A Systematic Literature Review of the Risk Landscape in Fintech

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Abstract: The current study is primarily concerned with the developments in financial technology, or fintech, that have significantly altered traditional financial systems, focusing on several risk categories that have emerged in the financial technology sector’s digital ecosystem. This paper is a review of existing literature related to the risk landscape in fintech, particularly its publication trend, journal productivity, impact, affiliated organizations, and related themes. A bibliometric and content analysis of 84 articles collected through Scopus’ structured database is performed for a comprehensive review. It is revealed that financial technology development has decreased physical crime while simultaneously increasing cybercrime. Another challenge is the asymmetrical technology between financial markets and the relevant supervisors. These current issues necessitate the creation of an Act on Fintech to create a comprehensive legislative framework. The present study’s findings are helpful for academia and industry to aid their existing knowledge about fintech and associated risks, particularly its timeline, geographical spread, and development of coherent themes.

Keywords: fintech; risks; bibliometric analysis; content analysis

1. Introduction

In the present era, the world has seen a remarkable transformation. Organizations, authorities and the entire populace must act quickly and appropriately to counter the speed of change to avoid the negative outcomes of hazards that are growing along with these transformations. With a specific emphasis on repeatable and scalable business models, the industry 4.0 model adopts innovation and technology to change existing business models (Kijkasiwat 2021). Over the past ten years, there has been a substantial surge in innovation and competition in payment methods, giving consumers more options and better customer experiences (Gejke 2018; Mallekoote and Balraadjsing 2022). The global financial technology revolution is well underway and has produced significant potential in this area (Hollanders 2020; Mamonov and Malaga 2018; Murinde et al. 2022; Pantielieieva et al. 2022). Fintech frequently relies on software embedded in platforms and/or mobile applications that incorporates data mining techniques, algorithms, and machine learning to provide customers with automated and better financial services (Belozyorov et al. 2020). Financial technology has impacted almost all facets and divisions of the financial services sectors. Customers can communicate with financial institutions via increasingly automated channels thanks to fintech innovations (Milian et al. 2019). Over the past two decades, investments in fintech have risen sharply. There are astounding amounts of financial startups worldwide (Lu et al. 2021). As more and more technology companies enter finance, they can access a sizable customer database and provide distinct services that could not be possible otherwise (Chaudhry et al. 2022). Lack of services in the formal financial system
and significant government backing for advancing financial inclusion through digitalization are key factors for fintech development (Rupeika-Apoga and Wendt 2021). Because fintech lending is a distinct innovation in the current financial and banking industries, it has grown rapidly in many economies and is becoming a potential business model for the future. Due to the availability of mobile-friendly applications, fintech lending has quickly developed and is now easily accessible to everyone and everywhere (Kaur et al. 2021). Peer-to-peer lending, commonly referred to as P2P lending, is another new type of online lending that utilizes digital and communication technology to connect potential borrowers with investors (Varma et al. 2022). Equity crowdsourcing has developed as a result of recent changes in financial legislation and may eventually replace more conventional sources of venture capital (Macchiavello 2018; Mamonov and Malaga 2018).

The current study primarily concerns the developments in financial technology, or fintech, which have significantly altered traditional financial systems. We focus on several categories of risk that have emerged in the financial technology sector’s digital ecosystem. The digitization of finance has piqued the attention of researchers delving into the implications of fintech from several angles. In the present study, the authors conducted a systematic review using the PRISMA method. They conducted a content analysis on the resulting data because the primary aim of this study is to examine how digitization in finance has benefited this industry with a specific focus on various types of risks that have occurred as a result of this digitalization.

The objective of this review is to resolve the following research questions:

Research Question 1: What are the publications trends in the field of ‘Fintech and risks’?

Research Question 2: Who are the most well-known journals, authors, countries, and organizations contributing to research on ‘Fintech and risks’?

Research Question 3: Which risks have occurred due to digitalization in the field of finance?

Research Question 4: What are the major themes in the literature in the Fintech and Risks domain?

Research Question 5: What are the directions for future research?

