# Theoretical Models of Financial Literacy: A Bibliometric Analysis and Literature Review

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## ABSTRACT

**Manuscript type**: Literature review
**Research aims**: This study aims to identify research trends in theoretical models of financial literacy in the Scopus database from 2013 to 2021. Future research can focus on the least-used variables in theoretical models of financial literacy.
**Design/Methodology/Approach**: Seventy-three articles using theoretical models of financial literacy are discussed in this study. This paper uses bibliometric analysis to visualise the bibliographic coupling, co-citation, and co-occurrence of keywords.
**Research findings**: An increasing number of articles on financial literacy models have been published in the Scopus database, suggesting a growing interest in theoretical models of financial literacy and financial literacy knowledge. Performance, competitive advantage and business experience are increasingly being used as variables, indicating an opportunity to further investigate financial literacy models.
**Theoretical contribution/Originality**: This study is the first to investigate theoretical models of financial literacy using bibliometric analysis and a literature review. This study focuses on articles published between 2013 to 2021.
**Practitioner/Policy implication**: This study is important because it connects previous and more recent studies, identifies gaps in understanding, and suggests new ways to study theoretical models of financial literacy.

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**Research limitations/Implications**: The material used in this study was only taken from the Scopus database. Therefore, further research needs to be done by including indexing and other databases.

**Keywords**: Financial literacy, Theoretical model review, Literature review, VOSviewer, Scopus
**JEL Classification**: G53

## 1. Introduction

The concept of financial literacy first appeared in 1797 when John Adams, the second president of the United States, stated:

> *All the perplexities, confusion, and distress in America arise not from deficits in the Constitution or Confederation, nor from want of honour or virtue, so much as from downright ignorance of the nature of coin, credit, and circulation. (Muñoz-Céspedes et al., 2021)*

This explains why Adams is called the founding father of financial literacy in the US. He was the first to recognise the significance of financial literacy, and emphasise the necessity of a foundational knowledge of the essence of money (Goyal & Kumar, 2021). However, the term 'financial literacy' only appeared in research in the late 1990s due to the increasing regulation of financial markets and the ease of access to credit loans for the community (Marcolin & Abraham, 2006). Bakken (1967) and Danes and Hira (1987), who examine the need for special education in money management, conducted early studies on financial literacy among high school and college students. In 1992, the National Foundation for Educational Research defined financial literacy as the ability to make the right decisions regarding money management (Noctor et al., 1992). This concept became the starting point for the development of financial literacy studies until the recent boom.

The global economic crisis that occurred in 2008 was caused by increased housing transactions using bank credit and the inability of consumers to pay instalments due to rising interest rates (Faulkner, 2015). Consumers who are financially literate will be more careful about taking credit, while those who are financially blind may not know the risks they face later (Abdullah & Chong, 2014). The Covid-19 pandemic that began in 2020 showed the public the importance of a personal financial budget in the event of an unexpected loss of income. The lack of financial literacy was shown in the global economic crisis and the recession caused by the global pandemic (Kurowski, 2021). Because of this, many financial literacy studies have been carried out to see if people who have more knowledge about money can withstand crises or mitigate its effects. Studies on financial literacy have been carried out at both the individual and at the organisational or company level (Damayanti et al., 2018). Financial literacy for individuals involves managing personal finances, in terms of daily expenses, emergency funds, children's education and retirement (Kasman et al., 2018). The pace of life in today's world and the fact that many individuals do not meet a decent standard of living underline the importance of financial literacy (Vitt et al., 2000). Financial inclusion, meanwhile, refers to public access to the various financial products and services offered by financial institutions (Kodongo, 2018). According to the World Bank, financial inclusion can reduce poverty and improve people's welfare (Singh & Gupta, 2020), underlining the need for individual financial literacy coupled with financial inclusion (Verma & Oum Kumari, 2016).

Financial literacy is also applied at the company or organisational level (Damayanti et al., 2018). Organisational financial literacy encourages managers and CEOs to better understand credit, debt, budget, insurance, and other financial dimensions related to a firm's operational activities (Adomako & Danso, 2014; Plakalović, 2015). Given its importance, it would be beneficial to carry out a bibliometric analysis and literature review of existing financial literacy studies from the past to the present to help people learn about managing their money.

## 2. Literature Review

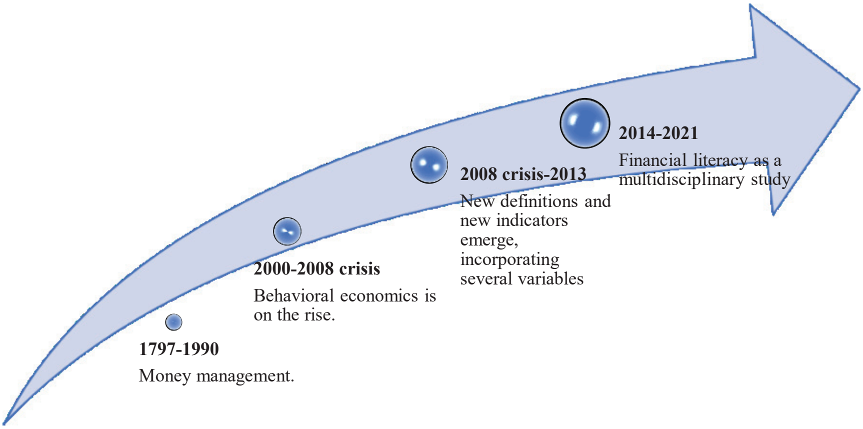
We list below definitions of financial literacy over three decades to see how the concept has evolved. Noctor et al. (1992) define financial literacy as the ability to make sound judgments and to take effective decisions regarding the use and management of money. This three-decade old definition, which was still general in nature, only discusses financial literacy as the management of money, but did, however, spur further research. Huston (2010), meanwhile, defines financial literacy as the measure of how well individuals can understand and use information related to personal finance. This definition only focuses on individual and family financial literacy enhanced through financial education programmes, but it distinguishes financial literacy from financial literacy education. The following year, Lusardi et al. (2011) termed financial literacy as the knowledge of basic financial concepts and the ability to perform simple calculations. According to the authors, women and youth with low education levels in the US have low literacy levels, so the solution is to provide basic financial education. In a 2014 Organisation for Economic Co-operation and Development (OECD) working paper, a measurement of financial literacy is derived from Atkinson and Messy (2012) for almost every country, such as Albania, Armenia, Germany, Ireland, Malaysia, Norway, Peru, Poland, South Africa, the United Kingdom, and the British Virgin Islands. In the paper, financial literacy is defined as:

> [the] *knowledge and understanding of financial concepts and risks, and the skills, motivation and confidence to apply such knowledge and understanding in order to make effective decisions across a range of financial contexts, to improve the financial well-being of individuals and society, and to enable participation in economic life.* (OECD, 2014)

From some of the literature above, it is clear that the definition of financial literacy and how it is measured are still being developed and discussed today.

Additionally, we also provide an overview of the evolution of the concept of financial literacy adopted by Muñoz-Céspedes et al. (2021). Based on the explanation above, the evolution of financial literacy is as follows: from 1797 to 1990, it pertained to the initial study of money management; the years 2000 until the 2008 crisis saw the boom of the term 'financial literacy'; from the post-crisis period until 2013, some definitions of financial literacy and indicators emerged; and lastly, from 2014 to 2021, financial literacy became a multidisciplinary study (see Figure 1).

**Figure 1: The evolution of financial literacy**



Why the need for a bibliometric analysis and literature review on theoretical models of financial literacy? A bibliometric analysis makes it easier and more useful to organise and study the growing number of publications. Both a bibliometric analysis and literature review can link past and more recent research, identify gaps in understanding, and suggest new research opportunities (Demartini & Beretta, 2020). Several literature reviews on the topic of financial literacy have been carried out by Abdullah and Chong (2014) on Islamic financial products, Fatoki and Oni (2014) on financial literacy in South Africa, Faulkner (2015) on definitions of financial literacy and why it matters, Kimiyaghalam and Safari (2015) on the concept of financial literacy and its measurements, and Garg and Singh (2018) on financial literacy among youth around the world. A bibliometric analysis has been carried out by Goyal and Kumar (2021) presenting quantitative and qualitative knowledge on the rapidly-evolving subject of financial literacy.

A bibliometric analysis is useful in examining the development of a published theme. One of the first articles to use the bibliometric method was written by Billings (1881) to review medical science literature. Initially, the bibliometric method was carried out using the application of mathematics and statistics for the study of literature in libraries (Nicholas & Ritchie, 1978; Pritchard, 1969). The bibliometric method was used to calculate the number of publications, the number of citations, and research groupings (Moed et al., 1985). Bibliometric research is generally used in quantitative studies of articles, journals, books, or other types of written communication (Heersmink et al., 2011). Bibliometric research is bibliographic research to present scientific concepts contained in an article as seen from the keywords that appear and the documents cited (Tupan et al., 2018).

The development of financial literacy research can be viewed from the theoretical models used. A theoretical model is an effort to simplify a problem into statistical concepts, such as variables, symbols (notations), and so on. However, we believe that a bibliometric analysis and literature review study that focuses on theoretical models, in terms of the different variables and statistical tools used, has never been carried out.

This article contains a comprehensive discussion of the Scopus-published theoretical models of financial literacy. Specifically, this study seeks to identify the total number of publications, the 10 most cited major journals, the most cited articles, the authors with the greatest number of theoretical models of financial literacy, and the variables used in those models. The objective is to map the variables and derive which can be used for future research. To do this, we conducted a bibliometric analysis and literature assessment of the financial literacy model and provide ideas for future research that will benefit the study of financial literacy.

## 3. Methods

The focus of the present study is the theoretical models of financial literacy, with subject areas covering the social sciences, economics, econometrics and finance, business, management and accounting, and computer science. This study adopts a methodological approach similar to that of Bedi et al. (2019), Ingale and Paluri (2020), Goyal and Kumar (2021), Ansari et al. (2022), and Gallego-Losada et al. (2022). Based on this study, articles exploring theoretical models of financial literacy with the abovementioned domains were scanned, analysed, and curated to assimilate the data set.

We used a two-step approach to identify the articles to be analysed and reviewed. The first step is to determine the appropriate search terms to mine the Scopus database for relevant articles. This database was chosen for its comprehensive coverage of peer-reviewed research in leading journals and its pervasive presence within the academic community (Gan & Yusof, 2020; Pellegrini et al., 2020; Mubarrok et al., 2020). In the second step, we decided which articles to put in our database for bibliometric analysis by using certain criteria.

The collected databases were mapped and visualised graphically using the VOSviewer application for further analysis (van Eck & Waltman, 2010). The bibliographic coupling analysis shows the closeness of related articles. Bibliographic coupling means that the articles observed will be visualised and networked if other articles have the same references. Co-citation will visualise the references used by the article being observed. In co-citation, references will be linked if they are used in the same article. Co-occurrence displays a visualisation of the network between keywords presented in the abstract. There are three visualisation displays in the VOSviewer application, namely network, overlay, and density visualisation, which show the network between the visualised terms, traces of research history, and density/emphasis on research groups, respectively. Density can also be used to see research groups that have received less attention.

### *3.1 Identifying Keywords for Database Searches*

Past bibliometric analyses on the topic of financial literacy were reviewed to explore potential keywords for the database search. The keywords 'financial literacy', 'financial knowledge', 'financial attitude', 'financial behaviour', 'financial education', 'financial ability', 'financial abilities', 'financial skills', and 'financial training' were selected to scan the selected database on February 4, 2022.

### *3.2 Selecting Articles for the Database*

To compile research relevant to this study, we restricted our Scopus search to just articles, and excluded all other types of documents, such as reviews, conference papers, editorials, and book chapters. The range 2013 to 2021 was specified in the year of publication for inclusion in the final dataset. Furthermore, we only included articles in the database that were published in peer-reviewed journals across the categories of social sciences, economics, econometrics and finance, business, management and accounting, and computer science.

These criteria were applied to fulfil our research objective to consider management and related fields. Thus, we excluded other study domains, such as medicine, psychology, engineering, arts and humanities, environmental science, mathematics, energy, decision sciences, and material sciences. We also applied the inclusion criteria to the publishing language, considering only English-language articles. The selection criteria for this article were used to compile a database of 73 articles on financial literacy theoretical models. The data were saved in a research information system (RIS) and comma-separated values format (CSV) with the necessary citations and bibliographic information for further analysis.

## 4. Results and Discussion

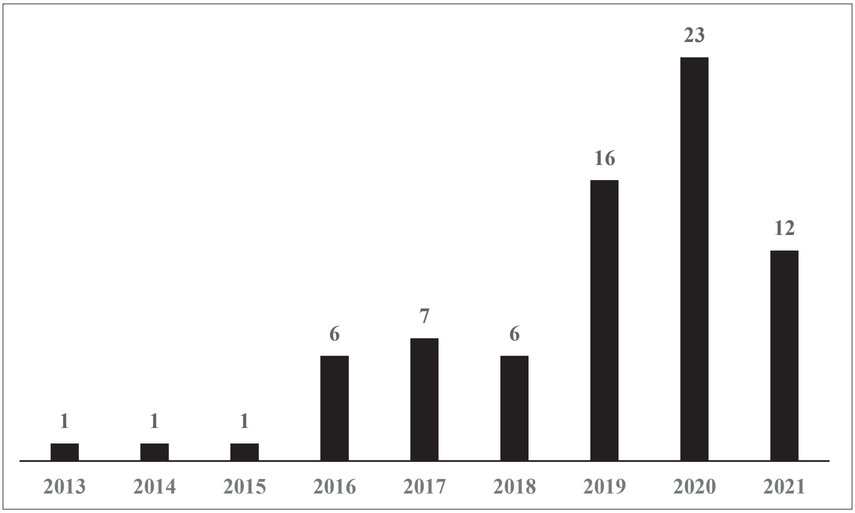
### *4.1 Descriptive Analysis*

This section will analyse the theoretical model of financial literacy, in terms of the number of publications, the 10 most published major journals, the 10 most cited articles, the most prolific proponents of theoretical models, and the countries where theoretical models are studied. Finally, we map the variables contained in these theoretical models. The theoretical models of financial literacy are divided into four parts: financial literacy as a moderating variable, as a mediating variable, as an independent variable, and as a dependent variable.

One of the software tools used to determine trends in a particular discipline or topic is VOSviewer. The application offers text mining functionality that can be used to build and visualise a network of shared events using key terms extracted from the literature. We use VOSviewer to see trends in theoretical models of financial literacy network between variables in 73 articles from the Scopus database. We also use visualisation, overlay, and density networks in VOSviewer to see trends in the models. The visualisation of the variable network can be seen from the results of the VOSviewer analysis below. The labels in the image indicate keywords or variables that appear frequently, while the colours indicate clusters. Each circle represents a frequently-occurring keyword or variable. The bigger the circle, the more often the keyword or variable is being looked at.

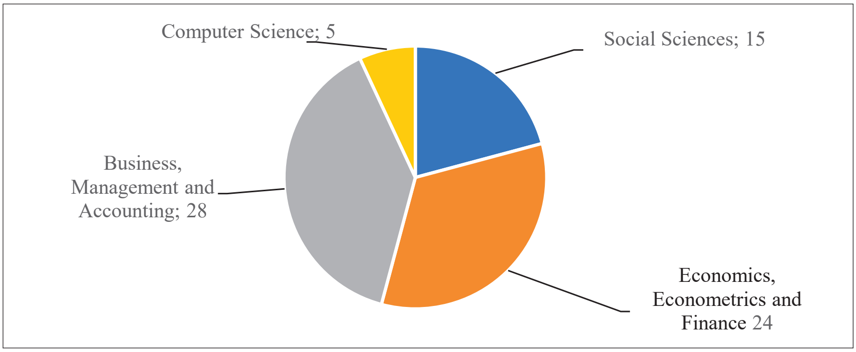
In the Scopus database, studies using theoretical models of financial literacy have experienced a drastic increase. In the period of 2013 to 2021, financial literacy research with theoretical models produced a total of 73 articles. From 2013 to 2015, only one article was produced each year. However, in 2016, this increased to six articles, seven in 2017, and six in 2018. This increased again in 2019 with 16 articles, 23 articles in 2020, and 12 articles in 2021 (see Figure 2).

**Figure 2: Number of articles published per year**



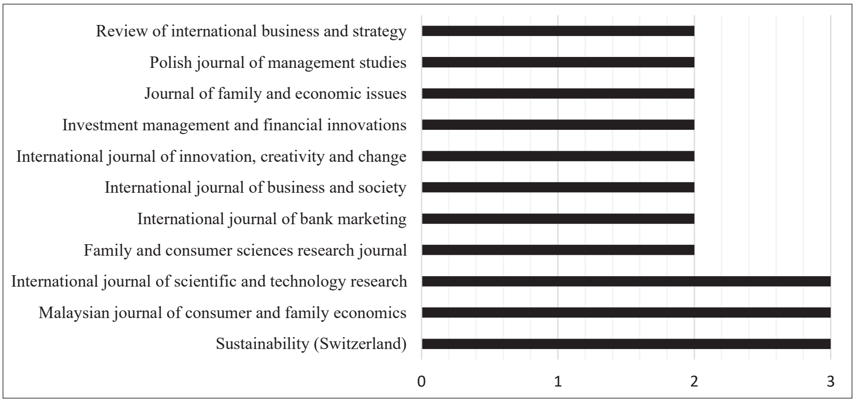
The theoretical model articles in the Scopus database began to increase from 2016 onwards, which shows that the topic of financial literacy is still in demand today. With regard to the subject area of research, business, management and accounting had the most publications with 28 articles, followed by economics, econometrics and finance with 24 articles, social sciences with 15 articles, and computer science with five articles (see Figure 3).

**Figure 3: Subject areas of theoretical models of financial literacy**




The journals that published the most articles on theoretical models of financial literacy are *Sustainability (Switzerland)*, *Malaysian Journal of Consumer and Family Economics*, and *International Journal of Scientific and Technology Research* with three articles each. Other journals published the same number of articles (see Figure 4).

Figure 4: Journals with the highest number of articles



The articles on the theoretical model of financial literacy with the highest impact are those with the most citations in the Scopus database. Of the 10 most cited articles, Gerrans et al. (2014) was the most frequently cited with 65 citations, followed by Ying et al. (2019) with 46 citations, and Adomako et al. (2016) with 45 citations. Many of the articles with a lot of citations were written in 2016 and 2017. Three of the top 10 articles discussed financial literacy as a moderating variable, and four as an independent variable (see Table 1).

**Table 1: Most cited articles**

| Authors | Title | Citations |
|---|---|---|
| Gerrans et al. (2014) | The relationship between personal financial wellness and financial wellbeing: A structural equation modelling approach | 65 |
| Ying et al. (2019) | The role of a manager's intangible capabilities in resource acquisition and sustainable competitive performance | 46 |
| Adomako et al. (2016) | The moderating influence of financial literacy on the relationship between access to finance and firm growth in Ghana | 45 |
| Okello Candiya Bongomin et al. (2017) | The relationship between access to finance and growth of SMEs in developing economies: Financial literacy as a moderator | 29 |
| Ye and Kulathunga (2019) | How does financial literacy promote sustainability in SMEs? A developing country perspective | 26 |
| Potrich & Vieira (2018) | Demystifying financial literacy: A behavioral perspective analysis | 18 |
| Ngek (2016) | Performance implications of financial capital availability on the financial literacy: Performance nexus in South Africa | 18 |
| Okello Candiya Bongomin et al. (2016) | Financial inclusion in rural Uganda: Testing interaction effect of financial literacy and networks | 17 |
| Adam et al. (2017) | Financial literacy and financial planning: Implication for financial well-being of retirees | 17 |
| Mindra & Moya (2017) | Financial self-efficacy: A mediator in advancing financial inclusion | 16 |

Of the authors who wrote the most articles using theoretical models of financial literacy in the Scopus database, John C Munene authored six articles, George Okello Candiya Bongomin authored five, and Joseph Mpeera Ntayi authored four. All three authors are from the same university in Uganda. Four authors with three articles each are from the same university in Indonesia, I Made Candiasa, Nyoman Trisna Herawati, Naswan Suharsono, and I Ketut Yadnyana. The list is completed by Muhammad Anwar from Pakistan with three articles, and finally Muhammad Fazli Sabri from Malaysia with three articles (see Table 2).

**Table 2: Most cited authors**

| Name | Organisations | Documents |
|---|---|---|
| John C. Munene | Makerere University Business School, Kampala, Uganda | 6 |
| George Okello Candiya Bongomin | Makerere University Business School, Kampala, Uganda | 5 |
| Joseph Mpeera Ntayi | Makerere University Business School, Kampala, Uganda | 4 |
| I Made Candiasa | Universitas Pendidikan Ganesha, Singaraja, Indonesia | 3 |
| Nyoman Trisna Herawati | Universitas Pendidikan Ganesha, Singaraja, Indonesia | 3 |
| Naswan Suharsono | Universitas Pendidikan Ganesha, Singaraja, Indonesia | 3 |
| I Ketut Yadnyana | Universitas Pendidikan Ganesha, Singaraja, Indonesia | 3 |
| Muhammad Anwar | International Islamic University Islambad, Pakistan | 3 |
| Muhammad Fazli Sabri | Universiti Putra Malaysia | 3 |

Bibliographic coupling refers to the analysis of the relationship between authors by counting the number of references that a group of documents has (documents A and B are combined if both cite article C). Figure 4 shows the results of this analysis. A large circle indicates the author has more articles. Figure 5 shows the bibliography of coupling countries, for all countries, and the total link strength calculated. The countries with the largest number of publications, number of citations, and total link strength were selected. Number one is Indonesia, with 20 publications, 57 citations, and 1,010 total link strengths. The other countries are Malaysia (14; 68; 1,222), China (8; 89; 1,218), Uganda (8; 94; 685), and the United States (5; 24; 521).

**Figure 4: Bibliographic coupling authors**

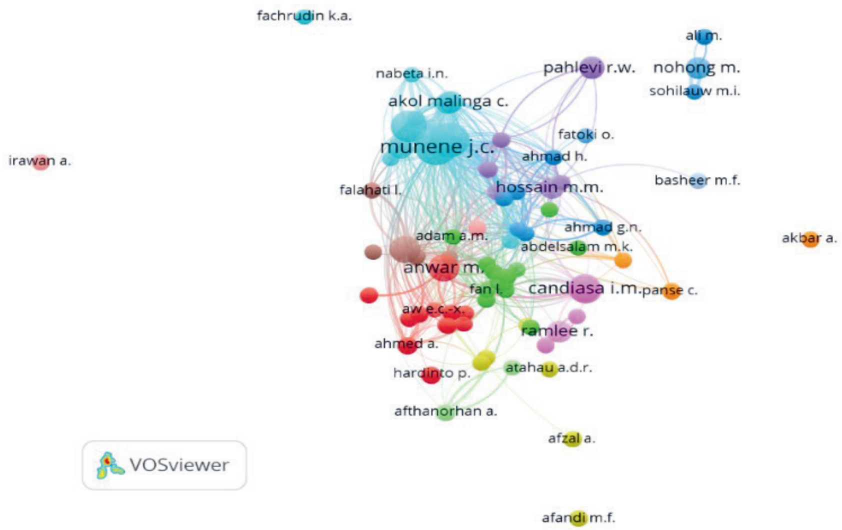



**Figure 5: Bibliographic coupling countries**

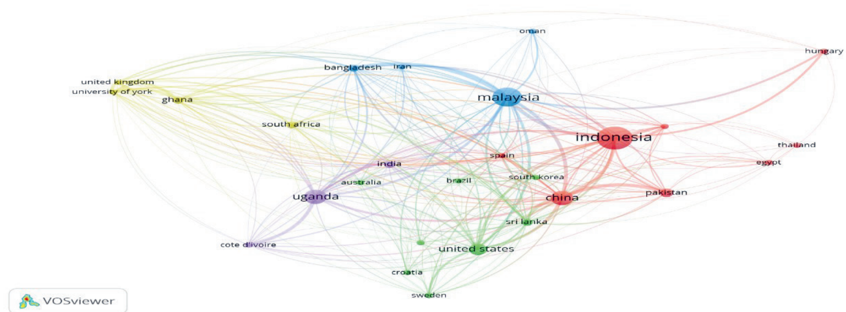



Figure 6 below shows that the biggest circle is 'financial literacy' because it the variable reviewed in this study. In addition, the keywords or variables that are relevant to financial literacy are 'financial risk tolerance', 'risk tolerance', and 'entrepreneurial performance'. The colour difference of the connecting line in Figure 6 shows that there is a cluster relationship in the theme of financial literacy. The topic interaction of financial literacy is divided into eight clusters, where each keyword or variable has a relationship in its visualisation. Details of the cluster items are listed in Table 3 below.

**Figure 6: Interaction topic of financial literacy**

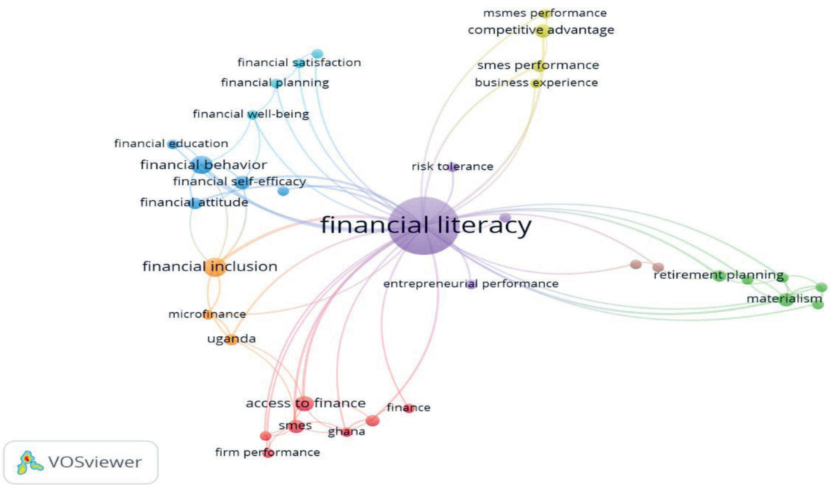



**Table 3: Cluster topic of financial literacy**

| Cluster | Topic |
|---|---|
| Cluster 1 | Access to finance, finance, firm performance, growth |
| Cluster 2 | Financial decision, materialism, moderation (*wasatiyyah*), retirement planning, saving attitude |
| Cluster 3 | Financial attitude, financial behaviour, financial education, financial self-efficacy, parental socioeconomic status |
| Cluster 4 | Business experience, competitive advantage, MSME performance, SME performance |
| Cluster 5 | Entrepreneurial performance, financial literacy, financial risk tolerance, risk tolerance |
| Cluster 6 | Financial planning, financial satisfaction, financial well-being, gender differences |
| Cluster 7 | Financial inclusion |
| Cluster 8 | Investment |

The keyword or variable 'financial literacy' ranks first with 68 occurrences and a total link strength of 95. Following in second place, 'financial inclusion' had eight occurrences, 'financial behaviour' had seven occurrences, and 'access to finance' had five occurrences. Details of the occurrence and total link strength of keywords or variables can be seen in Table 4.

**Table 4: The frequency of occurrence and the total link strength**

| Keyword/variable | Occurrences | Total link strength |
|---|---|---|
| Financial literacy | 68 | 95.00 |
| Financial inclusion | 8 | 16.00 |
| Financial behaviour | 7 | 14.00 |
| Access to finance | 5 | 11.00 |
| Financial self-efficacy | 4 | 11.00 |
| Materialism | 4 | 11.00 |
| Growth | 3 | 8.00 |
| Retirement planning | 3 | 8.00 |
| Competitive advantage | 4 | 7.00 |
| Financial attitude | 3 | 7.00 |
| Financial decision | 2 | 7.00 |
| Moderation (*wasatiyyah*) | 2 | 7.00 |
| Saving attitude | 2 | 6.00 |
| Financial well-being | 2 | 5.00 |
| SMEs performance | 3 | 5.00 |
| Financial planning | 2 | 4.00 |
| Financial satisfaction | 2 | 4.00 |
| Firm performance | 2 | 4.00 |

In addition to network visualisation, visualisations can also be displayed as overlays. The colour of the circle can indicate the year in which the article had the keyword or variable studied. The darker the colour in the circle, the longer the variables are discussed in the study, and conversely, the brighter the colour in the circle, the more actual the variables. The overlay visualisation can be seen in Figure 7.

**Figure 7: Visualisation by overlay**

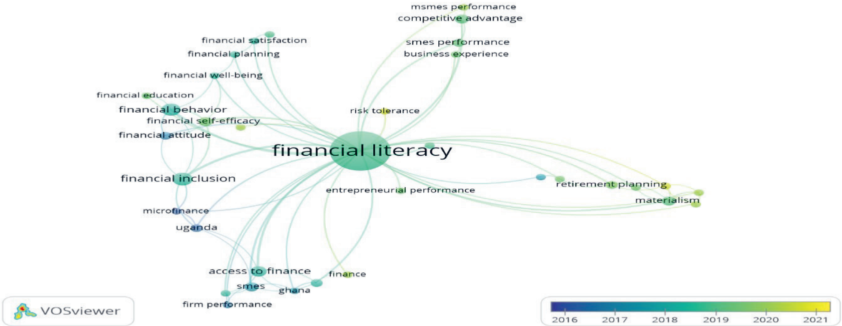


Figure 7 above shows that the variables financial attitude, firm performance, and investment are represented by a purplish-blue circle and were discussed from 2016 to 2017, while the variables financial literacy, financial inclusion, financial well-being, financial planning, financial satisfaction, access to finance, growth, and financial behaviour are represented by a dark green circle and were discussed in 2018. The light green circle for gender differences, financial education, financial self-efficacy, business experience, SME performance, competitive advantage, entrepreneurial performance, retirement planning, and materialism shows that it was discussed in 2019. While the yellow circle for MSME performance, risk tolerance, parental socioeconomic status, and financing shows that it was discussed in 2020.

In Figure 8, the results of the density visualisation show that the number of keywords or variables that often appear can be seen in the purple hue surrounding the financial literacy, risk tolerance, and entrepreneurial performance variables. This area is a variable that has been extensively studied. This is different from the variables represented as yellow, such as MSME performance, competitive advantage, SME performance, and business experience.

**Figure 8: Visualisation by density**

With regard to the MSME performance, competitive advantage, SME performance, and business experience variables in financial literacy research, this study suggests that if business actors have adequate financial literacy skills, then the financial and business decisions that are determined will be directed at better developments from time to time, which will increase the company's ability to survive in crises and be more sustainable in the long term. These variables have not been extensively studied much, and there is ample opportunity for further research. Based on the resource-based view (RBV) theory, with competitive advantage, business experience, performance, and financial literacy, a firm face changes in the business environment.

MSMEs have a unique characteristic in that there tends to be cooperation rather than competition among business actors. The MSMEs that are aware of the benefits of working together are the ones who will be able to make their business survive and even develop in the midst of a swift current of change. Financially literate or experienced managers can identify new opportunities that lead to high performance, organise resources that drive firm performance, as well as understand the market and customer demands, which allows them to perform better and gain a competitive advantage. Educated and educated entrepreneurs easily recognise new opportunities for future business growth.

After mapping theoretical models of financial literacy and identifying future research opportunities based on descriptive analysis using VOSviewer, we also investigated the variables built into financial literacy models as a moderating variable, as a mediating variable, as an independent variable, and as a dependent variable.

### *4.2 Theoretical Model with Moderating Variables*

In general, the moderating effect shows the interaction between the independent and the moderating variables in influencing the dependent variable (Baron & Kenny, 1986; Henseler & Fassott, 2010). Moderated regression analysis (MRA) is a common technique used in multiple linear regression analysis by incorporating a third variable as a moderating variable in the form of a multiplication between two independent variables. This will result in a nonlinear relationship, in which the measurement error of the MRA estimate coefficient utilising the latent variable will be inconsistent and biased. A good solution is to use a structural equation model, which can fix this measurement error by taking into account the interaction effect.

Table 5 shows the studies using a theoretical model with financial literacy as a moderating variable. The independent variable most commonly used is access to finance (Adomako et al., 2016; Okello Candiya Bongomin et al., 2017; Mohd Zukime et al., 2019; Fatoki, 2021). These studies found a positive relationship between access to finance and company performance by including financial literacy as a moderating variable. Financial literacy helps owners and managers access financial services, such as loans from banks, to develop companies (Okello Candiya Bongomin et al., 2017). The explanation above is based on the RBV theory that financial literacy facilitates financial access and company performance (Adomako et al., 2016).

As we can see in Table 5, other independent variables, such as education, demographics, cognition, enterprise risk management, entrepreneur passion, financial resource availability, artistic orientation, and intellectual capital were investigated with financial literacy as a moderating variable. The popular dependent variables in this model are performance and growth. In addition, other dependent variables such as investment decisions, financial risk tolerance, financial inclusion, competitive advantage, entrepreneurial persistence, and resource acquisition were examined. Testing was carried out using using hierarchical regression and structural equation modelling (SEM). The subjects in this theoretical model are CEO/owner, senior finance managers, active investors, entrepreneurs, adults, and managers.

**Table 5: Theoretical models with financial literacy as the moderating variable**

| Year | Author(s) | Independent variable | Moderating variables | Dependent variable | Method | Subjects |
|---|---|---|---|---|---|---|
| 2016 | Adomako et al. | Access to finance | Financial literacy | Firm growth | Hierarchical regression | CEO and senior finance managers in Ghana |
| 2016 | Fachrudin & Fachrudin | Education | Financial literacy | Investment decision | SEM | Investors are active in Medan, Indonesia |
| 2017 | Okello Candiya Bongomin et al. | Access to finance | Financial literacy | Growth of SMEs | Hierarchical regression | SMEs in Uganda |
| 2017 | Shusha | Demographic variables | Financial literacy | Financial risk tolerance | Hierarchical regression | Egyptian adults |
| 2018 | Bongomin et al. | Cognition | Financial literacy | Financial inclusion | Hierarchical regression | Poor in rural Uganda |
| 2018 | Yang et al. | Enterprise risk management | Financial literacy | Competitive advantage | SEM | SMEs in emerging economies |

| Year | Author(s) | Independent variable | Moderating variables | Dependent variable | Method | Subjects |
|---|---|---|---|---|---|---|
| 2019 | Al Issa et al. | Entrepreneur passion | Financial literacy | Entrepreneurial persistence | PLS-SEM | Malaysian entrepreneurs |
| 2019 | Mohd Zukime et al. | Access to finance | Financial literacy | SME performance | PLS-SEM | SMEs in Pakistan |
| 2019 | Owusu et al. | Financial resource availability | Financial literacy | SME growth | Regression | SMEs in Ghana |
| 2019 | Purnomo | Artistic orientation | Financial literacy | Entrepreneurial performance | Hierarchical regression | Small creative business entrepreneurs in Yogyakarta, Indonesia |
| 2019 | Ying et al. | Intellectual capital | Financial literacy | Resource acquisition | SEM | SME owners/ managers in Pakistan |
| 2021 | Fatoki | Access to finance | Financial literacy | SMME performance | Hierarchical regression | SMME owners in South Africa |

In Table 6, financial literacy is used as an independent variable with differing moderating variables. One of the more popular moderating variables is gender. It was found that men have higher financial literacy than women (Kirbiš Škreblin et al., 2017), which contrasts with the finding working women have better financial literacy and ability than men (Sabri et al., 2017). Such findings are interesting and warrant further research. Other moderating variables include patient financial responsibility, financial capital availability, networks, private organisation support, and government support. The dependent variables tested were patient engagement, firm performance, financial inclusion, financial satisfaction, financial capability, retirement planning, small firm growth, small firm financial growth, and risk tolerance. Testing was carried out using hierarchical regression and SEM. The subjects for this theoretical model include US adults, SME owner-managers, poor households in rural Uganda, Croatian citizens, and young employees in Malaysia.

**Table 6: Theoretical models with financial literacy as an independent variable**

| Year | Author(s) | Independent variable | Moderating variables | Dependent variable | Method | Subjects |
|---|---|---|---|---|---|---|
| 2016 | Meyer and Hudak | Financial literacy | Patient financial responsibility | Patient engagement | Hierarchical regression | American adults |
| 2016 | Ngek | Financial literacy | Financial capital availability | Firm performance | Hierarchical regression | SME owner-managers |
| 2016 | Okello Candiya Bongomin et al. | Financial literacy | Networks | Financial inclusion | Hierarchical regression | Poor households in rural Uganda |
| 2017 | Kirbiš kreblin et al. | Financial literacy | Gender | Financial satisfaction | Regression | Croatian citizens |
| 2017 | Sabri et al. | Financial literacy | Gender | Financial capability | SEM | Young employees in Malaysia |
| 2018 | Zhao et al. | Financial literacy | Generation status, Gender | Attitude toward paid professional financial advisor | Regression | Chinese-American consumers |
| 2020 | Afthanorhan et al. | Financial literacy | Gender, age, income, marital status, education | Retirement planning | SEM | Junior and senior executives in business, officers, managers, and CEOs |
| 2020 | Hossain | Financial literacy | Private organisation support | Small firm growth | PLS-SEM | Owner-managers of small firms in Bangladesh |
| 2020 | Hossain et al. | Financial literacy | Government support | Small firm financial growth | PLS-SEM | Owner-managers of small firms |
| 2020 | Li and Qian | Financial literacy | Industrial regulation | Entrepreneurial participation, entrepreneurial performance | Regression | Chinese family panel studies |
| 2021 | Naiwen et al. | Financial literacy | Gender difference | Risk tolerance | PLS-SEM | Men and women in the textile sector of Pakistan |

### 4.3 *Theoretical Model with Mediating Variables*

The mediating effect is the relationship between the independent variable and the dependent variable through a connecting variable. This implies that the influence of the independent on the dependent variable could be direct or indirect through a connecting variable or mediation. By adding a third variable called the mediating variable, which is also called the intermediary or intervention variable, mediation tries to find and explain the mechanism or process behind the relationship between the independent variable and the dependent variable (Baron & Kenny, 1986).

Table 7 shows that SEM and regression are the most common methods used to test the financial literacy mediation model. SEM is a multivariate statistical analysis technique used to analyse structural relationships. This technique combines factor analysis and multiple regression analysis, and is used to analyse structural relationships between measured variables and latent constructs. This method is preferred by researchers because it estimates many interrelated dependencies. In this analysis, two types of variables are used, namely endogenous variables and exogenous variables. The endogenous variable is the same as the dependent variable, while the exogenous variable is the same as the independent variable.

**Table 7: Theoretical models with financial literacy mediator variables**

| Year | Author(s) | Independent variable | Mediating variables | Dependent variable | Method | Subjects |
|---|---|---|---|---|---|---|
| 2017 | Adams et al. | Retirement planning | Financial literacy | Financial well-being | PLS-SEM | Pensioners Association in Cape Coast Metropolis, Ghana |
| 2017 | Okello et al. | Institutional framing | Financial literacy | Financial inclusion | SEM | Poor households in Uganda |
| 2019 | Rahmawati et al. | Family economic education | Financial literacy | Financial inclusion | Regression | Students from several universities in Indonesia |
| 2019 | Sabri and Aw | Preferences for media, preference for financial planners, preferences for family and peers, use of the internet in managing finance | Financial literacy | Income allocation for investment, having a financial planner | Regression | Malaysian public sector employees, private sector employees, Felda/rural residents, and youth in institutions of higher learning |

| Year | Author(s) | Independent variable | Mediating variables | Dependent variable | Method | Subjects |
|---|---|---|---|---|---|---|
| 2019 | Son and Park | Financial education | Financial literacy | Personal finance sound | Regression | Consumer Empowerment Index survey of the Korea Consumer Agency |
| 2020 | Aeknarajindawat | Trust | Financial literacy | Risk tolerance, risk perception | PLS-SEM | Financial advisors of the banking sectors |
| 2020 | Herawati et al. | Financial learning quality, parental SES | Financial literacy | Financial self-efficacy | Regression | Accounting students in Bali |
| 2020 | Tan and Singaravelloo | Socio-demographic | Financial literacy | Retirement Planning | PLS-SEM | Malaysian government officers |
| 2020 | Widyastuti et al. | Financial education | Financial literacy | Financial behaviour | PLS-SEM | Teachers of senior high school and vocational school in Greater Jakarta, Indonesia |
| 2020 | Yuesti et al. | Financial attitude, financial behaviour | Financial literacy | Financial well-being | PLS-SEM | Household heads in Denpasar, Indonesia |
| 2020 | Zhao and Zhang | Financial socialisation | Financial literacy | Financial behaviour, financial well-being | SEM | US adult population |
| 2021 | Fan and Zhang | Financial education | Financial literacy | Emergency savings | Regression | US adults |
| 2021 | Larisa et al. | Ages, education, income | Financial literacy | Retirement planning | PLS-SEM | Workers in various locations in Indonesia |
| 2021 | Setiawan et al. | Government support | Financial literacy | Fintech adoption | PLS-SEM | Fintech users |

Table 7, in terms of subject background, we find pensioners' associations in Cape Coast Metropolis, poor households in Uganda, students from several universities in Indonesia, citizens from various sectors in Malaysia, the Consumer Empowerment Index survey of the Korea Consumer Agency, financial advisors from the banking sector, accounting students in Bali, Malaysian government officers, teachers of senior high school and vocational schools in Greater Jakarta, household heads in Denpasar, American adults, workers in various locations in Indonesia, and fintech users. A popular independent variable is financial education. Other independent variables tested were retirement planning, institutional framing, preference for media, preference for financial planner, preference for family, use of the internet in managing finance, trust, financial learning quality, parental SES, socio-demographic, financial attitude, financial behaviour, financial socialisation, age, education, income, and government support. In this model, the popular dependent variables are financial well-being, financial behaviour, financial inclusion, and retirement planning. Other dependent variables tested were income allocation for investment, sound personal finance, risk tolerance, risk perception, financial self-efficacy, retirement planning, emergency savings, and fintech adoption.

Table 8 shows that the mediating variables were designed and tested on the theoretical model for different subject backgrounds. The popular mediating variables were financial self-efficacy, access to finance, *wasatiyyah*, financial risk attitude, and risk tolerance. The financial self-efficacy variable can mediate financial literacy and financial inclusion (Mindra & Moya, 2017). Consumers with a high level of financial self-efficacy are more confident in choosing their own financial products and services (Kartawinata et al., 2021). Other mediating variables studied are access to finance and financial risk attitude. These variables can mediate financial literacy on SMEs sustainability (Ye & Kulathunga, 2019), while access to finance and financial risk attitude can mediate financial literacy on SMEs performance (Buchdadi et al., 2020). Other mediating variables such as *wasatiyyah* can mediate financial literacy on financial decisions (Ramlee et al., 2019; Husain et al., 2021). Popular dependent variables such as financial well-being, financial performance, financial inclusions, financial decisions, and SMEs performance.

**Table 8: Theoretical model with mediating variables and financial literacy as an independent variable**

| Year | Author(s) | Independent variable | Mediating variables | Dependent variable | Method | Subjects |
|---|---|---|---|---|---|---|
| 2013 | Sabri et al. | Financial literacy | Financial stress | Financial well-being | SEM | Employees in Malaysia |
| 2014 | Gerrans et al. | Financial literacy | Financial satisfaction | Personal well-being | SEM | Individuals in Western Australia |
| 2015 | Henager and Mauldin | Financial literacy | Saving behaviour | Financial well-being | Regression | Households in the United States |
| 2016 | Okello Candiya Bongomin et al. | Financial literacy | Social capital | Financial inclusion | Regression | Rural poor households in Uganda |
| 2017 | Mindra and Moya | Financial literacy | Financial self-efficacy | Financial inclusion | SEM | Adult individuals in urban central Uganda |
| 2018 | Mabula and Ping | Financial literacy | Use of financial services | Firm performance | PLS-SEM | Tanzania SMEs |
| 2018 | Malinda et al. | Financial literacy | work engagement | Financial performance | PLS-SEM | Active agents in Palembang, Indonesia |
| 2018 | Potrich and Vieira | Financial literacy | Materialism; compulsive buying | Propensity to indebtedness | SEM | Brazilian residents |
| 2019 | Citradika et al. | Financial literacy | Attitude of non-cash transactions | Interest of non-cash transactions | PLS-SEM | Batik SMEs in Pekalongan, Indonesia |
| 2019 | Farida et al. | Financial literacy | Competitive advantage | Performance | Regression | Creative MSMEs in Jember, Indonesia |
| 2019 | Kimiyagahlam et al. | Financial literacy | Saving attitude | Retirement planning | PLS-SEM | Adults in Klang Valley, Malaysia |
| 2019 | Kumari and Ferdous Azam | Financial literacy | Financial inclusion | Women's economic empowerment | PLS-SEM | Rural poor women in Sri Lanka |
| 2019 | Nohong et al. | Financial literacy | Capital structure | Competitiveness; risk management | PLS-SEM | SMEs in Makassar, Indonesia |

| Year | Author(s) | Independent variable | Mediating variables | Dependent variable | Method | Subjects |
|---|---|---|---|---|---|---|
| 2019 | Ramlee et al. | Financial literacy | *Wasatiyyah* | Financial decisions | SEM | Muslim consumers in Malaysia |
| 2019 | Resmi et al. | Financial literacy | Business growth | Competitive advantage | SEM | Creative MSMEs actors in Yogyakarta, Indonesia |
| 2019 | Ye and Kulathunga | Financial literacy | Access to finance; Financial risk attitude | Sustainability in SMEs | SEM | Chief financial officers (CFOs) of SMEs in Sri Lanka |
| 2020 | Aeknarajindawat | Financial literacy | risk tolerance; risk perception | Asset allocation | PLS-SEM | Financial advisors of the banking sectors |
| 2020 | Anwar et al. | Financial literacy, Business Experience | Opportunity recognition | SMEs performance | SEM | Pakistani SMEs from the manufacturing, trading, and service sectors |
| 2020 | Buchdadi et al. | Financial literacy | Access to finance products; Financial risk attitude | SMEs performance | SEM | Indonesian SMEs |
| 2020 | Dewi et al. | Financial literacy | Financial perception | Financial behaviour | SEM | Lecturers in Central Java Island, Indonesia |
| 2020 | Kengatharan et al. | Financial literacy | Financial planning | Financial satisfaction | SEM | Central Depository System (CDS) account holders |
| 2020 | Kulathunga et al. | Financial literacy | ERM practices | SME performance | PLS-SEM | Sri Lanka SMEs |
| 2020 | Okello Candiya Bongomin et al. | Financial literacy | Social network | Financial inclusion | SEM | The poor using microfinance banks in developing countries |
| 2020 | Okello Candiya Bongomin et al. | Financial literacy | Financial intermediation | Financial inclusion | PLS-SEM | The poor in rural Uganda |
| 2020 | Raut | Financial literacy | Perceived behavioural control; attitude | Intention to invest in stock market | SEM | Individual investors in India |

| Year | Author(s) | Independent variable | Mediating variables | Dependent variable | Method | Subjects |
|---|---|---|---|---|---|---|
| 2020 | Sohilauw et al. | Financial literacy | Financial capital | SME financial performance | SEM | Indonesian SMEs |
| 2021 | García-Perez-de-Lema et al. | Financial literacy | Alleviating financial constraints | Technological innovation | SEM | Spanish SMEs |
| 2021 | Husayn et al. | Financial literacy | *Wasatiyyah* | Financial decisions | SEM | Malaysian university students |
| 2021 | Kartawinata et al. | Financial literacy | Financial self-efficacy | Financial inclusion | PLS-SEM | Telkom University students |
| 2021 | Liu and Zhang | Financial literacy | Financial self-efficacy | Risky credit behavior | Regression | College students in the Pearl River Delta, China |
| 2021 | Naiwen et al. | Financial literacy | Risk tolerance | Investment decision | PLS-SEM | Men and women in the textile sector of Pakistan |
| 2021 | Rastogi et al. | Financial literacy | Financial stability | Financial inclusion | PLS-SEM | PMJDY customers in India |
| 2021 | Resmi et al. | Financial literacy | Competitive advantage | Performance | SEM | Indonesian MSMEs |
| 2021 | Setiawan et al. | Financial literacy | User innovativeness | Fintech adoption | PLS-SEM | Fintech users |

Table 9 shows several theoretical models with mediating variables. In this theoretical model, financial literacy acts as the dependent variable. The independent variables tested were prevention, promotion, parental income, parental education level, parental profession, and gender, while the mediating variables include power, prestige, retention time, distrust, anxiety, supply chain management, and financial anxieties. According to Pereira and Coelho (2020), the relationship between regulatory focus theory and financial literacy is partly mediated by money attitude carried out by students from Portuguese public universities. Another research model made in Radianto et al. (2020) shows that supply chain management mediates the relationship between parental income, parental education level, parental profession, and financial literacy for young entrepreneurs or students who start businesses at universities in Indonesia. Tinghög et al. (2021) shows that the relationship between gender and financial literacy can be mediated by financial anxiety in Swedish women.

**Table 9: The theoretical model with the mediator variable and financial literacy as dependent variable**

| Year | Author(s) | Independent variable | Mediating variables | Dependent variable | Method | Subjects |
|---|---|---|---|---|---|---|
| 2020 | Pereira and Coelho | Prevention, promotion | Power-prestige, retention-time, distrust, anxiety | Financial literacy | SEM | Students from a Portuguese public university |
| 2020 | Radianto et al. | Parental income, parental education level, parental profession | Supply chain management | Financial literacy | PLS-SEM | Entrepreneurship education undergraduates in an Indonesian university |
| 2021 | Tinghög et al. | Gender | Financial anxiety | Financial literacy | Regression | Women in Sweden |

## 5. Conclusion

This research is based on bibliometric analysis and a literature review of theoretical models of financial literacy. A theoretical model is a representation of the problem domain using general rules and concepts, as well as a simplified and idealised understanding of alternative solutions. The variables, research methods, and research subjects of theoretical models of financial literacy research in 73 studies from 2013 to 2021 are reviewed here. It was found that studies with theoretical models of financial literacy have increased in number from 2019. The subject area of research is dominated by business, management, and accounting, and the countries with the highest number of publications are Indonesia and Malaysia.

It is suggested that more studies are carried out on the least-occurring variables related to financial literacy, such as MSME performance, competitive advantage, SME performance, and business experience. With regard to SME performance, it is known that managers have good financial literacy and business experience and are mediated by opportunity recognition. Nonetheless, financial literacy can increase SME performance by mediating access to finance products and financial risk attitudes. Regarding the competitive advantage variable, it can be a mediating variable in a theoretical model that links financial literacy with SME performance.

Although there was ample discussion on the role of financial literacy as a mediating and moderating variable, as well as an independent variable, there have only been a handful of papers on financial literacy as a dependent variable. Additionally, as this study on focuses on Scopus, it is also recommended that analyses be carried out on databases like GoogleScholar, Crossref, WoS, and ProQuest.

This study only provides a static overview of a highly dynamic area, but several implications can be drawn from the financial literacy literature. This study contributes to the field by providing past, current, and future research directions with potential and important insights.

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