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INVESTIGATION OF FINANCIAL TECHNOLOGY IN THE CONTEXT OF RISK AND COMPLIANCE: A QUALITATIVE RESEARCH ON PARTICIPATION BANKS

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ABSTRACT

The rapid development of today's digital technology has created financial technology by integrating traditional finance and modern technology. Financial technology (FinTech) has many new business models and technologies, including the Internet of Things, cyber security, artificial intelligence, cloud computing, crypto assets and blockchain. Financial technology emphasises companies and company representatives that bring together finance with innovative services produced with the help of modern technology. In this regard, financial technologies are critical in bringing today's commercial banks to an advantageous position. Participation banks, called interest-free banking, have different dynamics than traditional banks and operate with many products unavailable in traditional banks. These products bring with them many risks. Accordingly, risk and risk factors can threaten the survival and success of these banks. However, it is noteworthy that there is a lack of literature on the functionality of financial technology for participation banks within the scope of risk and compliance. In this context, this qualitative study, in which the literature review approach was used, aimed to reveal the importance of financial technologies regarding the risk and compliance process in participation banks and to raise awareness of these technologies. In this regard, it has been concluded that although FinTech applications have some limitations, it is crucial for participation banks to use these applications in order to carry out their activities effectively and efficiently in risk and compliance processes.

Keywords: FINANCIAL TECHNOLOGY, FINTECH, RISK, COMPLIANCE, BANK, PARTICIPATION BANK

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FİNANSAL TEKNOLOJİNİN RİSK VE UYUM BAĞLAMINDA İNCELENMESİ: KATILIM BANKALARI ÜZERİNE NİTEL BİR ARAŞTIRMA

ÖZET

Günümüz dijital teknolojisinin hızla gelişimi, geleneksel finans ile modern teknolojiyi bütünleştirerek finansal teknolojiyi ortaya çıkarmıştır. Finansal teknoloji (FinTech), nesnelerin interneti, siber güvenlik, yapay zeka, bulut bilişim, kripto varlıklar ve blok zincir de dahil olmak üzere yeni iş modelleri ve faydalanılan teknolojiler çerçevesinde oldukça geniş bir yelpazeye sahiptir. Finansal teknolojide, modern teknoloji yardımıyla üretilen yenilikçi hizmetleri, finansla buluşturan şirketlere ve şirket temsilcilerine vurgu yapılmaktadır. Bu doğrultuda finansal teknolojiler, günümüz ticari bankalarının avantajlı konuma gelmesinde oldukça kritik bir role sahiptir. Faizsiz bankacılık olarak belirtilen ve geleneksel bankalardan farklı dinamiklere sahip olan katılım bankaları, geleneksel bankalarda bulunmayan birçok ürünle faaliyet göstermektedir. Bu ürünler birçok riski de beraberinde getirmektedir. Buna göre risk ve risk faktörleri bu bankaların hayatta kalmalarını ve başarılarını tehdit edebilmektedir. Bununla birlikte risk ve uyum kapsamında katılım bankalarına ilişkin finansal teknolojinin işlevselliğine yönelik literatür eksikliği dikkat çekmektedir. Bu bağlamda literatür taraması yaklaşımının kullanıldığı bu nitel çalışmada, katılım bankalarında risk ve uyum sürecine ilişkin finansal teknolojilerin öneminin ortaya çıkarılması ve bu teknolojilere yönelik farkındalığın artırılması amaçlanmıştır. Bu doğrultuda, risk ve uyum süreçlerinde katılım bankalarının faaliyetlerini etkin ve verimli bir şekilde gerçekleştirebilmeleri için FinTech uygulamalarının bazı kısıtlara sahip olmasına rağmen bu uygulamaları kullanmalarının oldukça önemli olduğu sonucuna varılmıştır.

Anahtar Kelimeler: FİNANSAL TEKNOLOJİ, FİNTEK, RİSK, UYUM, BANKA, KATILIM BANKASI

1. INTRODUCTION

FinTech (Financial Technology), as the name suggests, is a combination of the words finance and technology (Goldstein, Jiang, & Karolyi, 2019). Dorfleitner et al. (2017) emphasize the companies and company representatives that provide innovative services with the help of modern technology and meet with finance within the scope of FinTech. In this context, Merello, Barberá and Poza (2022) state, FinTech refers to firms that use technology-based systems to offer innovative and cheaper financial services or to make traditional financial services more efficient, highlighting financial technology ventures and entrepreneurs. In addition, Vasiljeva and Lukanova (2016) define the concept of FinTech as "not only a term related to traditional financial institutions that want to modernize their methods and solutions or their processes but also emerging technologies that want to disrupt traditional industries."

In recent years, on a global scale, companies that apply new technological innovations such as FinTech and create new business practices, models, products, or services have emerged (Nalluri & Chen, 2024). The establishment of FinTech firms also improves the general financial infrastructure (Liu, Li, & Wang, 2020). Therefore, it is unsurprising that the number of FinTech firms has increased significantly (Singh, Sahni, & Kovid, 2020) and attracted billions of dollars of new investment to the country's economy (Abbasi et al., 2021). FinTech refers to a state-of-the-art and revolutionary system that facilitates the efficient and uninterrupted flow of economic transactions (Akartuna, Johnson, & Thornton, 2022). FinTech innovations affect many different areas of financial services; This concept is defined as technologically effective innovation that can result in new business models, applications, processes or products in financial services that have a material impact on financial services provision, financial markets and institutions (Financial Stability Board, 2023). In the context of these rapid developments in technology, one of the areas where technology has radically changed lives and businesses in the banking sector (Sardana & Singhania, 2018).

