Navigating Obstacles Encountered by Fintech Startups: An in-Depth Systematic Literature Review

Nurul'ain Mohd[1♣], Mastura Razali and Siti Khadijah Ab Manan
Academy of Contemporary Islamic Studies (ACIS), Universiti Teknologi MARA (UiTM) Shah Alam 40450, Selangor, Malaysia

ABSTRACT

The primary objective of this systematic literature review (SLR) was to summarize and synthesize current research on the challenges faced by fintech startups, a field that has recently gained prominence in the financial and economic worlds. To highlight current challenges, direct future research directions, and increase theoretical understanding, this SLR aims to track the development and topics of study, propose a specific categorization, and identify significant problems. The current research employed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) framework to conduct the review. Two primary journal databases, Scopus and Web of Science, were utilized. Consequently, the search efforts yielded 36 articles that would be systematically analyzed. Notably, the review identified nine themes based on thematic analysis: Regulation, Risk, Financial constraint, Innovative growth, Data security, Competition, Technology control, Human capital, and Customer management. Overall, further examination of the nine themes led to the identification of eleven subthemes. In the discussion of this research, several recommendations for future researchers are provided.

Keywords: Financial Technology; Fintech; Fintech Startups; Fintech Startups Challenges; SLR

ARTICLE INFO

Article History:
Received: 31 December 2023
Accepted: 02 February 2024
Available online: 01 April 2024

♣ Corresponding Author: Nurul'ain Mohd; Academy of Contemporary Islamic Studies (ACIS), Universiti Teknologi MARA (UiTM) Shah Alam 40450, Selangor, Malaysia; +6013 246 7418; ainmohd@uitm.edu.my

INTRODUCTION

The introduction of the fintech industry resulted from the modernization of information technology. Financial institutions and businesses are beginning to integrate Financial Technology (Fintech) into their operating systems. According to the World Bank Group (2022), Fintech is "advances in technology that can transform the provision of financial services spurring the development of new business models, applications, processes, and products. Examples include e-money, peer-to-peer lending, credit scoring and decision, robo-advisory services, and distributed ledger technology". Meanwhile, European Banking Authority (2017) defines Fintech as "technologically enabled financial innovation that could result in new business models, applications, processes or products with an associated material effect on financial markets and institutions and the provision of financial services."

Therefore, Fintech is distinguished by its low marginal costs per account or transaction and its scale efficiencies. Digital processes generate a data trace that can better comprehend consumers, improve products, manage risks, and promote regulatory compliance, enhancing transparency and reducing information asymmetries (World Bank Group, 2022). Fintech today encompasses a wide range of sectors and businesses, including digital payments, electronic money, personal financial management and digital financial literacy tools, digital savings products and services, digital banking, alternative digital finance and credit scoring, and data analytics, insurtech (insurance tech), cryptocurrencies, digital currencies, digital accounting, and business tool providers. Fintech has a wide range of applications, which enables its rapid global expansion. This is demonstrated by a report from Innovate Finance, which indicated that fintech investments nationwide have increased yearly. Due to the macroeconomic downturn and the geopolitical environment, fintech investment had reportedly declined from $130.6 billion to only $92.2 billion in 2022 (Innovate Finance, 2022).

FinTech startups are newly founded companies that provide financial services based on FinTech (Gimpel et al., 2018). The emergence of FinTech startups has been either disruptive or collaborative, depending on the country's economy and the structure and composition of the financial market (Abdelghani Echchabi et al., 2021). While there are several potentials for

FinTech businesses seeking to disrupt the financial system, there are also significant hazards. Although many existing financial regulations and policies were developed before the Internet age, organizations delivering new financial services must guarantee that their business strategy, operations, and products do not violate legal requirements. (Leong et al., 2017). The global count of FinTech startup firms has risen from 2018 to 2023 across the Americas, Europe, Middle East, Africa (EMEA), and Asia Pacific (APAC) regions (Statista.com)

Conducting a Systematic Literature Review (SLR) entails the collection of relevant publications and documents that match specific predetermined criteria, intending to tackle a specific research question. By utilizing accurate and systematic techniques, the process aims to mitigate the risk of bias across various stages, including search, identification, assessment, integration, analysis, and study synthesis. This method produces reliable results and robust deductions when carried out diligently and with minimal inaccuracies. Such insights can then support decision-makers and scientific professionals in making informed decisions and undertaking suitable measures within their respective fields (Mengist et al., 2020). In Fintech, where regulatory shifts are frequent, Systematic Literature Reviews (SLRs) offers valuable insights into the obstacles regulators and policymakers confront. These insights are a compass for shaping effective regulations and policies that encourage innovation while upholding consumer safeguarding and financial stability.

Moreover, Fintech encounters challenges often distinctive to the financial sector due to its unique attributes. These distinct Fintech challenges can be generated through an SLR, empowering researchers and practitioners to tailor solutions that cater to the industry's requirements. The construction of the present systematic review revolved around a central research query: What challenges are faced by Fintech startups? These challenges encompass the entire spectrum of stakeholders within the Fintech landscape, including regulators, business owners, consumers, and all affiliated parties. Furthermore, this portion addresses the requirement for systematically reviewing fintech startups' challenges. Subsequently, the next segment outlines the method used to address the research question. Moving forward, the third segment conducts a systematic review to identify, choose, and assess critical challenges encountered by fintech startups by synthesizing existing scholarly literature. Lastly, the final section deliberates on recommendations for future scholars concerning the raised issues.

METHODOLOGY

Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA)

The idea of a SLR was taken and incorporated into the writing of this article. According to Moher et al., (2010) a systematic review is a review of a clearly defined question that employs systematic and explicit methods to identify, select, and critically appraise relevant research and collect and analyze data from the included studies. PRISMA, or Preferred Reporting Items for Systematic Reviews and Meta-Analyses, is a recognized standard for systematic literature reviews. (Shaffril; et al., 2019). These frameworks direct the systematic review in gathering all relevant data that satisfies predetermined eligibility standards to respond to specific research questions. This enables the researcher to use a precise and methodical approach to minimize bias (Wu et al., 2018). PRISMA helps authors improve how systematic reviews are reported (Bellucci et al., 2022). Identification, screening, eligibility of exclusion, and inclusion criteria are the four nodes in the PRISMA article selection flow diagram (Priyashantha et al., 2021). Therefore, PRISMA was chosen instead of some of the other protocols already in place because of its breadth of coverage, its application in a variety of fields all around the world, and its potential to improve consistency among reviews.(Liberati et al., 2009; Pahlevan-Sharif et al., 2019)

Resources

Since no database has published every piece of literature, a systematic literature search should look at more than one database (Xiao & Watson, 2019). Scopus and Web of Science (WoS) were used as sources for this SLR article. Web of Science (WoS) is a reputable, publisher-independent, global database of citations. It integrates regional, specialty, data, and patent indexes to the Web of Science Core Collection through a transdisciplinary platform. WoS's extensive platform enables the monitoring of ideas across disciplines and time using about 1.9 billion references and more than 171 million records. At the same time, Scopus provides a comprehensive coverage of any database of abstracts and citations from different fields. Scopus is used by researchers, teachers, librarians, and students in 240 different fields because it makes it less likely that they will miss essential

publications. Scopus makes it easy to find authoritative and relevant research, find experts, and get access to reliable data, metrics, and tools for analysis. It comprises 1.8 billion cited references from 1970 and more than 84 million records. Although bibliographic data sources and metrics have increased significantly over the past ten years, the Web of Science (WoS) and Scopus databases remain the two most essential and complete sources of publication information and impact indicators. (Pranckutė, 2021)

The Systematic Review Process for Selecting The Articles

Identification

According to Shaffril; et al., (2019) there are three critical stages of the systematic review process used to choose a number of pertinent publications for the current study. The initial step is identifying keywords and looking for related and comparable terms using a thesaurus, dictionaries, encyclopedias, and recent research. In August 2022, search strings were created for the Scopus and Web of Science databases once all pertinent keywords had been identified. (Refer to Table2). This identification method successfully retrieved 60 relevant articles from WOS and 99 relevant articles from Scopus, bringing the total number of relevant articles obtained from both databases to 159.

