

Article

# How Does Financial Literacy Promote Sustainability in SMEs? A Developing Country Perspective

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**Abstract:** Role of the knowledge-based resources in promoting sustainability in small and medium enterprises (SMEs) is currently a topic of debate. Financial literacy has been identified as a vital knowledge resource for financial decision making, but insufficient attention has been given to how SMEs' financial literacy affects their sustainability. Drawing upon a knowledge-based perspective, peaking order theory and dual process theory, we constructed an integrated model to examine the impact of financial literacy, access to finance and financial risk attitude on SMEs' sustainability. The sample included 291 chief financial officers (CFOs) of SMEs in Sri Lanka. The output of structural equation modelling revealed direct positive effects of financial literacy, access to finance and financial risk attitude on sustainability. Financial literacy also emerged as a predictor of access to finance and financial risk attitude. Moreover, access to finance and financial risk attitude were found to be partial mediators of the relationship between financial literacy and SMEs' sustainability. Theoretical implications and practical implications for policymakers, industry practitioners and academics interested in promoting sustainability amongst SMEs are discussed.

**Keywords:** financial literacy; access to finance; financial risk attitude; SMEs sustainable performance

## 1. Introduction

Small and medium enterprises (SMEs) make an immense contribution to economic development through wealth distribution, creation of employment, technological advancement, reduction of poverty and innovation [1,2]. Having a strong SME sector is crucial to establishing a solid industrial sector in an economy [3] and therefore, well-functioning SMEs are essential to steady and continuous economic growth. The rapid economic development and higher profitability of emerging markets give SMEs the opportunity to become more competitive in both domestic and global markets [4,5]. Having a strong SME sector is essential for developing economies, where there is huge potential for the development of this sector although they have yet to realize the full benefits of a strong SME sector. The SME sectors of developing countries have stagnated rather than expanding and becoming more sophisticated. Some of the characteristics of a developing economy—economic turbulence, unstable exchange rates, immature information infrastructure, higher transaction costs, political unrest, high inequality and worsening unilateralism in trade policy—are additional threats to the sustainability of SMEs [6,7]. Hence, there has been interest amongst researchers and those directly involved in the SME sector in finding ways to increase the sustainability of SMEs.

Recently there has been an increase in interest in the knowledge-based view (KBV) of organizational performance. The KBV suggests strategies by which firms can achieve competitive advantage and improve their performance [8]. It posits that collective and tacit knowledge are key resources when it comes to improving organizational performance [9]. The KBV also emphasizes the importance of a

firm's ability to integrate individual—and firm-level knowledge of its product and services. Hence organizations rich in knowledge-based resources are more likely to enjoy good returns than their competitors. Knowledge can be considered a vital resource that is difficult to imitate or transmit and socially complex [10,11]. However, in the growing literature on SMEs performance, scant attention has been devoted to the significance of SMEs knowledge-based resources and their role in SMEs sustainable performances.

Despite the importance of knowledge resources to the sustainability of SMEs most previous research has focused on other factors, such as competitive advantage, supply chain management and internationalization [12–14]. However, Ying et al. [15] examined the contribution of managers' intangible capabilities to SMEs' sustainability and concluded that they play an important role in enabling managers to deal with turbulent market conditions. Hussain et al. [16] also examined the contribution of knowledge resources to SMEs' performances and concluded that knowledge resources, such as financial literacy and business experience help SMEs to sustain their performance. There have been few in-depth analyses of how specific knowledge resources, such as financial literacy, influence the sustainability of SMEs and so this study, which provides an in-depth analysis of financial literacy and explores the mechanisms by which financial literacy can boost SMEs' sustainability, extends the literature.

The aim of the study was to examine the importance of financial literacy in the SME sector and thus to address a gap in the literature. This study contributes to the literature on financial literacy and the sustainability of SMEs in five ways. First, the research draws on three theoretical perspectives, namely the KBV, peaking order theory and dual-process theory, to describe the importance of financial literacy, access to finance and financial risk attitude in the SME sector. Second, the research expands knowledge of financial literacy because it investigated the indirect relationship between financial literacy and SMEs' sustainability. It also contributes to the literature because it represents one of the first applications of structural equation modelling (SEM) in the field of financial literacy. Third, although it is widely accepted that financial literacy is important in the context of personal finance decisions, the concept of firm-level financial literacy is less well understood and researched, especially in developing countries. This research addresses this gap by exploring firm-level financial literacy in the Sri Lankan SME sector. Fourth, the research generated a framework that could be used by SMEs to sustain their firm's performance. As only a small proportion of SMEs survive their first few years [17], such a framework has practical value for new and emerging SMEs. Fifth, the findings of this study should help policy makers to design and initiate programs to improve financial literacy, including programs specifically tailored to the needs of SMEs. If the relevant agencies were to offer more robust, more specific training programs it would boost the financial literacy of key players in the SME sector. This research also contributes to research on a particular geographical region, namely Sri Lanka, and the findings should help to enhance the sustainability of Sri Lankan SMEs.

The remainder of this research article is organized as follows. In the next section we review relevant literature and present our hypotheses and conceptual framework. Section 3 describes our methods: It details the sample and population from which it was drawn, describes data collection procedure, measurement of variables and the analytical techniques used. The results are presented in Section 4, which also contains a brief discussion of the key findings. Section 5 sets out the theoretical and managerial implications of the findings, the limitations of the research, future research directions and the final section presents our conclusions.

## 2. Literature Review and Hypotheses Development

The emerging significance of financial literacy is well documented in recent literature. Financial literacy has been defined as the knowledge and cognitive capabilities required to manage finances and make effective decisions on financial matters [18]. Korutaro et al. [19] defined financial literacy as “the ability of an individual to make an informed judgement and take effective decisions regarding the use and management of money”. Thus, financial literacy is vital for entrepreneurs. SMEs need

financial literacy in order to evaluate their business's financial affairs and make financial decisions. Financial literacy should also help businesses to deal with challenges in cutting edge credit markets. Financial literacy enables entrepreneurs to manage risks through strategies, such as maintaining financial reserves, diversifying their investment portfolio and buying insurance. Inadequate financial literacy has been identified as one of the main barriers to the sustainable development of SMEs. Empirical studies have shown that levels of financial literacy are low amongst entrepreneurs. Eniola and Entebang [20] identified a lack of financial literacy as a common problem in SMEs; lack of financial literacy has an impact on business organizations in the starting up phase and subsequently. Kotzè and Smit [21] concluded that lack of financial literacy was the main reason for the failure of SMEs. However, although the importance of financial literacy has been demonstrated empirically, its impact on SMEs' sustainability has not been extensively studied.