The banking sector is heavily regulated due to its role as the basic infrastructure of market economies (Bofondi & Gobbi, 2017). Therefore, it is understood that banks considered an indispensable element of financial markets, are intertwined with this technology (Goldstein et al., 2019). According to Hassan (2009), participation banks referred to as interest-free banks, have different dynamics from conventional banks and operate with many products not found in conventional banks. These products also bring many risks (pp. 23-24). Therefore, in a variable market environment, participation banks face numerous risks such as credit, liquidity, currency,

market, and interest rate risks (State Bank of Pakistan, 2007). In this context, risk and risk factors can threaten the survival and success of these banks (Hassan, 2009). However, when the relevant literature is examined, the lack of literature on compliance with risk factors, understood to be very important in the context of participation banks, is striking. In this scope, Deloitte (Deloitte Touche Tohmatsu Limited) organization is one of the largest international firms that provides accounting, auditing, tax and management consulting services in more than 150 countries, 700 offices and approximately 312000 employees (Wikipedia, 2023), and it can be argued that addressing the "Risk and Compliance Program Framework" proposed by Deloitte (2019) in the context of participation banks will contribute to filling an essential gap in the relevant literature. This model illustrates the framework of a risk and compliance program derived from the expectations of the regulations and consists of the risk response capabilities of the nature of the operating organization (Deloitte, 2019). In this qualitative research, where the literature review approach is used, many national and international publications have been examined. In this context, this research conducted within the framework of participation banks aims to examine financial technology in terms of risk and compliance. Accordingly, in the research, it can be stated that basic information will be provided on the roles of financial technologies in the compliance process of risk factors within the scope of participation banks. In the research, it can be said that information on FinTech in the risk and compliance process will be presented to the stakeholders of participation banks (bank managers, policymakers, customers, suppliers, etc.). Therefore, it can be argued that these stakeholders can benefit from this basic information while implementing their strategies.

2. FINANCIAL TECHNOLOGY

The term "FinTech", a short form of financial technology, refers to companies or representatives combining financial services with modern and innovative technologies (Dorfleitner et al., 2017). FinTech, as the name suggests, is a fusion of finance and technology concepts (Goldstein et al., 2019). According to Dorfleitner et al. (2017), newcomers to the market typically offer internet-based and application-oriented products. FinTechs usually aim to attract customers with products and services that are more user-friendly, efficient, transparent and automated than currently available. In this context, FinTechs also offer products and services in the banking sector, distribute insurance and other financial instruments, and provide third-party services. Moreover, FinTech companies are subject to different legal and regulatory obligations due to their different business models and highly diverse products and services (pp. 5-6). FinTech started with money transfers, mobile payments, crowdfunding and peer-to-peer

loans (P2P) and has spread to cryptocurrencies, newer blockchain and robo-investment advisory (Goldstein et al., 2019).

FinTech applications can also be considered in the context of the supply chain. According to He, Zhang and Wang (2024), supply chain management, which is the cornerstone of contemporary business practices, plays a significant role in determining a firm's ability to adapt to the challenges posed by globalization. These challenges include the complexity of international transactions, exchange rate fluctuations, geopolitical risks and macroeconomic changes. In addition, adopting FinTech in supply chain management also entails broader implications, such as the need for skilled personnel, data interoperability issues and potential shifts in power dynamics among different stakeholders. The rise and acceptance of FinTech have become the critical technological catalysts driving supply chain concentration. Firms can use FinTech tools such as blockchain, big data, artificial intelligence, smart contracts and instant payments to increase transaction efficiency, enhance supply chain visibility, strengthen cross-sector collaboration and potentially streamline the supply chain, reduce the number of suppliers and develop closer relationships with primary suppliers, thereby increasing overall operational efficiency. However, the challenge lies in effectively assimilating these technologies (pp. 1-2).

The business models of financial technology ventures that implement their products and services can be classified under six main headings: payments, wealth management, lending, crowdfunding, capital markets and insurance transactions (Lee & Shin, 2018). FinTech covers a wide range of activities and operations, from developing new technologies to commercialising financial services (Bofondi & Gobbi, 2017).

According to Bofondi and Gobbi (2017), new FinTech companies threaten established firms' market shares and profit margins in almost all business areas. The financial sector, especially the banking sector, is subject to intense regulation due to its role as the fundamental infrastructure of market economies. Disruptions in the supply of financial services can have considerable consequences in terms of welfare losses (p. 108). Financial innovation triggers widespread instability; therefore, it is thought that the balance between the costs and benefits of competition in the sector is important (Thakor, 2012). In this direction, according to Bofondi and Gobbi (2017), understanding the transformations triggered by FinTech in the financial environment at an early stage is meaningful in developing the regulatory framework efficiently. In addition, since most of the existing regulations are institution-oriented rather than activity-

oriented, it is also important to evaluate how new FinTech startups adapt to the framework and how established institutions react (p. 108).