Section 2 examines what has already been written on fintech and several risk categories that have emerged in the financial technology sector’s digital ecosystem. Section 3 contains a summary of the data and methods used. Section 4 presents the bibliometric analysis results, and Section 5 discusses the content analysis results. Section 6 concludes with some closing remarks.

2. Risk Landscape in Fintech

Financial inclusion has given many small and medium-sized businesses, and low-income people, access to financial services and has become the greatest contribution of fintech to society (Bavoso 2020; Jain and Bansal 2022). The COVID-19 epidemic has sped up the fintech revolution and helped the banking industry adopt digital technologies more quickly (Rupeika-Apoga et al. 2022). Nowadays, people utilize these technologies excessively, particularly when making purchases, because digital payment systems are quick, accessible, and practical. Additionally, fintech promotes financial inclusion, adds to the economy, spurs creativity, and makes it easier to acquire financial services. The insurance business is benefiting from digitalization and developing cutting-edge insurance solutions. Peer-to-peer insurance is one of these products. It is a technology-based risk-sharing insurance concept that links policyholders and allows them to pool their premiums to insure against risk. However, this model is not yet well-liked (Clémente and Marano 2020). Technological progress opens up new possibilities for insurance risks (Jangir et al. 2022). Another study sought to understand how high-tech applications in the current supply chain insurance business digitalization took into consideration the dangers related to the employment of cutting-edge technologies (Praslov et al. 2020). Based on the examination of the practices of the top insurance firms, it is seen that they adopt a few
incremental and combinatorial innovations but do not actively engage with customers using contemporary communication channels. The findings demonstrate the necessity of collaboration between insurance and fintech businesses in the ecosystem of innovations (Yehorycheva et al. 2020).

Digital financial technologies’ growth and use have contributed to reshaping economic and financial processes worldwide, but they have also exposed people, systems, and administration to new risks that undermine the efficiency of procedures and current rules (Ashta and Herrmann 2021; Gasiorkiewicz et al. 2020). Fintech offers more easy and efficient payment methods. However, there are risks linked with digital economic innovation (Khiaonarong and Goh 2020; Zhao and Chen 2022).

Without a doubt, technological advancements have benefited the financial industry globally (Bhatnagar et al. 2022), but they also carry several hazards related to competitiveness, privacy, and financial stability (Hollanders 2020; Mishchenko et al. 2021). As a result, many individuals are worried about privacy concerns, system reliability, cyber security, and any potential vulnerability to cyber-attacks. According to empirical evidence, the latest and possibly biggest hazard emerging in the current environment is cyber risk in the Fintech sector (Duran and Griffin 2021; Vučinić and Luburić 2022). The current global pandemic, a previously unheard-of occurrence, has profoundly impacted contemporary society. Due to the global pandemic-driven increase in cashless transactions and business digitization, cyber dangers are increasing (Fabris 2022).

Along with the rapid growth of internet lending, there was also an increase in reports of unethical and illegal business activities (Tritto et al. 2020). Another significant issue is the difficulty of cooperation between banks and Fintech startups (Pu et al. 2021). In their study, Duran and Griffin (2021) analyze the dangers posed by smart contracts, a revolutionary advancement in financial technology, and determine if they could one day jeopardize the stability of the world financial system. This industry’s other difficulties include regulatory uncertainty, unlawful activities, and data exploitation (Hua and Huang 2021). Perceiving four different types of risks, i.e., financial, legal, security, and operational risks, Ryu (2018) built a model to analyze users’ intention of digital financial technologies. He found that legal risk had the strongest negative impact on users’ intentions to continue using fintech. The study also discovered that early and late adopters frequently have different specific benefits and risk consequences.