According to dual process theory the financial decisions of people with high financial literacy are influenced by cognitive processes and intuition. For instance, Widdowson and Hailwood [22] suggest that financial literacy helps people to take advantage of increased financial market competition by applying their risk management knowledge and skills. Research has also shown that financial literacy helps entrepreneurs to make their case to bankers during a client interview and that it enables SMEs to meet the challenges of changes to the business and to financial markets and hence to achieve sustainability [23–25]. We argue, therefore, that financial literacy has both direct and indirect influences on firms' sustainability. Thus far most empirical research has used experimental research designs to investigate how individuals' financial literacy influences predefined decisions, such as investment decisions and strategy [26,27]. Further, most of the research on financial literacy has been carried in developed economies and few studies have investigated financial literacy in the SME sectors of developing economies [28]. Hence in this research we investigated the direct and indirect influences of financial literacy on the sustainability of SMEs in a developing economy and explored new mechanisms by which financial literacy might affect the sustainability of SMEs.

### *2.1. Financial Literacy and the Sustainability of SMEs*

The resource-based view (RBV) posits that a firm's competitive advantage and performance are dependent on its tangible and intangible resources [29]. To preserve their competitive advantage firms, need a wide range of resources and a wide knowledge base [30]. Carmeli and Tishler [31] also revealed that intellectual capital has a positive impact on organizations' sustainability. According to a KBV, financial literacy is a knowledge resource that determines the sustainability of SMEs. Thus, financial literacy plays a significant role in the value creation process of SMEs, which leads to sustainable performance [32,33]. Financial literacy contributes to an organization's knowledge base, helping it to adapt to changes in the business environment and profit from opportunities presented by such changes [8]. Therefore, firms should understand the importance of financial literacy and their strategic roles in order to increase the knowledge capabilities of the firm.

There is a considerable body of research demonstrating that financial literacy is positively related to firm performance [34]. Financially literate firms have better insight into the financial aspects of strategic issues; hence, their performance is better. Wise [35] showed that financial literacy was important to the survival of SMEs in both developed and developing countries. Low financial literacy caused poor financial management practices and led to frequent financial mistakes [36]. Huston [34] pointed out that financial literacy is needed to cope with rapid economic changes. Similarly, Widdowson and Hailwood [22] concluded that people with strong financial knowledge were more likely to invest in complex assets and more likely to do so successfully. Davidson III et al. [37] also found an association between financial literacy and firm performance. Furthermore, financial literacy is known to be an important factor in wealth accumulation, as well as firm performance [38]. Accordingly, financial literacy has become one of the most important driving forces in organizational decision-making [39] and strategic, long-term financial planning [36]. Financially literate firms are more likely to employ

sound financial management practices that will boost their development and sustainability. Thus, financial literacy is presumed to have a positive effect on SMEs' sustainability.

We hypothesized that:

**Hypothesis 1.** *Financial literacy is positively related to SMEs' sustainability.*

## 2.2. Access to Finance and SMEs' Sustainability

There is a flourishing strand of research dealing with the financial constraints that SMEs encounter [40–42]. Access to finance has been identified as one of the major constraints on the sustainability of SMEs [43,44]. Gambetta et al. [45] showed that the underdeveloped financial markets and weak financial instruments in emerging economies led to poor allocation of financial sources among business organizations. Access to finance is defined as the availability of financial services, in the form of demand deposits, credit, payments or insurance [46,47]. Firms have good access to finance if they are able to access financial services that are affordable, usable and meet their financial needs [48]. Most SMEs are started with personal financial resources and often family members, relatives and friends provide financial capital in return for a share in the business. As a firm develops more financial resources are required for expansion, innovation and to ensure the survival of the firm. It is more difficult for SMEs to access sources of finance, such as banks, capital markets or other suppliers of credit than it is for larger organizations [49]. Although all organizations need financial resources to start, survive and grow [50], it is difficult and costly for SMEs to gain access to external financial resources and in fact the accessibility of such resources has declined sharply. Hence limited access to finance has been recognized as one of the main barriers to SMEs realizing their full potential.

The importance of access to finance to the sustainability of SMEs is well documented in the literature. Shepherd et al. [51] showed that access to finance was important in enabling SMEs to achieve sustainable performance goals. Access to finance improves organizations' sustainability by making market entry easier, increasing entrepreneurial activities, boosting capacity for innovation and improving risk management skills [52]. Tiwari et al. [53] showed that providing small businesses with loans at concessionary interest rates increased their access to finance hence boosted their performance. Further, Aranda-Usón et al. [54] found that increasing the availability and quality of sources of finance stimulated the implementation of circular economy initiatives in businesses. Hence our second hypothesis:

**Hypothesis 2.** *Access to finance has a positive effect on SMEs' sustainability.*

## 2.3. The Links between Financial Literacy, Access to Finance and SMEs' Sustainability

Despite the direct influence of financial literacy on SMEs sustainable performance, the indirect influence of financial literacy on SMEs sustainable performance through access to finance is explained by the peaking order theory. Myers [55] extended the peaking order theory, stating that organizations take a hierarchical approach to investment and financing needs, favoring internal funds, external debt and external equity in that order. The literature suggests a number of side reasons regarding demand and supply for this preference hierarchy. For instance, Stiglitz and Weiss [56] argued that supply side constraints exist when SMEs cannot access debt financing, due to factors, such as higher interest rates and collateral requirements, resulting in undercapitalization. Demand-side factors, as described by Bolton [57] and LeCornu et al. [58], are based on the well-established fact that the managers of SMEs are extremely reluctant to relinquish control of their business and therefore try to first of all to finance the needs of the business from their own money (personal savings and retained earnings), turning second to short-term borrowing and third to longer term debt [59]. Studies on SME finance have frequently suggested that scarcity of funds is a problem in this sector [60] and poor financial literacy

has been identified as a major reason for the high failure rate of SMEs [61]. It has also been noted that SMEs' limited access to financial markets [62] means that they are generally reliant on internally generated funds; however, there is a limit to the extent to which internally generated funds can sustain the performance of SMEs.

Many studies have attempted to determine how important financial literacy is to various aspects of the performance of SMEs and particularly to their sustainability [35,63]. Beal and Delpachitra [64] identified financial literacy as a major skill which empowers people to navigate the financial markets and make well-informed decisions on finance and reduces the chances of being deceived on financial matters. Financial literacy amongst leadership can increase a firm's access to finance so that effective decisions can be made to avoid financial losses and distress. Poor financial statement preparation and lack of financial information make it more likely that loan applications will be rejected and hence have implications for access to finance [65]. Financially literate SMEs improve their access to financial resources through proper dissemination of timely and useable financial information to relevant parties, such as bankers and lenders [66]. Lusardi and Mitchell [23] revealed that financial literacy is key to preparation of loan applications and to convincing bankers during a client interview; good financial literacy enables SMEs to meet the challenges of changes in the business and financial markets [24,25]. Accordingly, financial literacy increases SMEs' physical access to and eligibility for financial resources, as well as making finance more affordable and making it easier to create sound capital structure, thereby enhancing sustainability. Hence our third and fourth hypotheses:

**Hypothesis 3.** *Financial literacy has a positive effect on access to finance.*

**Hypothesis 4.** *Access to finance mediates the relationship between SMEs' financial literacy and sustainability.*

#### 2.4. Financial Risk Attitude and Sustainability in SMEs

Business and financial risks are assumed to be increasing rapidly given the prevailing instability of economic systems. SMEs in emerging markets have to deal with more challenging economic conditions than developed markets and most of them are struggling to survive [6]. This means that the financial managers of SMEs in emerging markets have to efficiently manage risks to ensure the survival of their organizations [67]. Financial risk attitude is an important factor in the survival and development of SMEs in today's challenging economic environment. In psychology financial risk attitude has been extensively measured as a personality characteristic of entrepreneurs that may contribute to SMEs' success [68]. The importance of financial risk attitude in SMEs in developing countries is also well-documented [69]. Economic theories also explain the relationship between risk and return. Risk averse entrepreneurs are willing to accept lower returns in exchange for reduced exposure to risk, whereas entrepreneurs who are willing to take higher risks are compensated with a higher expected return. Financial risk attitude influences decisions about which business sector to invest in. Some sectors generate higher returns, but the variance in returns is higher, which creates more risk for investors. Similarly, business sectors which require large initial capital carry the additional risk of bankruptcy. Risk averse entrepreneurs will not invest in such sectors.

The financial risk attitude allows a firm to identify opportunities and risks that are associated with business and financial decisions [70]. Gärling et al. [71] found that financial risk attitude influenced the financial decision-making process of organizations. Financial risk attitude influences the survival and failure rates of firms, as well as their decision-making [72]. Financial risk attitude may also vary according to the characteristics of the business owners and the management. For instance, entrepreneurs tend to evaluate business situations more positively than non-entrepreneurs because they focus on business opportunities rather than the threats [73]. Accordingly, differences in financial risk attitude can have a strong influence on business performance. We propose, therefore that financial risk attitude influences SMEs' sustainability.



There has been considerable empirical research on how financial risk attitude is related to success in the SME sector [68,74,75]. Grable and Lytton [76] showed that total income is positively related to financial risk attitude and Díez-Esteban et al. [77] also found an association between a firm's performance and its financial risk attitude. Xiao et al. [78] reported that firms that were willing to take substantial risks generally had a larger share of assets than those that were unwilling to take risks. In general, the likelihood that a firm will engage in a given risky activity is based on a trade-off between its expected benefits and riskiness. Accordingly, firms with an appropriate approach to risk should perform better [79]. Hence our fifth hypothesis:

**Hypothesis 5.** *Financial risk attitude is positively related to sustainability in SMEs.*

### *2.5. The Links between Financial Literacy, Financial Risk Attitude and Sustainability in SMEs*

The indirect effect of financial literacy on SMEs' sustainability via financial risk attitude can be explained by the theory of dual-process. Dual-process theory posits that thoughts are affected by both cognitive processes and intuition. Intuitions are views, judgements, understandings or beliefs that cannot be empirically verified or rationally justified. Individuals who are highly dependent on intuition are willing to use mental short-cuts and thus their thoughts are highly influenced by their emotions [80]. Cognitive processes include the mental processes involved in acquiring, transforming, evaluating, elaborating, storing and using knowledge (thoughts and experiences) and sensory inputs. Cognition encompasses comprehension, calculation, reasoning, problem solving and decision making [80]. The relative prevalence of cognitive and intuitive thinking patterns influences financial risk attitude thereby decision-making process [36].

The growing literature on financial literacy includes scant research on the relationship between financial literacy and financial risk attitude [81]. Financial risk attitude can be defined as the extent to which a firm is willing to pursue risky financial resource opportunities in ventures with unknown outcomes. In other words, an organization's financial risk attitude reflects its enthusiasm for making large and risky resource commitments [82]. Cacciotti and Hayton [83] noted that financial risk attitude is affected by both cognitive and emotional factors. Intuitively one would expect firms' responses to any given situation to differ according to their underlying financial risk attitude. Some firms can accept more risk than others and some can manage risk better than others; financial risk attitude and management of risk depend partly on attitude to uncertainty.

Positive attitude on risk taking which arise with sound financial literacy may contribute to an understanding of business uncertainty and to good financial and strategic performance. For instance, Hallahan et al. [84] found correlations between financial risk attitude and financial literacy and education level. Hsiao and Tsai [85] also found a positive relationship between financial literacy and financial risk attitude. Van Rooij et al. [86] showed that poor financial literacy was associated with poor financial decisions. Increasing a firm's financial literacy may improve its attitude to financial risks and challenges. Improving a firm's financial literacy would help to improve both knowledge and managerial skills, leading to better management of financial resources and affairs [20].

Widdowson and Hailwood [22] suggested that better financial literacy would make it easier for firms to take advantage of increased financial market competition because financially literate firms have better financial knowledge and risk management skills. Financial literacy may also facilitate the decision-making process. There is a belief that the greater a firm's experience of strategic risk-taking, the more confident it will be about the likely outcomes of particular risks and hence the better its decisions [87]. Moreover, financial literacy may reduce the degree of potential losses associated with risk taking by facilitating firms to more comprehensively judge and rationalise their actions. Financial literacy may influence the extent to which particular strategic responses are perceived as tolerable risks. Financially illiterate firms may lack the knowledge required to judge risks, which may, in practice limit their access to opportunities to achieve very high returns. SMEs with high levels of financial literacy

are more likely to be involved in strategic risk-taking, which may enhance their sustainability. Hence our sixth and seventh hypotheses:

**Hypothesis 6.** *Financial literacy has a positive effect on financial risk attitude.*

**Hypothesis 7.** *Financial risk attitude mediates the relationship between financial literacy and sustainability in SMEs.*

The hypothesized relationships and the variables are shown in Figure 1.

