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Implications of Financial Literacy on Entrepreneurship

Thomas HAMMER, MBA,
International School of Management,
Frankfurt am Main, Germany,
ORCID Code: https://orcid.org/0000-0002-7173-8251

Prof. Dr. Dr. Patrick SIEGFRIED, MBA,
International School of Management,
Frankfurt am Main, Germany,
ORCID Code: https://orcid.org/0000-0001-6783-4518,
e-mail: patrick.siegfried@ism.de

Abstract

Financial literacy is the focus of today's scientific research and has attracted considerable attention. The research focused almost on measuring and interpreting the financial literacy of individuals and households. Research on the general financial literacy of entrepreneurs has so far been limited. Entrepreneurs are drivers of innovation and growth and their ability to make the right financial decisions requires financial literacy among entrepreneurs.

The OECD has defined financial literacy of entrepreneurs as the combination of awareness, knowledge, skills, attitudes, and behavior that a potential entrepreneur or an owner or manager of a micro, small, or medium-sized enterprise should to make effective financial decisions to start a business, run a business and ultimately ensure its sustainability and growth. This defines the general need to understand whether entrepreneurs have the skills/abilities or are accessible to make "effective financial decisions". Such decisions may concern the use of short and long-term capital of their enterprises, working capital and investment decisions, and access to finance for the latter, financing decisions (OECD, 2018).

This paper examines the implications of financial literacy on entrepreneurship that emerge from contemporary research and provides approaches for further necessary research in this area.

KEY WORDS*: entrepreneurship; financial literacy; MSMEs; risk literacy; startups;*

JEL Classification*: G41, G53*

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Introduction

"Financial literacy for entrepreneurs is the combination of awareness, knowledge, skills, attitudes, and behavior that a potential entrepreneur or an owner or manager of a micro, small or medium-sized enterprise should have to make effective financial decisions to start a business, run a business, and ultimately ensure its sustainability and growth" (OECD, 2018).

Policy and academic interest in financial literacy and entrepreneurship

The importance of financial literacy was officially recognized by OECD governments as early as 2002 with the launch of the first financial literacy project. In 2008, the project was further expanded by the creation of the International Network on Financial Education (INFE), a network of over 240 public institutions (including central banks, financial regulators and supervisors, and ministries of finance and education) in over 110 countries.

In 2014, INFE established a special expert sub-group focusing on financial literacy for potential entrepreneurs and MSMEs. In the context of INFE's research on what financial literacy can imply for MSMEs and potential entrepreneurs, a formal definition was adopted in 2018. INFE also published a Core Competency Framework on Financial Literacy for MSMEs and potential entrepreneurs (OECD 2018).

The framework aims to design some concrete, survey-based measures of entrepreneurs' financial literacy. The ultimate goal is to complement or improve the financial literacy of MSME owners and managers and of potential entrepreneurs in their experience of starting, running, or expanding a business.

Financial literacy of individuals and entrepreneurs

Academic research has so far focused primarily on the financial literacy of individuals and has only recently begun to develop models that differentiate the areas of competence of individuals and the related skills and abilities of successful entrepreneurs (Anderson et al., 2018; Bacigalupo et al., 2016; Gibb, 2008; Bätz et al., 2021). A central component of these studies is financial literacy, although the literature has only recently begun to test its influence on entrepreneurial skills (Anderson et al., 2018; Suparno & Saptono, 2018). Overall, there is only a limited range of empirical studies that have specifically examined the relationship between financial literacy and entrepreneurship. From a scientific point of view, there is a large research gap to provide empirical and scientifically valid results.

Financial literacy, the cause of entrepreneurship

Existing scientific empirical evidence suggests that more financially literate individuals can make better financing, investment, and working capital decisions (Siegfried, 2021). Another hypothesis is that individuals with high levels of financial literacy are less reluctant to become entrepreneurs because they have a high level of understanding of alternative sources of finance in the market and are better able to talk to banks or other financial intermediaries. They may even become more successful entrepreneurs if they can secure and proactively manage the financial resources a start-up needs in the early stages of its development. These hypotheses lead to the conclusion that the level of financial literacy of entrepreneurs is crucial for entrepreneurship, thereby fostering innovation, growth, and prosperity (OECD, 2015).

1. Implications of financial literacy on entrepreneurship

1.1. Disruptive factors in entrepreneurship

The Asian Development Bank (ADB) listed several disruptive factors identified in its 2005 report. The main feature consisted predominantly of issues related to financing the venture. Even though it is not easy to obtain investors or bank financing for one's venture, the conditions that ultimately must be paid for the capital play a significant role for the company. Too poor terms and correspondingly high financing costs hurt the company's liquidity and thus its ability to invest in other projects. Brown et al. (2005) also identify equity and debt financing as a major obstacle during the nascent and growth stages of the firm. In addition, capital, and access to it are by far the most central resource (Huke et al., 2021). Capital can be converted into any desired resource and thus forms the basis for obtaining all other required resources (Dollinger, 2008). According to the ADB, in addition to capital, insufficient information about the market is also considered a factor that can contribute to the failure of the venture. Those who do not analyze their environment and anticipated business field sufficiently in advance may encounter market entry barriers that are difficult to overcome, great competitive and price pressure, or market transaction costs that are excessively high. Other barriers include a lack of institutional support from the state and inadequate legislation.

In a report by the Gallup Organization (2007) commissioned by the European Commission, a survey found that almost half of small and medium-sized enterprises in Europe believe that they operate in an over-regulated environment. Administrative regulations are seen by them as one of the keys and biggest barriers to doing business. In a study, the European Commission (2018) shows the average number of days required in European countries to establish a limited liability company (GmbH). Germany in particular, with a duration of 7.6 days, is far above the European average of 3.1 days and ranks third behind Slovenia and Sweden (European Commission, 2018). In addition, the capital needed for the bureaucratic start-up influences the entrepreneurial start-up process. In Germany, an entrepreneur must include 383 euros for registration and notarization in addition to the share capital of 25,000 euros to establish a GmbH, whereas in the United Kingdom, for example, only a minimum contribution of one euro and a further 13 euros are required to register the “Private Limited Company” (European Commission, 2018). In addition, the Gallup Organization (2007) identifies the lack of implementation of innovative solutions to problems and product innovations, in addition to infrastructural problems such as connectivity and the position of the company. Another factor why many companies leave the market after a short life cycle and do not continue operating Is a lack of patience. After all, starting a company is the result of perseverance and long-term determination.

In addition, the location can also restrict the growth of the company. Due to the partially existing overregulation of individual countries, it becomes impossible for many companies to maintain their competitiveness abroad (Seipp et al., 2021). Restrictions such as export and import duties make it difficult to offer a competitive price in the respective target country. Apart from this, it is possible that the company's products may not be exported to the target country due to restrictions or may only be used there to a limited extent and not with all the intended functions.

Besides these points, the aspect of inadequate qualification and education forms the central factor that can cause the failure of an entrepreneur. A profound education both in the anticipated business field as well as in general and financial terms provides essential assistance and contributes to identifying the other disturbing variables early on and developing solutions. In addition, financial literacy in particular contributes to overcoming the financing obstacle. Sufficient expertise in this field enables the entrepreneur to distinguish between good and unfavorable financing conditions and thus make the right financial decisions. Furthermore, the entrepreneur analyzes precisely which financial aspects stand in the way of the business and how to calculate or what exactly needs to be calculated to set up a solid financial plan for the first years of business. Thus, improving financial literacy is a key factor in the success formula for improving entrepreneurial performance (Adomako et al., 2016).

1.2. Effects of financial literacy on business performance

In a business world characterized by dynamism and uncertainty, entrepreneurs are confronted with a multitude of challenges daily, but most of them can be overcome or effectively solved with the help of financial literacy. Entrepreneurs should therefore be able to make complex financial decisions in daily. life, from private matters such as housekeeping to key business decisions (Siegfried, 2015). Most academics agree that entrepreneurs, regardless of their age, are routinely involved in decision-making that involves the acquisition and use of resources, which almost always include financial consequences. Therefore, in order to take efficient decisions, entrepreneurs must be financially literate (Oseifuah, 2010). In addition, Hartog et al. (2010) elicited the effects of various characteristics between (salaried) employees and self-employed entrepreneurs. The study found that mathematical, analytical, and technical skills in financial topics have a significant value for entrepreneurs, driving them in their ventures more than other traits.

However, the lack of knowledge in this area contributes to the low prevalence of start-ups or the resulting high failure rate of SMEs, as many would-be entrepreneurs are intimidated by the high financial administrative burden (Spinelli et al., 2015). In their work on financial literacy as an aid to start-ups, Leifels and Metzger (2015) describe the average dropout rates of German start-ups by analyzing start-up and dropout data between 2005 and 2014 using the KfW Start-up Monitor. It was found that the probability of a company breaking off after one year was around 15% and after three years a total of 30% (Leifels & Metzger, 2015). Furthermore, it is described that financial knowledge has a major impact on the resilience and thus on the survival of the company (Siegfried, 2014). Statistically, the average dropout rate after a start-up is reduced by around one-third simply through profound financial competence (Leifels & Metzger, 2015).

Financial literacy is the ability to apply learned financial knowledge to manage financial resources effectively and efficiently to achieve lifelong financial well-being (PACFL, 2008). It includes knowledge of financial planning with factoring in interest rates, time value of money, borrowing, and assets and liabilities. According to various researchers, it is the decisive factor in financial well-being and entrepreneurial success. Moreover, it enables making informed decisions related to money. Wrong decisions about capital usage can have long-term and serious consequences and also jeopardize the survival of the company in the market.

Regardless of whether a country is developed or still in the process of development, financial literacy is becoming increasingly important worldwide, especially in entrepreneurship and the effective management of one's finances. Thus, the “President's Advisory Council on Financial Literacy” established in USA, in its annual report to the President also prompted the development of a plan to improve financial literacy domestically to strengthen the economy (PACFL, 2008). Furthermore, in many developing and emerging countries, efforts are being made to promote domestic financial literacy and use it as a tool to strengthen the economic activity of citizens and thus fight poverty in the countries.

Several studies prove that a positive correlation exists between financial education and entrepreneurial success. In his study, Njoroge (2013) investigates the relationship between financial literacy and entrepreneurial success in Nairobi, Kenya. For the study, he collected data from small and medium enterprises that measured the entrepreneur's level of financial literacy and entrepreneurial success. Financial literacy was analyzed using a “Big Three”-style survey consisting of questions related to interest rates, inflation, time value of money, risk and its diversification, and general knowledge of financial markets. Entrepreneurial success was determined by parameters such as the period of operation on the market, the number of permanent employees, the sales growth rate, and the general growth within the first five business years. After conducting and adjusting for unusable results, the sample size studied was of 79 companies.

Table no. 1. Survey Results according to Njoroge

Company success [achieved score]	**N**	79
	Result Range	87
	Minimum	13
	Maximum	100
	Mean Value	65.97
	Standard Deviation	27,979
	Variance	782,864
Financial literacy [achieved score]	**N**	79
	Result Range	87
	Minimum	13
	Maximum	100
	Mean Value	68
	Standard Deviation	25,355
	Variance	642,897

Source: Own projection, based on survey results from Njoroge, 2013

As can be seen in **Table no. 1**, the minimum score achieved in financial literacy was 13%, while the highest level of education was 100%. The average score achieved was 68%, implying that most entrepreneurs have some level of financial literacy and understand at least basic financial concepts. A similar result emerged from the research regarding success. Again, the minimum score was 13%, while the maximum score achieved was again 100%. The average score was 65.97%.

In analyzing the results, Njoroge was able to establish a strong positive correlation between financial education and the degree of success of the entrepreneur. The correlation between the dependent variable of success and the independent variable of financial literacy could be explained and fixed with an R^2 of 0.852 and thus 85.2%.

According to the study, the financial literacy of an entrepreneur thus contributes to a large extent to the success of the business. Successful SMEs are run by entrepreneurs who are financially literate and understand key financial concepts, such as risk management, interest rates, and the time value of money. Furthermore, the study concludes that financially literate entrepreneurs have a higher chance of success than their uneducated competitors (Njoroge, 2013).

It has been proven that financially educated individuals exhibit positive financial behavior when dealing with money (Hilgert et al., 2003). However, this effect does not only manifest itself in the private sector. Andoh and Nunoo (2011) interpret financial literacy as one of the main factors in the SME sector based on their study and show that the possession of this education has a direct impact on firm performance. Compared to more financially illiterate entrepreneurs, those with a high level of financial education also exhibit better savings behavior as well as better risk management and are more likely to engage in the purchase of any insurance policies. As a result, they are less susceptible to disruptive factors triggered by a financial bottleneck or other crises and are de facto more successful than their competitors in the long run due to the few setbacks.

However, it remains to be seen to what extent financial literacy plays a key role in entrepreneurship. So far, the effects have only been described based on developing countries such as Ghana and Kenya, where the majority of the population comes from the informal sector, where the general level of education is of a low standard. Many researchers studying developing countries often associate financial literacy only with basic principles such as simple bookkeeping regarding achieved sales of goods (Musah & Muazu, 2014). Therefore, there is reason to believe that an increased level of financial literacy has a higher effect on boosting business performance in developing countries than in developed countries, as many entrepreneurs based there lack a general basic knowledge of entrepreneurial practices.

The study by Li and Qian (2019) on the role of financial education in entrepreneurial participation confirms the previous findings using China as a case study. Even though the People's Republic of China is an emerging economy, it is undoubtedly one of the most entrepreneurially active countries in the world. The “Global Entrepreneurship Monitor” (GEM) notes an entrepreneurial intention index of 21.42% (GEM, 2019). The index is calculated as a percentage and represents the proportion of the population aged 18 to 64 that is latently entrepreneurial and intends to start a business within the next 36 months. This rate puts China just below the global average of 23.73% and well above many developed industrialized countries such as Germany, where the intention index is 9.12% (GEM, 2019). In addition, the GEM documents the “Total early-stage Entrepreneurial Activity” (TEA). This index describes the percentage of the 18- to 64-year-old population that is either budding entrepreneurs or owners of a new business. China also has a slightly higher value for the TEA index (8.66%) than Germany (7.52%). However, both countries are below the global average of 12.81% (GEM, 2019).

The 2014 “China Family Panel Studies” (CFPS) questionnaire served as the data basis for Li and Qian's study. The CFPS is a nationally representative survey conducted by the “Institute of Social Science Survey of Peking University”, consisting of a variety of economic information. The 2014 CFPS questionnaire, which included questions related to both financial literacy and entrepreneurship, consisted of a sample size of 3575 households after adjusting for non-usable data. After analyzing the data as well as the statistical hypothesis tests, it was found that, again, financial literacy is strongly positively correlated with entrepreneurial success. The results prove that education positively influences the entrepreneurial process both in the entry phase and in the operational phase and contributes to the increase of the generated income. In addition, financial literacy was also shown to be strongly positively correlated with, significantly influence, and contribute to increasing the intention to become an entrepreneur (Li & Qian, 2019). It remains questionable to what extent the ratio is actually increased by financial literacy and whether its influence is manipulated by China's large informal sector, similar to developing countries, and consequently amplified many times over.

As part of her dissertation, Fernandes researched the correlation between the performance of small and medium-sized companies and the financial literacy level of their directors in Portugal (Fernandes, 2015). Similar to the study of Njoroge (2013), this research used questionnaires, based on the “Big Three”, as well as company ratios and their evolution to measure financial literacy and company performance. After analyzing the collected data, a significant positive correlation between the level of financial literacy of the entrepreneur and the performance of his business was also demonstrated in this case. Once again, the relevance of providing financial education opportunities is emphasized here by demonstrating that financially literate entrepreneurs also tend to be more successful with their businesses than their less-educated competitors.

In addition to the correlation between education and performance, Fernandes was able to demonstrate the discrepancy between the subjectively perceived and objectively assessed level of financial literacy. For this purpose, participants were asked to give a realistic self-assessment of their level of knowledge before answering the questions, which were then compared with the collected and categorized values.

Table no. 2. Discrepancy between Self-Assessment/Test Results according to Fernandes

Score class [%]	Test results [%]	Self-assessment [%]
0 – 25	**11**	0
26 – 50	**33**	11
51 – 70	**31**	52
71 – 85	**19**	34
86 – 100	**6**	3

Source: Own projection, based on survey results from Fernandes, 2015

As can be demonstrated from **Table no. 2**, the results were divided into five different point ranges in each case. It can be deduced from the results that respondents tend to overestimate their knowledge. This is particularly evident in the category with low financial literacy. The entrepreneurs belonging to this category (11%) did not classify themselves in this category in advance. Only in the top category were comparable values achieved between the subjectively perceived and objectively measured levels of education (Fernandes, 2015). Overestimating one's entities, particularly in the area of the already low level of education, can pose a threat to the company through financially incorrect decisions and thus jeopardize its continued existence.

In addition, Fernandes was able to demonstrate that financial literacy tends to be higher in larger firms.

Table no. 3. Score achieved, categorized by Revenues, according to Fernandes

Revenues	Mean Value (Test results) [%]
0 – 10,000 €	2.50
10,001 – 100,000 €	29.61
100,001 – 500,000 €	45.06
500,001 – 2,000,000 €	55.25
> 2,000,000 €	73.42

Source: Own projection, based on survey results from Fernandes, 2015

Based on the mapped results from **Table no. 3**, it can be deduced that the entrepreneurs of larger companies (in terms of revenues) were able to demonstrate a higher financial literacy level on average than entrepreneurs located in the lower revenues segment. The largest leap in the various mean values is recorded between the categories up to 10,000 € and between 10,001 – 100,000 €.

Further insight into the effect of financial literacy on developed countries is provided by the recent Dutch study by Alperovych et al. (2020). In this study, similar to the previous ones, the correlation between education level and company performance was measured. However, in contrast to the previously mentioned studies, this one examined only the employee's reported level of knowledge instead of objective measurement. In the 2016 survey, financial literacy was examined using four categories: accounting, strategy, financing the firm, and taxation. Three variables were used to measure firm performance: gross profit margin from the previous year – 2015, revenue growth over the last three years before the survey, and annual revenue of the firm. A positive correlation between literacy level and business performance was also found in terms of self-reported financial literacy. Entrepreneurs who described themselves as financially literate tended to also own larger firms in terms of revenue, revenue growth rate, and higher profitability than those who rated themselves lower in terms of their knowledge level (Alperovych et al.; 2020). In addition to the correlation to financial literacy, a correlation between a university degree or a minimum of five years of entrepreneurial experience and the performance variables studied was also found. This correlation could not always be proven to be statistically significant. In most cases, however, experienced entrepreneurs have larger firms but are not necessarily more profitable than those inexperienced entrepreneurs.

Even though this study, published in 2020, is the most recent investigation of the issue based on an industrialized country, its representativeness remains an open issue. To measure financial literacy, Alperovych et al. used only subjective self-reported knowledge. The discrepancy between self-reported and objectively measured knowledge levels is a confounding factor that may skew the results of this study. Entrepreneurs, especially those with low financial literacy, tend to estimate their level of knowledge to be significantly better than it is (Fernandes, 2015).

Beyond this topic, Alperovych et al. (2020) analyzed the propensity of entrepreneurs to rely on financial advice from both professional advisors and private individuals. Here, it is suggested that financial advice of a professional nature is of higher quality than advice that comes from family or friends. The research found that a higher level of financial literacy results in less frequent seeking of professional help (Alperovych et al.; 2020). Efficient tax planning with professional help could also help to optimize the profit generated after the deduction of any taxes.

However, a lack of competence in financial sub-areas does not necessarily mean failure or failure of entrepreneurial activity. In the event of a lack of skills or uncertainty regarding upcoming financially fraught decisions, entrepreneurs can turn to professional help from tax advisors, accountants, or business partners (BDC, 2017). If entrepreneurs recognize when they need to seek advice at the right time, the expertise of professionals can contribute greatly to business success. In addition to seeking paid assistance, there are low-cost alternatives. Due to access to the Internet, both entrepreneurs and private individuals now have an almost limitless, free source of information at their disposal and have the opportunity to educate themselves further in various sub-areas. Questionable remains, however, whether they are also in a position to filter out from the multitude of sources and information exactly the part that is relevant to their circumstances, let alone to be able to distinguish between reliable and unreliable sources (BDC, 2017).

1.3. Financial literacy and start-up financing

Hussain et al. (2018) describe financial literacy as a connective resource that reduces information asymmetry, particularly in evaluating and distinguishing between credit and financing options. With the extensive expertise gained as a result, financial literacy can be portrayed as a core resource that supports effective decision-making by owners. This capability helps optimize capital structures and contributes to the stable scaling of the company. By improving capital structures, cutting unnecessary costs, and obtaining improved financing options, financial literacy also makes a significant contribution to maintaining competitiveness.

There is still a financing gap, particularly in the SME sector. This is determined by limits on the amount of funding sought by potentially viable and profitable businesses that cannot raise the required finance (*Department of Business Innovation and Skills*, UK, 2012). On average, about 20% of start-ups are affected by financing difficulties, which typically manifest themselves in a lack of equity, protracted loan negotiations, or ultimately failure to finance (Leifels & Metzger, 2015). Small companies in particular often receive poorer financing conditions and have to provide higher collateral and pay high-interest rates compared to their larger competitors. This in turn limits the growth potential of SMEs. The establishment, as well as the growth of SMEs, is particularly limited in developing countries. Due to the lack of capital in general, it is particularly difficult to obtain financing here. The problem here is that profitable and innovative ideas or business models could exist in the companies, but these are never realized due to a lack of financing and accordingly cannot contribute to the development of the already weak economy. In addition, the financing behavior of industrialized banks has declined considerably in recent years, especially in the area of SME financing, which underscores the aspect of financing as a hurdle. One reason for this is that banks usually prefer to finance the projects of larger companies, as these concepts are significantly more lucrative from the bank's point of view due to the size of the loan required. The comparatively small sums required by SMEs tend to be unattractive to the bank, as the bureaucratic and personnel workload behind them is usually identical to that involved in processing larger orders. Furthermore, the traditional borrowing of SMEs is further hampered due to their lack of creditworthiness (Leifels & Metzger, 2015). The assessment of companies in terms of their ability to borrow is often based on the evaluation of revenues and the performance of recent years or on the extent to which the company can provide collateral for the loan. This particularly affects founders who come from a financially weak background and thus cannot rely on the support or performance of a guarantee from their family environment. Given the relevance of the SME sector through its innovative strength and the creation of the majority of jobs, eliminating the financing gap seems particularly necessary (Leifels & Metzger, 2015).

1.4. Possibilities of Alternative Financing

Especially about this gap, it is more important than ever to manage the available capital as efficiently as possible with the help of financial expertise or to inform oneself about alternative financing options.

In their study, Seghers et al. (2012) analyzed how limited knowledge about financing alternatives causes suboptimal financing decisions. Whether in the start-up phase or to overcome liquidity shortages, the lack of knowledge in the financial sector means that financially illiterate entrepreneurs often resort to the wrong and thus unfavorable alternatives, as they are usually unaware of the low-cost options. Opportunities such as crowdfunding, private equity, venture capital investments, or financially supportive start-up assistance from the government offer in most cases more lucrative financing to start a business than the classic bank loan. In crowdfunding, in particular, the company itself can decide what is paid to investors as compensation, depending on the amount of their investment. In addition, financing through a crowdfunding platform offers several advantages for the budding company. By advertising the project on the platform, interested parties are made aware of the company virtually free of charge. This in turn enables the company to build up a customer and prospect base even before actively participating in the market, which is just waiting to purchase the advertised company's products. In addition to building a customer base, the advertisement can be used to determine whether the product is appealing to the market or whether it is indistinguishable from existing alternatives and thus rejected. There is also the possibility of funding companies that were originally rejected in a bank's previous evaluation because their product or venture was generally deemed unviable (Seghers et al., 2012).

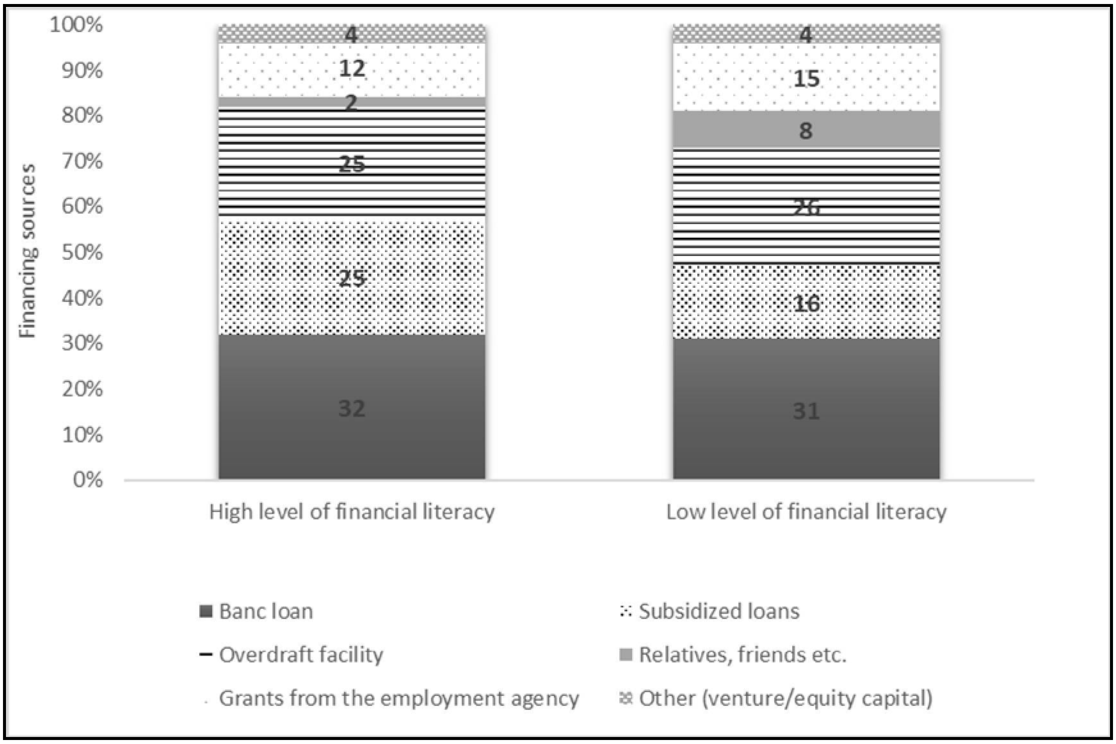
Another option is to appear on TV. Offshoots of the American business reality show “Shark Tank” exist worldwide and offer the appearing entrepreneur the opportunity to secure financial support from investors present. Even if many entrepreneurs are deterred by the possibly harsh criticism of the jury, the appearance on TV allows them to advertise free of charge and to reach other investors through the resulting publicity. Likewise, the criticism of the jury can be accepted, which can improve the existing business plan.

The essential force of these listed financing options is the trend of advancing digitalization. The Internet in particular enables the acquisition of and communication with a large number of international investors, which above all reduces the obstacle of financing in this context.

But there are also alternatives for overcoming financial bottlenecks when the company is already operating on the market, such as the factoring of liabilities, in which outstanding receivables are sold to a third party, or the sale-and-lease-back procedure, in which equipment, for example, is sold and leased back on instalment terms from the proceeds to be able to realize a short-term liquidity boost from this (Klapper, 2006).

Figure no. 1 illustrates different sources of financing in terms of their use by financially literate as well as financially illiterate entrepreneurs.

Figure no. 1. Utilization of different financing options by level of financial literacy



Source: KfW Start-up Monitor 2014, from "Fokus Volkswirtschaft" No. 107 (Leifels & Metzger, 2015).

As can be seen in ***Figure no. 1***, entrepreneurs with good financial knowledge tend to use financing alternatives that are more advantageous for themselves. Financially literate entrepreneurs more often turn to subsidized loans, where capital is obtained from the public sector at favorable rest rates.

1.5. Financial literacy and interpreting of reports and figures

Another link between business performance and financial literacy was established by Dahmen and Rodriguez (2014). As part of an inventory for the use of business consulting services, a total of 14 companies were financially evaluated by the "Florida Business Development Center". The financial literacy of the entrepreneurs and the incorporation of financial reports in strategic decision-making were included. It was found that a total of seven of the 14 companies had problems with financial constraints. In this regard, six of the seven companies indicated that they very rarely if ever reviewed the company's financial reports and accordingly did not include them in the strategic decision-making process. All of the entrepreneurs who experienced difficulties with financial bottlenecks and indicated that they did not review the reports admitted that they were unable to do so due to a lack of competence. Accordingly, a correlation can be established between the use of own financial reports and company performance.

The relevance of financial report writing has also been demonstrated in a Canadian study on the impact of financial literacy on new business survival by Wise (2013). In his study, a total of 509 young entrepreneurs who received start-up loans for their business creation through their participation in a program of the "Candian Youth Business Foundation" were interviewed regarding their financial literacy, the regularity of preparation and use of financial reports, and the overall financial situation of the business. Initially, it was assumed that the meticulous inclusion of these reports would help improve the overview of the company's financial situation, thereby identifying emerging risks and financial bottlenecks early on. The research found that higher levels of financial literacy led to financial reports being prepared on a comparatively more regular basis and incorporated into the decision-making process, better factoring in loan repayments and thus preventing involuntary closure of the business (Wise, 2013).

In addition to the studies on the correlation between education and business success, Cumurovic and Hyll (2018) investigated the relationship between the financial literacy level and the employment relationship of the tested person. The "German Save Study" from 2009 served as the data basis. For the analysis of the facts, the respondents were categorized as wage earners or self-employed depending on their vocation and employment relationship. A selection of a total of nine questions served to measure the level of education. The first four questions dealt with basic topics from the "Big Three", while the remaining five dealt with more advanced sub-areas. Here, questions were asked regarding money value illusion, volatility, the stock market, funds, and the bond market.

Self-employed persons were generally more likely to answer the basic questions correctly than wage earners. The same tendency could also be found in the advanced questions. On average, the self-employed respondents answered 6.5 of the questions correctly, while the wage earners were slightly lower, with an arithmetic mean of 5.7 questions answered correctly. Even though the difference is small, a tendency can be derived from a total of 1039 respondents (Cumurovic & Hyll, 2018).

As entrepreneurs are more aware of financial opportunities and risks, they may not only have a better understanding of how or what makes a business more profitable, but may also be more willing to take the step into self-employment than those who do not have a basic knowledge of how to deal with the challenges, risks, and responsibilities of running a business (Cumurovic & Hyll, 2018). In addition, Elert et. al. (2015) found that entrepreneurial education during secondary school would increase both the long-term probability of starting a business and the future income from the business.

Conclusions

In summary, financial literacy is key as it helps reduce information asymmetry (Hussain et al. 2018) and assists in achieving better-informed financial decisions in both personal and business terms. In her dissertation, Fernandes (2015) shows a positive correlation between company performance and the level of education and also demonstrates the discrepancy between self-reported and objectively tested financial literacy. Furthermore, Alperovych et al. (2020) likewise demonstrated a positive correlation between the two variables. However, this Dutch study only included self-reported knowledge levels. Another positive correlation has been demonstrated by Dahmen and Rodriguez (2014) in the U.S. and by Wise (2013) in Canada, examining the relevance of preparing financial reports meticulously or incorporating them strategically and their positive effects on business performance, which was found to be more frequent among financially literate entrepreneurs. Since the effects of financial literacy on entrepreneurship and the often-studied business performance have been less researched, it is advisable to conduct further research with qualitative data collection in this field. The focus should be, especially in developing countries, to investigate the issue based on a leading industrialized country, such as Germany, to further strengthen the evidence for effects based on this country. In addition, a standardized measure such as the "Big Three" framework should be used to measure financial literacy to rule out falsification of the results and to ensure the representativeness and comparability of the data collected. Furthermore, research on the impact of financial literacy on the overall likelihood of entrepreneurial activity and the promotion of entrepreneurship should take into account that many country-specific factors, such as the cost of setting up a legal entity and the tax rate of the income generated, can significantly influence this activity and lead to a distortion of the research results.

Overall, the existing international studies indicate a correlation between financial literacy and entrepreneurship, but this has not yet been scientifically validated to the same extent as the correlation between financial literacy and wealth creation. In particular, there is a lack of empirical evidence from the industrialized countries – above all from Germany. To achieve scientific evidence a nationwide empirical Germany study among start-ups and SMEs is planned and will provide significance to the link between financial literacy and entrepreneurship in research and policy discussion.

Appendices

Appendix 1: The "Big Three" financial literacy questionnaire

The "Big Three" financial literacy questions (listed below), created by Professor Annamaria Lusardi and Professor Olivia S. Mitchell, have now been used in more than 20 countries to measure financial knowledge. Comparisons of results across countries have demonstrated that financial illiteracy is a global problem, that financial literacy peaks in middle age, and that women consistently score lower than men. (Note: Correct answers are in **bold**).

1. Suppose you had $100 in a savings account and the interest rate was 2% per year. After 5 years, how much do you think you would have in the account if you left the money to grow?

- **More than $102**
- Exactly $102
- Less than $102
- Do not know
- Refuse to answer

2. Imagine that the interest rate on your savings account was 1% per year and inflation was 2% per year. After 1 year, how much would you be able to buy with the money in this account?

- More than today
- The same
- **Less than today**
- Do not know
- Refuse to answer

3. Please tell me whether this statement is true or false. "Buying a single company's stock usually provides a safer return than a stock mutual fund."

- True
- **False**
- Do not know
- Refuse to answer

Source: GFLEC, Three Questions to Measure Financial Literacy

Appendix 2: The “Big Five” financial literacy questionnaire

(Note: Correct Answers are in **bold**)

1. Suppose you had $100 in a savings account and the interest rate was 2% per year. After 5 years, how much do you think you would have in the account if you left the money to grow?

A) More than $102
B) Exactly $102
C) Less than $102
D) Don’t know
E) Prefer not to say

2. Imagine that the interest rate on your savings account was 1% per year and inflation was 2% per year. After 1 year, how much would you be able to buy with the money in this account?

A) More than today
B) the same
C) Less than today
D) Don’t know
E) Prefer not to say

3. If interest rates rise, what will typically happen to bond prices?

A) They will rise
B) They will fall
C) They will stay the same
D) There is no relationship between bond prices and the interest rate
E) Don’t know
F) Prefer not to say

4. A 15-year mortgage typically requires higher monthly payments than a 30-year mortgage, but the total interest paid over the life of the loan will be less.

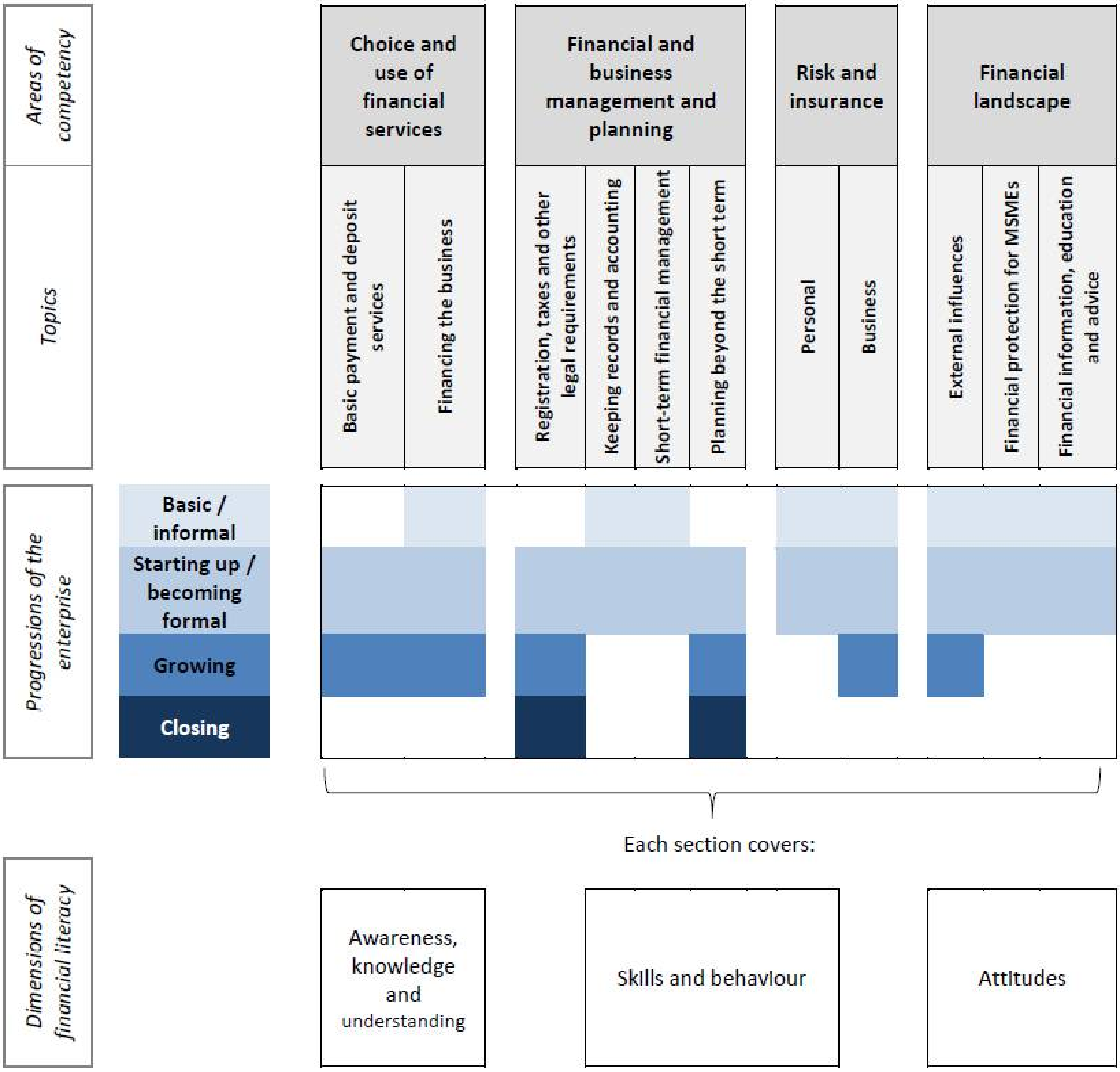
A) True
B) False
C) Don’t know
D) Prefer not to say

5. Buying a single company’s stock usually provides a safer return than a stock mutual fund.

A) True
B) False
C) Don’t know
D) Prefer not to say

(Source: GFLEC, “Big Five”: Test your financial literacy knowledge with the “Big Five” questions)

Appendix 3: OECD framework on financial literacy for MSMEs



Source: OECD/INFE Core Competencies Framework on Financial Literacy for MSMEs, 2018

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