Mascarenhas et al. (2021) enhanced the Ryu (2018) model to account for perceived risks and advantages that may affect the continued adoption of fintech and concluded that early adopters consider the operational risk to be the most significant. In contrast, late adopters are more worried about financial risk. Another study uses the TAM model to examine how demographic factors affect customers’ opinions regarding the risks involved and their propensity to use fintech services from banks (Alshari and Lokhande 2022). Gozman and Willcocks (2019) have outlined the risks associated with cloud-based financial technologies in their research and grouped them into distinct risk patterns with escalating repercussions for businesses and individuals. These dangers include cloud deployments that are opaque and difficult to manage, incompatible data rights and architectures, and resilient and long-lasting vendors. Another major concern for those involved in the fintech lending industry, according to Arkanuddin et al. (2021), is the rise in non-performing loans. She emphasized that if this issue is not resolved, the fintech ecosystem will be disrupted. Big Tech may threaten regulators’ control over the digital economy, businesses’ sizable advantage over consumers due to the use of cutting-edge technology for big data analysis, and the rise in cybercrime. Cryptocurrencies are making it easier for many risks connected to money laundering and financing terrorism to occur (Akartuna et al. 2022). Regtech solutions come with dangers such as dehumanization, algorithmic biases, and cyber risk (Lanfranchi and Grassi 2022). A USA study identified twenty risk factors in the fintech industry (Tritto et al. 2020). Another study empirically assesses the systemic and tail risks of technology enterprises, which could present new problems for financial stability (Chaudhry et al. 2022).
The institutional framework of the global financial system is overly complicated by the use of financial technologies. Normal functional linkages break down as a result, leading to the emergence of new institutions, interdependencies, and systemic risks. The most significant driver of the financial sector’s destabilization and the emergence of financial bubbles in various market areas is the absence of institutional backing for innovative financial technology (Azarenkova et al. 2018). It is discovered that the public sector is relatively safe in the current online lending market, while the risk is primarily concentrated in the private sector. Regulations must rigorously oversee all financial innovations as early as possible due to the evolution of default risk; otherwise, high costs are needed to recover the loss caused by risks (Rupeika-Apoga and Wendt 2022). The extant literature, however, does not go into enough detail about how supervisors must create new tools to address new risks brought on by emerging technologies in the digital financial world.

Table 1 depicts the major risks identified in the articles reviewed in this study.

<table>
<thead>
<tr>
<th>Type of Risk</th>
<th>Description</th>
<th>Sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cyber-security risk</td>
<td>The risk of information’s integrity, availability, or secrecy.</td>
<td>(Duran and Griffin 2021; Boulianne and Fortin 2020; Lanfranchi and Grassi 2022; Eskindarov et al. 2019; Mishchenko et al. 2021; Fabris 2022; Irwin and Dawson 2019; Vučinić and Luburić 2022; Kaigorodova et al. 2021)</td>
</tr>
<tr>
<td>Loss of Privacy and Data-rights</td>
<td>The danger of clients allowing fintech companies to access their bank account information to do tasks on their behalf.</td>
<td>(Hua and Huang 2021; Hollanders 2020; Saliba et al. 2022)</td>
</tr>
<tr>
<td>Financial Crimes and lack of investor protection</td>
<td>As it is simpler to assume false identities online, fintech channels are prone to far higher fraud rates.</td>
<td>(Jamil et al. 2022; Šapkauskiene and Višinskaitė 2020; Hollanders 2020)</td>
</tr>
<tr>
<td>High Cost</td>
<td>The high cost of digitalization restrains banks and insurers from using digital financial technologies.</td>
<td>(Kaigorodova et al. 2021)</td>
</tr>
<tr>
<td>Lack of Financial Literacy</td>
<td>Due to financial illiteracy, customers in developing countries fear using financial technologies and prefer traditional methods.</td>
<td>(Demirgüç-Kunt et al. 2020; Eskindarov et al. 2019; Kijkasiwat 2021; Ozili 2021a)</td>
</tr>
<tr>
<td>Systematic/Financial Stability Risk</td>
<td>Financial technologies lead to the instability of the entire financial system in an economy.</td>
<td>(Bavoso 2020; Azarenkova et al. 2018; Chaudhry et al. 2022; Li 2022; Khiaonarong and Goh 2020; Yang and Li 2018; Jonker and Kosse 2022; Mascarenhas et al. 2021; Alshari and Lokhande 2022; Nabilou 2020; Ozili 2018; Vučinić 2020; Gasiorkiewicz et al. 2020; Thakor 2020; Das 2019)</td>
</tr>
<tr>
<td>Operational Risk</td>
<td>Fintech companies face the risk of inefficient internal systems, procedures, and personnel.</td>
<td>(Zhao and Chen 2022; Mascarenhas et al. 2021; Hsu et al. 2021; Wei et al. 2022; Gao et al. 2020)</td>
</tr>
<tr>
<td>Default Risk</td>
<td>Loan defaults are increased in digital lending as compared to traditional lending.</td>
<td>(Arkanuddin et al. 2021; Mallekoote and Balraadjising 2022; Xia et al. 2021; Mascarenhas et al. 2021; Wu et al. 2020; Nigmonov and Shams 2021)</td>
</tr>
<tr>
<td>Lack of Interaction between Banking/Insurance and Fintech Companies</td>
<td>Banks and insurance companies face the challenges of digitalization while interacting with fintech companies.</td>
<td>(Pu et al. 2021; Yehorycheva et al. 2020; Zveryakov et al. 2019)</td>
</tr>
<tr>
<td>Volatility in Crypto-currencies</td>
<td>Huge volatility in crypto assets creates financial instability in the fintech industry.</td>
<td>(Huang et al. 2020; Boulianne and Fortin 2020; Luo et al. 2021; Miglo 2022)</td>
</tr>
</tbody>
</table>
The preceding literature shows that various researchers discuss various risks in the fintech industry. Some of the studies concentrated on cybersecurity risk, while others discussed regulatory risk. A few studies also addressed default risk and operational risks. However, no previous studies have been conducted to systematically analyze the available literature and identify all of the risks associated with fintech. In this regard, the current study is an attempt to summarize the main risks confronting fintech.