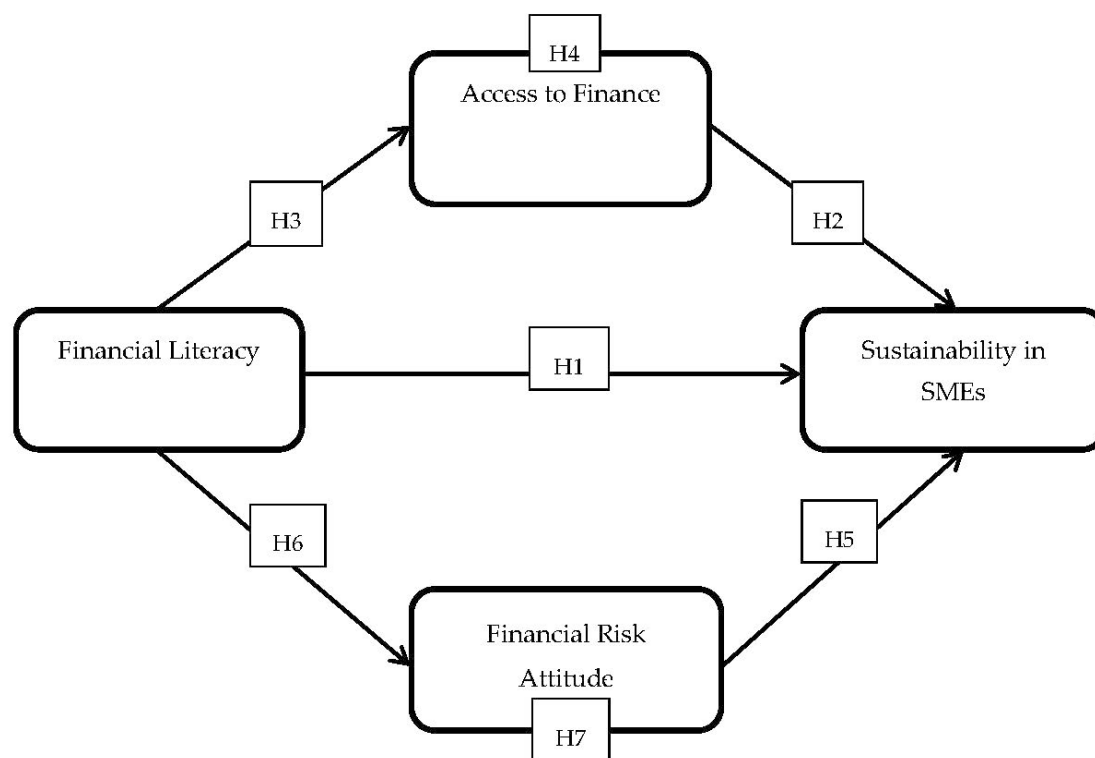


Figure 1. Conceptual framework.

### 3. Methodology

#### 3.1. Sample Design and Data Collection

The population for this study comprised SMEs in Sri Lanka. After considering the number of definitions on SMEs we selected the sample from the population of firms in the western, central and southern provinces that had 5–99 employees. These provinces were chosen because more than 60 percent of Sri Lankan SMEs are based in them. It was difficult to identify sampling frame for this study, due to lack of a comprehensive database of SMEs in Sri Lanka, so we used the Yellow Pages directory to identify eligible firms and selected a convenience sample. The Yellow Pages directory provides the industrial sector and mailing address of firms. We started by having a telephone conversation with the CFO of each organization during which we requested information on the number of employees, if this was between 5 and 99, then we invited the firm to participate in the research and arranged to visit their premises to collect data if they agreed.

A structured questionnaire was used to collect data; such questionnaires are an efficient method of collecting data on the values, opinions, attitudes or beliefs of a sample [88]. A questionnaire survey enables the collection of data from a representative sample distributed across many industries and geographical regions, which was useful because SMEs are geographically dispersed across Sri Lanka [89,90]. The questionnaire was based on questions used in previous studies conducted in

different contexts. The questionnaire was sent to five senior academics in Sri Lanka and to five CFOs of SMEs to gauge its validity. On the basis of their feedback a few items were changed or reworded to make them more suitable for the Sri Lankan context. The final questionnaire had five main sections. Data were collected from 300 CFOs of SMEs. CFOs were chosen as respondents because of their involvement in and responsibility for the financial affairs of their organization [91]. Nine questionnaires were excluded from analysis, due to missing data, thus the final sample comprised 291 completed questionnaires.

The sectoral distribution of participating SMEs was as follows—41.2% of firms were involved in manufacturing, 30.3% in trade and 28.5% in services. Over a quarter (27.8%) had 21–40 employees, 27.1% had 41–60 employees, 16.5% had 61–80 employees, 16.2% had 5–20 employees and 12.4% had 81–99 employees. Nearly a third of the sample of SMEs (30.6%) had been operating for 6–15 years, 29.2% of SMEs had been established for 16–25 years, 22% were newly established SMEs and 18.2% SMEs had existed for 26 years or more (see Table 1).

**Table 1.** Profile of the sample.

	Frequency	Percentage
Industrial sector		
Manufacturing	120	41.2%
Service	83	28.5%
Trade	88	30.3%
Size		
5–20 employees	47	16.2%
21–40 employees	81	27.8%
41–60 employees	79	27.1%
61–80 employees	48	16.5%
81–99 employees	36	12.4%
Age		
≤5 years	64	22.0%
6–15 years	89	30.6%
16–25 years	85	29.2%
≥26 years	53	18.2%

### 3.2. Measurement of Variables

*Financial Literacy:* Previous studies have used questions on inflation, exchange rates, interest rates and future values to measure financial literacy [92], but effective management of financial matters is vital for SMEs in today’s complicated business and financial environments, so we wanted to use a more practically relevant scale to index the financial literacy of SMEs. We used 13 items from the measurement scale developed and validated by Bongomin et al. [93] to measure the financial literacy of the CFOs in our sample of SMEs. A sample item is “We have the ability to analyze the firm’s financial performance periodically”. Responses were given using a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree).

*Access to finance:* Access to finance was measured using the approach described by Bongomin et al. [94]. Ten items were used to measure access to finance. Initially this measurement scale was developed by Claessens and Tzioumis [95] and Ardic et al. [96]. We modified the items to make them more appropriate for the SME context. A sample item is “The financial services offered by the bank have led to [an] improvement in our business”. Responses to all items were given using a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree).

*Financial risk attitude:* The psychometric instrument developed by Weber and Blais [97] was used to measure financial risk attitude. This recognizes two aspects of financial risk attitude, namely risk perception and propensity for risk-taking, both of which were assessed using six items. This instrument



has been extensively tested in Western countries and was adapted for use in the Sri Lankan context. To measure risk propensity, CFOs were asked to specify their willingness to engage in six different types of risky behavior, one was “Betting a day’s income at a high-risk game, such as casino”. Responses were given using a five-point Likert scale ranging from extremely unlikely to extremely likely. The same six behaviors were used to assess risk perception. Respondents were asked to rate the riskiness of each using a five-point Likert scale ranging from not at all risky to extremely risky.

*Sustainability:* The lack of publicly available financial data on SME makes it difficult to measure the sustainability of SMEs [91]. The owners of SMEs are often reluctant to provide the financial information needed to assess performance [98] and it is difficult to verify the accuracy of SMEs’ financial reports and data [99]. When objective data is not available researchers are encouraged to base their research on self-reported data, so we indexed SMEs’ performance according to the CFO’s assessment of the business’s performance using the measurement scale developed by Mikalef and Pateli [100]. This scale was later adapted by Degong et al. [12] and Ying et al. [15]. CFOs were asked to compare their firm’s performance with that of its competitors in eight domains. All responses were given using a five-point Likert scale ranging from extremely poor (1) to extremely good (5).

*Control Variables:* To get better results we used firms’ age, size and industry type as control variables. The age and size of the SMEs were directly assessed in the model whilst the industrial sector was analyzed as a categorical variable (manufacturing; trading; services).