Banks, non-bank financial institutions, exchanges and crypto platforms increasingly rely on different digital technologies and innovative business models (Cappa et al., 2022; Carlini et al., 2022; Lorenzo & Arroyo, 2022). In the information and communication technology era, various firms and industries use FinTech in financial matters, leading to an advanced and automated distribution system and financial service applications (Hornuf et al., 2021). The global financial crisis of 2008 motivates the users of FinTech services to overcome the challenges of traditional financial services (Barbu et al., 2021; Li et al., 2020). This includes investments such as stocks and cryptocurrencies that use blockchain technology, which empowers all sectors and decentralized financial platforms, such as education, banking, and lending (including peer-to-peer (P2P) lending and shadow lending) (Chen & Bellavitis, 2020; Kimani et al., 2020). This new situation challenges existing businesses with technological advancements, as financial technology helps reduce cost savings and save time and labour in practice (Pandey et al., 2024). FinTech also creates new business opportunities, including the development of mobile applications with the necessary security features to exploit these opportunities (Kowalski, Lee, & Chan, 2021; Senyo & Osabutey, 2020; Stewart & Jürjens, 2018). As retail payment becomes a key area of FinTech applications due to the increase in online payments for most transactions (Jun & Yeo, 2016), banking sectors use it for collection and payment through UPI (Unified Payments Interface) (Pandey et al., 2024). Financial innovation and risk management (Drasch, Schweizer, & Urbach, 2018; Jünger & Mietzner, 2020; Wang, Xiuping, & Zhang, 2021) increase the profit of the banking sector through non-bank financial intermediaries that match potential debtors and lenders via online platforms (Maier, 2016). Different mobile applications are used in stock market and cryptocurrency operations (Pandey et al., 2024). In this context, it is considered to be quite essential to reveal various dimensions of FinTech (Abbasi et al., 2021; Bhatia, Chandani, & Chhateja, 2020; Carlini et al., 2022; Sheng, 2021; Wang et al., 2021).

In recent years, FinTech has undergone a significant transformation for the underserved (Nalluri & Chen, 2024). The technological advancements in this field have led to the development of new business models and the delivery of quality and timely FinTech services (Ozuem, Howell, & Lancaster, 2018). FinTech can create advanced technology and applications in structured electronic payments and mobile phone-enabled solutions (Gozman, Liebenau, & Mangan, 2018). In other words, according to Nalluri and Chen (2024), FinTech is

a term used to describe new technology that aims to automate and improve the delivery of services. FinTech is a term used to describe the use of specialized algorithms and software on smartphones and computers to help firms, business owners, and customers better manage their financial processes, operations, and lives (p. 3). This range of services is provided by tools such as biometric devices, electronic cards, phablets, chips and other electronic devices (Arora, 2020). In this context, FinTech applications can offer more opportunities for customers to receive better financial services (Nalluri & Chen, 2024). In addition, according to Goldstein et al. (2019), technology has always influenced the financial sector, and developments have changed the way the financial sector operates. In this regard, testing and introducing new technologies to the financial sector is faster than ever (pp. 1647-1648).

3. PARTICIPATION BANKS

Islamic finance is a system that provides financial functions for individuals and institutions that conventional finance system performs while also taking into account the compliance of these functions with Islamic rules (Güçlü & Kılıç, 2020). These rules include the main principles that Islamic finance is based on: prohibition of interest, risk sharing, avoidance of excessive uncertainty, avoidance of excessive risk-taking and gambling-like behaviours, abstention from forbidden activities and transactions, asset-backedness, contract-based transactions and rules related to property rights (Iqbal & Mirakhor, 2011; Omar, Abduh, & Sukmana, 2013). In the Islamic finance system, transactions not based on real economic activity and not bearing the risks associated with these activities are prohibited, and fixed income is not allowed (Syed Ali, 2008).

According to Güçlü (2018), the financial system performs its functions for the economy through financial institutions and instruments. The leading institutions and instruments are banks, stock exchanges, investment funds, the insurance sector, debt, and derivative instruments. The Islamic finance system also offers its users the financial institutions and instruments the conventional finance system uses in different forms. The difference is that the institutions in the Islamic finance system act in accordance with Islamic rules in their transactions and activities. In this context, one of the main application areas of Islamic finance is participation banking (pp. 68-69).

Participation banks are institutions that have been established to meet the financial needs of Muslims and have different operations and rules from conventional banking (Şekkeli & Güçlü, 2023). According to Yanpar (2015), participation banks perform the function of

collecting the savings of households and investors and channelling these savings into investments. In this context, it cannot be said that the primary function of participation banks is very different from that of traditional banks. The difference between them is the methods applied in performing this function. Participation banks act under Islamic rules in their financial transactions (p. 125).

According to Kalaycı (2013), one of the main reasons for the emergence of participation banks is to integrate the savings of investors who do not want to invest their savings in interest-bearing banks into the economy. In addition, factors such as the increased income of especially Gulf countries with oil flowing to Western banks and the preference of conventional banks for short-term loans rather than long-term investment projects have also played a role in the establishment of participation banks (p. 61).

According to Kettell (2011), the basic logic of the participation banking system is to conduct activities based on the principle of profit-loss sharing. These banks cannot charge interest from their customers for the funds they provide. However, they participate in the profit generated by the project that uses the funds. Likewise, individuals who deposit their savings in a participation bank receive a share of the bank's profit at a predetermined rate. In this case, while a partnership relationship is established between the participation bank and the saver on one side, another partnership relationship is established between the participation bank and the investor who needs funds on the other side. In such a relationship, the participation bank acts like a fund manager that ensures the efficient use of the savers' resources (p. 32).