Table 1: The Search String Was Used for The Systematic Review Process

	Database Search String
SCOPUS	TITLE-ABS-KEY((“challenge*” OR “issue*” OR “difficulties” OR “problem”) AND (“startup*” OR “start-up*” OR “young company*” OR “initial business stage” OR “first stage*”) AND (“FinTech” OR “fintech” OR “financial technology*”))
Web of Science	TS = ((“challenge*” OR “issue*” OR “difficulties” OR “problem”) AND (“startup*” OR “start-up*” OR “young company*” OR “initial business stage” OR “ first stage*”) AND (“FinTech” OR “fintech” OR “financial technology*”))

Screening

At this point, the authors applieda particular criteria to the filtering process to select articles that were more targeted to the research question and provide a higher level of specificity. (Refer to Table 2). First, the author chose journal articles in quantitative and qualitative studies to obtain a more comprehensive output. In contrast, book chapters, seminar articles, proceedings, and literature review articles were set aside. Second, in order to

increase the possibility of retrieving related articles, the author only chooses articles written in English that were related to Business, Management & Accounting, Economics, Government & Law, Econometrics and Finance, Social Sciences, Computer Science, Decision Sciences, Engineering, Arts and Humanities, Mathematics, Public Administration, Information Science & Library Science, Religion, Sociology, and International relation. Third, the author restricted the time frame to the most recent five years, from 2018 to 2022, to focus on the most up-to-date challenges confronting Fintech startups, as discussed in the article. In total, 159 articles passed the screening process based on these criteria. It is important to remember that when the screening procedure was finished, 21 duplicates of articles were removed. Shaffril; et al., (2019) recommended that it is appropriate to eliminate the duplicate articles after the screening procedure has been completed. This approach is believed to help authors remove duplicate articles, as the remaining articles should be reduced after screening.

Table 2: Eligibility of Exclusion and Inclusion Criteria

Criterion	Inclusion	Exclusion
Types literature	Article journal	Conference Paper Book Chapter Book Review Conference Review
Language	English	Non- English
Scope	**Scopus** Business, Management and Accounting, Economics, Econometrics and Finance, Social Sciences, Computer Science, Decision Sciences, Engineering, Arts and Humanities, Mathematics	**Scopus** Biochemistry, Genetics and Molecular Biology, Energy, Environmental Science, Pharmacology, Toxicology and Pharmaceutics
	WoS Business & Economics; Government & Law; Public Administration; Computer Science; Information Science & Library Science; Social Sciences; Religion; Sociology; International relation; Mathematical Methods In Social Sciences	**WoS** Environmental Sciences & Ecology; Geography; Science Technology
Timeline	5 years (2018-2022)	-
Countries and territories	All	-

Eligibility of exclusion and inclusion criteria

At this eligibility stage, the titles, abstracts, and primary contents of all of the articles were subjected to an extensive review to verify whether or not they met the inclusion criteria and were suitable to be used in the current study. This review ensured that the current research could accomplish the study's objectives. This stage had 60 articles, and after a rigorous review, 23 articles were removed since they needed to address the Fintech start-up's challenges. Although the excluded articles were not included in the analysis of the study, they were used as additional references. Finally, at the end of the review process, 36 articles were chosen for the qualitative analysis. The identification, screening, exclusion, and inclusion eligibility can be referred to in Figure 1 and Table 2.

Data Extraction and Analysis

This is the process of creating relevant themes and subthemes based on thematic analysis. The compilation of data was the initial phase of the theme development process. During this phase, 36 chosen articles to extract statements or facts that responded to the study questions were thoroughly examined. Afterward, the raw data was converted into usable data by identifying themes, concepts, or ideas. Using thematic analysis, we identified and formulated appropriate topics and sub-themes. The thematic analysis process entailed identifying recurrent patterns presented as overarching statements or themes by researchers (Lochmiller, 2021). The analysis generated nine themes: Regulation, Risk, Financial constraint, Innovative growth, Data security, Competition, Technology control, Human capital, and Customer management (Refer to Table 4). The earlier 5 themes were further classified into eleven sub-themes, and there were no sub-themes in the other four themes.

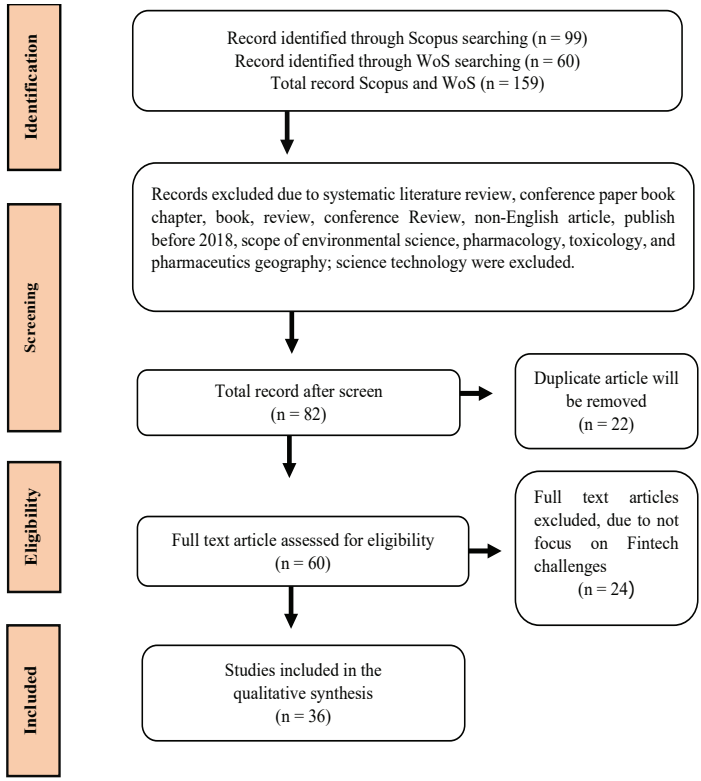

Figure1: Flow Diagram of the Study
(adapted from Shaffril; et al., 2019)

RESULTS AND DISCUSSION

General Finding

The research generated nine (9) themes and eleven (11) subthemes concerning the challenges of fintech startups. As shown in Table 3, the main themes were Regulation, Risk, Financial constraint, Innovative growth, Data security, Competition, Technology control, Human capital, and Customer. As for Regulation themes, there were three sub-themes; Entry regulation, Licensing, and Exemption regulation. The next theme, Risk, was elaborated through three sub-themes: Fraudulent Risk, Liquidity Risk, and Financial Risk. The financial constraint theme explained further in two sub-themes; Profit and Investment Management.

Table 3: Research Location

N	Author	Research location	N	Author	Research location
1.	(Cumming & Schwienbacher, 2018)	-	19.	(Polasik et al., 2020)	European union countries
2.	(Chang, 2018)	Indonesia	20.	(Khajehpour et al., 2020)	KPMG Startup Fintech
3.	(E. Lee, 2018)	China	21.	(Kraus et al., 2020)	Ukraine
4.	(Gomber et al., 2018)	-	22.	(Bavoso, 2020)	United Kingdom
5.	(Stewart & Jürjens, 2018)	Germany	23.	(Hendrikse et al., 2020)	Belgium
6.	(Lui & Lamb, 2018)	-	24.	(Suwarni et al., 2020)	Indonesia
7.	(Gozman et al., 2018)	-	25.	(Albarrak & Alokley, 2021)	Saudi Arabia
8.	(Loo, 2018)	United State America	26.	(Eichengreen, 2021)	-
9.	(I. Lee & Shin, 2018)	-	27.	(Hodson, 2021)	United Kingdom & Germany
10.	(Petrushenko et al., 2018)	Ukraine	28.	(Dijmărescu, 2021)	United Kingdom
11.	(Omarini, 2018)	-	29.	(Alkhaaleh, 2021)	United Arab Emirates
12.	(Wonglimpiyarat, 2018)	USA, Europe and Asia	30.	(Kijkasiwat, 2021)	Thailand
13.	(Sa'ad et al., 2019)	-	31.	(Hussein et al., 2021)	Iraq
14.	(Schwienbacher, 2019)	United Kingdom & Germany	32.	(Zarrouk et al., 2021)	United Arab Emirates
15.	(Allen, 2019)	United State America	33.	(Turcan & Deak, 2022)	Canada
16.	(Ramesh, 2019)	India	34.	(J. Lee et al., 2022)	United State America
17.	(Flögel & Beckamp, 2020)	Germany	35.	(Valverde et al., 2022)	Spain
18.	(Di Porto & Ghidini, 2020)	-	36.	(Zen et al., 2022)	Brazil

Meanwhile, Innovative growth consisted of one sub-themes; Country Openness. Next was data security, explained by one sub-theme: Information Asymmetry. In contrast, Customer management elaborated on one sub-theme, which was awareness. There were no sub-themes in the other three themes: Competition, Technology control, and Human Capital. All of these studies were conducted in various locations. About 27 out of all articles mentioned the location of the investigation, including Saudi Arabia, Germany, Ukraine, Belgium, and Thailand. The remaining nine studies did not mention the location of their research. (Refer to Table 4). In terms of publication year, the present study indicated that the topic under research had the most significant number of articles published in 2018, with 10

articles in the Web of Science (WOS) database. Conversely, the Scopus database recorded the highest publication count in 2021, with four articles. (Refer to Figure 2)