#### 4. Results

We used AMOS.23 software to test model fit and our hypotheses. SPSS 23 was used for preliminary analyses to confirm the suitability of the data for SEM. Next a measurement model was tested to ensure the validity of the constructs. Finally, a structural model was used to test the hypotheses. We assessed potential indirect effects according to the procedure recommended by Hayes [101] and conducted mediation analysis by performing bootstrapping with the PROCESS macro for SPSS.

##### 4.1. Preliminary Analysis

The sample of 291 sets of responses was deemed adequate for SEM analysis as it exceeded the threshold level of 200 [102]. In the data screening stage, a few missing values were found and replaced with the mean of the corresponding non-missing values [103]. We confirmed that the data on financial literacy, risk-taking propensity, risk perception, access to finance and sustainability were normally distributed by calculating skewness; all values were between +1 and -1 [104]. Then the linearity of the data was confirmed ( $p = 0.000$ ). All the variation inflation factor (VIF) values were below the cut-off was of 3 and hence the data were deemed free from multicollinearity problems [105]. All the Durbin-Watson values were close to 2, indicating that the data were free from autocorrelation [106]. All scale reliabilities exceeded the threshold of Cronbach’s alpha = 0.7 [105] (Financial Literacy:  $\alpha = 0.87$ ; Risk-taking propensity:  $\alpha = 0.92$ ; Risk perception:  $\alpha = 0.90$ ; Access to finance:  $\alpha = 0.88$ ; Sustainability:  $\alpha = 0.89$ ).

When all data is collected from a single source at one point in time common method bias (CMB) may be a problem [107]. We used Harmon’s one-factor test in SPSS to check for CMB; the results confirmed the absence of CMB from our data set as the first factor explained only 37.53% variance, which is less than the threshold, 50%.

##### 4.2. Confirmatory Factor Analysis

We carried out Confirmatory Factor Analysis (CFA) to evaluate standardized factor loadings, validity and reliability for the variables of interest. Cronbach’s alpha, composite reliability (CR) and average variance extracted (AVE) were used to assess the reliability and validity of the constructs. Table 2 shows descriptive statistics, discriminant validity and CR values and AVE values for the constructs.

**Table 2.** Correlation matrix, CR, AVE and descriptive statistics for the measurement model.

Variable	CR	AVE	FL	RPr	RPe	AF	FS
Financial literacy	0.872	0.688	<b>0.829</b>				
Risk-taking propensity	0.924	0.656	0.503	<b>0.809</b>			
Risk perception	0.902	0.696	0.614	0.398	<b>0.834</b>		
Access to finance	0.882	0.724	0.413	0.402	0.265	<b>0.851</b>	
Sustainability	0.894	0.688	0.331	0.263	0.307	0.513	<b>0.829</b>
Mean			3.563	3.284	3.346	3.612	3.191
Standard deviation			0.609	0.781	0.615	0.603	0.593
Cronbach's $\alpha$			0.871	0.923	0.901	0.881	0.892

Notes: Bold values on the diagonal of the correlation matrix are the square root of AVE. CR, construct reliability; AVE, average variance extracted; FL, financial literacy; RPr, propensity for risk-taking; RPe, perception of risk; AF, access to finance; FS, firm's sustainability.

The initial output of CFA with 43 manifest variables did not produce a good result. Four items were dropped from the analysis, due to low indicator outer loadings (<0.4) and deletion of another two items in the range of 0.04–0.07, increased the constructs reliability and validity [103]. Exploratory factor analysis of the remaining 37 manifest variables produced a better result: The Kaiser-Meyer-Olkin value = 0.913 and Bartlett's test of sphericity = 0.000. All other indicator outer loadings were above 0.7 and explained more than 50% of the variance in the corresponding indicator, a satisfactory degree of indicator reliability (Table 3).

We employed a convergent validity test to identify the correlations of the items with respect to their constructs. All the constructs had convergent validity values above 0.50, thus the convergent validity of the variables was confirmed [105]. CR values were used to evaluate the internal consistency of the constructs. As all constructs had CR values above the threshold of 0.7 [105] we concluded that they were internally consistent. Discriminant validity explains the degree of the differences among the constructs in the model [105]. As the AVE values were greater than the squares of inter-construct correlations, we concluded that the constructs had satisfactory discriminant validity. The indices of model fit indicated that the final model had acceptable fit ( $\chi^2/df = 2.196$ , GFI = 0.87, AGFI = 0.84, NFI = 0.91, RMR = 0.019 and RMSEA = 0.061) after drawing few covariance among the error terms of the redundant items.

**Table 3.** Confirmatory factor loading (CFL).

Constructs	Items	Reflective Latent Measures	CFL
Financial literacy	FL1	We have the ability to analyze our financial performance periodically	0.81
	FL2	My firm prepares monthly income statements	0.87
	FL3	I have received training on book-keeping	Dropped
	FL4	My firm has bought formal insurance for our business	Dropped
	FL5	The management of this firm can compute the cost of its loan capital	0.78
	FL6	My firm has a savings account	0.80
	FL7	The entrepreneur can prepare basic accounting books	Dropped
	FL8	The firm is aware of the required documents to get a loan from a bank in order to fulfil our financial needs	0.81
	FL9	I am aware of the costs and benefits of accessing credit	0.79
	FL10	The firm is able to calculate interest rates and loan payments correctly	0.90
	FL11	We have the skills required to assess the financial outlook for the firm	0.89
	FL12	We have skills for minimizing losses by minimizing bad debts	0.88
	FL13	The managers of this business have basic accounting knowledge	0.81
Access to finance	AF1	The financial services offered by the bank have led to an improvement in our business	0.85
	AF2	The financial services offered by the bank have improved our access to sophisticated technology	0.81
	AF3	The financial services offered by the bank have enabled us to pay utility bills	Dropped
	AF4	The saving product provided by the bank is suitable for us	0.78
	AF5	The savings product offered by the bank is safe for us	Dropped
	AF6	The loan product provided by the bank suits our needs	0.86
	AF7	The terms and conditions on bank loans are favorable to us	0.81
	AF8	The financial services provided by the bank are safe for us	0.81
	AF9	The account opening fees charged by the bank are affordable	0.84
	AF10	The cost of making a trip to the bank is affordable	0.85