4. INVESTIGATION OF FINANCIAL TECHNOLOGY IN THE CONTEXT OF RISK AND COMPLIANCE IN PARTICIPATION BANKS

A new paradigm or in other words, financial technology, has emerged gradually in the financial sector following the global financial crisis (2008 Crisis) (Dai & Chen, 2022). FinTech refers to technology-enabled innovation in financial services that could result in new business models, applications, processes or products with a material effect on the provision of financial services (Financial Stability Board, 2017). According to Geng, Guo and Cheng (2023), FinTech applications have been prominent in the global financial markets in recent years. The scope of activity in FinTech started with mobile payments, money transfers, peer-to-peer lending and crowdfunding and has now expanded to the newer world of artificial intelligence, big data, cloud computing and blockchain. Start-up firms with new technology are competing to fill the gaps left by traditional firms in customer experience across all these dimensions. FinTech

ventures are spreading rapidly and in large numbers due to the intense interest in FinTech (p. 1811). This rise of FinTech is welcomed, and it is argued that emerging technologies have the potential to radically transform financial services by making transactions cheaper, more convenient and more secure (Begenau, Farboodi, & Veldkamp, 2018; Chen, Wu, & Yang, 2019; Chiu & Koeppl, 2019; Fuster et al., 2019; Zhu, 2019).

According to Sardana and Singhania (2018), one of the areas where technology has radically transformed lives and businesses in the context of rapid technological developments in the banking sector. The entry of digital technology into the banking field has led to a paradigm shift in banking and created a phenomenon called Digital Banking. In a broad sense, digital banking means using technology to carry out banking transactions smoothly. Therefore, Digital Banking includes online banking, electronic banking and mobile banking, which are widely used. Unlike traditional banking, digital banks aim to develop adaptable digital products and services that meet the needs of their customers. While traditional online banks use pre-designed software to increase their access and assets and respond to customer needs, digital banks use information technology experts to understand and comprehend their customers and design their products accordingly. In this context, the integration of technology is becoming indispensable for every sector and businesses that do not adapt to it face serious consequences. In this direction, especially since the banking sector and participation banks are highly dependent on customers, it is thought that it is crucial for participation banks to adapt to technological innovations (p. 28).

According to Zhang et al. (2023), it is crucial for banks, which are considered an essential part of the financial sector, to follow the challenges and opportunities that FinTech brings. In this context, it can be argued that FinTech should be developed by participation banks in order to advance their commercial innovation and improve their risk prevention and control ability. On the other hand, the existing technical and operational risks in the development of FinTech by participation banks will also affect the financing decisions and, inevitably, the bank's financial risk. However, FinTech can also support the financial stability of participation banks through artificial intelligence, cloud technology, and other channels (p. 1). In this regard, it can be suggested that it is crucial for participation banks to adopt FinTech and create and develop a suitable FinTech ecosystem (Daud et al., 2022). Accordingly, it is understood that commercial banks, which are the main body of traditional financial institutions and, therefore,

participation banks, can play critical roles in implementing FinTech actively for strategic transformation (Zhang et al., 2023).

According to Geng et al. (2023), bank FinTech has two aspects of impact on stability: bright (positive) and dark (negative). It is argued that bank FinTech enhances stability by improving risk control and increasing net interest margin (i.e., good effects) but also reduces stability by increasing non-interest activities. However, it is noted that the adverse effects of bank FinTech on stability are weaker for public banks. Moreover, it is stated that the negative effects of bank FinTech weaken over time (as time progresses). In addition, it is claimed that artificial intelligence and big data technologies in bank FinTech increase bank stability, but internet technology reduces bank stability (p. 1811). In this context, it is considered very important to adapt to FinTech applications in participation banks to maximize their benefits and make decisions by considering the risks in this compliance process.

According to Islamic rules, creditors and debtors have certain rights and responsibilities, so Islamic banks can manage risk up to a specific limit where they have to bear the risk/loss (Ayub, 2007). It is argued that Islamic financial institutions (such as participation banks) face some risks arising from profit-sharing investment deposits, which are different from the risks faced by conventional financial institutions (Khan & Ahmed, 2001). Ayub (2007) states that although participation banks can take real collateral to provide financing, they cannot rely too much on it due to various risks associated with the transactions. Therefore, they must make a more careful assessment of these risks. In this context, asset, market and Shariah non-compliance risks, higher return rate risks, more significant fiduciary risks, greater legal risks and greater withdrawal risks are the additional risks that participation banks face as long as the goods are in the bank's ownership, all ownership-related risks belong to the bank. Hence, asset risk is present in all modes, especially in Murabahah, Salam and Ijarah. Some economic developments or the government's trade policy can affect the demand and prices of goods, leading to asset, price and return rate risks. Receivables created under Murabahah cannot be increased even if the general market interest rate (benchmark) rises. In case of non-compliance with Sharia rules, the relevant income will not only go to the Charity Account but also may lead to credibility risk for an Islamic bank. This may also lead to withdrawal risk and a "contagion effect" for the Islamic finance sector. The banks' participation in physical assets may also lead to more significant legal risks than conventional banks. In addition, unique expertise and solid knowledge of Sharia rules are needed to comply with Sharia rules in the context of risk reduction (pp. 84-85).

According to the "Risk and Compliance Program Framework" proposed by Deloitte (2019), a model consisting of seven headings for an organization operating in the field is expressed, which are "governance and policy", "risk assessment and regulatory change", "monitoring and testing", "data capture", "issue management", "awareness and training" and "regulatory interaction", and two essential elements, namely "people and culture" and "business risk strategy", are located at the centre of this model. This model shows the framework of a risk and compliance program that consists of the risk response capabilities inherent in the nature of the operating organization and derived from the expectations related to the regulation (p. 3). FinTechs that use such a framework as a guide can arrange a broad-based risk management program according to their needs, and it is thought that the components of this model can be addressed within the scope of participation banks (Deloitte, 2019).