3. Materials and Methods

The researchers devised a plan to find the pertinent literature for this systematic review. Using the keywords Risks AND Fintech, literature from the structured database of Scopus was searched on 26 October 2022. Due to its strength and acceptance in emerging technology research, this database was chosen. The database had 341 results in total. The mapping of the body of literature is the search’s main objective. The 5-year search window, from 2018 to 2022, was set as the limit. ‘Business Management’, and ‘Accounting’, and ‘Economics, Econometrics’, and ‘Finance’ were the subject areas chosen for the study. The search approach is also restricted to journal articles exclusively. Only articles published in journals are included for a full examination. The new number was 148 when the research was restricted to only journal papers. Since some of the pieces were at the press stage rather than the final step, they had to be removed from the process, bringing the total to 95.

Additionally, papers written in languages other than English were eliminated. Six of these publications were removed after the researchers carefully examined the abstracts of these articles and discovered they had no relevance to the study’s goals. In all, 84 articles are ultimately chosen for evaluation. These articles have the qualities listed below.

All of the articles discuss the risks associated with digitalization in the domain of finance. Extracted articles were published between 2018 and 2022. The articles were released in journals that are listed in SCOPUS. The only language in which the articles are published is ‘English’. Figure 1 was created for a literature review using the Page et al. (2021) PRISMA model.

<table>
<thead>
<tr>
<th>Type of Risk</th>
<th>Description</th>
<th>Sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regulatory compliance and Legal risk</td>
<td>The Fintech industry requires strict adherence to laws and regulations due to its online functioning, but still, no specific laws prevail regulating this industry.</td>
<td>(Ryu 2018; Hua and Huang 2021; Bavoso 2020; Murinde et al. 2022; Gozman and Willcocks 2019; Clemente and Marano 2020; Boulianne and Fortin 2020; Kijkasiwat 2021; Milian et al. 2019; Bu et al. 2022)</td>
</tr>
<tr>
<td>Money Laundering and Finance Terrorism</td>
<td>Due to accessibility through the internet, criminals have developed advanced technologies for money laundering.</td>
<td>(Akartuna et al. 2022; Muryanto et al. 2022)</td>
</tr>
</tbody>
</table>
Additionally, papers written in languages other than English were eliminated. Six of these publications were removed after the researchers carefully examined the abstracts of these articles and discovered they had no relevance to the study's goals. In all, 84 articles are ultimately chosen for evaluation. These articles have the qualities listed below. All of the articles discuss the risks associated with digitalization in the domain of finance. Extracted articles were published between 2018 and 2022. The articles were released in journals that are listed in SCOPUS. The only language in which the articles are published is 'English'. Figure 1 was created for a literature review using the Page et al. (2021) PRISMA model.

4. Bibliometric Analysis

Figure 2 depicts the annual trend of publications included in the present review. There is a very clear uptrend in publications in this field. Researchers started taking an interest in the research on fintech in 2018. In 2018 and 2019, there were only eight and six studies, respectively. Out of 84 analyzed scholarly articles, 22 are credited to each of the years 2020 and 2021. This is since, during that period, the features, implementation and research of fintech technologies in the finance domain were given more attention. The regression line and R square, equal to 0.8125, show a statistically significant and continuous increase in published articles. As a result, the area remains attractive in terms of study.

Figure 2. Publication Trend.
Figure 3 shows the ten most active journals with the total number of publications in the field of fintech during the period under study. The table also includes other useful information, such as the number of citations and H-index of the respective journals. ‘Electronic Commerce Research and Applications’ has four publications, 168 citations, and an H-index of 2. ‘Technological Forecasting and Social Change’ comes in second, based on citations with four publications, 97 citations, and the 3 H-index. The figure below shows the number of publications in each journal, total citations, and H-index.

Figure 3. Journal Impact (‘Authors’ compilation).

The current study extracts author affiliations to identify the top nations supporting fintech research. The nations that contributed the most to fintech literature are China, Ukraine, the U.K., and Australia (see Table 2). Table 3 also lists the top universities engaged in the field of risks in fintech. The top-performing contributing institutions are Banking Universities, Peking University, St. Petersburg State University, and Vilnius University.

Table 2. Contributing Countries (‘Authors’ compilation).

<table>
<thead>
<tr>
<th>Country</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>40</td>
</tr>
<tr>
<td>Ukraine</td>
<td>18</td>
</tr>
<tr>
<td>UK</td>
<td>13</td>
</tr>
<tr>
<td>Australia</td>
<td>12</td>
</tr>
<tr>
<td>USA</td>
<td>9</td>
</tr>
<tr>
<td>Italy</td>
<td>6</td>
</tr>
<tr>
<td>Poland</td>
<td>5</td>
</tr>
<tr>
<td>Canada</td>
<td>4</td>
</tr>
<tr>
<td>Indonesia</td>
<td>4</td>
</tr>
<tr>
<td>Lithuania</td>
<td>4</td>
</tr>
</tbody>
</table>

Table 3. Top universities engaged in the field of risks in fintech (‘Authors’ compilation).

<table>
<thead>
<tr>
<th>Affiliation</th>
<th>Articles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Banking Universities</td>
<td>4</td>
</tr>
<tr>
<td>Peking University</td>
<td>4</td>
</tr>
<tr>
<td>St. Petersburg State University</td>
<td>3</td>
</tr>
<tr>
<td>Vilnius University</td>
<td>3</td>
</tr>
</tbody>
</table>
5. Content Analysis

VOSviewer analyzed the co-occurrence of terms between selected articles. The terms were taken from both the title and abstract fields. A total of 2509 terms were found. When the co-occurrence threshold limit was set at 5, 110 terms met this threshold. As per the default settings in the software, 66 terms (60%) came into the visualization. Some of the terms were found to be irrelevant to the present study. These were excluded from term analysis, and finally, the co-occurrence of 56 terms was studied. Based on the network, three clusters were identified. The reasoning behind clustering is that terms in a similar cluster reflect the same study themes. The term ‘framework’ occurred in 14 articles, followed by ‘process’, which occurred in 13 articles and ‘country’ in 12 articles. Table 4 depicts the occurrences, relevant scores, and link strength of all 56 terms analyzed in the content analysis. Link strength is the number of articles in which two key terms appear together, and the relevant score describes the relevance of each term in terms of average citations (van Eck and Waltman 2012).

Table 4. Co-occurrence of Terms (‘Authors’ compilation).