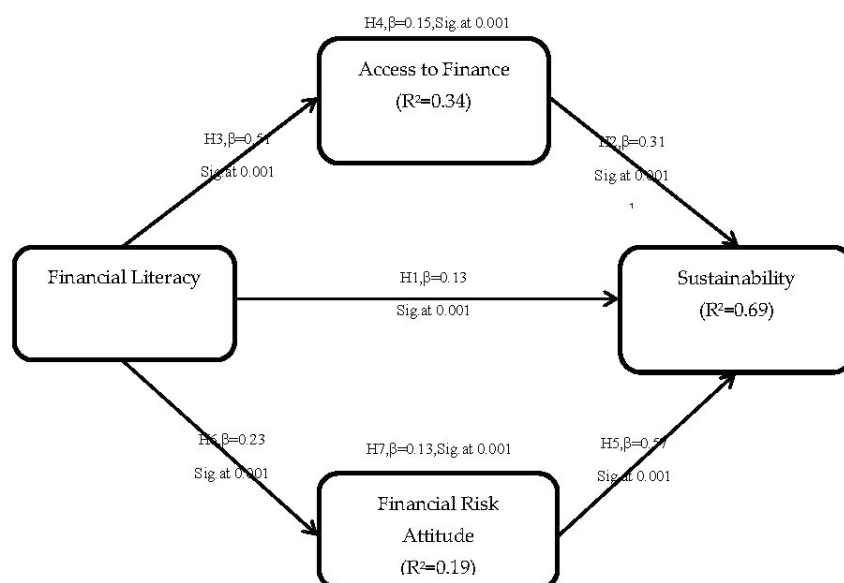
Table 3. Cont.

Constructs	Items	Reflective Latent Measures	CFL
<b>How likely are you to engage in the following financial activities?</b>			
Risk-taking propensity (RPr)	RPr1	Bet a day's income at a high-risk game, such as casino	0.91
	RPr2	Invest 10% of your annual income in a new business venture	0.86
	RPr3	Bet a-day's income on the outcome of a sporting event, such as a horse race abroad	0.83
	RPr4	Invest 10% of your annual income in stocks	0.90
	RPr5	Invest 10% of your annual income in an informal savings vehicle that promises a very high return	0.87
	RPr6	Invest 10% of your annual income in an IT-BPO industry	0.88
<b>How risky do you perceive the following financial activities to be?</b>			
Risk perception (RPe)	RPe1	Betting a day's income at a high-risk game, such as casino	0.78
	RPe2	Investing 10% of your annual income in a new business venture	0.84
	RPe3	Betting a day's income on the outcome of a sporting event, such as a horse race abroad	0.80
	RPe4	Investing 10% of your annual income in stocks	0.83
	RPe5	Investing 10% of your annual income in an informal savings vehicle that promises a very high return	0.82
	RPe6	Investing 10% of your annual income in an IT-BPO industry	0.84
Firm's sustainability	FS1	Reducing operating costs	0.87
	FS2	Increasing profit growth rates and growing market shares	0.78
	FS3	Increasing customer satisfaction	0.88
	FS4	Rapid confirmation of customer orders	Dropped
	FS5	Rapid response to market demand	0.77
	FS6	Decreasing product or service delivery cycle time	0.81
	FS7	Profits as a percentage of sales	0.85
	FS8	Return on investments (ROI)	0.83

#### 4.3. Structural Model and Hypothesis Testing

SEM implemented in AMOS was used to test the direct hypotheses. We examined the direct relationships between financial literacy and sustainability, access to finance and financial risk attitude, and between a firm's sustainability and their financial risk attitude and access to finance. Two approaches were used to assess the impact of financial literacy on sustainability with access to finance and financial risk attitude as mediating variables.

As ours was a multiple mediation model, we first used the bootstrap approach suggested by Cheung and Lau [108] to evaluate the direct influence, total indirect influence and total influence of the structural model in AMOS. We constructed 5000 sub-samples at 95% confidence level using the bootstrapping technique. Second, we assessed the indirect effects of access to finance and financial risk attitude on the relationship between financial literacy and sustainability using the procedure recommended by Hayes [101] (Figure 2). The output ( $\chi^2/df = 2.076$ , GFI = 0.92, CFI = 0.96, TLI = 0.95, RMSEA = 0.057) shows acceptable model fit.



**Figure 2.** Path coefficients of structural model.

We tested seven hypotheses. The results show that financial literacy had a direct effect on sustainability ( $\beta = 0.13, p < 0.001$ ). Furthermore, the total effect of financial literacy on sustainability was 0.41 ( $p < 0.001$ ). We concluded that financial literacy is positively related to the sustainability of SMEs, hence Hypothesis 1 was accepted.

There was an effect of access to finance on sustainability ( $\beta = 0.31, p < 0.001$ ) and an effect of financial risk attitude on sustainability ( $\beta = 0.57, p < 0.001$ ). These results indicate that both access to finance and a good financial risk attitude promote sustainability, but the effect of financial risk attitude is greater than that of access to finance. Thus, Hypotheses 2 and 5 were also accepted. There were also direct effects of financial literacy on access to finance ( $\beta = 0.51, p < 0.001$ ) and financial risk attitude ( $\beta = 0.23, p < 0.001$ ), hence hypotheses 3 and 6 were accepted.

Hypothesis 4 proposed that the relationship between financial literacy and sustainability is mediated by access to finance. We found that access to finance had an indirect effect ( $\beta = 0.15, p < 0.001$ ) in the line of the relationship among financial literacy, access to finance and firm's sustainability. Hypothesis 7 proposed that financial risk attitude mediates the relationship between financial literacy and sustainability. We found an indirect effect of financial risk attitude ( $\beta = 0.13, p < 0.001$ ) in the line of the relationship among financial literacy, financial risk attitude and firm's sustainability. We concluded that the relationship between financial literacy and sustainability was mediated by access to finance and financial risk attitude because the 95% bias-corrected confidence interval of the indirect effects did not contain zero in the bootstrap analysis carried out with the PROCESS macro. When both access to finance and attitude to risk were included in the model, the direct effect of financial literacy on sustainability was reduced, but remained significant, indicating that this relationship was only partially mediated by access to finance and financial risk attitude. Thus Hypotheses 4 and 7 were partially supported. The results of tests of the specific indirect effects are shown in Table 4.

**Table 4.** Bootstrapping results with indirect effects.

Path	Estimate	95% Confidence Level		SE
		Lower	Upper	
FL → FR → FS	0.15 **	0.076	0.143	0.0314
FL → AR → FS	0.13 **	0.051	0.161	0.0421

Note: N = 291; Unstandardized path coefficients are reported; \*\*  $p < 0.01$ ; FL, financial Literacy; AF, access to finance; FR, financial risk attitude; FS, firm's sustainability.

Together financial literacy, financial risk attitude and access to finance explained 69% of the variation in sustainability ( $R^2 = 0.69$ ) whilst financial literacy explained 34% and 19% of the variation in access to finance and financial risk attitude respectively. The results of the hypothesis testing are summarized in Table 5.

**Table 5.** Summary of hypothesis testing.

Hypotheses	Estimate	Decision
H1: Financial literacy is positively related to sustainability	0.13 **	Accepted
H2: Access to finance is positively related to sustainability	0.31 **	Accepted
H3: Financial literacy has a positive effect on access to finance	0.51 **	Accepted
H4: Access to finance mediates the relationship between financial literacy and sustainability	0.15 **	Partially Accepted
H5: Financial risk attitude is positively related to sustainability	0.57 **	Accepted
H6: Financial literacy has a positive effect on financial risk attitude	0.23 **	Accepted
H7: Financial risk attitude mediates the relationship between financial literacy and sustainability	0.13 **	Partially Accepted
Financial Literacy → Sustainability (Total Effect)	0.41 **	

Note: N = 291; unstandardized path coefficients are reported. \*\*  $p < 0.01$ .

## 5. Discussion

### 5.1. Discussion of the Findings

The purpose of this study was to examine the role of financial literacy in SMEs' sustainability. Using an integrated structural equation model, we examined the direct and indirect (via access to finance and financial risk attitude) influence of financial literacy on SMEs' sustainability. We also attempted to quantify the direct influence of access to finance and financial risk attitude on SMEs' sustainability. After carrying out a comprehensive literature review, we developed a conceptual framework and formulated seven hypotheses that would be the basis of this study. The findings indicate that financial literacy has a positive effect on SMEs sustainability, access to finance and financial risk attitude. Moreover, access to finance and financial risk attitude were identified as partial mediators of the relationship between financial literacy and sustainability. Both mediating variables have a positive influence on sustainability.

The positive influence of financial literacy on sustainability is consistent with the results of Eniola and Entebang [20], who found that financial literacy had a direct, positive impact on the performance of Nigerian SMEs, and Purnomo [109], who also found that financial literacy had a direct impact on SMEs' performance. We identified financial literacy as an important component of organisations' intellectual capital and thus our findings are consistent with those of Carmeli and Tishler [31], who found that intellectual capital had a positive effect on SMEs' sustainability. Furthermore, financial literacy helps to improve SMEs' sustainability as it ensures they can cope with sudden economic shocks and the rapidly changing financial and credit markets [36]. Our findings are also congruent with those of Widdowson and Hailwood [22], who found that financial literacy enabled SMEs to identify and invest in profitable business opportunities. Moreover, financial literacy improves financial management practices and minimizes financial mistakes, thus helping to increase SMEs' sustainability [36]. However, the findings of this study conflict with those of Eresia-Eke and Raath [110], who found no correlation between financial literacy and SMEs' performance, perhaps because they measured owner-managers' financial literacy to index organizations' financial literacy, whereas we used CFOs' financial literacy. Our results suggest that having a qualified, highly financially literate CFO improves the sustainability of SMEs.



We found a positive association between access to finance and the sustainability of SMEs, which is consistent with the results of Bongomin et al. [94] who revealed that financial access affected the profitability of SMEs. Our results are also in accordance with Storey's [42] finding that access to finance had a positive influence on SMEs' performance. According to Ahlstrom et al. [49], it is more difficult for SMEs to access finance than it is for large organizations. Difficulty in accessing finance may cause SMEs to turn to inappropriate sources of finance and thus reduce their sustainability. Moreover, access to finance affects the growth and innovation of SMEs [52]. All in all, the evidence suggests that SMEs with better access to finance are better placed to sustain their performance and survive in today's competitive business environment. It is difficult for SMEs in emerging markets to access suitable, affordable financial services [48]. Accordingly, it is evident that the poor access to finance of SMEs in the emerging markets contributes to poor performance and to their high failure rate. Hence, our findings are consistent with those of Irwin and Scott [43] and Khan et al. [44], who concluded that access to finance was a major barrier to the sustainability of SMEs.

SMEs are generally characterized by a lack of financial knowledge and managerial skills. These weaknesses restrict their access to external financial resources. We found that financial literacy had a positive impact on access to finance, which is consistent with Wise's [35] finding that financial literacy was an important determinant of access to finance. Moreover, our findings are consistent with those of Carbo-Valverde et al. [111], who revealed that financial literacy was positively related to awareness of different sources of finance and the ability to identify appropriate sources of finance for a business. This indicates that SMEs need to be financially literate in order to overcome the 'equity gap'—i.e., compared with larger organizations they pay higher interest and have to provide more collateral when borrowing. Better financial literacy would also enable SMEs to prepare timely, relevant and accurate financial statements, which are required to access finance and would thus help to solve the problem of scarcity of funds [60] which affects SMEs in emerging markets.

In today's rapidly changing business environment the businesses that survive are those that can and do adapt to changes. This means that the ability to anticipate changes and manage the risks arising from them is important to the sustainability of SMEs. We found that financial risk attitude had an effect on SMEs' sustainability, supporting our fifth hypothesis (H5). Our findings corroborate those of Krauss et al. [69], who found that financial risk attitude had a positive impact on the performance of SMEs. Willebrands et al. [70] also found that a financial risk attitude improved performance, because it enabled firms to identify opportunities and risks. Furthermore, our findings are compatible with those of Earle and Sakova [112], who suggested that financial risk attitude, was an important predictor of SMEs' performance. Moreover, as Palich and Bagby [73] noted, a positive attitude encourages organizations to focus on business opportunities rather than threats. However, findings of this study conflict with those of Rauch and Frese [68] and Naldi et al. [113], who found a negative relationship between risk attitude and SMEs' performance.

The influence of financial literacy on financial risk attitude has not been receiving enough attention [80], so we attempted to fill the gap by investigating the impact of financial literacy on organizations' financial risk attitude. We found that financial literacy affects organizations' financial risk attitude, which supports our sixth hypothesis (H6) and is consistent with the findings of Hsiao and Tsai [85], who found that financial literacy had a positive effect on financial risk attitude. Goswami et al. [74] found that higher education levels can diminish inherent risks associated with the entrepreneurial activities. Although Goswami et al. [74] did not distinguish between education and financial literacy, their findings are compatible with ours, as both education and financial literacy reduce risk aversion by ensuring that people have the knowledge required to make sound business decisions. More financially literate SMEs are more likely to take advantage of highly profitable business opportunities because they are willing to take risks.

We found that access to finance and financial risk attitude partially mediated the relationship between financial literacy and SMEs' sustainability, thus our fourth and seventh hypotheses were partially supported. The fact that access to finance mediates the relationship between financial

literacy and SMEs sustainable performance is consistent with peaking order theory, which posits that financial literacy improves SMEs' sustainability by minimizing the information gap [18], thereby giving SMEs access to appropriate sources of finance. Financial literacy enables SMEs to create a sound and appropriate capital structure for the organization, thus minimizing their capital costs and enhancing their sustainability. Our findings corroborate Widdowson and Hailwood's [22] argument that financial literacy influences risk management skill and hence firms' performance. Moreover, our findings are consistent with those of Hussain et al. [16], who concluded that financial literacy is important to the making of sound investment decisions and to risk mitigation, and thus enhances SMEs' sustainability. The fact that financial risk attitude mediates the relationship between financial literacy and the sustainability of SMEs is also congruent with dual-process theory. Financial literacy affects cognitive processing, improving the comprehending, calculating, reasoning, problem solving and decision-making capabilities of organizations [80], leading to better decisions and enhanced sustainability. It should be noted, therefore, that financial literacy is vital to SMEs' sustainability and it is directly related to sustainability and also has an indirect influence via associations with access to finance and financial risk attitude. Thus, our investigation of the relationships between SMEs' sustainability and their financial literacy, access to finance and financial risk attitude extends knowledge of financial literacy by identifying new pathways by which it can enhance SMEs' sustainability.

### *5.2. Theoretical Implications*

This study has described the structural relationships among financial literacy, access to finance, financial risk attitude and SMEs' sustainability. Financial literacy promotes the sustainable development of SMEs through its effects on access to finance and financial risk attitude. This indicates the importance of using multiple theories and concepts to explain how financial literacy affects the performance of SMEs. Examining the contribution of financial literacy to SMEs' sustainability in terms of multiple concepts and perspectives is vital as it expands our understanding of financial literacy.

By identifying the antecedents of sustainability in a sample of SMEs Sri Lanka, which is a developing country in South Asia, we have helped to address the gap in contextualized information on financial literacy. Furthermore, the consistency of our findings and those of earlier studies conducted in developing and developed countries indicates that financial literacy is a universal concept rather than a context-specific concept.

The application of SEM to research on the financial literacy of SMEs also constitutes a novel contribution to the literature and fills a methodological gap. Previous research only considered the linear relationship between financial literacy and SMEs' performance, leaving a gap in knowledge about the possible indirect impact of financial literacy on the sustainability of SMEs. We addressed that research gap by developing multi-mediator structural equation model to test hypotheses about indirect relationships. Furthermore, this is the first study of financial literacy to be conducted in Sri Lankan context using SEM. The conclusion, that access to finance and financial risk attitude partially mediate the relationship between financial literacy and SMEs' sustainability, hints at the existence of additional channels linking financial literacy and sustainability.

### *5.3. Implications for Managers*

There are two main reasons why financial literacy is critical to the sustainability of SMEs. First, financial literacy has a direct influence on SMEs' sustainability, independently of access to finance and financial risk attitude. Second, financial literacy directly influences access to finance and financial risk attitude and in turn, indirectly affects sustainability. The implications of these findings for owners and managers of SMEs and policy makers who are interested in improving the sustainability of SMEs are discussed below.

Workshops, training and seminars to improve the financial literacy of SMEs should be organized and included in the annual training and development schedule of SMEs. The programs should cover bookkeeping, financial statement analysis, cash flow analysis, business environment analysis,

risk analysis, investment management and development of project proposals as these topics are relevant to the financial literacy of organizations. Although programs for financial and accounting staff should not be compromised, the employees of other departments should be encouraged to participate in financial literacy programs. Special programs, such as 'finance for non-finance employees' could be developed in order to provide all employees with basic financial management knowledge. SMEs should recruit well-qualified CFOs as their financial literacy is crucial to the financial literacy of the organization.

Access to finance was also identified as an important factor in SMEs' sustainability. SMEs could improve their access to finance by maintaining proper accounts. This would make it easier for them to access formal sources of finance and thus avoid relying on expensive, informal sources. We suggest, therefore, that SMEs should implement sophisticated accounting systems and build strong relationships with bankers and other financial institutions. Such relationships would assist SMEs to update with financial supportive programs introduced by different organizations. Thus, SMEs can overcome the 'equity gap' problem by using the most appropriate source of finance.

Given the importance of financial risk attitude to the sustainability of SMEs, we recommend that they organize more risk management training for their leadership team, as these people directly influence the decision-making process of the organization. The training should improve the cognitive processes of the top managers, as explained by dual-process theory. Further the leadership of SMEs should be trained to scan the business environment to identify opportunities and threats that emerge as the business environment changes.

Greater involvement of third parties, such as policy makers, is essential to the development of a strong SME sector in developing economies. Accordingly, those parties can organize training specifically to develop the financial literacy of SMEs. Such programs should not be limited to accounting and bookkeeping knowledge; they should also cover access to finance and risk management. Furthermore, policies to improve SMEs' access to finance should be implemented. For instance, SME development officers could be appointed in each district and given responsibility for strengthening the SME sector in their district. This would also enable the government to monitor the performance of SMEs in each district and implement tailored development strategies. The reach of governmental and non-governmental programs to enhance the financial literacy of SMEs should be carefully monitored to ensure that they reach the organizations where they are most needed. Special attention should be devoted to addressing the weaknesses of financial markets and financial instruments in emerging economies as this would improve SMEs' access to finance. Policy makers could also develop policies to enable SMEs to share the risk of projects with government institutions, which would encourage SMEs to take advantage of highly profitable business opportunities.

#### *5.4. Limitations and Future Research Directions*

Although this study contributes to the literature on financial literacy it has some limitations. First, the sample was drawn from just three provinces of Sri Lanka. Extending the sample to cover the whole country would provide a more representative picture. In future it would be useful to compare results across countries as this would provide information about the generality of our findings. Second, this study does not establish cause and effect relationships among the variables investigated, due to the cross-sectional design. Future researchers are encouraged to examine the causal relationships linking these variables through longitudinal research. Third, we indexed organizations' financial literacy as financial literacy of the CFO; in future it would be better to use the financial literacy of the whole management team, as all managers are involved in SMEs' decision-making processes. Fourth, we only examined two potential mediators of the relationship between financial literacy and sustainability. Together these variables, access to finance and financial risk attitude, only partially mediated the relationship between financial literacy and sustainability, which suggests that there are other pathways linking the latter two variables. It would be worthwhile, therefore, to expand

our model to include other potential mediating and moderating variables, such as enterprise risk management and entrepreneurial competencies, in order to improve its explanatory power.

## 6. Conclusions

Research into the development of SMEs is a growth area. This research attempted to answer the question ‘How does financial literacy influence the sustainability of SMEs?’ We used the KBV, peaking order theory and dual-process theory to develop a conceptual model that included access to finance and financial risk attitude as mediators of the relationship between financial literacy and SMEs sustainable performance. The model was tested with data collected from 291 Sri Lankan SMEs via a structured questionnaire. We used SPSS for the preliminary analysis and AMOS to test our hypotheses. The results demonstrate that financial literacy, access to finance and financial risk attitude directly affect the sustainability of SMEs, whilst access to finance and financial risk attitude partially mediate the relationship between financial literacy and sustainability. Thus, we concluded that financial literacy is an important predictor of access to finance, financial risk attitude and sustainability in SMEs. Furthermore, we found that the direct influence of financial risk attitude on SMEs’ sustainability was greater than that of financial literacy and access to finance. This indicates that managers’ attitudes are an important factor in the sustainability of SMEs, because they directly influence organizational decision-making. Moreover, this research expands the SME development literature by demonstrating that access to finance and financial risk attitude are antecedents of SMEs’ sustainability and suggesting new ways of enhancing the sustainability of SMEs, particularly in developing economies.

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