4.1. People and Culture

Ensuring all employees' participation and commitment in operational activities effectively fulfils many critical roles related to work (Papathomas & Konteos, 2023). In this regard, people and culture are often critical factors associated with the performance of an organization (Govindarajan & Kopalle, 2006; Yu & Hang, 2010). In this context, it is suggested that the main issues that bank managers are most concerned about are issues related to people, culture and technology, which are the cornerstones of almost every organization (Agyei-Boapeah, Evans, & Nisar, 2022). Banks have a legacy of having very profitable business models for years, and running them in a completely different way is perceived as a risky move; this is expressed in the literature as the "main innovator dilemma", which means that banks program themselves not to change by ignoring new models (Christensen, Raynor, & McDonald, 2015). According to Agyei-Boapeah et al. (2022), it is expected that any change related to their culture and people will take time to adapt, as employees often exhibit a structure that is quite attached to their way of working. The reason for this is that growth and maximizing profitability come before meeting customer needs, especially in a risk-averse environment (partly due to regulation). This explanation does not mean that employees do not explore new models or try to rethink their working methods. They do this development process by developing new skills with expertise in the field through innovation programs, new lean methodologies and work environments (pp. 142-143).

According to Deloitte (2019), it can be stated that it is essential for the risk and compliance management program of participation banks in the FinTech context to be

compatible with the organizational culture and to be operationalized to meet regulation/sector expectations. Accordingly, it is understood that the organizational culture of the participation bank is critical within the scope of FinTech. In this context, it is thought that organizational culture can empower participation bank employees to carry out appropriate risk management for FinTech applications and achieve business goals. In this regard, it can be argued that it is appropriate for the "people and culture" element to be at the centre of participation banks in the risk compliance process (p. 3).

4.2. Business Risk Strategy

It is stated that FinTech encourages banks to rethink and redesign the business models they depend on (Frame, Wall, & White, 2018). It can be argued that information technology helps participation banks reduce transaction costs, improve service quality, optimize business structures and promote business transformation and development (Lapavitsas & Dos Santos, 2008; Martín-Oliver & Salas-Fumás, 2008; Shu & Strassmann, 2005). On the other hand, it can be claimed that information technology can bring great difficulties to participation banks (Holland, Lockett, & Blackman, 1997).

According to Deloitte (2019), the risk and compliance strategy of participation banks in the context of FinTech can be stated that it is compatible with risk management and business strategy. Risk management of participation banks in the context of FinTech; It is shaped around an axis of opinion and makes recommendations on strategy to the bank, the bank management and the bank's board of directors. In this regard, it can be argued that it is appropriate for the "Business Risk Strategy" element to be at the centre of participation banks in the risk compliance process (p. 3).

4.3. Governance and Policy

Governance and policy rules are needed to ensure intelligent processes (e.g., FinTech) for transaction smoothness, security, integrity, and confidentiality (Kartika, Fatimah, & Supangkat, 2018). According to the reflection effect, technological innovations are reflected in businesses' management structures and processes (Colfer & Baldwin, 2016; Frenken & Mendritzki, 2012; Langlois, 2002; Sanchez & Mahoney, 2013). One of the main effects in this regard is the change in the boundaries of businesses (Baldwin, 2020; Jacobides & Billinger, 2006). Re-evaluation of the boundaries of the business; It involves determining the scope of activities implemented within hierarchical ownership (internal) and determining the activities to be carried out through external relationships such as long-term contracts and market

transactions in the market (Williamson, 1991, 2005). In the banking economy, challenged by digital developments, efforts are being made to achieve a groundbreaking transformation in governance regulations (Hayen, 2016; Tanda & Schena, 2019; Vives, 2017).

Problems faced by Islamic banks include the lack of money market instruments and a legal and regulatory framework that does not support them and can be a source of systemic risk (Khan & Ahmed, 2001). According to Deloitte (2019), it is thought that clear and well-expressed roles, responsibilities, and decision rights in participation banks can support the risk culture and strategy in the FinTech context. In this context, it is predicted that the presence of boards in participation banks that have the authority to make suggestions and/or decisions is effective in the emergence of FinTech applications. The policy framework of FinTech in these banks: It can be argued that it is essential to implement it effectively by culture, strategy, regulatory requirements and sound risk management practices. Accordingly, it can be said that a risk and compliance management program defined within the scope of the participation bank can establish minimum standards and guidelines for board activities, including the development of templates for board regulations and meeting agendas/minutes. In this regard, it is envisaged that selecting board members from the participation bank who know FinTech will help ensure the integrity of this board (pp. 3-4).

4.4. Risk Assessment and Regulatory Change

Since participation banks are in a highly competitive environment, it can be said that service quality is crucial in risk assessment (for example, credit risk assessment) (Krichene, 2017). When a customer requests financing from the bank, the bank must evaluate the financing request as soon as possible to gain a competitive advantage (Bekiroglu, Takci, & Ekinci, 2011; Krichene, 2017). In addition, the same process is repeated for each financing request and creates costs for the bank (Krichene, 2017). Due to the importance of risk analysis, it is understood that most techniques and models (for example, FinTech) have been developed to help decide whether to provide financing by participation banks (Çinko, 2006).