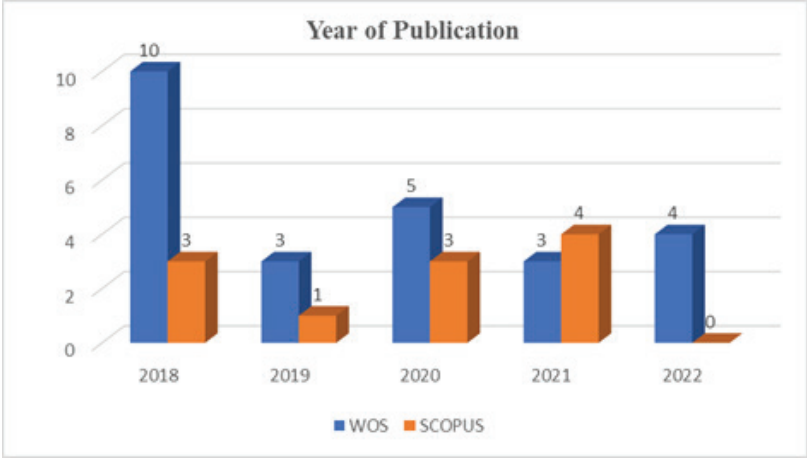

Figure 2: Year of Publication

Main Finding

The argumentation in this part focuses on nine significant ideas, including regulation, risk, financial constraint, human capital, technology control, customer management, data security, innovative growth, and competition.

Regulation

Regulation is crucial in integrating startup fintech within a single nation. It will decide whether or not a financial firm will be successful in that country. In this instance, a total of 19 previous papers highlighting regulatory barriers in fintech ventures were located. This made regulation the most discussed topic in comparison to other obstacles. Regulation of financial advice; bias; confidentiality and safety. Financial stability needs to establish an innovative and appropriate framework for regulating AI in the financial industry. A new regulatory strategy must consider the growing reliance of industry players on computer programs and algorithms to advise clients (Lui & Lamb, 2018). Despite continued efforts to create regulatory frameworks for digital financial services and regulations governing the issue

of cryptocurrencies, the finTech sector's expansion is being hampered by a lack of suitable legal legislation due to regulatory gaps (Alkhaaleh, 2021). FinTechs call into question the current state of financial regulation. This may appear to be a significant worry given that FinTechs are still subject to less regulation than traditional finance and banking, especially given the new generation of hazards that may have consequences for the general health of the financial system (Zarrouk et al., 2021

N	Author	Regulation	Risk	Financial constraint	Innovative growth	Data security	Competition	Technology control	Human capital	Customer management
1.	(Cumming & Schwienbacher, 2018)	✓			✓					
2.	(Chang, 2018)	✓								
3.	(E. Lee, 2018)	✓	✓							
4.	(Gomber et al., 2018)				✓					
5.	(Stewart & Jürjens, 2018)					✓				
6.	(Lui & Lamb, 2018)	✓						✓		
7.	(Gozman et al., 2018)						✓			
8.	(Loo, 2018)	✓								
9.	(I. Lee & Shin, 2018)	✓	✓							✓
10	(Petrushenko et al., 2018)				✓					
11	(Omarini, 2018)				✓					
12	(Wonglimpiyarat, 2018)	✓								
13	(Sa'ad et al., 2019)	✓								
14	(Schwienbacher, 2019)		✓		✓					
15	(Allen, 2019)	✓								
16	(Ramesh, 2019)				✓			✓		
17	(Flögel & Beckamp, 2020)	✓								
18	(Di Porto & Ghidini, 2020)								✓	
19	(Polasik et al., 2020)	✓								
20	(Khajehpour et al., 2020)			✓						
21	(Kraus et al., 2020)	✓								
22	(Bavoso, 2020)	✓	✓							
23	(Hendrikse et al., 2020)						✓			
24	(Suwarni et al., 2020)						✓			
25	(Albarrak & Alokley, 2021)	✓			✓				✓	
26	(Eichengreen, 2021)	✓		✓			✓	✓		✓
27	(Hodson, 2021)	✓								
28	(Dijmărescu, 2021)							✓		
29	(Alkhaaleh, 2021)	✓	✓	✓	✓					
30	(Kijkasiwat, 2021)	✓				✓		✓		
31	(Hussein et al., 2021)		✓	✓						✓
32	(Zarrouk et al., 2021)	✓		✓					✓	
33	(Turcan & Deak, 2022)				✓					
34	(J. Lee et al., 2022)		✓						✓	
35	(Valverde et al., 2022)			✓						
36	(Zen et al., 2022)									✓

Table 4: Summary of Themes

In Thailand, the advancement of technical development and the government's assistance "brings a number of competitors" between finTech businesses and corporate banks. There is a notion that the Thai government has adopted legislation and policies that promote the growth of startup enterprises in general rather than FinTech startup firms in particular. Some rules and regulations are being examined to see whether they may be eased to improve FinTech companies in Thailand. Although some nations, such as

Singapore, had no limits on issuing convertible debt, it was inappropriate for startup enterprises (Kijkasiwat, 2021). The number of FinTech approvals issued by the Capital Markets authorities remained low. Approximately 35 approvals were granted in Saudi Arabia, and some enterprises were not yet operational. Limited cohorts were accepted into these sandboxes, and many businesses are processing applications with a waiting period of three to nine months (Albarrak & Alokley, 2021). Indonesia's National policy lacked a clear guidance on explicitly regulating the Bitcoin industry and safeguarding the various parties legally. To date, a number of Indonesian regulations regarding cryptocurrencies appear skeptical regarding the ecosystem's ability to contribute to national financial stability and good economic growth (Chang, 2018). Government and regulatory backing undoubtedly contribute to the growth of FinTech and occasionally encourage start-ups to engage in regulatory arbitrage. Launching a regulatory sandbox and innovation centers is a significant type of direct government support for FinTech start- ups. This is especially crucial for FinTech organizations in the payment business, which constantly develop and deploy new technologies that are not always kept up with by regulatory rules. This presents substantial difficulties for financial supervision (Polasik et al., 2020). FinTech balance sheet lenders should be regulated by the same government agency that oversees investment banks and non-bank lenders (Eichengreen, 2021). Investors in peer-to-peer platforms are not provided with the same regulatory protection. Therefore, when given the option to choose between safer, lower-yielding deposits with traditional banks and riskier but more lucrative investments in P2P loans, most retail consumers choose the former (Bavoso, 2020).

Entry regulation

Entry regulation should strike a compromise between stimulating innovation and competition by keeping entry barriers low and protecting security and stability by mandating and implementing specified entry standards. This issue is especially pronounced in the case of FinTech, the sector of finance where innovation is the most rapid but where ramifications for security and stability are the least evident. Overall, it is impossible to say whether the entry standards for alternative financial institutions and activities should be more or less stringent than those for traditional financial institutions and activities. In order to decide whether to grant a license for a FinTech, a minimum should demand proof of adequate governance (competent and experienced management), adequate equity funding (to

avoid excessive leverage), resources sufficient to cover early-stage losses (capital, in other words), adequate internal controls, and practical risk management arrangements (including robust cybersecurity processes) (Eichengreen, 2021). In Arab nations, structural and institutional obstacles confronted and constrained FinTech growth. The current unfavorable business climate in general and the problem of restrictions on the entry of foreign entities into markets hampered the potential of accessing international financial technology businesses that were already functioning in the markets (Alkhaaleh, 2021). The partial license restrictions and the various laws and norms in each emirate confused and made it challenging to comprehend local regulations as a single entity (Zarrouk et al., 2021). Difficulties found in Asian nations inluded enacting legislation to enhance the intellectual (IP) system, which is required to safeguard commercialized ideas. Meanwhile, the challenges of overcoming funding legislation differences across European countries were impediments to the long-term development of the pan-European crowdfunding industry (Wonglimpiyarat, 2018)

Licensing

These startups must get a number of licenses in order to operate (Albarrak & Alokley, 2021). Accreditation will always be a problematic business task for competing financial technologies and banks. In this environment, however, cooperation between technological innovators and traditional institutions can improve the delivery system for financial business services (Kraus et al., 2020). FinTechs have been denied banking licenses by U.S. regulators. FinTech has experienced additional entrance barriers, such as the capacity of established corporations to impede market access and the difficulty of acquiring a federal bank license, despite the fact that a portion of the problem is due to the sheer volume of the regulation (Loo, 2018). In the US, before they can even start to market their product or service, many FinTech startups will have to spend a lot of time and money on these things. In contrast, regulated financial institutions have already spent much time and money figuring out which regulations apply to them and which licenses and permissions their lines of business require. Federal banking law also overruled many state banking laws, which were suitable for chartered banks but not for FinTech startups (Allen, 2019). There are unique rules in some European nations that apply to the lending activities

of FinTech companies, including entrance standards, investor protections, and risk management requirements. Germany is not one of those countries. FinTech lenders must either be accredited as banks, like NBank, or use an executing bank for the actual lending, as aux money, since only banks are permitted to make loans. This law often lessens the regulatory advantages of FinTech lenders because the executing banks must adhere to bank regulations (Flögel & Beckamp, 2020). In the 2010s, FinTech affected retail banking in the UK and Germany without breaking the law, operating in a legal gray area, or using political pressure to remove existing legislation. It concluded that by showcasing their compliance capabilities to regulators and investors, fintech banks like Starling, Monzo, and N26 upended the retail banking industry. As a result of the global financial crisis and their desire to participate in what they perceived as a worldwide race for FinTech, UK and German policymakers were found to be generally supportive of FinTech banks. In the broadest sense, disruption happened when "a smaller company with fewer resources successfully challenges existing incumbent businesses." (Hodson, 2021)

Exemption of regulation

Regulators must be aware and consider offering reporting and registration exemptions to start-up companies, as these companies often need more financial resources to spend on regulatory compliance than listed corporations issuing IPOs do. In order to achieve legislative efficiency, it is required to update and modernize existing securities legislation (for IPO offers) while establishing regulations for crowdfunding. This can be accomplished by preventing legislative changes from becoming disproportionately expensive for new businesses (E. Lee, 2018). A mobile payments firm would also risk being deemed an uncontrolled deposit- taking institution by banking regulators, as it would be required to receive client money with the promise to return them on demand to perform its services. To avoid sanctions from banking regulators, mobile payment companies have frequently engaged in carefully organized and transparent arrangements with regulated banks authorized to accept deposits (Allen, 2019).

Traditional financial institutions and FinTech firms confront regulatory obstacles regarding capital requirements, anti-money laundering, and privacy and security. Depending on the type of financial services they offer, traditional financial institutions and fintech startups are subject to varying

regulatory restrictions (Lee & Shin, 2018). One of the specific issues of regulating Fintech is that the industry's rise was driven by software firms that are not subject to banking and finance regulations. This is because their business spans multiple industries. Fintech may remain unregulated unless the corporate enterprise recognizes the significance of adopting laws to manage risk (Cumming & Schwienbacher, 2018).

Risk

Fraudulent Risk

Unless information security standards are reinforced, cyberattacks may cause operational interruption, financial loss, reputational harm, and even a disability restriction (Alkhaaleh, 2021). In the US, in the contact of initial coin offerings (ICO), in February 2018, in addition to issuing scores of subpoenas and information requests to technology businesses involved in ICOs, The U.S. Securities and Exchange Commission (SEC) filed charges against several fraudulent ICOs. In May 2018, over 40 state and provincial jurisdictions in the United States and Canada announced one of the most extensive coordinated series of enforcement actions to crack down on fraudulent initial coin offerings (ICOs), resulting in nearly 70 ongoing investigations and 35 pending or completed enforcement actions (J. Lee et al., 2022).

Liquidity Risk

In the case of crowdfunding start-ups, it is challenging to appraise independently unlisted securities. The investment is illiquid because there is no secondary market for reselling and transferring unlisted shares to a potential buyer. In contrast to shareholders of publicly traded firms, who may be able to reduce their losses by selling their shares on an open market exchange at any moment, crowd funders in start-up enterprises cannot sell their stock to reduce their losses. If the issuer becomes insolvent, the only option for shareholders is to hold on to their shares and hope they may escape uninjured if the start-up company can attract new investors to keep it afloat (Lee, 2018). For crowdfunding Fintech companies, if their application is accepted, equity crowd funders become part owners of the issuer. If the company that issued the shares goes bankrupt, they could lose everything they have in it. Since shareholders are at the bottom of the pecking order relative to a company's creditors regarding claims on its remaining assets,

they are the last to receive any payment from the company's liquidator. The remaining assets must be used to pay liquidation fees (including court fees and liquidators' salaries), any taxes owed by the company, and creditor reimbursements. After these expenditures are paid, it is unlikely that any assets will remain. This is especially true for start-up businesses, as they lacked sufficient funds, to begin with, necessitating crowdfunding in the first place (Lee, 2018). This is a barrier for all investors in private shares (including business angels and venture capitalists). However, it is incredibly challenging for crowd investors, who will likely have fewer exit choices. A trade sale is the most typical exit option (excluding liquidation) (i.e., the start-up is acquired by another, more prominent firm, which purchases all the outstanding shares) (Schwienbacher, 2019). Due to the fact that many Fintech was founded after the 2008 financial crisis, they must thoroughly comprehend their exposure to liquidity risk and interest rate risk. Due to the current ultra-low interest rate environment in the financial market, the current lending environment is drastically different from that of the past; therefore, it is crucial for Fintech participating in lending to understand how the current lending climate will affect them (Lee & Shin, 2018).

Financial Risk

FinTech impacts financial stability, which holds for operational, credit, liquidity, concentration, and systemic risks, as well as other risks to financial stability, like keeping up with economic cycle trends, shadow banking, and financial integrity. Despite the fact that these dangers are not new, they may accelerate financial technology's rapid development (Hussein et al., 2021). Meanwhile, P2P systems do not list all the possible problems their activities can cause. This has consequences regarding their overall risk management and, in particular, the credit risk that their investors are exposed to. First, it is essential to consider whether investors should be permitted to be exposed to a degree of credit risk that is still challenging to fully understand, given the nature of the underlying loans and the lack of a well-established and trustworthy rating methodology. The second question is whether the growing trend of platforms using securitization to access the wholesale market might lead to interconnectivity and systemic risk issues (Bavoso, 2020). In crowdfunding Fintech, shareholder equity dilution occurs when a firm issues additional share (i.e., new ones) after a successful crowdfunding campaign. Since many start-ups undertake many investment rounds, the risk of dilution is high. Similarly, there is a risk of

a decline in dividend value, as many issuers will not declare dividends. However, as firms are not required to pay dividends to their shareholders, most companies seeking capital through equity crowdfunding do not pay dividends to their investors. This is because the majority of these companies are early-stage start-ups (E. Lee, 2018).

Financial Constraint

Profit

In their infancy, FinTech companies struggle to become profitable. Some initiatives struggle to monetize their ideas and are subsequently removed from the market, failing to survive the launching phase. Large, well- capitalized FinTech companies with a low proportion of long-term physical assets are more likely to be profitable. Large FinTech firms have a higher probability of profitability. Additionally, FinTech businesses have a higher chance of being profitable if their asset structure has a higher ratio of current assets to non- current assets and a higher solvency ratio. Receiving outside funding does not raise the likelihood of success. However, there is a larger likelihood that a FinTech company will be profitable if it was developed at an incubator or participated in a FinTech accelerator program in part. Contrary to assumptions, the likelihood of reaching a break-even threshold does not increase by being within a FinTech technical cluster (Valverde et al., 2022).

Investment management

In a business world that is getting more competitive, it will be essential to be able to judge the value of projects accurately. Without good portfolio management of fintech projects, it is easy for financial firms to get lost in the number of fintech technologies. It can be hard to choose the best fintech projects. It is still too early to say what the best portfolio of fintech projects will lead to the most profitable and competitive results. In order to compete with fintech startups, financial institutions may decide to put money into their fintech projects. On the other hand, financial institutions can make joint investments with fintech startups to stay on the cutting edge of technology without developing new ideas on their own. A FinTech startup might, for example, put money into a robo-advisor FinTech. The FinTech startup can use the financial institution's modeling and analysis skills, and the financial institution can learn more about what kinds of fintech services clients want, as well as how much they cost and how they make money (Lee & Shin, 2018)

Data Security

The biggest problems with FinTech innovation are problems with data security, bad user interface design, and a lack of customer trust. To give customers more faith in FinTech, data security issues and the user interface must be well thought out from the beginning of the planning process. There have been situations where information security and usability were misjudged, and discriminant validity was not evaluated or done well, which turned out to be a big problem for FinTech innovation. In Germany, customers still do not know much about how their data is collected and used. This is a big problem regarding technology (Stewart & Jürjens, 2018).

Information asymmetry

During the past few years, ICOs and cryptocurrency exchanges have operated in a legal and regulatory grey area. Initial public offerings (IPOs), which could obstruct adequate funding, use a different underwriting procedure, exacerbating the high degree of information asymmetry associated with young start-up firms. The information asymmetry associated with ICO firms, often new blockchain businesses, is probably higher than public equities. (Lee et al., 2022). One disadvantage of a symbiotic connection is information leakage, which has an indirect influence on the corporate performance of FinTech startups. Information is leaked when investors also serve on corporate committees for companies in the same industry (Kijkasiwat, 2021).

Innovative Growth

FinTech found it challenging to innovate and expand under the retail deposit services regulatory framework. These new FinTech business models have compelled companies to become more customer-centric by providing clients with precisely what they want through more efficient bundling. Being client-centric is especially critical for fintech companies, which typically deploy business systems requiring extensive customer self- service.(Gomber et al., 2018). As a Fintech Start-up Growth Manager explained, “There are gaps in financial institutions’ services, and they have not had to innovate as quickly as other industries, so these FinTechs are filling in major gaps that the banks want to fill.” A Financial Advisor of a financial institution said, “We have the customer; they innovate faster. As soon as we can work together,

there will be a real benefit for the members and the clients."(Turcan & Deak, 2022). Foreign FinTech startups are not allowed to operate directly and must establish a subsidiary, or a new FinTech firm, license their technology, or employ an agent. (Albarrak & Alokley, 2021). Cross-border investments in equity crowdfunding and international operating platforms are extremely rare due to linguistic and cultural differences and, in part, to legislative restrictions(Schwienbacher, 2019). One of the main issues in Ukraine is the lack of understanding of FinTech innovations. Lack of demand results in insufficient technological advancement in the banking industry. As using FinTech as a payment channel requires confidence to eliminate uncertainty, the confidence gap" and financial awareness levels are significant barriers for fintech firms. Both the promotion of these services and the customer's level of knowledge in Arab nations provide challenges (Alkhaaleh, 2021). One of the most serious issues in Ukraine is a lack of awareness and information about FinTech innovations. In the financial industry, a lack of demand leads to inadequate technological progress (Petrushenko et al., 2018).

In developed vs. underdeveloped nations, the democratization of digitalization may differ. In industrialized and developing nations, there might be differences in the fintech industry's scale and scope economics (Cumming & Schwienbacher, 2018). FinTech startups face significant obstacles due to the lack of a widespread financial transaction infrastructure, notably in India's rural areas, which lack bank accounts, credit scores, and experience with online transactions and apps. Obtaining loans from banks and financial institutions in India is difficult and time-consuming because of regulations that require physical document verifications for things like identification, salary, legal representative copies of all documents, signatures, and physical inspections of the property (Ramesh, 2019). Regarding e-wallets, neither consumers nor merchants are encouraged to join the platform network until the opposite side of the platform has already seen significant acceptance (Omarini, 2018).

Competition and Recognition

BigTech companies have access to even more data, which they can use to hinder competition from banks and FinTechs. They can skim off high-quality loans using their superior customer data, leaving just low-quality borrowers for competing lenders. Customers may find it challenging

or unappealing to transfer to alternative suppliers due to their capacity to offer comprehensive nonfinancial services that banks and FinTech start-ups cannot. This risk is magnified when BigTech companies monopolize complementary industries and marketplaces (Eichengreen, 2021). Fintech companies often work with incumbents to find different flows of financial information (such as mortgage payments, insurance premiums, credit card transactions, and checking account transactions) and then combine them to create new forms of value. This helps them collect, organize, and analyze personal information about consumers (e.g., Budget Insight). A customer-centric strategy could also be carried out by combining the back-office systems of incumbents with FinTech systems to offer banking services geared toward the customer. Regulations that limit how personal data can be shared and used could slow down such innovations and hurt the viability of related services. As a response to these problems, FinTech makes it possible to use personal financial data legally by making it anonymous or giving control back to the consumer. (Gozman et al., 2018). How to become visible, or to put it another way, how to be recognized by the market as a usable good or service. Startups use various techniques known to many parties to obtain market approval and exposure. As a result, startups must work harder and smarter to establish themselves in the market because they frequently compete with several other competitors and established goods or businesses. (Suwarni et al., 2020). In Belgium, there is a lack of culture or climate that actively encourages the growth of Fintechs and cultivates national champions beyond the initial start-up phase. They intend to create an ecosystem that brings together all of the necessary parties that wish to work on creating and providing future financial services (Hendrikse et al., 2020).

Technology Control

Public authorities are concerned about the possibility that unmanaged technology will increase the strictness of consumer knowledge, the prevention of money laundering, or the financing of terrorism (currently identified as threats to the stability of companies). Humans must continue to remain in charge of technology so that civilizations do not end up being wholly ruled by machines (Dijmărescu, 2021). Digital challenger banks are often asset-light and drive their customer-centric approach through customer data and technology. Consequently, the business models of challenger banks are expected to be driven by algorithms, predictive analytics, and machine

learning. As a result, these reasons have prompted the Big Five banks to employ financial technology (FinTech), such as artificial intelligence, in the financial sector (Lui & Lamb, 2018). A cyber-attack or other disruption in the operation of an electronic payments system poses a threat to stability. Banks increasingly rely on crucial third-party services (such as data storage, transfer, and analytics), which are frequently provided by a single or small number of vendors. Both FinTechs and traditional banks use cloud computing, and the small number of leading cloud computing systems provides a rich target for hackers, terrorists, and other troublemakers. Cloud outsourcing introduces operational risks for FinTechs and hazards to the financial system's overall stability. The European Banking Authority has issued cloud outsourcing guidelines to address these concerns. Other financial bodies could benefit from following suit. Finally, consider how platforms, AI, and algorithm-based financial services impact macroeconomic volatility (Eichengreen, 2021).

Meanwhile in India, Since the digitally literate population in India is low, the current non-traditional banking and financial services cannot accommodate the vast majority of Indians. Their service applications are restricted to the 40 million digitally literate Indians, while the rest of the population remains unaffected (Ramesh, 2019). Financial and digital literacy: It was discovered that individuals can utilize "user-friendly functions" and are aware of how to get digital information. People prefer to use the Internet and mobile applications for online shopping, money transfers, and billing. Nevertheless, the employment of new technology in lending, crowdfunding, insurance, investing, or taxation is uncommon. Many people said that hacking, phishing, and decryption hazards associated with these activities were much more significant than their capacity to identify and control. More crucially, many prefer "representatives based in the office who can give some advice" over accepting money transfers and online payments (Kijkasiwat, 2021).

Human Capital

Due to the limited local education and training opportunities, FinTech has little human capital (Albarrak & Alokley, 2021). Usually, Fintech startups are small and medium-sized businesses (SMBs) that do not have excellent data analytics skills (so they hire outside help) and do not have

much data on customer behavior that they can use to run analytics on and offer more personalized information or payment services (Di Porto & Ghidini, 2020). In the case of an Initial Coin Offering (ICO) product, ICO analysts do not receive any direct compensation for their ratings, unlike traditional equities analysts at investment banks. They may therefore lack the motivation to provide correct evaluations. Additionally, ICO analysts are less likely to have a background in finance or business. Instead, they come from various disciplines, including data science and information technology (J. Lee et al., 2022). The inability to locate workers with the necessary skills in the UAE, the workforce's low education level, the availability of data centers and cloud solutions, and the ability to open an office must be addressed (Zarrouk et al., 2021)

Customer Management

The success of a financial firm in this fast-paced environment depends on its ability to respond quickly and compassionately to client concerns. Robo-advisors are intended to offer more affordable, 24/7 service to a larger audience with higher levels of personalization. In investment services, the human aspect is still significant. Although challenging, offering a personalized experience without substantially raising costs is essential for attracting new customers and keeping them around. FinTechs must better address customer needs by providing greater accessibility, convenience, and specialized goods because Gen X and Gen Y customers are more tech-savvy. Due to this addition, it will be more crucial to have an integrated client service management system (I. Lee & Shin, 2018). FinTech regulation should cover general consumer protection issues and issues unique to digital money. In general, regulators are in charge of defending consumers against unfair business practices. The innovative goods that FinTech companies give their customers might not be well known to them, making them susceptible to loss-leader and bait-and-switch strategies. FinTechs could entice clients by advertising cheap headline loan rates with additional, obtrusive restrictions. Regulators ought to demand a minimum level of transparency that is acceptable. Regulators should mandate that FinTechs notify clients when a financial service is still beta testing and poses unanticipated hazards (Eichengreen, 2021). As a result of the present economic crisis, businesses confront several difficulties in a complex and rapidly changing environment, including the difficulty of forming relationships with and co- creating with

their customers. In the case of Warren, the Brazilian FinTech company, many customers have withdrawn the funds they invested in Warren. In the messages sent to customer service and the comments posted on social media, apprehension about the unpredictability of the future was evident. The frequency of refusal to partake in co-creation meetings increased. There are numerous reasons, including health issues, psychological exhaustion, technological infrastructure issues, and excessive demands. (Zen et al., 2022).

Awareness

Moreover, customers of banks in Iraq are afraid of new financial service advances due to a lack of appropriate awareness about what they are. The activity of FinTech businesses, a lack of awareness of available services, and fear of fraudsters enhance loyalty to government banks with security concerns, which may be a primary cause for customers to choose payment over receipt (Hussein et al., 2021)

DISCUSSION

FinTech start-up businesses must overcome several obstacles to compete in the financial sector. The issue of regulation emerged as the most extensively discussed topic in this SLR. It highlights concern over the regulatory side of the legislation, which is deemed less persuasive. In addition to the complexities associated with entrance regulation, there are variations in licensing requirements and exemptions from regulation across different countries. According to KPMG (2018), regulators should continue to watch and respond as new threats to individual enterprises, financial stability, and consumers emerge. In some cases, this will take the form of adapting existing regulation (and supervision) in areas such as addressing cross-border legal issues posed by innovations in cross-border lending, insurance, trading, and payment transactions; assessing and updating the regulatory perimeter on a timely basis; and attempting to agree on common standards in areas where national regulators are taking different regulatory approaches. In addition, some authorities have established fintech-specific teams that assist FinTech companies with licensing issues and offer guidance throughout the process, including innovation facilitators. Other authorities have incorporated FinTech expertise into traditional supervision divisions to facilitate cross-

pollination with the financial sector and risk-management disciplines. Establishing interdepartmental working groups to evaluate the hazards involved, the level of detail required by examinations, whether dedicated teams would be appropriate, and what specific expertise and techniques are required is a viable alternative. Regtech and suptech approaches can facilitate supervisory and compliance processes for both authorities and industry and may help surmount resource limitations, but they are not a panacea (World Bank Group, 2022)

This SLR contained eight articles that explored the risks that fintech startups confront. Three sub-themes discussed were: fraudulent risk, liquidity risk, and financial risk. Governments and regulators worldwide are implementing strategies to foster a cooperative environment between financial institutions and FinTech companies. The aim is to facilitate the development of advanced technological software solutions with automated control mechanisms. These mechanisms are designed to effectively monitor and mitigate the risk of fraudulent activities occurring on digital platforms. Simultaneously, several stakeholders, including business organizations, banks, financial institutions, and payment participants, are actively enhancing their risk management systems to mitigate the risk of fraud (Chari, 2021). While in liquidity risk, research in Latin America revealed that equity funding for financial technology startups has often followed the global liquidity cycle (Bakker et al., 2023). Liquidity risk correlates with all elements of the FinTech ecosystem, particularly those of fintech startups and traditional financial institutions. Liquidity risk mitigation must be performed. One method of mitigating risk is persistent cooperation with investors or lenders as stand-by investors or lenders and reserve funds for business operations (Wijaya et al., 2022). In response to the financial risk, creditworthiness assessment requirements are a vital safeguard against unaffordable lending. In a P2PL context, it seems essential that these obligations apply to the entity in the best position to conduct such assessments. This is typically the P2PL operator as opposed to an individual borrower, regardless of whether they are technically the lender under the applicable arrangement. One crucial measure commonly required in several international settings to protect client assets is the segregation of investor and borrower funds from other monies held by a peer-to-peer lending (P2PL) operator. In addition, in crowdfunding, to mitigate the risk that retail investors are uninformed of the illiquidity of investments made

through crowdfunding, regulators typically require platform operators to disclose this risk to investors. This includes explicitly informing potential investors of the possibility that they will be unable to withdraw their funds at any time (The World Bank, 2021).

In this SLR, six (6) articles discussed on financial constraints of a FinTech startup. FinTech startups confront financial obstacles in the form of funds, skills, and expertise when they first launch. Furthermore, the elements of profit and investment management must be highlighted. FinTechs' balance sheets often have high current assets and debt, sometimes revealing deficits due to losses or lack of capital. Failed and active FinTechs showed distinct balance sheet differences, and the third to fifth year after founding is a critical survival period. Active FinTechs generally have more equity, current assets, and liquidity, making them more responsive to employment changes (Stuckenborg & Leker, 2019). Meanwhile, five articles elaborated on Technology control; due to their global and decentralized character, crypto-assets pose such hazards. According to the FATF's annual evaluation (May 2021), the value of virtual assets engaged in most ML/TF cases detected was still relatively low compared to cases involving more conventional financial services and products (World Bank Group, 2022). The rapid advancement of technology underscores the need for regulators to proactively monitor and adapt to the evolving landscape of Fintech within their markets. Regions must cultivate new skills, capabilities, and innovative organizational culture to effectively navigate the growth of technology- driven financial services. This approach fosters innovation and enhances risk management through initiatives like innovation hubs and regulatory sandboxes. The utilization of regtech and Supertech tools, encompassing novel financial technologies to bolster regulatory compliance and supervisory surveillance, is crucial. While these tools offer the potential for improved regulation, oversight of fintech entities, and risk monitoring, their implementation should be proportionate to the scale, intricacy, and progress of both the fintech sector and the broader financial industry. Regtech aids in regulatory reporting, tackling issues like anti-money laundering and countering the financing of terrorism reporting. Meanwhile, suptech focuses on analyzing misconduct, data management, AI analytics, virtual assistance, micro and macro-prudential measures, and market surveillance, presenting a potent avenue for enhancing supervisory oversight (Kwon et al., 2023)

There were nine articles focusing on innovative growth themes. In most sophisticated nations, innovation activity is governed by varying degrees of government participation. Entrepreneurial subjects (multinational corporations, representatives of large, medium, and small businesses) are given the leading role in innovation activity processes. The development of regulatory sandboxes has begun in various jurisdictions to provide a secure environment for fintech startups to conduct real-world market research and market reaction testing without the need for a license. In 2016, the United Kingdom adopted this concept. This has helped FinTech startups develop long-term experimentation skills, which are essential for innovation and enable startups to comprehend consumer requirements. (Zetzsche et al., 2017). Given an appropriate ecosystem and regulatory framework, FinTech has the potential to emerge as a highly inventive instrument for enhancing financial inclusivity (Ediagbonya & Tioluwani, 2023). Meanwhile, as for the Competition theme, this SLR identified four articles discussing it. The FinTech world requires a better connection between regulations and competition rules, which is currently lacking. In areas like FinTech payments, banking, wealth management, and financial advice, essential goals such as stability, consumer protection, and data privacy should harmonize with fair competition. It is uncertain how well the current setup coordinates these efforts to reduce conflicts (Carmona et al., 2018)

Data security on fintech startups was explained in two articles. Cybersecurity risks in FinTech must be continuously monitored and tightly controlled, as they can rapidly impact financial ecosystems, influencing the trust and reputation of financial services. Controls should consider the entire ecosystem, including the roles and interrelationships of fintech, the broader financial system, and consumers. Regulators can collaborate with the industry to provide market-appropriate guidance. These should require certifications such as ISO 27001 for information security management and ensure that firms have adequate cybersecurity risk management plans in place (Kwon et al., 2023). Next, on the themes of Human capital, this SLR identified four articles on these issues. FinTech firms play an essential role in modern finance and must prioritize building their human resource pipeline. This includes providing improved working conditions, extensive training, and collaborating with higher education institutions to build a trained workforce capable of meeting the unique demands of the FinTech industry. Supporting entrepreneurial ventures via targeted finance and

investments may foster both industry growth and innovation at the same time (Sampat et al., 2023). Lastly, Customer management in this SLR was elaborated by four articles. FinTech companies are accountable for educating consumers about their financial service options, enhancing their financial management skills, and collecting data that informs credit decisions, product development, and recommendations in an ethical manner. By educating customers about the benefits of FinTech, collecting and protecting data responsibly, and assuring its appropriate use, these businesses contribute to consumer protection. In addition, their commitment to responsible lending and protection of consumers from fraudulent activities exemplifies their responsibility to maintain a trustworthy and secure financial environment (Sampat et al., 2023)

CONCLUSION

This study sought to investigate the challenges faced by emerging FinTech startups. A comprehensive SLR compiled 159 scholastic works published between 2018 and August 2022 from the prestigious databases SCOPUS and Web of Science (WOS). The selection process involved a meticulous evaluation of titles and abstracts, resulting in the compilation of 36 final research papers subjected to rigorous thematic analysis. This research was organized into nine discussion areas concerning challenges faced by fintech startups: Regulation, Risk, Financial constraint, Innovative growth, Technological control, Data Security, Human Capital, and Customer Management. Among all the topics covered in the literature review, the issue of regulatory challenges emerged as the most extensively addressed. Despite diverse themes like human resources and financial aspects, the regulatory context within a specific country remained crucial. Establishing a regulatory sandbox and implementing regulatory technology (Regtech) and supervisory technology (Suptech) can provide excellent support for safeguarding fledgling fintech startups. This SLR has the potential to support many stakeholders, including policymakers, researchers, the financial banking industry, and fintech start-ups, in developing strategies to enhance the implementation of Fintech in the market. Furthermore, this study might serve as a helpful reference within the FinTech literature. Future research could further explore the comprehensive examination of challenges within the existing fintech categories, encompassing domains like crowdfunding,

peer-to-peer (P2P) platforms, robo-advisory services, and mobile payment systems.

ACKNOWLEDGEMENTS

We extend our deepest gratitude to the Malaysia Development Bank (BPMB) for providing funding for the Research Grant (100-TNCPI/PRI 16/6/2 (018/2021), as well as to Universiti Teknologi MARA (UiTM) for their assistance in overseeing the administration of this research grant.

REFERENCES

Abdelghani Echchabi, Mohammed Mispah Said Omar, Abdullah Mohammed Ayedh, & Welcome Sibanda. (2021). Islamic Banks Financing of FinTech Start-Ups in Oman: An Exploratory Study. The Journal of Muamalat and Islamic Finance Research, 18(1), 55–65. https://doi.org/10.33102/jmifr.v18i1.329

Albarrak, M. S., & Alokley, S. A. (2021). FinTech: Ecosystem , Opportunities and Challenges in Saudi Arabia.

Journal of Risk and Financial Management, 14(10), 460.

Alkhaaleh, A. M. K. (2021). Challenges and Opportunities for Fintech Startups: Situation in the Arab World.

Academy of Accounting and Financial Studies Journal, 25(3).

Allen, H. J. (2019). Regulatory sandboxes. George Washington Law Review, 87(3), 579–645. https://doi.org/10.4337/9781788979023.00028

Bakker, B. B., Garcia-Nunes, B., Lian, W., Liu, Y., Marulanda, C. P., Siddiq, A., & Sumlinski, M. (2023). The Rise and Impact of Fintech in Latin America The Rise and Impact of Fintech in Latin America. International Monetary Fund.

Bavoso, V. (2020). The promise and perils of alternative market-based finance: the case of P2P lending in the UK. Journal of Banking Regulation, 21(4), 395–409. https://doi.org/10.1057/s41261-019-00118-9

Bellucci, M., Cesa Bianchi, D., & Manetti, G. (2022). Blockchain in accounting practice and research: systematic literature review. Meditari Accountancy Research, 30(7), 121–146. https://doi.org/10.1108/MEDAR-10- 2021-1477

Carmona, A. F., Lombardo, A. G.-Q., Pastor, R. R., Quirós, C. T., García, J. P. V., Muñoz, D. R., & Martín, L. C. (2018). Competition issues in the Area of Financial Technology (FinTech). Policy Department for Economic, Scientific, and Quality of Life Policies, July. https://www.europarl.europa.eu/RegData/etudes/STUD/2018/619027/IPOLSTU(2018)619027_EN.pdf

Chang, S. (2018). Legal Status of Virtual Currency in Indonesia in the Absence of Specific Regulations. Indonesia Law Review, 8(3), 328–348. https://doi.org/10.15742/ilrev.v8n3.485

Chari, K. (2021). Fraud Risk in a Digitized Fintech Ecosystem Troubling trends, issues, and approaches to mitigate Fraud Risk. 33–54. https://doi.org/10.1007/978-3-030-66691-0_2

Cumming, D. J., & Schwienbacher, A. (2018). Fintech venture capital. Corporate Governance: An International Review, 26(5), 374–389. https://doi.org/10.1111/corg.12256

Di Porto, F., & Ghidini, G. (2020). "I Access Your Data, You Access Mine": Requiring Data Reciprocity in Payment Services. IIC International Review of Intellectual Property and Competition Law, 51(3), 307–329. https://doi.org/10.1007/s40319-020-00914-1

Dijmărescu, E. (2021). Towards a Fiduciary Digital Currency. Romanian Journal of European Affairs, 21(2), 5–18.

Ediagbonya, V., & Tioluwani, C. (2023). The role of Fintech in driving financial inclusion in developing and emerging markets: issues, challenges and prospects. Technological Sustainability, 2(1), 100–119. https://doi.org/10.1108/techs-10-2021-0017

Eichengreen, B. (2021). Financial regulation in the age of the platform economy. Journal of Banking Regulation, 0123456789. https://doi.org/10.1057/s41261-021-00187-9

European Banking Authority. (2017). Discussion paper on the EBA's approach to financial technology (FinTech). In Eba/Dp/2017/02 (Issue August). https://eba.europa.eu/sites/default/documents/files/documents/10180/1919160/7a1b9cda-10ad-4315-91ce- d798230ebd84/EBA Discussion Paper on Fintech %28EBA-DP-2017-02%29.pdf?retry=1

Flögel, F., & Beckamp, M. (2020). Will FinTech make regional banks superfluous for small firm finance ? Observations from soft information-based lending in Germany. Econnomic Notes, 49(2), 1–20. https://doi.org/10.1111/ecno.12159

Gimpel, H., Rau, D., & Röglinger, M. (2018). Understanding FinTech start-ups – a taxonomy of consumer- oriented service offerings. Electronic Markets, 28(3), 245–264. https://doi.org/10.1007/s12525-017-0275-0

Gomber, P., Kauffman, R. J., Parker, C., & Weber, B. W. (2018). On the Fintech Revolution: Interpreting the Forces of Innovation, Disruption, and Transformation in Financial Services. Journal of Management Information Systems, 35(1), 220–265. https://doi.org/10.1080/07421222.2018.1440766

Gozman, D., Liebenau, J., & Mangan, J. (2018). The innovation mechanism of fintech start-ups: Insight from SWIFT's innotribe competition. JOURNAL OF MANAGEMENT INFORMATION SYSTEMS, 35(1), 145–179.

Hendrikse, R., Meeteren, M. van, & Bassens, D. (2020). Strategic coupling between finance, technology and the state: Cultivating

a Fintech ecosystem for incumbent finance. Environment and Planning A: Economy and Space, 52(8), 1516–1538. https://doi.org/10.1177/0308518X19887967

Hodson, D. (2021). The politics of FinTech: Technology, regulation, and disruption in UK and German retail banking. Public Administration, 99(4), 859–872. https://doi.org/10.1111/padm.12731

Hussein, H. H., Amen, H. A., & Hachim, B. A. (2021). Financial technology between reality and application developing the incubating environment and the expected role in achieving sustainable development in Iraq. Academy of Entrepreneurship Journal, 27(2), 1–17.

Innovate Finance. (2022). FinTech Investment Landscape 2022.

Khajehpour, H., Sadatrasoul, S. M., & Zenouz, R. Y. (2020). Does Fundraising Have Meaningful Sequential Patterns? The Case of Fintech Startups. Iranian Journal of Management Studies (IJMS), 13(4), 763–790.

Kijkasiwat, P. (2021). Opportunities and challenges for fintech startups: the opportunities and challenges for fintech startups: The case study of Thailand. ABAC Journal, 41(2), 41–60.

KPMG. (2018). Regulation 2030 - What lies ahead? (Issue April). https://kpmg.com/xx/en/home/insights/2018/03/regulation-2030-fs.html

Kraus, N., Kraus, K., & Osetskyi, V. (2020). New quality of financial institution. Baltic Journal of Economic Studies, 6(1), 59–66.

Kwon, Y., Lee, J.-D., & Owens, J. (2023). Managing Fintech Risks: Policy and Regulatory Implications. ADB BRIEFS, 245. https://www.adb.org/publications/managing-fintech-risks-policy-regulatory-implications

Lee, E. (2018). Equity crowdfunding in Hong Kong: potential, challenges and investor protection. Journal of Corporate Law Studies, 0(0), 1–26. https://doi.org/10.1080/14735970.2017.1369235

Lee, I., & Shin, Y. J. (2018). Fintech: Ecosystem, business models, investment decisions, and challenges. Business Horizons, 61(1), 35–46. https://doi.org/10.1016/j.bushor.2017.09.003

Lee, J., Li, T., & Shin, D. (2022). The Wisdom of Crowds in FinTech: Evidence from Initial Coin Offerings. Review of Corporate Finance Studies, 11(1), 1–46. https://doi.org/10.1093/rcfs/cfab014

Leong, C., Tan, B., Xiao, X., Tan, F. T. C., & Sun, Y. (2017). Nurturing a FinTech ecosystem: The case of a youth microloan startup in China. International Journal of Information Management, 37(2), 92–97. https://doi.org/10.1016/j.ijinfomgt.2016.11.006

Leong, K., & Sung, A. (2018). FinTech (Financial Technology): What is It and How to Use Technologies to Create Business Value in Fintech Way? International Journal of Innovation, Management, and Technology, 9(2), 74–78. https://doi.org/10.18178/ijimt.2018.9.2.791

Liberati, A., Altman, D. G., Tetzlaff, J., Mulrow, C., Gøtzsche, P. C., Ioannidis, J. P. A., Clarke, M., Devereaux, P. J., Kleijnen, J., & Moher, D. (2009). The PRISMA statement for reporting systematic reviews and meta- analyses of studies that evaluate health care interventions: Explanation and elaboration. PLoS Medicine, 6(7). https://doi.org/10.1371/journal.pmed.1000100

Lochmiller, C. R. (2021). Conducting thematic analysis with qualitative data. Qualitative Report, 26(6), 2029– 2044. https://doi.org/10.46743/2160-3715/2021.5008

Loo, R. Van. (2018). Making Innovation More Competitive : The Case of Fintech. 65 UCLA Law Review, 232.

Lui, A., & Lamb, G. W. (2018). Artificial intelligence and augmented intelligence collaboration: regaining trust and confidence in the financial sector. Information & Communications Technology Law, 27(3).

Mengist, W., Soromessa, T., & Legese, G. (2020). Method for conducting systematic literature review and meta- analysis for environmental

science research. MethodsX, 7, 100777. https://doi.org/10.1016/j.mex.2019.100777

Moher, D., Liberati, A., Tetzlaff, J., & Altman, D. G. (2010). Preferred reporting items for systematic reviews and meta-analyses: The PRISMA statement. International Journal of Surgery, 8(5), 336–341. https://doi.org/10.1016/j.ijsu.2010.02.007

Omarini, A. E. (2018). Fintech and the Future of the Payment Landscape : The Mobile Wallet Fintech and the Future of the Payment Landscape : The Mobile Wallet Ecosystem - A Challenge for Retail Banks ? International Journal of Financial Research, 9(4), 97–116. https://doi.org/10.5430/ijfr.v9n4p97

Pahlevan-Sharif, S., Mura, P., & Wijesinghe, S. N. R. (2019). A systematic review of systematic reviews in tourism. Journal of Hospitality and Tourism Management, 39(March), 158–165. https://doi.org/10.1016/j.jhtm.2019.04.001

Petrushenko, Y., Kozarezenko, L., Glinska-Newes, A., Tokarenko, M., & But, M. (2018). The opportunities of engaging FinTech companies into the system of cross-border money transfers in Ukraine. Investment Management and Financial Innovations, 15(4), 332–344. https://doi.org/10.21511/imfi.15(4).2018.27

Polasik, M., Huterska, A., Iftikhar, R., & Mikula, Š. (2020). The impact of Payment Services Directive 2 on the PayTech sector development in Europe. Journal of Economic Behavior and Organization, 178, 385–401. https://doi.org/10.1016/j.jebo.2020.07.010

Pranckutė, R. (2021). Web of Science (Wos) and Scopus: The Titans of bibliographic information in today's academic world. Publications, 9(1). https://doi.org/10.3390/publications9010012

Priyashantha, K. G., De Alwis, A. C., & Welmilla, I. (2021). Gender stereotypes change outcomes: a systematic literature review. Journal of Humanities and Applied Social Sciences. https://doi.org/10.1108/jhass-07- 2021-0131

Ramesh, L. (2019). Fintech: A new avenue for banks to enhance customer digital experience (DX). International Journal of Innovative Technology and Exploring Engineering, 8(8), 644–648.

Sampat, B., Mogaji, E., & Nguyen, N. P. (2023). The dark side of FinTech in financial services : a qualitative inquiry into FinTech developers perspective. International Journal of Bank Marketing. https://doi.org/10.1108/IJBM-07-2022-0328

Schwienbacher, A. (2019). Equity crowdfunding: anything to celebrate? Venture Capital, 21(1), 65–74. https://doi.org/10.1080/13691066.2018.1559010

Shaffril;, H. A. M., Samsuddin;, A. A. S. S. F., & Ali, Z. (2019). Mirror-mirror on the wall, what climate change adaptation strategies are practiced by the Asian fishermen of all? Journal of Cleaner Production, 232, 104–117. https://doi.org/10.1016/j.jclepro.2019.05.262

Stewart, H., & Jürjens, J. (2018). Data security and consumer trust in FinTech innovation in Germany. Information and Computer Security, 26(1), 109–128. https://doi.org/10.1108/ICS-06-2017-0039

Stuckenborg, L., & Leker, J. (2019). The survival of the German FinTech market: An accounting-based valuation. The Journal of Entrepreneurial Finance, 21(1). https://doi.org/10.57229/2373-1761.1334

Suwarni, Noviantoro, R., Fahlevi, M., & Abdi, M. N. (2020). Startup Valuation by Venture Capitalists : An Empirical Study Indonesia Firms. International Journal of Control and Automation, 13(2), 785–796.

The World Bank. (2021). Consumer Risks in Fintech New Manifestations of Consumer Risks and Emerging Regulatory Approaches.

Turcan, R. V, & Deak, B. (2022). Fintech – stick or carrot – in innovating and transforming a financial ecosystem : toward a typology of comfort zoning k. FORESIGHT, 24(1), 126–139. https://doi.org/10.1108/FS-02- 2021-0052

Valverde, S. C., Solas, P. J. C., & Fernández, F. R. (2022). Entrepreneurial, institutional, and financial strategies for FinTech profitability. Financial Innovation, 8(15). https://doi.org/10.1186/s40854-021-00325-2

Wijaya, C., Nugroho, B. Y., & Arkanuddin, M. F. (2022). The Analysis of Risk Effect Towards Fintech Ecosystem on P2P Lending Industry in Indonesia. Indonesian Journal of Business and Entrepreneurship, 8(3), 481– 491.

Wonglimpiyarat, J. (2018). Challenges and dynamics of FinTech crowdfunding: An innovation system approach. Journal of High Technology Management Research, 29(1), 98–108. https://doi.org/10.1016/j.hitech.2018.04.009

World Bank Group. (2022). Fintech and the Future of Finance - Overview. https://documents1.worldbank.org/curated/en/099450005162250110/pdf/P17300600228b70070914b0b5ed f26e2f9f.pdf

Wu, X. V., Chan, Y. S., Tan, K. H. S., & Wang, W. (2018). A systematic review of online learning programs for nurse preceptors. Nurse Education Today, 60(August 2017), 11–22. https://doi.org/10.1016/j.nedt.2017.09.010

Xiao, Y., & Watson, M. (2019). Guidance on Conducting a Systematic Literature Review. Journal of Planning Education and Research, 39(1), 93–112. https://doi.org/10.1177/0739456X17723971

Zarrouk, H., Ghak, T. El, & Bakhouche, A. (2021). Exploring economic and technological determinants of fintech startups' success and growth in the United Arab Emirates. Journal of Open Innovation: Technology, Market, and Complexity, 7(1), 1–24. https://doi.org/10.3390/joitmc7010050

Zen, A. C., Bittencourt, B. A., & Spohr, R. (2022). Co-creation strategies in times of crisis: The case of Warren. International Journal of Entrepreneurship and Innovation, 23(2), 144–150. https://doi.org/10.1177/14657503221092969

Zetzsche, D. A., Buckley, R. P., Arner, D. W., & Barberis, J. N. (2017). Regulating a Revolution: From Regulatory Sandboxes to Smart Regulation. Fordham Journal of Corporate & Financial Law Volume, 23(1). https://doi.org/10.2139/ssrn.3018534 https://www.statista.com/statistics/893954/number-fintech-startups-by-region/, retrive on 17th August 2023