<table>
<thead>
<tr>
<th>Id</th>
<th>Term</th>
<th>Occurrences</th>
<th>Relevance Score</th>
<th>Link Strength</th>
<th>Cluster</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>access</td>
<td>7</td>
<td>15.4286</td>
<td>28</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>artificial intelligence</td>
<td>5</td>
<td>6.8</td>
<td>20</td>
<td>3</td>
</tr>
<tr>
<td>3</td>
<td>banking</td>
<td>9</td>
<td>9.4444</td>
<td>39</td>
<td>4</td>
</tr>
<tr>
<td>4</td>
<td>banking sector</td>
<td>7</td>
<td>5.5714</td>
<td>36</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td>blockchain</td>
<td>8</td>
<td>18.625</td>
<td>28</td>
<td>3</td>
</tr>
<tr>
<td>6</td>
<td>control</td>
<td>6</td>
<td>6.5</td>
<td>17</td>
<td>2</td>
</tr>
<tr>
<td>7</td>
<td>covid</td>
<td>6</td>
<td>7</td>
<td>20</td>
<td>1</td>
</tr>
<tr>
<td>8</td>
<td>cryptoassets</td>
<td>6</td>
<td>16.3333</td>
<td>19</td>
<td>1</td>
</tr>
<tr>
<td>9</td>
<td>customer</td>
<td>7</td>
<td>6.7143</td>
<td>28</td>
<td>3</td>
</tr>
<tr>
<td>10</td>
<td>digitalization</td>
<td>6</td>
<td>2.5</td>
<td>21</td>
<td>4</td>
</tr>
<tr>
<td>11</td>
<td>financial inclusion</td>
<td>11</td>
<td>9.5455</td>
<td>48</td>
<td>2</td>
</tr>
<tr>
<td>12</td>
<td>financial innovation</td>
<td>9</td>
<td>9.3333</td>
<td>41</td>
<td>1</td>
</tr>
<tr>
<td>13</td>
<td>financial institution</td>
<td>7</td>
<td>11.1429</td>
<td>34</td>
<td>1</td>
</tr>
<tr>
<td>14</td>
<td>financial literacy</td>
<td>5</td>
<td>6.4</td>
<td>21</td>
<td>2</td>
</tr>
<tr>
<td>15</td>
<td>financial market</td>
<td>8</td>
<td>7.25</td>
<td>29</td>
<td>3</td>
</tr>
<tr>
<td>16</td>
<td>financial regulation</td>
<td>7</td>
<td>13.5714</td>
<td>33</td>
<td>2</td>
</tr>
<tr>
<td>17</td>
<td>financial stability</td>
<td>7</td>
<td>4.8571</td>
<td>30</td>
<td>1</td>
</tr>
<tr>
<td>18</td>
<td>financial system</td>
<td>10</td>
<td>18.7</td>
<td>44</td>
<td>3</td>
</tr>
<tr>
<td>19</td>
<td>fintech development</td>
<td>6</td>
<td>8.8333</td>
<td>32</td>
<td>3</td>
</tr>
</tbody>
</table>
A representation of the term co-occurrence network based on the frequency with which a specific term appears in the text of several articles is shown in Figure 4. The size of the circles shows how frequently certain terms occur. A word will appear in publications more frequently as the circle gets bigger. Circles of the same color indicate that the topics of the publications are comparable (Guo et al. 2019). If two terms are more frequently used together in publications, there will be a stronger correlation between the terms. In the network, terms with higher correlation and more co-occurrence are closer to one another than those with lower co-occurrence (Mbeng et al. 2021). In the network, five clusters are created based on how similar the topics are inside each cluster.

- **Cluster 1: Role and Risks of Financial Innovations during pandemic (Red)**

The pandemic experience has rapidly driven the platform-based financial revolution expanding the fintech sector. Through several different avenues, the pandemic has impacted fintech businesses. While social isolation, lockdowns, and other limitations have strongly influenced the digitalization of payments and increased usage of financial innovation, the pandemic’s economic effects have also impacted the broader society and fintech businesses (Fabris 2022). As traditional instruments have been failing in hedging, exchange-traded funds (ETFs) for hedging pandemic-induced market risks played a significant role at this time. ETFs were able to survive greater levels of uncertainty brought on by the pandemic, demonstrating the financial innovation’s hedging potential (Salisu et al. 2022). A cashless society has also been brought about by the COVID-19 pandemic (Fabris 2022). The rising use of mobile payments and different financial management apps has been influenced
by social estrangement. During the pandemic, fintech companies substantially altered their business models (Al Nawayseh 2020). The development of private cryptocurrencies has been one of the most significant advances in the financial system. Digital payments spared consumers the trouble of carrying a wallet and protected them from theft and money loss. In nations with low levels of fintech adoption and borrowers with poorer credit ratings, the impact of COVID-19 risk is greater (Nigmonov and Shams 2021). The dark side of this innovation during the pandemic is the harmed financial stability due to increased cyber risk (Fabris 2022) and default risk (Nigmonov and Shams 2021) created by it.

**Figure 4.** Co-occurrence of Terms (‘Authors’ compilation through VOSviewer).

- **Cluster 2: Risks of Financial Inclusion (Green)**

  Included in fintech are Digital innovations and business model advances enabled by technology. These advancements can remove existing boundaries between industries, promote strategic disintermediation, alter the methods by which current businesses deliver their services, open new doors for entrepreneurship, and democratize access to financial services (Kakinuma 2022). On the other side, they provide significant privacy, regulatory, and law enforcement challenges and might increase the likelihood of various forms of discrimination (Ozili 2021b). The fintech sector depends on innovations, including various blockchain applications, new digital trading systems, artificial intelligence, machine learning, peer-to-peer lending, equity crowd-funding, and mobile payment systems (Ashta and Herrmann 2021; Gao et al. 2020; Macchiavello 2018; Zhang 2020). Fintech is projected to lower financial intermediation costs while simultaneously generating new regulatory concerns. By easing restrictions and promoting quicker economic growth, less poverty, and less income disparity, the development of financial services may help maintain macroeconomic stability. The quick expansion of fintech may have advantages, but it also may jeopardize the financial system’s stability. Another major challenge is financial illiteracy in most developing economies (Ozili 2021a). International organizations and state entities consider fintech while assessing potential risks and developing regulatory frameworks to maintain financial stability and comprehend how they may be impacted by fintech operations (Vučinić 2020).
**Cluster 3: Opportunities and Challenges for Fintech Development (Blue)**

Due to rising smartphone adoption and artificial intelligence-based infrastructure, the fintech business is expanding at an exponential rate globally. The top 10 fintech nations, according to the Global Fintech Index City Rankings 2020, are the United States, the United Kingdom, Singapore, Lithuania, and Switzerland (Demirgüç-Kunt et al. 2020). Online lending companies that quickly and digitally process loans for individuals and businesses are rising (Gasiorkiewicz et al. 2020). Because of the disruption of the traditional lending process caused by these platforms, underserved and unbanked populations now have easier access to loans (Ferrari 2022). Fintech offers businesses, especially startups, cost-effective solutions that help them cut costs and streamline business operations. The financial sector is a very elusive yet significant part of society, and as a result, it is heavily regulated by regulators (Kijkasiwat 2021). Fintech adoption can contribute to increased economic growth, particularly in emerging nations. With stakeholders pushing the boundaries of product innovation and providing additional value-added services, the insurtech ecosystem is likewise rapidly changing (Lanfranchi and Grassi 2022). Fintech players are using blockchain to improve security and access newer technologies. Additionally, the government is accelerating the switch from paper to electronic payments through tax rebates and a decrease in transaction costs (Saba et al. 2019). However, regulatory compliance (Hua and Huang 2021), data security (Hollanders 2020), and creating a liaison with the legal system of banks (Pu et al. 2021) are major challenges for the development of the fintech industry.

**Cluster 4: Risks of Fintech in Banking (Yellow)**

The financial industry has seen technological advancements thanks to distributed ledger technologies, enabling firms worldwide to access enough funding. The development of the banking industry depends heavily on investments made in technological breakthroughs. Even in the banking industry, technical advancements have led to new study avenues (Zveryakov et al. 2019). Financial technology firms undoubtedly play a significant role in the growth of banks. Both the banks and their clients have profited from this technology. However, they have produced several new hazards, and developing cooperation between banks and financial technology firms is the main issue (Pu et al. 2021). To guarantee financial stability, fintech enterprises must be supervised and governed (Li 2022; Nabilou 2020).

**Cluster 5: Occurrence of Systematic and Operational Risks in Fintech (Purple)**

Technology improvements have undoubtedly benefited the financial sector globally, but they also pose several systematic (Bavoso 2020) as well as operational risks (Mascarenhas et al. 2021). As a result, many people are concerned about issues including privacy concerns, system dependability, cyber security, and any potential for cyberattacks (Duran and Griffin 2021). Technology and systemic risks may also create new stability issues for the financial system (Chaudhry et al. 2022). Additional significant dangers in the digital financial sector include data exploitation and regulatory uncertainty (Hua and Huang 2021).

**6. Conclusions**

Financial technology development has decreased physical crime while simultaneously increasing cybercrime. In addition to cyber-security risk, this literature review identifies the presence of other types of risks, such as default risk, operational risk, financial stability risk, financial illiteracy risk, money laundering, financial crimes, and regulatory risk in the fintech industry. Government funding for developing fintech setups, especially for small businesses, is enormous. These businesses must utilize most of this funding to increase their compliance with regulatory requirements. There is a critical need to strengthen cutting-edge risk management strategies and raise the operational stability of financial institutions. Additional safeguards must be developed to safeguard and reimburse financial institutions for losses brought on by such risks.
In the case of fintech risks, the link between scientific research and industrial practice is that both can provide valuable insights into potential risks and how to mitigate them. Scientific research can identify potential technological risks and investigate the most recent security technologies and advances, whereas industrial practice can provide insights into the human side of risk management, such as social engineering, insider threats, and compliance. Businesses can develop effective fintech risk management strategies by combining insights from both areas.

Policymakers must pay more attention to issues such as data protection and privacy in the fintech era. Although privacy concerns have always existed, fintech’s increasing digitalization and interconnection have provided criminals with more access points and favorable circumstances to use personal data for illicit purposes. In the absence of effective regulations, the intermediary nature of some fintech applications, as well as the complexity of some fintech products, may encourage further illegal activity, price manipulation, and asymmetric information. As a result, proper regulatory measures must be implemented, as well as an environment where regulators and fintech firms can exchange specializations and engage in constructive discussions. This will eventually encourage regulators to propose effective and specific legislation to strengthen the fintech ecosystem for all parties, thereby helping to maintain financial system stability. It is also necessary to develop regulatory strategies that are specific to each country’s fintech characteristics, applications, and possibilities. The use of Regtech and SupTech may make it easier to implement these ideas quickly and effectively. One of the most serious risks today is asymmetrical technology between financial markets and relevant regulators. As a result, having a digital financial supervision system with a functional SupTech is one of the best risk management techniques in this regard. To create a comprehensive legislative framework, these current issues necessitate the creation of a Fintech Act. Regulators must seek strategies that balance expansion in the fintech industry while mitigating risks.

This study attempted to provide a comprehensive overview of the existing literature. As a result, more specialized topics such as fintech challenges in sustainable development and market-level variations in regulation are not adequately covered. Future research may expand on the findings of this paper by addressing its flaws and delving deeper into the themes discovered through content analysis. Data for this study were gathered solely from the ‘SCOPUS’ bibliometric database by applying filters such as publication type, year of publication, and research fields. Other organized worldwide databases, such as the Web of Science, may also be incorporated by future researchers. Only articles published in journals were considered for this study. Book publications, conference proceedings, and other sources of information can be examined further. Because of the limitations of the current evaluation, future research should include a complete content analysis.


Funding: This research received no external funding.

Data Availability Statement: Data are available from the authors upon reasonable request.

Conflicts of Interest: The authors declare no conflict of interest.

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