According to Deloitte (2019), it is understood that a successful customer process in the context of participation banks' FinTech applications includes both an understanding of regulatory requirements and controlled definitions and applications. Within the scope of these practices, it is considered very important to know and control the relevant control gaps and valid regulatory obligations and to follow an established change process. Accordingly, like financial institutions, FinTechs are subject to many risks, including credit, liquidity,

operational, compliance and reputation. Therefore, it can be stated that attention should be paid to the identification and scoring of inherent risks specific to the activities undertaken (pp. 3-4).

4.5. Monitoring and Testing

Within the scope of long-term bank relationships between the participation bank and the customer, it can be said that the bank monitoring process is essential to increase the reliability of management forecasts (Kato, Skinner, & Kunimura, 2009). Accordingly, participation banks, like other traditional banks, carry out governance activities such as monitoring and scanning (Ahn & Choi, 2009). Among these activities, monitoring is considered one of the bank's most prominent and essential activities (Freixas & Rochet, 2008). According to Ahn and Choi (2009), the general purpose of bank monitoring is to reduce the bank's credit risk by preventing the borrower's opportunistic behaviour (moral hazard). In this context, moral hazard arises after a bank loan is given due to information asymmetry between banks and customers. Diamond (1984) and Fama (1985) focus on banks' ability to produce information and show why financial intermediaries, especially banks, have advantages in performing the monitoring function. It is suggested that banks carry out monitoring activities at lower costs because banks are authorized auditors (Diamond, 1984), and banks have information advantages (Fama, 1985) (Ahn & Choi, 2009). In this context, FinTech applications are considered very important for participation banks in today's technology environment.

Although participation banks create a relatively good risk management environment, it can be argued that internal controls need to be further developed through measurement, mitigation and monitoring processes (Khan & Ahmed, 2001). According to Deloitte (2019), it is thought to be very important to have a control testing and monitoring program in which the risks and problems regarding the minimum high-risk activities of FinTech applications in participation banks are feasibly reported. In this context, it can be argued that crucial performance and fundamental risk indicators for FinTech applications in participation banks should be further developed/implemented. These indicators should be monitored with defined thresholds (minimum cases) (p. 3).

4.6. Data Capture

According to Alibhai et al. (2017), it can be argued that if financial institutions (for example, participation banks) are interested in adopting data-based measurement and evaluation (for example, credit scoring) mechanisms, it is crucial for these banks to make investments to capture and store accurate data. Using the manual data capture and storage

process is not considered an optimal solution because the human touch is likely to lead to incomplete and possibly inaccurate data capture. Switching to digitized data capture is considered to be an essential step that participation banks should consider. It can also be stated that participation banks should consider that suitable data is not enough to adopt data-based lending successfully. Accordingly, it can be argued that participation banks should be quite willing to build an institutional capacity to use data to help them improve how their business is conducted (p. 5).

According to He et al. (2017), artificial intelligence and big data capture the parsing of large databases containing the characteristics and transactions of billions of economic agents through advanced algorithms to derive patterns used to predict behaviour and prices and eventually mimic human judgment in automated decisions. Related applications can automate loan approvals or recommendations, facilitate regulatory compliance and fraud detection, and automate the buying and selling of financial assets (p. 10). According to Deloitte (2019), the data informs the participation banks' management and board of directors about decision-making in the context of FinTech. It is thought that obtaining, measuring and reporting consistently is very important (p. 3). It can be stated that if this process is carried out successfully, effective, efficient and consistent decisions will be made within the scope of FinTech applications.

4.7. Issue Management

Issue management is an important yet often overlooked public relations function defined as organizing a company's (e.g., participation bank) expertise to enable it to participate effectively in shaping and resolving public issues that critically affect its operations (Arrington & Sawaya, 1984). Maintaining market share, reducing risk, creating opportunities, and helping manage the image as a corporate asset in favour of the organization and its shareholders are among the objectives of issue management (Tucker, Broom, & Caywood, 1993). Issue management is linked to crisis and risk management for the common goal of managing brand equity (Jaques, 2009; Heath & Palenchar, 2009). An organization aims to influence political, organizational or social decisions surrounding a particular event or concern through issue management, considering the impact of decisions on other stakeholders (Boutilier, 2012). According to Prahl, Duffy and Min (2023), while this process is carried out, corporate image may be affected because an organization may be recognized as having a say in an important issue or as a community builder. On the other hand, in addition to unsuccessful initiatives, there are also clear risks that may damage the corporate image (pp. 2-3).

Issue management requires good timing (Prahl et al., 2023), and FinTechs are thought to play essential roles in minimizing these risks in the context of participation banks. According to Deloitte (2019), it is considered very important to identify the issues regarding FinTech applications in the participation bank that are resolved at various levels, including business, risk management, senior management and the board of directors, and to communicate and correct them to the upper level. Within the scope of this statement, the focus on FinTech application is that it can be expressed as early identification of systemic/thematic issues and solving them in terms of sustainability (p. 3).

4.8. Awareness and Training

It can be said that information technologies play an essential role in accelerating the growth of financial services, primarily by increasing financial inclusion (Aziz & Naima, 2021). Integration of national and global financial systems within the framework of these technologies; This suggests that it may be effective in increasing the efficiency, service delivery speed and liquidity of participation banks (Chowdhury et al., 2023). In this context, it is understood that it is essential for participation banks to invest in these technologies in order to keep up with rapid technological developments and transformations that require improvement of hardware, software and information technology training of employees (Johnson, 2015; Bank for International Settlements [BIS], 2016).

It can be recommended that participation banks develop FinTech systems to increase business performance, customer satisfaction, and competitiveness (Lages, 2016). Accordingly, it is stated that investing in the latest hardware, software and workforce training is a critical element in creating a durable operational infrastructure and increasing efficiency, and it can be argued that it is important for participation banks to create policies that will encourage awareness and training programs for FinTech applications in order to reduce potential risks (Chowdhury et al., 2023). In this regard, according to Deloitte (2019), the training program for FinTech applications; It is understood to include training on risk management that is valid in participation banks (p. 4). It is envisaged that depending on these trainings, awareness about FinTech can be created throughout the bank, and the level of knowledge can be increased.

4.9. Regulatory Interaction

According to Taylor et al. (2019), rapid developments in financial technology increase potential risks, although they transform the economic and financial framework and offer wide-ranging opportunities. FinTech can strengthen financial development, inclusion and efficiency

but can pose risks to financial stability, integrity and customer protection. In this context, it can be argued that in order to maximize benefits and reduce possible risks, it is crucial for participation banks to be resistant to technological change without hindering the transformation, innovation and competition process. The potentially "disruptive" nature of FinTech can create new risks and challenges for regulators, and if this is not prevented, FinTech can negatively impact financial stability and integrity. From a risk perspective, it is anticipated that FinTech may increase traditional and/or operational risks related to the core products and institutions of participation banks, as well as data privacy and consumer protection risks. In addition, there are certain sector-specific risks in banks that need to be addressed (for example, business model risks associated with maturity transformation or the calibration of net asset values for money market funds). However, one of the purposes of regulation is to address distortions and potential stability risks caused by certain activities, regardless of the bank conducting them (p. 1). In this regard, it can be argued that it is essential for participation banks to carry out the regulatory compliance process effectively and efficiently. Moreover, as can be understood, although FinTech contains some risk elements due to its characteristics, it is thought that participation banks can carry out the compliance process in fulfilling the regulatory issues quickly and effectively, thanks to the positive features of these technologies. Here, in the context of FinTech, it can be said that it would be helpful to explain the concept of RegTech (Regulatory Technology).

RegTech is a subsection of the FinTech sector and focuses on technologies that can facilitate meeting regulatory requirements more efficiently and effectively than existing competencies (Anagnostopoulos, 2018). It can be argued that while participation banks are accelerating their efforts to adapt to rapidly changing regulations, they are also trying to control increasing costs (Grassi & Lanfranchi, 2022). In the context of these two situations, the concept of RegTech acts as a bridge between companies and regulatory requirements (Grassi & Lanfranchi, 2022), and it is defined as any application of technology-enabled innovation for regulatory, compliance and reporting requirements implemented by a regulated entity (with or without the help of the RegTech provider) (European Banking Authority [EBA], 2021, p. 5). Like FinTech, the benefits of RegTech lie in addressing regulatory requirements more efficiently and effectively than existing tools (Financial Conduct Authority [FCA], 2016). In this context, higher compliance requirements, rapid and continuous changes in regulation and high digital dynamics in financial markets; It strengthens RegTech, which is defined as

technology-enabled innovation applied to the world of regulation, compliance, risk management, reporting and auditing (Grassi & Lanfranchi, 2022). In this regard, financial markets, services and institutions are directly interested in FinTech's technology-oriented innovations and new technologies that offer significant opportunities (Zavolokina, Dolata, & Schwabe, 2016). According to Deloitte (2019), it is considered important to ensure the coordination of communication and messaging with the necessary regulatory institutions, which consistently and accurately reflects the business and risk performance and strategy implementation of FinTech within the scope of participation banks. Additionally, it can be argued that the participation bank for implementing this technology must have skills that will enable an immediate response to regulatory exams and requests (p. 4).

5. CONCLUSION AND RECOMMENDATIONS

FinTech consists of a combination of finance and technology concepts (Goldstein et al., 2019). Within the scope of FinTech, emphasis is placed on companies and company representatives that bring together innovative services produced with the help of modern technology and finance (Dorfleitner et al., 2017). FinTech innovations impact many different areas of financial services; This concept is defined in financial services as technologically enabled innovation that can result in new business models, applications, processes or products that have a material impact on financial markets and institutions and the provision of financial services (Financial Stability Board, 2023). In the context of these rapid developments in technology, one of the areas where technology has radically changed lives and businesses in the banking sector (Sardana & Singhania, 2018).

The banking sector is heavily regulated due to its role as the basic infrastructure of market economies (Bofondi & Gobbi, 2017). Therefore, it is understood that banks considered an indispensable element of financial markets, are intertwined with this technology (Goldstein et al., 2019). According to Hassan (2009), the most important feature of participation banking, defined as interest-free banking and has different dynamics than traditional banks, is related to the type of products and services they offer. Various financial instruments developed by participation banks are based on the "profit-loss sharing principle" and "profit share". Financial instruments based on the first principle include mudarabah and musharakah, while instruments based on the second include murabahah, bay'al-salam, ijarah and ijarah wa iqtina. Participation banks offer innovative products without violating Sharia principles to remain competitive in the market. In light of this information, participation banks operate with many products unavailable in traditional banks. These products bring with them many risks (pp. 23-24). For

this reason, participation banks in a volatile market environment face many risks such as credit, liquidity, foreign exchange, market, and interest rate risks (State Bank of Pakistan, 2007). In this context, risk and risk factors can threaten the survival and success of the Islamic banking sector (Hassan, 2009).

Deloitte (Deloitte Touche Tohmatsu Limited) organization is one of the world's largest international companies providing accounting, auditing, tax and management consultancy services, with approximately 312000 personnel working in more than 150 countries, 700 offices (Wikipedia, 2023); "Risk & Compliance Program Framework" is put forward by Deloitte (2019). This model is considered within the scope of participation banking; It represents the framework of a risk and compliance program that consists of the risk response capabilities inherent in the operating organization and is derived from regulatory expectations (Deloitte, 2019). In this qualitative research, in which the literature review approach was used, many national and international publications were examined, and it is thought that it is necessary for participation banks to benefit from FinTech against the risk factors that threaten their survival and success. In this regard, it can be stated that FinTech applications are critical in ensuring the compliance process of participation banks to internal and external risk factors.

As a result, in this qualitative research conducted in the context of a literature review, basic information was provided regarding the examination of the roles of financial technologies in the compliance process to risk elements within the scope of participation banks. In this context, it has been understood that although FinTech applications have some limitations, it is crucial for participation banks to use these applications in order to realize effective and efficient business processes against internal and external risk factors. In light of the explanations within the scope of the research, it is thought that it is imperative for participation banks to benefit from FinTech. Accordingly, the research presented information about FinTech in the risk and compliance process for participation banks' stakeholders (bank managers, policymakers, customers, suppliers, etc.). It is thought that these stakeholders can benefit from this basic level of information while implementing their strategies. However, the information within the scope of this study was obtained using the literature review approach. Therefore, it can be stated that the study's results can be diversified with quantitative and mixed research, and new results obtained in this direction can add depth to the study.

REFERENCES

Abbasi, K., Alam, A., Du, M. A., & Huynh, T. L. D. (2021). FinTech, SME efficiency and national culture: Evidence from OECD countries. *Technological Forecasting and Social Change*, *163*, 1-9. https://doi.org/10.1016/j.techfore.2020.120454.

Agyei-Boapeah, H., Evans, R., & Nisar, T. M. (2022). Disruptive innovation: Designing business platforms for new financial services. *Journal of Business Research*, *150*, 134-146. https://doi.org/10.1016/j.jbusres.2022.05.066.

Ahn, S., & Choi, W. (2009). The role of bank monitoring in corporate governance: Evidence from borrowers' earnings management behavior. *Journal of Banking & Finance*, *33*(2), 425-434. https://doi.org/10.1016/j.jbankfin.2008.08.013.

Akartuna, E. A., Johnson, S. D., & Thornton, A. (2022). Preventing the money laundering and terrorist financing risks of emerging technologies: An international policy Delphi study. *Technological Forecasting and Social Change*, *179*, 1-26. https://doi.org/10.1016/j.techfore.2022.121632.

Alibhai, S., Achew, M. B., Coleman, R., Khan, A., & Strobbe, F. (2017). *Algorithms for Inclusion: Data Driven Lending for Women Owned SMEs*. World Bank Group, IFC-World Bank SME Productivity Launchpad Program, pp. 1-6. Available at: https://documents1.worldbank.org/curated/en/492891498813444777/pdf/Algorithms-for-inclusion-data-driven-lending-for-women-owned-SMEs.pdf. Accessed on 17 May 2023.

Anagnostopoulos, I. (2018). Fintech and regtech: Impact on regulators and banks. *Journal of Economics and Business*, *100*, 7-25. https://doi.org/10.1016/j.jeconbus.2018.07.003.

Arora, R. U. (2020). Digital financial services to women: Access and constraints. In: *Gender Bias and Digital Financial Services in South Asia*. Emerald Publishing Limited. https://doi.org/10.1108/978-1-83867-855-520201004.

Arrington, C. B., & Sawaya, R. N. (1984). Issues management in an uncertain environment. *Long Range Planning*, *17*(6), 17-24, https://doi.org/10.1016/0024-6301(84)90214-0.

Ayub, M. (2007). *Understanding Islamic Finance*. West Sussex: John Wiley & Sons.

Aziz, A., & Naima, U. (2021). Rethinking digital financial inclusion: Evidence from Bangladesh. *Technology in Society*, *64*, 1-10. https://doi.org/10.1016/j.techsoc.2020.101509.

Baldwin, C. Y. (2020). *Design Rules*, Volume 2: Chapter 2—Transactions in a Task Network (August 12, 2020). Design Rules Volume 2: How Technology Shapes Organizations. http://doi.org/10.2139/ssrn.3690565.

Barbu, C. M., Florea, D. L., Dabija, D.-C., & Barbu, M. C. R. (2021). Customer experience in Fintech. *Journal of Theoretical and Applied Electronic Commerce Research*, *16*(5), 1415-1433. https://doi.org/10.3390/jtaer16050080.

Begenau, J., Farboodi, M., & Veldkamp, L. (2018). Big data in finance and the growth of large firms. *Journal of Monetary Economics*, *97*, 71-87. https://doi.org/10.1016/j.jmoneco.2018.05.013.

Bekiroglu, B., Takci, H., & Ekinci, U. C. (2011). Bank credit risk analysis with Bayesian network decision tool. *International Journal of Advanced Engineering Sciences and Technologies*, *9*(2), 273-279.

Bhatia, A., Chandani, A., & