on a definition of FL in the context of firms.[1]

SMEs represent approximately 95% of the business population in most countries, and they are the largest job creators worldwide. Their influence on societies in terms of contributions to innovation and improving economic conditions is recognized universally (ICSB 2019; World Trade Report, 2016). Despite their relevance to the global economy promoting economic and social development, approximately half of SMEs fail no more than five years after they are created (Calvino et al., 2015). Prior evidence has claimed that this high failure rate could be explained by poor manager decision making, due to a frequent lack of relevant managerial capabilities, such as FL (Ganotakis, 2010; Haliassos, et al., 2020). Therefore, the continuation of research on FL in SMEs is vital.

A few papers have explored some of the impacts of FL in the context of SMEs using qualitative (e.g., Halabi et al., 2010; Hussain et al., 2018) and quantitative (e.g., Adomako et al., 2016; Yang et al., 2018) techniques, as well as combinations of both (e.g., Roux & Steyn, 2007). These investigations have consistently found positive impacts of FL on financial attitudes, behaviors, organizational capabilities and both financial and

[1] In this study, we considered FL in SMEs as a combination of financial knowledge and the ability to apply it to make decisions in SMEs (see section 3.2 for further details).

nonfinancial performance. However, most of this research has been performed in developing countries, emulating investigations in the context of personal finance (Hung et al., 2009; Lusardi & Mitchell, 2014). This may explain some of the issues arising in organizational settings, since the personal finance investigations were focused on the efficacy of training programs on FL (Lusardi & Mitchell, 2014). Mirroring this approach, the concept was later applied to institutions promoting entrepreneurship, such as business incubators, so attention was then drawn to measuring the efficacy of educational programs for entrepreneurs/managers.

There are two major pitfalls in this stream of research, namely the lack of an agreed upon definition of FL in relation to firms and the need for the integration of results obtained so far to enable advancement in the accumulation of knowledge about this relevant factor. The lack of a definition may have influenced some of the existing results, since only a few studies have included antecedents of FL in the research models; indeed, some authors have even included a factor that could be part of the definition as an antecedent, and only a handful have explored mediation or moderation effects. The absence of an integrative attempt may lead scholars to continue exploring relations that are theoretically very questionable or empirically spurious.

A complete understanding of the antecedents and consequences of FL is especially relevant for improving the performance of small new ventures, in which a founding team or a single entrepreneur makes important business decisions (OECD, 2018), quite frequently doing so in situations of high uncertainty. This situation has critical implications since the onset of the COVID-19 pandemic[2] because serious doubts are

[2] A recent stream of the literature (e.g., Croteau et al., 2021; Portuguez Castro & Gomez Zermeño, 2021; Purnomo et al., 2021; Sharma & Rautela, 2021) has used theoretical and qualitative approaches to provide insights into managerial practices in the current COVID-19 context. The main problems faced by any firm during the pandemic are related to financial liquidity. SMEs are more strongly affected because of

being cast on the financial decisions that give ventures the best chance in terms of survival and successful growth. Evidence for the impact of COVID-19 can still be found only for the short term and should be compared with past crises to check for potential common and differential issues to cope with this type of crisis (Dvouletý et al., 2021). The managerial skills in SMEs tend to be more limited than in larger companies (Lavia & Hiebl, 2015; West III, 2007). Thus, FL is particularly pertinent when researching the impact of this intersection of personal and organizational features on a firm's performance.

To address these issues and integrate the extant knowledge on the antecedents and consequences of FL in SMEs, we followed the stepwise methodology suggested by Tranfield et al. (2003) and Simsek et al. (2021) to perform a systematic integrative literature review. This methodology favors transparency and facilitates replicability for future reviews. Our systematic review comprised 71 articles that met our criterion for inclusion by the end of the search period (July 2021), namely, that each paper should empirically analyze FL in the context of SMEs. We sought to summarize the contributions made to this field so far and to propose a framework for further research avenues on this relevant topic.

The remainder of this paper is organized as follows. In section 2, we provide the antecedents and consequences of FL already found in previous research on personal finance, which serves as a starting point. In section 3, we present the methodology used for the systematic review. Additionally, we note the descriptive characteristics of the

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their poorly-sophisticated processes, lack of certain managerial skills, and limitations of obtaining external financing, accentuating the difficulties in adjusting to and reorganizing operations to the new situation. Overall, these articles signal that managers with higher management abilities are able to retool their operations in line with the long-term opportunities that emerge during the subsequent phases of economic recovery. Therefore, it is likely that FL is essential for SMEs to resist the new economic environment that the onset of the COVID-19 pandemic has triggered.

reviewed articles and the measures of FL applicable to an SME setting. In section 4, we identify the antecedents and consequences of FL studied so far in the context of SMEs. In section 5, we discuss our findings and critically argue why some of the relationships found should be reframed, providing a schema reflecting the extant research and suggesting a research agenda for further inquiry. Finally, we summarize the main conclusions of the research on the antecedents and consequences of FL in SMEs.

2. Financial literacy in the context of personal finance: Antecedents and consequences

In this section, we summarize the main findings from research on the personal finance setting to establish a basis prior to reviewing the antecedents and consequences of FL in the context of SMEs. Scholars have found different antecedents of FL in the context of personal finance. Fox et al. (2005) argued that financial training programs increase FL. Christelis (2010), Lusardi (2012) and Lusardi and Mitchell (2007a, 2011a, 2011b) proved that individuals with lower educational levels and those who lack numeracy skills show lower levels of FL. Huston (2010) suggested that financial decision experience, which can be regarded as knowledge learned by doing, is an antecedent of FL. Consistent with this argument, Lusardi and Mitchell (2011b) found that baby boomers (aged 51-56 years in 2004) were much less knowledgeable about inflation likely due to their limited historical exposure to inflation.

FL has also been found to vary according to individuals' economic positions, statuses, and salaries (Lusardi & Mitchell 2011a; Lusardi & Tufano 2015). Moreover, some studies argue that ethnicity (Lusardi & Mitchell 2007a, 2007b, 2011c), religion (Alessie et al., 2011), state regulations (Jappelli & Padula, 2013) and political preferences (Arrondel et al., 2012) influence FL. Klapper and Panos (2011) proved that an individual's place of residence affects his or her FL. Individuals living in rural areas have less FL than individuals living in cities. This suggests that FL is relatively easily acquired through social interaction (Lusardi & Mitchell, 2014). Finally, a wide corpus of literature has evidenced patterns that pinpoint a relevant difference in FL by gender (Lusardi, et al., 2010). In specific settings, the likelihood of women correctly answering both basic and sophisticated questions about FL is considerably lower than that of men (Fonseca et al., 2012; Lusardi & Mitchell, 2014). Chen and Volpe (2002) and Mandell (2008) studied samples of highly educated individuals and found a low level of FL in women. In this regard, Bucher-Koenen et al. (2017) recognized the important role of self-confidence because women have a lower perception of their own level of FL than men. Nonetheless, this discussion of FL differences between genders is currently far from being closed. Therefore, further research is required to better understand this gap.

Regarding the consequences of FL in the context of personal finance, Hallahan et al. (2004) and Hsiao and Tsai (2018) demonstrated that FL decreases the risk aversion of an individual and increases his or her capacity to face economic shocks (Huston, 2010; Lusardi et al., 2011). FL also improves financial decisions, allowing individuals to decrease, for example, their mortgage costs (Lusardi & Tufano, 2015) by persuading bankers to do so in credit request interviews (Lusardi & Mitchell, 2011a) or by refinancing (Campbell, 2006). Likewise, FL prevents people from engaging in detrimental financial actions such as using high-cost credit cards or borrowing money backed by retirement plans to finance their activities (Mottola, 2013). Moreover, FL affects individuals' attitudes, for instance, toward saving, and these attitudes have an impact on investment decisions; these decisions in turn improve the well-being of individuals during financial emergencies or low-income stages of life, such as retirement (Lusardi & Mitchell, 2007a, 2014; Lusardi et al., 2011). Furthermore, individuals with a high level of FL participate more often than others in share markets by investing in complex products (Lusardi & Mitchell, 2007a) as financial assets (Christelis et al., 2010; Van Rooij et al., 2012; Yoong, 2011), and their portfolios are more diversified (Abreu & Mendes, 2010). Thus, FL clearly affects an individual's financial behavior.

Previous research on personal finance has also provided evidence on the positive influence of FL on wealth. Van Rooij et al. (2012) proved that FL improves the net worth of an individual, and Jappelli and Padula (2013) noted a positive correlation between FL and wealth. Both variables increase during individuals' careers and fall after their retirement. Likewise, some academics have argued that the FL-wealth relation may be mediated by financial behavior. For example, Lusardi and Mitchell (2007a, 2007b, 2011c) proved that financially literate individuals developed more sophisticated financial planning – *behavior* – so they accumulate more wealth. Furthermore, Stango and Zinman (2009) demonstrated that financially illiterate individuals could not calculate interest rates; consequently, they borrow more money – *behavior* – and accumulate less wealth than financially literate individuals.

In conclusion, FL has been widely investigated in the context of personal finances (Lusardi et al., 2017). Together, these studies offer some important insights from this context to establish the basis on which we build a review of FL in SMEs.

3. Method

3.1 The systematic review

To find articles that empirically analyzed the antecedents and consequences of FL in SMEs, we follow the stepwise methodology suggested by Tranfield et al. (2003) and Simsek et al. (2021), which assures the transparency and replicability of our method.

Databases. Following the procedures of other systematic literature reviews (e.g., López-Duarte et al., 2016), we focused on Scopus and the Web of Science databases, to increase our likelihood of finding relevant studies and maximizing our investigation's reliability and replicability (Franco-Santos et al., 2012*).*

Rules for inclusion. The first group of keywords used in the search strategy was related to the concept of FL. We based our search strategy on previous literature reviews of personal finance (e.g., Atkinson & Messy, 2011; Hung et al., 2009; Huston, 2010) to ensure that we incorporated all of the terminology potentially associated with FL, namely financial education, financial knowledge, the application of financial knowledge, financial attitudes, and financial behavior. The second group of keywords addressed small companies. Thus, consistent with the work of Lavia and Hiebl (2015), this group included a variety of terms referring to SMEs at any developmental stage, such as small ventures or start-ups. To be included in the review, an article was required to have a combination of keywords from the two groups, namely, those related to FL and those related to small companies, in its title, abstract or keywords. We used the wildcard symbol (*) to capture all the variations in the terms (see the detailed search strategy in Appendix 1). We limited our search to empirical articles published in English on business, management, and accounting (Scopus) or business economics (core collection of the Web of Science), and social sciences (both databases). No restriction was imposed on the year of publication. Following Franco-Santos et al.'s (2012) methodology, we screened the references of the 111 articles found to avoid missing relevant studies, and we found another six papers not indexed in the Web of Science or Scopus that met our rules for inclusion. We finished the search in July 2021 with 117 papers to be screened.

Rules for exclusion. Of the 117 articles screened, we excluded 32, mainly due to topic, methodology or setting mismatches.[3] Consequently, we found 85 papers that fit our research focus. We also examined the methods sections of these papers to control for a consistent operationalization of SMEs and FL. First, there is no standardized definition of SME used worldwide. Consistent with OECD and EU definitions, the most used criterion for designating an SME is a maximum of 250 employees. However, this threshold varies from country to country and can be as high as 500 employees in the case of the United States. The selected 85 papers use a consistent operationalization of SME. Only four papers reported some observations from firms with more than 250 employees, constituting a tiny proportion of the full sample in each article.[4]

Moreover, papers should address at least one of the two main components of FL, namely financial knowledge or its application. Consequently, we excluded 14 papers that did not meet this criterion[5] (see Appendix 2 for a list of these articles). The remaining 71 papers[6] were retained.

The examination process, which is represented in the flow diagram included in Figure 1, followed the PRISMA-2009 standards (Moher et al., 2009).

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[3] Any articles focusing on similar topics, such as international financial reporting standards, corporate governance, learning processes, tax evasion or economic crises in SMEs, were excluded from the analysis because they did not address FL. Additionally, nonempirical investigations, such as literature reviews or descriptive studies, were excluded. Papers that did not include SMEs were also excluded.

[4] The potential exclusion of these articles reporting observations from firms with more than 250 employees would not significantly change the results presented in our study.

[5] The relevant literature spanning scientific studies (Faulkner, 2015; Huston, 2010; Lusardi & Mitchell, 2007a), policy-related documents (e.g., Atkinson & Messy, 2011; BDC, 2017; Lentz et al., 2016) and relevant working papers (e.g., Alperovych et al., 2020; Trombetta, 2016) agrees that financial knowledge forms the basis and more significant dimensions of FL. Financial knowledge and FL are not equivalent, but any article that aims to capture an approximation of FL should include in its metrics at least some questions about the core element, i.e., financial knowledge.

[6] We maintained nine articles in the review that operationalized a measure of FL that only contained the knowledge dimension. To reflect this casuistry, we indicate this set of papers with the subscript (1) when they are mentioned in the text

**************INSERT-FIGURE-1-ABOUT-HERE********************

Classification of relations. We should mention that in the mediation models in which FL was an independent variable, both the dependent variables and the mediator variables included were classified as consequences of FL. For example, Nohong et al. (2019) found an indirect relation between FL and SME performance through financial behavior. In this case, both financial behavior and SME performance were classified as consequences of FL. When a study explored FL as a moderator, we considered the dependent variable in that study a consequence of FL. For example, Adomako et al. (2016) demonstrated that FL moderates the relation between organizational capabilities (independent) and SME performance (dependent); thus, in our study, the latter variable was considered a consequence of FL. However, in this example of interactive effects, it is unclear which variable is the moderator and which is the independent variable. One might argue that the relation between organizational capabilities and performance existed first; therefore, FL was added as a moderator later. Nevertheless, the opposite argument may also hold; in this case, the main relation would be between FL and performance, and organizational capabilities would be the moderator. Since disentangling this issue requires solid theoretical arguments, we treated interactive variables as consequences of FL if there was another paper that had explored that interactive variable as a consequence of FL. This, for instance, was the case with organizational capabilities, which were reported as a consequence of FL in the contexts of innovativeness (Illmeyer et al., 2017; Shah et al., 2020, among others), the organizational ability to access bank and trade credit or major channels of external finance (Fatoki, 2021; Tian et al., 2020) and the capability to compete, i.e., competitiveness (Nohong et al., 2019).

3.2 Financial literacy measures in an SME setting

To identify and classify FL measures in an SME setting, we used the concepts and labels associated with FL in the personal finance literature as a starting point (see Table 1).We adhered to the conceptualization of FL developed by Huston (2010),[7] who posited that FL encompasses essentially two dimensions: (1) a knowledge of *basic* financial concepts (e.g., what an interest rate is); and (2) the application of such knowledge, e.g., the ability to apply it (e.g., skills to calculate an interest rate). This author also conceptualized financial education as an antecedent of FL, whereas financial attitudes and behaviors are consequences of FL. Therefore, we considered FL in SMEs as a combination of financial knowledge and the ability to apply it specifically to make decisions. Although providing a definition is not the goal of our reflection, we should emphasize what this definition should mean in the setting of SMEs. FL should not only encompass the *basic* notions already included in the definitions for personal finance research but the *advanced* notions revolving around the knowledge to manage the firm's finance and the ability to apply both basic and advanced financial knowledge in the management of SMEs.

***************INSERT-TABLE 1-ABOUT- HERE***************

We acknowledge that there are other conceptualizations of FL. Some of them include the metrics[8] of financial attitudes and financial behaviors in the concept, and we do not disregard or reject them. However, we pinpoint significant arguments that support the mentioned bidimensional conceptualization. First, this conceptualization is the most frequently used approach in the scientific literature in both the personal finance (Lusardi

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[7] The first investigation that conceptualized FL in this way.

[8] Despite some exceptions, most of both scientific and nonscientific literature acknowledges financial education as an antecedent of FL. Therefore, this metric is not a focus of discussion by researchers.

& Mitchell, 2014; Ouachani et al., 2021; Santini et al., 2019) and SME[9] (see Table 2) contexts. Second, several significant nonscientific investigations (BDC, 2017; Lentz et al., 2016) and working papers (Alperovych et al., 2020; Trombetta, 2016) have opted for this conceptualization to capture FL.[10] Third, a less developed line of research has suggested a broader conceptualization of FL, also adding metrics of financial attitudes and financial behaviors (Atkinson & Messy, 2011; OECD, 2018, 2020). Although these investigations showed that financial knowledge and its application have a strong, but not perfect, correlation with financial attitudes and financial behaviors (Atkinson & Messy, 2011),[11] both the attitudes and behaviors are influenced by the level of FL; thus, it means that FL is a prerequisite for certain attitudes and subsequent behaviors. Furthermore, FL is acquired over time, whereas attitudes and behaviors in a certain moment are the consequences of the FL acquired earlier. However, there can be a virtuous cycle of experiential learning from past behaviors to acquire higher levels of FL in a particular situation based on the past. To detect this cycle, we should separate financial behaviors and attitudes from FL. Therefore, considering all of these insights, we decided to employ Huston's conceptualization (2010) to integrate the antecedents and consequences of FL

[9] In addition, 62% of the reviewed articles capture FL exclusively using metrics of financial knowledge and its application. The remaining articles added some additional metrics associated with financial education, financial attitudes, and financial behaviors in their measures of FL.

[10] Nevertheless, the prior relevant literature reviews of personal finance, such as Huston (2010), Parker (2008), and Lusardi and Mitchell (2014), claim that prior research has interchangeably used the concepts of financial knowledge and financial literacy (including application). Checking the methods sections of Nitani (2020) and Rostamkalei et al. (2019), we acknowledge that the problem persists in the SME literature. These studies have called financial knowledge a measure that collects both dimensions that compound FL: knowledge and application (definitions available in Table 1). In fact, we found other articles, e.g., Riepe et al. (2020), which used a very similar measure but labeled it FL. Thus, in Table 2, we ticked the knowledge and application boxes depending on the items that actually formed the measure, regardless of the label that the authors employed.

[11] Furthermore, the OECD (2020) argued that any measure that aims to properly capture managerial FL should necessarily employ metrics of financial knowledge and its application, while the metrics of financial attitudes and financial behaviors can be omitted to assure the simplicity of the measure.

in SMEs and maintain financial attitudes and behaviors as separate constructs within consequences.

We should mention that an adaptation is required when the metrics of financial knowledge and application are translated from the context of personal finance to SMEs: such financial knowledge is, in this case, not only regards *basic* financial concepts but also is related to financially managing a small venture. Accordingly, it should not be a question of whether a surveyed individual knows what an interest rate is and how to calculate it. In contrast, the question should address whether the individual possesses knowledge regarding management-specific tools and concepts, such as risk management tools or annual cash plans (i.e., the knowledge one has about issues specific to financially managing firms) and how to apply these tools, namely the ability to apply this knowledge to make effective decisions relative to starting, running and growing a business in terms of financial decisions. We should acknowledge that the level of the manager's FL has an impact on the level of any organization's FL – e.g., Agyapong and Attram (2019) found a positive correlation between a business owner's lack of personal FL and poor business management.[12] This relationship could be particularly relevant in developing and underdeveloped economies, in which personal finance studies have mainly been conducted, so when the overall financial culture in the economy is low, any marginal increase in FL will have a large impact on improving personal wealth. This point could also be transferred to the study of SMEs' FL. However, the question remains for the organizational FL, i.e., how much FL remains in the firm once individuals are substituted.[13]

[12] We thank one of the reviewers for pointing out this impact.

[13] As usual in organizational studies, there should be a distinction between the mere sum of the individuals' capabilities in an organization and the organization's capability itself. These latter capabilities remain in the

***************INSERT-TABLE 2-ABOUT- HERE***************

3.3 Main features of the reviewed articles

Table 3 presents the descriptive characteristics of the reviewed articles. Sixty-one papers used a quantitative approach, and nine opted for a qualitative[14] approach. Only one paper utilized a mixed approach. The data collection methods employed included surveys (47 papers), interviews (seven papers), the collection of secondary or archival data (nine papers) and combinations of any of these methods (four papers). Additionally, four investigations combined one or more of these methods with a field experiment. The information was mostly obtained from entrepreneurs/managers[15] (56 papers), followed by other sources, such as employees, financial statements, or students (12 papers). Specifically, three articles used samples obtained from both entrepreneurs/managers and employees. The qualitative studies surveyed a median of 23 cases (25 on average), whereas the quantitative investigations sampled a median of 298 cases (an average of 2008 cases). Structural equation modeling (SEM) was the most frequently used data analysis method (32 quantitative papers), particularly in conjunction with partial least squares (PLS) regression (18 articles). The bulk of the research was conducted in developing countries – 69.6% was conducted in Sub-Saharan Africa countries and South-East Asia, as shown in Figure 2 – which appears to mirror the investigations on personal finance (Hung et al., 2009; Lusardi & Mitchell, 2014).

***************INSERT-TABLE 3-ABOUT- HERE***************

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organization even when all of the individuals are substituted for a new set of individuals, and they are materialized in formal and informal procedures and routines – procedures repeated time after time – which is what we should refer to as organizational FL.

[14] Hereafter, qualitative studies will be shown in italics.

[15] CEO, manager, or another member of an organization's founding team.

**************INSERT-FIGURE-2-ABOUT-HERE*********************

4. Financial literacy findings in the context of SMEs

In this section, we develop a conceptual framework in line with the work of Franco-Santos et al. (2012), Bettinelli et al. (2017) and Santos et al. (2018). In Figure 3, we display a summary of the antecedents and consequences that we have identified and analyzed in our review and their relations with FL. Similarly, we emphasize the level of maturity of the research on each relationship by identifying the number of papers that tested each one.

***************INSERT-FIGURE 3-ABOUT-HERE***************

4.1 Antecedents of financial literacy

Several field experiments were performed in which managers were taught about planning, saving, budgeting, and making better informed financial decisions (Abebe et al., 2018; Brunh & Zia, 2013; Roux & Steyn, 2007). Their results evidenced a positive association between financial training and financial literacy. Similarly, Nitani et al. (2020) showed that a manager's level of education (bachelor's or postgraduate degree) increases his or her FL. These findings suggest that education, particularly financial education, improves FL. This is consistent with the existing research on personal finance.

Several cultural- and context-specific factors were also suggested as drivers of FL. Agyei (2018) found a negative effect of Protestantism and no effect of Catholicism on FL. Cherotich et al. (2019)[1] reported a positive correlation between several characteristics of the manager, such as age, level of education, managerial experience, and number of contacts, and his or her level of FL. *Egbo et al. (2020)* suggested that individuals with prior managerial experience were likely to have more financial knowledge and skills to manage ventures efficiently.

Regarding the case of gender, in contrast to findings in personal finance research, there is not much evidence about differences in financial literacy due to gender, with only three recent investigations addressing this topic. Rostamkalaei et al. (2019) analyzed the differences in FL among entrepreneurs and employees as a function of gender, language, and attitude toward formation. The authors did not find a significant effect of position (entrepreneur or employee) on either objective or subjective FL. However, they found that men, English speakers, individuals with a positive orientation towards training or with a university education, and older individuals have a greater probability of possessing higher subjective levels of FL than women, French speakers, individuals without a positive orientation or training level and younger individuals. Kabo (2021) and Nitani et al. (2020) established a positive correlation between male gender and higher levels of FL, but they also showed that the gender difference was larger for younger than older individuals; therefore, the gap tends to decrease as the person grows older. The gender difference also holds for objective evaluations, with women less likely to be included in the group with high levels of objective FL. Furthermore, some differences exist in terms of the perception and self-evaluation of FL related to culture and education.

Consequently, two main antecedents arose: (financial) education and a broad variety of context-specific factors that may be viewed as cultural aspects, which may include demographic factors such as gender.

4.2 Consequences of financial literacy

We found many more consequences than antecedents. We divided the former into four groups, namely financial attitudes, financial behaviors, organizational capabilities, and SME performance.

4.2.1 Financial attitudes

Table 4 displays the identified effects of FL on financial attitudes. Considering Ajzen's (1991) theory of planned behavior, financial attitudes indicate the degree to which a person has favorable or unfavorable evaluations or appraisals toward making financial decisions (behavior).

Managers with less FL disregarded the implications of bankruptcy, so they rejected the use of any managerial practices to face it *(Ekanem,*[16] *2013).* In developing economies, noncash transactions were found to still be recognized as a risky activity among SMEs. In these contexts, FL leads to an acknowledgment of the benefits and costs of noncash transactions, which increases their acceptance (Citradika et al., 2019). Koropp et al. (2013a)[1] found that managers lacking FL have fears and prejudices about the use of external financial sources, such as debt. In summary, there is a positive association between an individual's level of FL and his or her predisposition to use a variety of tools to financially manage an SME (financial attitude).

Studies on personal finance such as those of Hallahan et al. (2004) or Hsiao and Tsai (2018) suggested that FL reduces risk aversion or, in other words, increases the threshold of risk that is deemed acceptable. In the context of SMEs, we found a positive relationship between FL and a relatively conscious attitude toward risk. Ye and Kulathunga (2019) found a positive association between FL and the use of financial risk management that, in turn, increases financial risk-tolerance. Buchdadi et al. (2020) argued that, in developing countries, managing risk efficiently is relevant to the survival of SMEs, so managers with high FL who are aware of this situation have a greater tendency to implement several risk management practices. Liu et al. (2020) suggested that

[16] Reminder: the authors in italics performed qualitative studies.

managers with FL have a good understanding of the implications of risks, so they have greater financial risk tolerance in relation to the financing of innovation activities. Thus, a high level of FL has a positive effect on an individual's predisposition to implement financial practices and utilize financing sources. These results are consistent with those of Riepe et al. (2020) who found that managers with high FL are more aware of business constraints, so they become more loss averse and avoid uncertain initiatives. This indicates a relation between FL and the acceptance of certain levels of potential losses that is negative in attitudinal terms: an individual becomes more conscious of risky financial decisions with an increase in his or her FL.

All of these findings seem to suggest that, in the context of SMEs, a high level of FL leads to increased awareness of the potential risks facing a venture, as shown by Buchdadi et al. (2020). This awareness induces a favorable predisposition towards using managerial tools –such as risk management practices in the Buchdadi et al. (2020) study– that may help alleviate the burden stemming from these risks. When a manager becomes more aware of any type of risk, he or she might either use managerial tools to minimize the resulting potential negative effects or simply decide not to engage in a behavior that is believed to yield uncertain results.

***************INSERT-TABLE 4-ABOUT- HERE***************

4.2.2 Financial behaviors

Table 5 shows the relationship between FL and financial behaviors. We view financial behaviors in SMEs as variations in the use of financial practices due to the knowledge and attitudes of the main person responsible for executing these practices (Sayinzoga, 2016). First, academics have agreed on the existence of a positive association between FL and the use of management accounting and control systems (MACS). *Isle et al. (2018)* and *Egbo et al.* (2020) suggested that FL increases an individual's awareness of liquidity constraints, increasing the use of cash-flow management practices used to avoid them. Ismanto et al. (2020)1 showed a positive relationship between FL and the use of several financial practices, such as calculation of costs and use of financial statements and recording practices. Likewise, FL is positively associated with the development and implementation of risk management practices (Tian et al., 2020). Managers with high FL can identify the risks and opportunities corresponding to economic changes, and they develop strong risk management practices as a result (Kulathunga et al., 2020). The low organizational complexity of SMEs could facilitate the implementation of risk management practices (Mabula & Ping, 2018a). Indeed, Nohong et al. (2019) found an indirect effect of FL through capital structure, which facilitates the use of resources to implement risk management practices. In addition, *Halabi et al. (2010)* argued that managers with high FL use more financial information than others in their relationships with stakeholders to give the appearance of being well managed. Akhtar and Liu (2018a) explained that managers with high FL have the knowledge and abilities to interpret financial statements and consequently use MACS relatively often in their decision-making processes.

Second, researchers found that FL is positively associated with the financing decisions made within SMEs. Managers with FL use fewer informal financing sources, such as family resources, internal finances *(Ekanem, 2013),* financial bootstrapping[17] (Jayawarna et al., 2011) and high-cost, short-term sources (Nitani et al., 2020). Finally, managers with high FL can convince lenders of their SMEs' viability, mitigating negative financial conditions and increasing access to debt (Koropp et al., 2013b)1. These results

[17] *"Financing methods other than the traditional debt and equity from financial* institutions and personal *equity"* (Carter & Van Auken 2005: p. 131). For example, these include personal credit cards, cross-subsidizing, advance payments and borrowing from family and friends (Jayawarna et. al, 2011).

are consistent with those of Mottola (2013) and Campbell (2006), who, in a personal finance setting, found that FL inhibits detrimental financial activities, such as using high-cost credit cards, and reduces financing costs.

Finally, consistent with the literature on personal finance, scholars have associated FL with the investment decisions of SMEs. These findings mainly suggest a positive relation between FL and new income activities and savings (Sayinzoga et al., 2016; Cherotich et al., 2019[1]; Pahlevi et al., 2020). These authors explained that managers with FL make optimal financial decisions and, consequently, that their SMEs have more monetary resources to engage in new income activities. Abebe et al. (2018) argued that a lack of knowledge about banking operations might inhibit saving behaviors within SMEs. Agabalinda and Isoh (2020) showed a positive correlation between an entrepreneur's level of FL and the savings and investments for retirement. These insights give continuity to the personal finance studies that have shown that FL improves savings in the long term due to a focus on financial well-being during retirement (Lusardi & Mitchell, 2007a).

***************INSERT-TABLE 5-ABOUT- HERE***************

4.2.3 Organizational capabilities

Table 6 presents the effects of FL on organizational capabilities. For our review, we adhere to Barney's (1996: p. 377) definition of organizational capability as the *"firm's ability to perform repeatedly a productive task which relates either directly or indirectly to a firm's capacity for creating value through effecting the transformation of inputs into outputs"*. This notion entails a dynamic perspective – *repeatedly* – which is consistent with the second capability category in the Collis classification (1994) and corresponds to the widest sense of the first category, including a firm's capacity to perform basic functional activities more efficiently than its competitors.

First, a strand of the literature identified several managerial abilities associated with FL. Belas et al. (2018)$_1$ argued that managers with high levels of FL use monetary resources to appropriately facilitate the management of credit risk in unstable situations, such as economic shocks. Managers with higher FL are more satisfied with their financial capacities and their own knowledge and confidence in efficiently managing human and business resources (Agyei et al., 2019; *Egbo et al., 2020*). Several investigations (e.g., Al Issa et al., 2019, Bilal et al., 2021$_1$; Burchi et al., 2021; Ćumurovic & Hill, 2018; Wongso et al., 2020) have suggested that entrepreneurship, which is understood as the ability to establish and grow a business, is improved[18] by FL because it provides entrepreneurs many skills related to calculating, managing, and mitigating the risks associated with starting and growing a venture. Riepe et al. (2020) found that loss-averse individuals will only become entrepreneurs when they have FL because FL provides awareness about managing risk that allows them to create and establish businesses.

Second, researchers have found a positive relationship between FL and innovativeness. Illmeyer et al. (2017) explained that FL encompasses an understanding of liquidity needs and causes of volatility, which is fundamental for engaging in innovative activities. Furthermore, Liu et al. (2020), Perez de Lema et al. (2021) and Tian et al. (2020) suggested that FL promotes innovative activities indirectly. Managers with high FL convince stakeholders to finance and invest in their SMEs, overcoming the financial constraints that usually limit innovation support. Scholars have argued that businesses that have implemented risk management practices are more innovative because they can manage the financing constraints associated with the creative and uncertain initiatives inherent to innovation. Additionally, managers with FL have a

[18] Kabo et al. (2021) and Oggero et al. (2020) only found a positive correlation between FL and entrepreneurship in older and male individuals, respectively.

greater predisposition to engage in financing activities that provide resources that support innovation. Shah et al. (2020) suggested that financially literate managers are more willing to invest in innovations because they have a better understanding of the positive association between innovation and business success.

Third, there is a consensus across the literature regarding the positive association of FL with financial accessibility, which can be understood as the capability of an organization to obtain financial services such as credit, investing, and insurance. One of the most important reasons for the lack of bank financing among SMEs is their inability to convince lenders of their merit (Bongomin et al., 2017). Managers with high FL have the knowledge and skills to present appropriate and high-quality information that helps to convince lenders about the viability of an SME *(Hussain et al., 2018)*. Managers with low FL do not present appropriate information to lenders, hindering their relationships with these lenders and, in turn, their financial accessibility (Buchdadi et al., 2020). Likewise, individuals with high FL are likely to analyze the costs, benefits and risks of different financing sources and, as a result, make optimal choices between financial alternatives (Mabula & Ping, 2018b). Thus, a high level of FL overcomes traditional financing difficulties such as collateral conditions or high interest rates, which result in underfinancing among ventures (Ye & Kulathunga, 2019). These findings are consistent with the examined personal finance studies, which found that FL improves financial resources by enabling individuals to persuade financial institutions (Lusardi & Mitchell, 2011a).

Fourth, FL is linked to competitiveness. Managers with high FL have a knowledge and awareness of risk regulations that enable them to adapt their risk management practices to new contexts, offering them an advantage over their competitors; thus, the effect of risk management practices on Porter's competitive strategy was found to be stronger among managers with high FL than among those with low FL (Yang, et al., 2018). Moreover, Ying et al. (2019) suggested that FL provides valuable, unique, and immutable resources for SMEs in the form of superior entrepreneurial capabilities that, in turn, can be translated into organizational capabilities and help achieve competitive advantages. Likewise, Nohong et al. (2019) found an indirect effect of FL on competitiveness. FL facilitates the procurement and allocation of financial resources, which enables the creation of a strong capital structure and enhances competitiveness.

Fifth, the extant research in this field has also proved the positive relationship of FL with international capacity. Shah et al. (2020) investigated this relationship in Pakistan and suggested that managers with FL are more conscious about the returns gained when expanding into new markets. Therefore, they are involved in the development of the China-Pakistan economic corridor, which is a free trade zone. However, such a positive effect is purely mediated by organizational and marketing innovations; thus, improved FL increases a firm's ability to develop certain innovations, which leads it to an increased involvement in international activities.

***************INSERT-TABLE 6-ABOUT- HERE***************

4.2.4 SME performance

Table 7 shows the studies that analyzed the relation between FL and SME performance. We designed a performance category following Franco-Santos (2012) that comprised the different effects of FL on the growth and financial and nonfinancial results of SMEs.

Academics agree on the positive association of FL with SME growth. In other words, a lack of FL is one of the main hindrances to the growth of SMEs (Mabula & Ping, 2018b). Hossain et al. (2020) suggested that managers with high FL have the knowledge and skills needed to make proper long-term decisions that enhance an SME's growth. Similarly, these authors found that the effect of FL on SME growth is greater when the firms receive support through government programs. Additionally, most of the articles showed a moderating effect of FL on the relationship between financial accessibility and SME growth. Managers with high FL promptly recognize risks and opportunities, so FL strengthens the positive association of access to financing with SME growth (Adomako, et al., 2016). Bongomin et al. (2017) and Fatoki (2021) argued that FL helps to manage loans and stocks, increasing the effect of access to financial resources on SME growth.

Other researchers suggested that FL improves an SME's financial performance. FL leads to an improved understanding of the meaning and implications of compound interest rates, inflation, and risk diversification; thus, FL facilitates a more rigorous expectation of the return on investment (Engstrom & Mckelvie, 2017). Anwar et al. (2020) argued that managers with FL make rational decisions, resulting in improved returns on assets, investments, and equity. Hendrawaty et al. (2020) suggested an indirect effect of FL on financial performance through the use of financial information for decision making. Managers with high FL use financial information to evaluate past investments, predict market conditions, and design strategies that enhance their returns on investments. Similarly, FL reduces the traditional financial constraints faced by SMEs, such as loss of revenue, excessive debt, and insufficient cash flow, because managers with high FL have the skills to properly cope with these challenges *(Dahmen & Rodriguez, 2014)*. Adomako and Danso (2014) proved that several moderation effects are associated with the relationship between FL and an SME's financial performance. FL improves debt management; therefore, increased access to financial resources strengthens the link between FL and financial performance. FL also improves financial performance because it facilitates the identification of financial opportunities within markets. In this regard, firms with flexible resources can adapt to market changes. Thus, the identification of financial opportunities facilitated by FL is enhanced if a business is adaptable (e.g., has high resource flexibility) to contextual changes.

Finally, a group of articles measured the effect of FL on financial and nonfinancial performance.[19] Purnomo (2019) has suggested that FL is the most valuable resource of SMEs because it reduces their failures related to poor financial management, improving their likelihood of achieving good financial and nonfinancial performance. Guliman and Uy (2019)1 argued that, in complex markets, FL can support more effective managerial decisions, increasing the financial and nonfinancial performance of the SME. In addition, most of the articles suggested that this relation is mediated by several variables such as financial accessibility, risk-tolerance and risk management practices. Ye and Kulathunga (2019) suggested that FL improves access to and eligibility for financial resources, reducing their financing costs and enhancing financial and nonfinancial performance. Buchdadi et al. (2020) found that managers with FL can access more financial resources than those without FL, allowing them to create a healthy capital structure and improving their SMEs' financial and nonfinancial performance. Likewise, FL facilitates informed judgment of financial risks, increasing individuals' acceptance of financial practices that enhance financial and nonfinancial performance (Buchdadi et al., 2020; Ye & Kulathunga, 2019). Kulatuhunga et al. (2020) argued that FL supports the implementation efficient risk management practices that increase an SME's financial and nonfinancial performance. Specifically, only Meoli et al. (2021) suggested a positive correlation between the level of FL and the survival of SMEs. The authors found that the crowdfunding platforms in which their investors were highly financially literate achieved a longer survival rate.

[19] In particular, Agyapong & Attram (2019) and Ismanto et al. (2020) measured the effect of FL on growth, financial performance and nonfinancial performance.

The results of this subsection are in line with the findings of the studies on personal finance, which proved that FL increases individual performance in terms of rent and wealth (Jappelli & Padula, 2013).

***************INSERT-TABLE 7-ABOUT HERE***************

5. Discussion

In this systematic literature review, we aimed to synthesize the extant research on the antecedents and consequences of FL in the context of SMEs to accumulate knowledge on this issue and provide some guidance for future research avenues. In this section, first, we will provide a synthesis of the findings. We will criticize some of those relations considering that some studies have found potential moderators and interactive effects. Then, we will propose a framework for future studies, which will include suggestions to overcome certain flaws detected in this systematic review.

5.1 Financial literacy, attitudes, behaviors and organizational capabilities

FL refers to financial knowledge and the application of such knowledge. Attitudinal theories of organizational behavior question that knowledge leads directly to performance since behavior is required for performance. For instance, Ajzen's (1991) theory of planned behavior has extensively shown that attitudes toward entrepreneurial behavior precede intentionality and actual entrepreneurial behavior and that these factors lead to performance. Firm performance is strongly dependent on the strategy that a firm has chosen and relies heavily on how well that strategy is deployed. Thus, it is pertinent to address this topic from both approaches to strategy: the industrial organization (IO) and the resource-based view (RBV).

The IO approach essentially explains a firm's performance in relation to the structure-conduct-performance paradigm, in which the results of a firm depend on its strategy –conduct, behavior– and this is shaped by the structure of the industry in which the firm competes (Porter, 1997; 2008). This is particularly relevant in the context of SMEs since the strategic options available to these firms are strongly restricted by industrial forces. With this approach, researchers have a greater chance of identifying mediated and moderated relations between the industry and the firm's performance.

Scholars can also identify such relations from the RBV approach by studying the mediated relations of FL and performance through any of the other FL consequences – attitudes, behavior, organizational capabilities – and the potential moderation of FL on already established relations between FL consequences – in particular, organizational capabilities – and the firm's performance. The RBV approach essentially posits that a firm's performance is dependent on the idiosyncratic combination of resources and capabilities that it chooses to develop its strategy and achieve a competitive advantage (Barney, 1991, 1996, 2001). Furthermore, to achieve an above-average performance, firms are expected to develop organizational capabilities that help dynamically reconfigure that combination based on the firm's environmental dynamics (Eisenhardt & Martin, 2000; Teece et al., 1997). Thus, these organizational capabilities have a direct impact on SME performance.

The remaining question is how the other examined elements–i.e., financial attitudes and behaviors– are involved in the relation between FL and organizational capabilities. According to the IO paradigm, a firm's conduct leads to performance. However, this behavior builds organizational capabilities for a firm to be able to sustain superior performance over time. Consequently, the relation between financial behavior and performance is likely to be mediated by capabilities. For instance, an increase in the use of management accounting systems leads to an increased level of finance accessibility that, ultimately, can facilitate the acquisition of other capabilities such as innovativeness or the capability to internationalize. Furthermore, according to Ajzen's (1991) theory, attitude precedes behavior. However, a high level of FL induces a more positive attitude toward the use of management and accounting systems, which is facilitated because the organization possesses valuable knowledge and can apply it to make better informed decisions.

It is, however, quite unlikely that an SME can improve its performance by simply improving its financial attitude. The behavior as an action is required, and such action should improve certain organizational capabilities. Thus, we recommend that scholars abandon the idea of directly linking FL to SME performance, since there is a high likelihood that a mediation model is applicable to this context.

5.2 Antecedents and consequences of financial literacy

Considering the relationships depicted in Figure 3 and the corresponding results, in the limited literature with this focus, there has been some agreement about what the main antecedents of FL should be (labeled "a" and "b" in the figure), namely education in its widest sense (Abebe et al., 2018; Nitani et al., 2020; Roux & Steyn, 2007) and a group of variables corresponding to the general concept of cultural- and context-specific factors (Agyei, 2018; Rostamkalaei et al., 2019).

Regarding consequences, it seems that some studies have suggested that FL could have a direct relationship with all of the consequences that we identified, namely financial attitudes and behaviors, organizational capabilities, and SME performance. While empirically valid, the main theories about firm management and performance could hardly support some of the direct links tested, indicating an omitted variable bias or spurious relations. In this regard, we suggest that, on the one hand, moderating variables might partially explain some of the inconclusive findings presented in the results section.

On the other hand, the evidence found about mediation relationships reflects the need for more refined models and for a robust examination of both theoretical and empirical operationalization.

These latter issues are particularly relevant in the current -COVID-19 global context since several environmental uncertainties and constraints have arisen. They can also be extrapolated to business incubators and new entrepreneurs who lack financial management skills, since FL is an antecedent of financial attitudes and behaviors and certain organizational capabilities and boosts new venture performance. Capabilities such as innovativeness and the ability to internationalize or increase competitiveness have already been tested in this context; however, additional fine-grained investigations are required to determine whether these observed relations hold for any type of capability– e.g., whether they are different for radical and explorative innovations than they are for exploitative and incremental innovations. Thus, Figure 4 proposes an integrated framework for the study of the impact of FL on SME performance.

****************INSERT-FIGURE 4-ABOUT- HERE****************

5.3 Research agenda to study financial literacy in SMEs:

Based on what we know and what we do not know, we summarized our suggestions to create the research agenda shown in Table 8. Figure 4 shows the proposed framework of relationships that should be considered in future studies of FL in SMEs. In the following, we develop each of the lines in more detail.

5.3.1 Definition and measurement of financial literacy in the context of SMEs

One of the most troubling methodological shortcomings identified in this study is the lack of agreement about the definition of FL in the context of SMEs. Only a few papers have used measures including specific knowledge related to SME financial management (e.g., ability to prepare a financial statement), while most of the reviewed papers used self-reported metrics of perceived level of FL. The previous literature on personal finance demonstrated that the difference between perceived and actual FL is significant and has an impact on individuals' financial decisions (Balasubraiman & Sargent, 2020). Thus, the development of objective measures of FL in SMEs also becomes necessary.

Also, further research should distinguish between the concepts of financial knowledge and FL. Agreement over a common definition of FL will facilitate the development of accurate metrics of FL, but this agreement necessarily implies identifying the main financial decisions made in SMEs and identifying the main components of FL in accordance. In addition, since there is no global standardized definition of SMEs, we recommend that scholars and reviewers alike strictly adhere – and to report it in empirical papers – to an international standard. [20] Not having consistency in the use of this term limits the possibility of properly conducting comparative analyses or evaluating the effects of FL in SMEs.

Additionally, FL is expected to improve the implementation of procedures – rules to be applied – and routines – repetition of procedures over time – that remain in an organization once individuals are excluded and that facilitate learning by shared

[20] In case of the EU, article 2 of the annex within Recommendation 2003/361/EC of the European Commission and the User Guide clearly state that the classification of a firm as an SME is the combination of the number of employees AND annual turnover OR total assets. The annual work unit should be fewer than 250 employees, and annual turnover should not exceed 50 million EUR OR annual balance sheet total should not exceed 43 million EUR. Article 4.2 explains how to compute this information over time since it is required that the conditions be met consistently in at least two of the latest three fiscal exercises, which are particularly relevant in volatile markets. This requirement does not apply if the change is the result of a change in ownership following a merger or acquisition (European Commission, 2015).

experiences within an organization, improving financial decisions over time. Thus, researchers could also advance into the measurement of organizational FL.

5.3.2 Longitudinal and comparative studies

There are also some limitations in terms of setting since the bulk of the examined research was conducted in emerging economies – roughly 65% of the papers that we analyzed correspond to this category. Thus, there is still a lack of longitudinal studies and comparative studies across settings. This means that we do not know what the dynamics of FL are over time and across settings. Time is also relevant because it is quite likely that the performance resulting from today's financial decisions and behaviors is influenced by past decisions and the resultant performance. However, this time-lag autocorrelation is still missing in the longitudinal investigations within this stream of research, although there are some studies that found that both financial decision and management experience precede some of the consequences of FL (Cherotich et al., 2019[1]; *Egbo et al., 2020*), such as the use of financial statements (Ahkthar & Liu, 2018a) and noncash transactions (Citradika et al., 2019).

5.3.3 Antecedents of financial literacy

The settings employed in this stream of literature comprised a very limited sample of countries (i.e., Ethiopia, South Africa, and Ghana vs. the U.S. and Canada). Thus, there is a need to widen the scope of countries examined to address the current variety of cultural settings worldwide, which will enable future comparisons between them. This approach will also facilitate a better understanding of which educational, cultural, and context-specific factors may foster increased levels of FL.

Very few studies have been conducted of the potential differences in FL between industries; indeed, the degree of FL possessed by an individual could depend on the level of competition within his or her industry since there is considerable pressure on firms' financial results when industry munificence is low. Thus, this may foster increased levels of FL that have a positive impact on the consequences of FL. In addition, considering the results of research on personal finance, there is also a need to dig deeper into the gender perspective in the research on FL in SMEs.

5.3.4 Consequences of financial literacy

Additionally, there is a need to extend and clarify the evidence about FL consequences. It could be a confounding effect in the context of FL and the use of management accounting and control systems (MACS). The stream of literature that has studied the effect of MACS on financial decisions has suggested that MACS are a driver of financial decisions. However, in the papers regarding FL on which we based this systematic review, we noticed that FL is a driver of MACS and of financial decisions. Therefore, further research should clarify the roles that FL and MACS play in financial decisions and their subsequent impacts on organizational capabilities, following investigations such as those by Sandino (2007), and Gomez-Conde et al. (2022), which found that the use of MACS influences innovativeness. However, whether the extent of such enhancement is dependent on FL is still an untold story. The same reasoning can be applied to the organizational ability to internationalize (Gomez-Conde & Lopez-Valeiras, 2018). We should emphasize the mediating effect of organizational capabilities on the relationship between FL and SME performance, as well as the potential moderating effect of FL on any of the relationships between the consequences of FL and firm performance. It has already been shown that the effect of context on performance is greater in adverse contexts because such settings improve executives' skills related to making decisions under risky conditions (Bruhn & Zia, 2013); indeed, FL can help individuals cope with such conditions (Ye & Kulathunga, 2019).

Also, we should note that, from the entrepreneurship literature, a number of recent papers have found a negative relationship between entrepreneurial education and the intention to become an entrepreneur (e.g., Oosterbeek et al., 2010), essentially because some students realize the potential risks in starting a business or, as noted in the more refined study of Fretschner and Lampe (2019), because: (a) it helps to prevent some uncertain students from choosing an incorrect career path by providing them with a better informed decision; and (b) it creates a state of uncertainty in initially overly self-confident students who could be successful entrepreneurs later. However, Fretschner and Lampe (2019) also concluded that financial education has a positive effect in the case of uncertain students who are well suited to pursue an entrepreneurial career. Financial literacy can play the same role as entrepreneurship education in those three situations. Consequently, a mediated-moderation or moderated-mediation model seems to offer the greatest potential in terms of boosting SME performance in particularly constrained situations and contexts in which FL interacts with the environment and with its consequences – e.g., when starting a new venture without managerial skills or when operating in contexts of high environmental uncertainty, such when a firm is internationalizing to a distant country, developing radical innovations, or addressing current COVID-19 market restrictions.

Furthermore, to date, the extant studies have mainly examined financial performance indicators and a very limited number of nonfinancial metrics. Thus, the triple bottom line should be considered, and scholars should also add indicators of social and environmental performance. The gender issue and team diversity should also be included in the research agenda since the number of studies addressing the latter has been limited, and very few papers have addressed the gender issue (Kabo, 2021; Nitani et al., 2020; Rostamkalaei et al., 2019).

5.3.5 Behavioral economics perspective

The fifth orientation of the research agenda[21] addresses the higher level of the underlying assumptions presented in FL research in SMEs thus far. The neoclassical orientation is latent in previous empirical work, assuming that managers' financial decisions are rational and contingent on cultural, contextual, and temporal factors of the decision task, the individual, and the SME environment. However, this approach ignores that decision makers might rely on heuristics and biases,[22] which can cause them to make systematic errors in judgment. FL is not immune to this risk; Lusardi and Mitchell (2011a) recognized that the intertwined relationships around how individuals process financial information make it difficult to isolate the true effect of FL from interactions with individuals' psychological characteristics. Thus, a behavioral economics approach could help to effectively analyze the uncovered lines of study that we suggested in our research agenda by extending the current evidence on the antecedents and consequences of FL in SMEs. For example, consistent with prior research (see Dijksterhuis et al., 2006), the complexity of the financial decision (e.g., the number of financial variables involved in the decision and/or the type of causal relationships between these variables and the optimal decision) could be associated with the presence of biases and the use of heuristics. Another factor that could also be associated with heuristics is the pressure for a quick response. This problem could be particularly relevant in the COVID-19 context, in which many SMEs have experienced in a very short period of time substantial changes in their revenue sources and therefore have faced urgency with respect to financial decision-making.

[21] We thank one of the reviewers for encouraging us to go beyond this work and include this approach.
[22] Kahneman and Tversky (1974) defined this heuristic as a mental shortcut for making frequency or probability judgments based on “the ease with which instances or occurrences can be brought to mind”. For a more detailed discussion of heuristics and biases, see Appendix 4.

****************INSERT-TABLE 8-ABOUT- HERE****************

6. Conclusion

The purpose of this article was to synthesize the antecedents and consequences identified in the existing studies on the impact of FL in the SME context to establish a framework of the extant research in this field and to propose a research agenda. Several literature syntheses have already been developed in the context of personal finance management (e.g., Huston, 2010; Hung et al., 2009; Lusardi & Mitchell, 2014). However, a synthesis of the antecedents and consequences of FL in SMEs has not yet been provided.

Our review of 71 empirical papers facilitated the identification of the antecedents and consequences of FL in SMEs. As already established in the context of personal finance, research on the SME context was mainly conducted in developing countries. FL is a key factor that influences SME performance in contexts of high uncertainty and instability. Thus, regarding the suggestions of the Organization for Economic Cooperation and Development (OECD) (2018), policymakers should continue encouraging FL training programs for entrepreneurs, managers and founding team members because FL is a critical factor in terms of managing SME organizations in difficult scenarios.

Specifically, our article contributes to the small business research on management, accounting, and finance. Our findings showed that educational, cultural and specific contextual factors increase FL. Moreover, we showed that FL has several consequences in the context of SMEs, such as financial attitudes, financial behaviors, organizational capabilities and organizational performance. We also noticed that some studies failed to test moderating and mediating variables, which should be included in a future research agenda; at a minimum, scholars should solidify theoretical arguments for the main relations that they explore. The framework that we proposed indicates that FL may interact with financial attitudes, behaviors, and organizational capabilities in their relationships with SME performance. We also provided theoretical arguments against a direct relationship between FL and performance, and we argued that the relationship between FL and organizational capabilities should be bridged, possibly through financial attitude and behavior – i.e., the use of management accounting and control systems. Therefore, we propose a future research agenda that could help to clarify certain under-researched lines of inquiry: a conceptualization of FL in SMEs; bounded methodology; an extension of the evidence about several of the antecedents and consequences of FL in the context of SMEs; and the appropriateness of the behavioral economics approach to disentangle the interaction of FL with the suggested variables and to separate cognitive bias from what is expected to be the normative *rational* behavior.

Finally, we recognize some limitations to this systematic review. First, we acknowledge the limited number of sampled articles. Nevertheless, the study of the role of FL at the organizational level is a still growing research area, yet an integration of the current knowledge of FL in the context of SMEs is needed because of the fragmentation observed. The current disagreement about the measures of FL and the lack of connections between the antecedents and consequences of FL in SMEs could limit investigations of such relevant factors for SMEs' success, particularly in uncertain times. This limitation is especially applicable to the coronavirus pandemic period, which began in March 2020, since it placed SMEs under dangerous financial stress that FL can help them to manage. We should consider that FL has been particularly helpful in unfavorable contexts, such as emerging economies, so it is very likely to be helpful during major crises. Additionally, our review encompassed only empirical articles published in English journals and indexed in either the Web of Science or Scopus database, and a few additional articles were drawn from a review of the cited references of these documents. This approach could have excluded other relevant papers and pieces of scientific inquiry. However, the employed databases are among the most reputed in any field (López-Duarte et al., 2016); therefore, we analyzed the core of this existing research, and additional investigations are unlikely to add further information.

In summary, FL is very likely to play a mediating and moderating/interactive role in explaining the antecedents of SME performance in conjunction with financial attitudes, behaviors, and organizational capabilities. These issues are crucial and should be investigated in longitudinal studies.

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Appendix

Appendix 1: The systematic review's search strategy

"financial literacy*" OR "financial education*" OR "financial knowledge*" OR "financial understanding*" OR "financial skills*" OR "financial capabilities*" OR "financial awareness*" OR "financial abilities*" OR "financial attitudes*" OR "financial behavio(u)rs*" AND "small business*" OR "small and medium-size enterprise*" OR "SME*" OR "medium-sized enterprise*" OR "small enterprise*" OR "medium enterprise*" OR "small firm*" OR "medium-sized firm*" OR "small company*" OR "medium-size company*" OR "start-up*" OR "start-up*" OR "entrepreneur*".

Appendix 2: List of articles that do not operationalize financial literacy as financial knowledge

Anderson, J. S., & Rajesh, C., & Bilal, Z. (2018). Pathways to profits: The impact of marketing vs. finance skills on business performance. *Management Science,* 64(12), 5559–5583.

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Appendix 4. Study of the impact of FL on SME's performance from the behavioral economics and decision-making perspectives

In the fifth line of our research agenda, we claim that a behavioral economics approach could extend our knowledge about FL and its relationship with the organizational and individual environment, financial attitudes, behaviors, organizational capabilities and performance. In behavioral economics, much of the literature has argued that decision makers rely on heuristics that cause them to make systematic errors in judgment. A heuristic is any shortcut used to decide based on prior experiences. It contrasts with the formal logical process that conforms to the norms of statistical inference. The use of heuristics has been associated within errors in judgment, known as cognitive biases, which eventually can transform into to poor decisions.

In contemporary research on decision making, economists and psychologists alike have acknowledged the intervention of two cognitive systems in the Dual Process Theory (Evans & Stanovich, 2013). One is the fast, unconscious, automatic, effortless, emotional and immediate response to perception yielded by the System 1, which is fed by experiential knowledge and is labeled as intuition. The other is the conscious, effortful, rule-governed and controlled reasoning of System 2, which is fed by analysis and is so labeled. System 1 is more prone to cognitive biases because of its immediacy and automatic response to a stimulus (see the example of the ball and bat cost in Frederick, 2005, the widely known biases stemming from framing, or anchoring among many others as reported by Kahneman et al., 2011). System 2 is controlled by rules and analysis, which could protect against these potential biases up to a point. However, there are situations in which several stressors call for an immediate response, which entails the intervention of System 1 (see examples in internationalization in Vlačić et al., 2021). The question is how we can combine both ideas fruitfully to avoid the perils of cognitive biases without losing the ability to make financial decisions quickly and safety.

In particular, we advocate for the combination of the two main schools of thought regarding how individuals make decisions. These schools are the heuristic-biases (HB) and naturalistic decision-making (NDM) – see Kahneman and Klein (2009) for a detailed discussion of both approaches. There has already been a call in the study of management to create a more complete picture of managerial decisions effectiveness, in which both analysis and intuition should be combined because of the rapid rate of change of current organization environments (Dane & Pratt, 2007).

HB translated to study FL in SMEs would mean that financial intuition cannot be trusted since it is more prone to cognitive biases, whereas the NDM would rely heavily on certain financial heuristics, with particular attention to fast-and-frugal heuristics as an adaptive toolbox (Gigerenzer and colleagues, such as Gigerenzer & Gaissmaier, 2011). Even a well-trained intuition could outperform analysis in situations in which the number of features to considered is very high or the products are complex (see Dijksterhuis et al., 2006), a characteristic that financial products meet.

These streams agree in what they disagree about. Scholars within the NDM stream have stated that fast-and-frugal heuristics can be trusted and accommodate uncertainty in quickly changing scenarios in which past observations cannot predict the future sufficiently accurately because the effect sizes have changed dramatically. Scholars within the approach of HB have claimed that intuitive judgments are more prone to cognitive biases and lead to wrong decisions most of the time, so tools for a careful analysis are required to avoid such biases. This belief does not mean that all of the heuristics are bad and more prone to biases but those that strongly trust experiential knowledge or expert intuition acquired too quickly or that occur in non-valid contexts,[24] and they are then applied in a different context – although the decision-maker might wrongly judge that both contexts are similar. A research program from these approaches should enable the distinction of what is to be considered as rational – normative[25]– financial behavior in SMEs depending on the context and the time – which should include how expectations are formed and the role that FL might play on it. We should acknowledge that behavioral biases are pervasive in personal finance investigations of FL (Altman, 2012). However, a remaining question regards the benchmark is of what is to be considered as rational choices and behaviors in financial economics when it comes to FL and SMEs, as well as that FL interacts with the environment through cognitive biases. Empirically, we call for more attention to the use of machine learning algorithms, which are very likely to imbue research in decision making, as is happening in management journals to predict other instances (e.g. Choudhury et al., 2021; Leavitt et al., 2021), in which a fast-and-frugal algorithm is trained over time and can learn from and adapt to these changing conditions to accommodate uncertainty and biases in prediction.

[24] A valid context is defined as one in which the clues are clear and unambiguously lead to a certain decision. Additionally, Kahneman claimed that learning from experience is very slow since it requires a certain time from when the intuitive-based decision is made, and it produces a certain outcome, so the decision maker can realize all of the internal processes and clues that lead to such a decision. Financial markets seem far from being considered a valid context since they are very volatile.

[25] We should emphasize the idea that rationality means *to behave as the theory predicts one should behave*, so any deviation could be considered a nonrational or even an irrational behavior. Simon (1987) distinguished rational decision making as decision making that is consciously analytic, nonrational decision making as intuitive and judgmental decision making and irrational decision making as behaviors that respond to emotions or that deviate from action chosen "rationally". Kahneman (1994: 18–19) stated that technical discussions of rationality are about *"an individual's beliefs and preferences are said to be rational if they obey a set of formal rules such as complementarity of probabilities, the sure thing principle or independence of irrelevant alternatives".* In academic instances, rationality *"asks whether beliefs are grossly out of kilter with available evidence, and whether decisions serve or damage the agent's".*

Tables

Table 1: Concepts associated with financial literacy in the context of personal finance

CONCEPT	LABELS	MEANING
Financial education	Financial education	Process that improves an individual's understanding of financial terms, financial products, and services (Hung et al., 2009).
Financial knowledge	Financial knowledge Financial understanding	Knowledge of basic financial concepts (Huston, 2010).
Application of financial knowledge	Financial skills Financial capabilities Financial abilities Financial awareness	Individual ability to apply financial knowledge (Huston, 2010), an understanding of the consequences caused by financial decisions (e.g., making a loan) or financial activities (e.g., budgeting) in terms of rent and wealth (Atkinson & Messy, 2011) and the necessary skills for engaging in financial activities (e.g., establishing or keeping a budget) (Lusardi & Mitchell, 2014).
Financial attitudes	Financial attitudes	Individuals' biases (e.g., risk aversion) towards financial activities (Atkinson & Messy, 2011).
Financial behaviors	Financial behaviors	Financial practices (e.g., save) that improve rent and wealth (Huston, 2010).

Source: Based on Atkinson & Messy, 2011; Hung et al., 2009; Huston, 2010.

Table 2: Financial literacy measures in SMEs

			FL DIMENSIONS				
N°	**Authors**	**Year**	**FE**	**FK**	**APP**	**FA**	**FB**
1	Abebe et al.	2018		X	X		
2	Adomako & Danso	2014		X	X		X
3	Adomako et al.	2016		X	X		X
4	Agabalinda & Isoh	2020		X	X		
5	Agyapong & Attram	2019		X	X		
6	Agyei	2018		X	X		
7	Agyei et al.	2019		X	X		
8	Akhtar & Liu	2018a		X	X		
9	Akhtar & Liu	2018b		X	X	X	
10	Al Issa et al.	2019		X	X		
11	Anwar et al.	2020		X	X		X
12	Aymen et al.	2019		X	X		
13	Belas et al.	2018		X			
14	Bilal et al.	2021		X		X	
15	Bongomin et al.	2017		X	X		X
16	Bruhn & Zia	2013		X	X		
17	Buchdadi et al.	2020	X	X	X		X
18	Burchi et al.	2021		X	X		
19	Cherotich et al.	2019		X			
20	Citradiika et al.	2019		X	X		
21	Ćumurovic & Hill	2018		X	X		
22	*Dahmen & Rodriguez*	2014		X	X		X
23	*Egbo et al,*	2020		X	X		
24	*Ekanem*	2013		X	X		
25	Engstrom & McKelvie	2017		X	X		
26	Eniola & Entebang	2017		X	X	X	
27	Fatoki	2021		X	X		X
28	*Fong et al.,*	2007		X			
29	Guliman & Uy	2019		X			
30	*Halabi et al.*	2010		X	X		
31	Hendrawaty et al.	2020		X	X		X
32	Hossain	2020		X	X		
33	Hossain et al.	2020		X	X		
34	*Hussain et al,*	2018		X	X		X
35	Illmeyer et al.	2017		X	X		
36	Iramani et al.	2018		X	X		X
37	Ismanto et al.	2020		X			
38	*Isle et al.*	2018		X	X		X
39	Jayawarna et al.	2011		X	X		
40	Kabo	2021		X	X		
41	Koropp et al.	2013a		X			
42	Koropp et al.,	2013b		X			
43	Kulathunga et al.	2020		X	X		X
44	Liu et al.	2020		X	X		
45	Mabula & Ping	2018a		X	X		X

Table 2 (continued): Financial literacy measures in SMEs

46	Mabula & Ping	2018b		X	X		X
47	Maes et al.	2005		X			
48	Meoli et al.	2021		X	X		
49	*Munyuki & Jonah*	2021		X	X		
50	Nitani et al.	2020		X	X		
51	Nkundabanyanga et al.	2014		X	X		
52	Nohong et al.	2019		X	X		X
53	Oggero et al.	2020		X	X		
54	Pahlevi et al.	2020		X	X		
55	Pérez de Lema et al.	2021		X	X		X
56	Purnomo	2019		X	X		
57	Rahim & Balan	2020		X		X	X
58	Resmi et al.	2021		X	X		
59	Riepe et al.	2020		X	X		
60	Rostamkalaei et al.	2019		X	X		
61	Roux & Steyn	2007		X	X		
62	Sayinzoga et al.	2016		X	X		
63	Shah et al.	2020		X	X		X
64	Tian et al.	2020		X	X		
65	Tuffour et al.	2020		X	X	X	
66	Wahyono & Hutahayan	2020		X	X		
67	Wongso et al.	2020		X	X	X	X
68	Yang et al.	2018		X	X		X
69	Ye & Kulathunga	2019		X	X		X
70	Ying et al.	2019		X	X		X
71	*Zakic et al.*	2017	X	X			X

*** Italics: qualitative study. FE: Financial education; FK: Financial knowledge; APP: Application of financial knowledge; FA: Financial attitudes; and FB: Financial behaviors.**

Table 3: Main features of the articles included in this review

Publication Data [a]	**Data Collection Method [b]**	**Sample Size**	**Data Analysis Method [c]**	**Country**
1. Abebe et al., (2018), JAE	Survey (E)	515	ANCOVA	Ethiopia
2. Adomako & Danso (2014), JMOS	Survey (E)	201	OLS and 2SLS	Ghana
3. Adomako et al., (2016), VC	Survey (E)	201	HRM	Ghana
4. Agabalinda & Isoh (2020), IJABE	Survey (O)	384	PLS-SEM	Uganda
5. Agyapong & Attram (2019), JGER	Survey (E)	132	SEM	Ghana
6. Agyei (2018), CEF	Survey (E)	300	OLS, LRM, TE	Ghana
7. Agyei et al., (2019), PPP	Survey (E)	300	OLS	Ghana
8. Akhtar & Liu (2018), JABR	Survey (E)	94	LRM	Pakistan
9. Akhtar & Liu (2018), JPAG	Survey (E)	275	PLS-SEM	Pakistan
10. Al Issa et al., (2019), PJMS	Survey (E)	273	PLS-SEM	Malaysia
11. Anwar et al., (2020), JSSI	Survey (E)	232	SEM	Pakistan
12. Aymen et al., (2019), PJMS	Survey (O)	217	PLS-SEM	Iraq
13. Belas et al., (2018), TEDE	Survey (E)	352	SEM	Czech Republic
14. Bilal et al., (2021), JOAFBE	Survey (E)	148	PLS-SEM	Pakistan
15. Bongomin et al., (2017), RIBS	Survey (O)	169	HRM	Uganda
16. Bruhn & Zia (2013), JDE	Field Experiment, survey and archival data (E)	297	OLS	Bosnia
17. Buchdadi et al., (2020), AAF	Survey (E)	71	PLS-SEM	Indonesia
18. Burchi et al., (2021), SUS	Archival Data (O)	51650	OLS	30 OECD countries
19. Cherotich et al., (2019), JADEE	Survey (E)	384	PRM	Kenya
20. Citradiika et al., (2019), IJBS	Survey (O)	99	PLS-SEM	Indonesia
21. Ćumurovic & Hill (2018), JCA	Archival Data (O)	1039	PRM	Germany
22. Dahmen & Rodriguez (2014), NUM	Interview and archival data (E)	14	CA	The U.S.A.
23. Egbo et al., (2020), AI	Interview (E)	20	CA	Nigeria
24. Ekanem (2013), IJCS	Interview (E)	50	CA	United Kingdom
25. Engstrom & McKelvie (2017), ISBJ	Survey and archival data (E)	739	OLS	Ecuador

Table 3 (continued): Main features of the articles included in this review

26. Eniola & Entebang (2017), GBR	Survey (E)	250	PLS-SEM	Nigeria
27. Fatoki (2021), WTBE	Survey (E)	175	HRM	South Africa
28. Fong et al., (2007), JECD	Interview (E)	6	MGT	The U.S.A.
29. Guliman & Uy (2019), DBER	Survey (E)	384	PLS-SEM	Filipinas
30. Halabi et al., (2010), QRAM	Interview (E)	10	CA	Australia
31. Hendrawaty et al., (2020), BSD	Survey (E)	301	SEM	Indonesia
32. Hossain (2020), JSBS	Survey (E)	407	PLS-SEM	Bangladesh
33. Hossain et al., (2020), JSBS	Survey (E)	407	PLS-SEM	Bangladesh
34. Hussain et al., (2018), SMED	Interview (E)	37	CA	United Kingdom
35. Illmeyer et al., (2017), ESI	Survey (O)	118	MRA	Austria
36. Iramani et al., (2018), IJEED	Survey (E)	399	LGRM	Indonesia
37. Ismanto et al., (2020), GM	Survey (E)	35	SEM	Indonesia
38. Isle et al., (2018), ATTA	Interview (O)	23	Delphi technique	Australia
39. Jayawarna et al., (2011), ERD	Survey (E)	211	OLS and BLR	United Kingdom
40. Kabo (2021), EMEBJ	Archival data (E)	8500	CR	The U.S.A.
41. Koropp et al., (2013), JSBM	Survey (E)	280	MRA	Germany
42. Koropp et al., (2013), SBE	Survey (E)	187	BLR	Germany
43. Kulathunga et al., (2020), IJ	Survey (E)	319	SEM and VAF	Sri-Lanka
44. Liu et al., (2020)	Archival data (E)	3307	MRA	China
45. Mabula & Ping (2018), JACS	Survey (E)	311	PLS-SEM, and ST	Tanzania
46. Mabula & Ping (2018), JACS	Survey (E)	311	PLS-SEM, and ST	Tanzania
47. Maes et al., (2005), SBE	Survey and archival data (E)	218	SEM	Belgium
48. Meoli et al., (2021), CGIR	Archival data (O)	432	WM	37 OECD countries
49. Munyuki & Jonah (2021), JEEE	Interview (E)	35	CA	South Africa
50. Nitani et al., (2020), JSBM	Archival data (E and O)	12,687	PR	United States
51. Nkundabanyanga et al., (2014), IJSE	Survey (E)	384	SEM	Uganda
52. Nohong et al., (2019), ES	Survey (O)	60	PLS-SEM	Indonesia
53. Oggero et al., (2020), SBE	Archival Data (O)	26,032	LPM	Italy

Table 3 (continued): Main features of the articles included in this review

54. Pahlevi et al., (2020), IJICC	Survey (E)	30	PLS-SEM	Indonesia
55. Pérez de Lema et al., (2021), TIS	Survey (E)	310	SEM	Spain
56. Purnomo (2019), EC	Survey (E)	375	HRM	Indonesia
57. Rahim & Balan (2020), IJBS	Survey (E)	300	PCT	Malaysia
58. Resmi et al., (2021), JAFEB	Survey (E)	210	SEM	Indonesia
59. Riepe et al., (2020), JSBM	Archival data (E and O)	726	PRM	Europe
60. Rostamkalaei et al., (2019), JSBM	Archival data (E and O)	3790	PRM	Canada
61. Roux & Steyn (2007), EMS	Field experiment, survey and open questions (E)	100	PC, ANOVA and CA	South Africa
62. Sayinzoga et al., (2016), RES	Field experiment, survey and archival data (E)	279	PLS, 2LS and ANCOVA	Rwanda
63. Shah et al., (2020), MDE	Survey (E)	209	PLS-SEM	Pakistan
64. Tian (2020), PBFJ	Survey (E)	2955	IVE	China
65. Tuffour et al., (2020), GBR	Survey (E)	200	PLS-SEM	Ghana
66. Wahyono & Hutahayan (2020), APM	Survey (O)	94	SEM	Indonesia
67. Wongso et al., (2020), IJST	Survey (E)	170	SEM	Indonesia
68. Yang et al., (2018), JRFM	Survey (E)	304	SEM	Pakistan
69. Ye & Kulathunga (2019), SUS	Survey (E)	291	SEM	Sri-Lanka
70. Ying et al., (2019), SUS	Survey (E)	384	SEM	Pakistan
71. Zakic et al., (2017), EOA	Interview and open questions (E)	30	CA	Serbia

[*]**Italics: Indicates a qualitative study, whereas the remaining articles use a quantitative design, except for the study of Roux & Steyn (2007), which combines both designs.** [a] **Full journal names are in Appendix 3.** [b] **Survey respondent in parenthesis: (E); entrepreneur, (O); other sources.** [c] *BLR: Binary logistic regression model, CA: Content analysis, CR: Cox proportional hazard regression model, HRM: Hierarchical regression model, IVE: Instrumental variables estimation, LGRM: Logistic regression model, LPM: Linear probability model, LRM: Logit regression model, LT: Levene' s test, MGT: Modified grounded theory, MRA: Multiple regression analysis, O-B: Oaxaca- Blinder model, OLS: Ordinary least squares, PCT: Pearson's chi-square test results, PLS: Partial least squares, PR: Poisson regression, PRM: Probit regression model, SEM: Structural equation model, 2SLS: Two stages least squares, ST: Sobel test, TE: Tobit estimation, VAF: Variance accounted for value, WM: Weibull proportional hazard model fitted.*

Table 4: Financial literacy's effect on financial attitudes

FINANCIAL ATTITUDES
• Attitudes towards the use of practices that can be employed when facing bankruptcy *(Ekanem, 2013).*
• Attitudes towards the use of noncash transactions (Citradika et al., 2019). **(+), (d)**
• Attitudes towards the use of debt *(Ekanem, 2013).* (Koropp et al., 2013a). **(+), (d)**
• Financial risk-tolerance (Ye & Kulathunga, 2019). **(+), (d);** (Buchdadi et al., 2020). **(+), (d);** (Liu et al., 2020). **(+), (d)**
• Loss-aversion (Riepe et al., 2020). **(+), (d)**

*** Italics: Indicates a qualitative study. Quantitative studies: (+) positive effect, (-) negative effect, and (d) direct effect.**

Table 5: Financial literacy's effect on financial behaviors

FINANCIAL BEHAVIORS

Use of MACS

- Cash flow management practices *(Egbo et al., 2020); (Isle et al., 2018).*
- Calculation of costs, use of financial statements and recording practices (Ismanto et al., 2020). **(+), (d)**
- Risk management practices (Kulathunga et al., 2020). **(+), (d);** (Mabula & Ping, 2018a). **(+), (d);** (Tian et al., 2020). **(+), (d)**
- The association of FL with risk management practices is mediated by capital structure [a] (Nohong et al., 2019). **(+), (i)**
- The use of financial information *(Halabi et al., 2010).*
- The use of financial statements (Akhtar & Liu, 2018a). **(+), (d)**

Financing decisions

- Capital structure (Nohong et al., 2019). **(+), (d)**
- Financial bootstrapping (Jayawarna et al., 2011). **(-), (d)**
- High-cost, short-term financing sources [b] (Nitani et al., 2020). **(-), (d)**
- The use of debt for financing SMEs (Koropp et al., 2013b). **(+), (d)**
- The use of family funds and internal finances *(Ekanem, 2013).*

Investment decisions

- Entrepreneur's preparedness for retirement [c] **(**Agabalinda & Isoh, 2020). **(+), (d)**
- New income activities (Sayinzoga et al., 2016). **(+), (d)**
- Saving (Abebe et al., 2018). **(+), (m) [The positive effect of FL on savings only occurs when entrepreneurs receive a reminder [d]];** (Cherotich et al., 2019). **(+), (d);** Pahlevi et al., (2020). **(+), (d);** (Sayinzoga et al., 2016). **(+), (d)**

*** Italics: qualitative study. Quantitative studies: (+) positive effect, (-) negative effect, (d) direct effect, (i) indirect effect, and (m) moderation effect.**

[a] The use of profits, savings, and debt as additional capital among SMEs.

[b] The use of payday loans, rent-to own facilities, auto-title loans, and pawn borrowing.

[c] The construct is composed of three items: savings and investments planned for retirement, information about retirement products, and perceived importance of retirement plans.

[d] A text message with financial information was sent by the organization that conducted the field experiment to the mobile phones of the participating entrepreneurs. In this message, the relevance of savings to the financial viability of each venture was reinforced.

Table 6: Financial literacy's effect on organizational capabilities

ORGANIZATIONAL CAPABILITIES

Abilities

- Entrepreneur's degree of satisfaction with their financial capacities [a] (Agyei et al., 2019**). (+), (d)**

- Entrepreneurship (Al Issa et al., 2019). **(+), (d);** (Bilal et al., 2021). **(+), (d);** (Burchi et al., 2021). **(+), (d);** (Ćumurovic & Hill, 2018). **(+), (d);** (Kabo, 2021). **(+), (m) [The positive effect of FL on entrepreneurship only occurs in older individuals];** (Oggero et al., 2020). **(+), (m) [The positive effect of FL on entrepreneurship only occurs in male entrepreneurs];** (Riepe et al., 2020). **(+), (m) [The positive effect of loss-aversion on entrepreneurship increases as financial literacy increases];** (Wongso et al., 2020). **(+), (d)**

- The ability to manage credit risk (Belas et al., 2018). **(+), (d)**

- The ability to manage business and human resources *(Egbo et al., 2020)*.

Innovativeness

- Innovation support [b] (Illmeyer et al., 2017). **(+), (d)**

- The association of FL with innovation support is mediated by financial risk-tolerance (Liu et al., 2020). **(+), (i)**

- The association of FL with innovation support is mediated by finance accessibility (Tian et al., 2020). **(+), (i)**

- The association of FL with technological innovation [c] is mediated by alleviating financial problems (Pérez de Lema, et al., 2021). **(+), (i)**

- The level of development of process, product, marketing, and organizational innovations (Shah et al., 2020). **(+), (d)**

Finance accessibility [d]

- Access to bank and trade credit (Fatoki, 2021). **(+), (d)**

- Access to major external financing channels during the last three years: bank loans, bank acceptance bills, commercial acceptance bills, and bond financing (Tian et al., 2020). **(+), (d)**

- Ease of obtaining funds from financial institutions and the cost associated with their acquisition (Mabula & Ping, 2018b). **(+), (d)**

- Financial services provided by banks (Bongomin et al., 2017). **(+), (d);** (Ye & Kulathunga, 2019). **(+), (d)**

- Perceived level of finance accessibility in comparison with that of competitors (Buchdadi et al., 2020). **(+), (d)**

Table 6 (continued): Financial literacy's effect on organizational capabilities

- Total amount of funds obtained from financial institutions and frequency of access to this external financing (Nkundabanyanga et al., 2014). **(+), (d)**

Competitiveness [e]

- Number of sources of Porter's competitive advantages the firm possesses [f] (Yang, et al., 2018). **(+), (m) [The positive effect of risk management practices on Porter's competitive advantages increases as financial literacy increases]**

- Resource acquisition [g] (Ying, et al., 2019). **(+), (d)**

- The association of FL with competitiveness [h] is mediated by capital structure (Nohong, et al., 2019). **(+), (i)**

International capability

- The association of FL with the level of a firm's participation in an international free trade zone is mediated by both marketing and organizational innovations (the China-Pakistan economic corridor) (Shah et al., 2020). **(+), (i)**

*** Italics: qualitative study. Quantitative studies: (+) positive effect, (-) negative effect, (d) direct effect, (i) indirect effect, and (m) moderation effect.**

[a] Perceived ability to meet current expenses from current income, save, maintain debt at sustainable levels, deal with financial problems, and general satisfaction with their financial condition.

[b] Ilmeyer et al. (2017) assessed this factor as R+D investment, technology support and the pursuit of innovative ideas; Tian et al. (2020) measured it as total R+D expenditure; Lui et al. (2020) evaluated it as the logarithm of R+D investment, R+D investment per asset, number of innovations developed and income from innovations.

[c] The number of products, services, and process changes introduced per year, the pioneer character of each new product, service, or process change, and the speed of response to each new product, service, or process change by competitors.

[d] Some articles do not specify how access to finance is measured. *(Fong* et al., *2007).* (+), (d); *(Hussain* et al., *2018).* (+), (d).

[e] Resmi et al., (2021) do not specify how competitiveness is measured. (+), (d).

[f] A combination of items that measure cost leadership (four items) and differentiation (four items) strategies.

[g] An SME's capability to obtain tangible and intangible external and internal resources.

[h] An SME's capability to deliver products on time in comparison with their competitors, to respond to their competitors' new ideas and to increase efficiency.

Table 7: Financial literacy's effect on SME performance

SME PERFORMANCE [(a)]

SME growth

- Increases in number of employees, market share and sales in comparison with competitors. (Adomako, et al., 2016). **(+), (m) [the positive effect of financial accessibility on SMEs' growth increases as financial literacy increases]**
- Increases in profitability, turnover and market share (Fatoki, 2021). (**+), (d), (m) [the positive effect of financial accessibility on SMEs' growth increases as financial literacy increases]**
- Increases in sales (Agyapong & Attram, 2019). (**+), (d)**
- Increases in sales and assets in comparison with competitors (Bongomin et al., 2017). (**+), (d), (m) [the positive effect of financial accessibility on SMEs' growth increases as financial literacy increases]**
- Increases in sales and profits in comparison with their expectations (Iramani et al., 2018). (**+), (d)**
- Increases in sales, assets, profit, and capital (Hossain et al., 2020). **(+), (d)**
- Increases in sales, assets, profit, capital, employees, market share and satisfied customers (Hossain, 2020). **(+), (d), (m) [the positive effect of financial literacy on SMEs' growth increases as government support increases [b]]**
- Productivity growth (Mabula & Ping, 2018b). (**+), (d)**
- The association of FL with increases in sales and in the number of employees are mediated by the use of MACS (Ismanto et al., 2020). **(+), (i)**

SME financial performance

- Cost efficiency and profit margin (Agyapong & Attram, 2019). (**+), (d)**
- Current-year ROE, ROA, and ROI in comparison with those of the three previous years (Anwar et al., 2020). **(+), (d)**
- Current-year sales in comparison with that of the previous year and perceived financial performance in comparison that of with competitors (Purnomo, 2019). (**+), (d)**
- Financial problems [c] (*Dahmen & Rodriguez*, 2014). **(-), (d)**
- Profit margin in comparison with competitors (Cherotich, et al., 2019). (**+), (d)**
- Profitability in comparison with their expectations (Rahim & Balan, 2020). **(+), (d)**
- Profitability in relation to sales (Guliman & Uy, 2019). (**+), (d)**
- Profits, revenues and sales (Tuffour et al., 2020). **(+), (d)**
- ROA (Adomako & Danso, 2014). **(+), (d), (m) [the positive effect of financial literacy on SMEs' financial performance increases as finance accessibility and resource flexibility increase];** (Engstrom & Mckelvie, 2017). **(+), (d)**

Table 7 (continued): Financial literacy's effect on SME performance

- ROI (Engstrom & Mckelvie, 2017). (+**), (d)**

- The association of FL with ROI is mediated by financial information in the decision-making process (Hendrawaty et al., (2020). **(+), (i)**

- The association of FL with operational costs, ROI, and profit in relation to sales is mediated by risk management practices, financial risk-tolerance, and finance accessibility (Kulathunga et al., 2020). **(+), (i);** (Ye & Kulathunga, 2019). **(+), (i)**

- The association of FL with the likelihood of breaking even and on operating costs is mediated by financial risk-tolerance and finance accessibility (Buchdadi et al., 2020). **(+), (i)**

- The association of FL with the profitability of total assets is mediated by the use of MACS (Ismanto et al., 2020). **(+), (i)**

Nonfinancial performance of SMEs

- Customer and employee satisfaction, market size and brand loyalty (Tuffour et al., 2020). **(+), (d)**

- Market share in comparison with competitors (Agyapong & Attram, 2019). (+**), (d);** (Guliman & Uy, 2019). **(+), (d).**

- Number of awards received and entrepreneur's level of satisfaction with business activities (Purnomo, 2019). (+**), (d)**

- The association of FL with customer satisfaction, the level of employees' alignment with firms' vision and mission and perceived response to market demand are mediated by financial risk-tolerance and finance accessibility (Buchdadi et al., 2020). **(+), (i)**

- The association of FL with perceived response to market demand, product, and service delivery time are mediated by risk management practices, financial risk-tolerance, and finance accessibility (Kulathunga et al., 2020). (+**), (i);** (Ye & Kulathunga, 2019). (+**), (i)**

Survival of SMEs

- Survival of crowdfunding platforms (Meoli et al., 2021). **(+), (d), (m) [the positive effect of financial literacy on the survival of SMEs increases as voting rights increase and decreases as value-added services increase]**

*** Italics: qualitative study. Quantitative studies: (+) positive effect, (-) negative effect, (d) direct effect, (i) indirect effect, and (m) moderation effect.**

[a] Some articles do not specify how an SME's performance is measured. (Agyei, 2018). (+), (d); (Akhtar& Liu, 2018b). (+), (d); (Aymen et al., 2019). (+), (d); *(Egbo et al., 2020)*; (Eniola & Entebang, 2017). (+), (d); *(Fong* et al., *2007)*; *(Hussain* et al., *2018)*; *(Munyuki & Jonah, 2021)*; Wahyono & Hutahayan (2020). (+), (d); (Wongso et al., 2020). (+), (d); *(Zakic* et al., *2017*).

[b] Support received by managers from governments (adequate infrastructure, license and registration requirements, tax incentives, friendly policies, law and order, skill training programs, relevant information, and the creation of business environments).

[c] Loss of revenue, excessive debt, and insufficient cash flow.

Table 8: Future research agenda

LINE	KEY POINTS
1. Definition and measurement of financial literacy in the context of SMEs.	• Conceptualize FL in SMEs. • Develop objective measures of FL in SMEs • Develop metrics of organizational FL.
2. Longitudinal and comparative studies.	• Use complex settings to compare results among different years and countries.
3. Antecedents: extend evidence about the implications of various cultural factors and specific contextual factors to the topic of financial literacy.	• Test the effects of financial decision experience and other specific contextual factors on FL. • Evaluate the specific context of SMEs and various macro-environment variables as drivers of FL.
4. Extend and clarify the evidence about certain consequences of financial literacy.	• Test whether FL and MACS are substitutive or complementary variables in financial decisions. • Clarify the relations between FL and organizational efficiency, uncertainty management and innovation. • Determine if FL enhances the effects of other variables on SME performance. • Prove the existence of a mediated/moderated relation between FL and SME performance through other FL consequences. • Study the impact of financial literacy on other dimensions of the triple bottom line (social and environmental performance)
5. Study the impact of FL on SMEs' performance from the behavioral economics perspective.	• Identify the impact of FL in the relationship between rational financial heuristics on SMEs' performance and the contexts in which each heuristic performs its best. • Evaluate how cognitive biases can affect the relationship between FL and SME performance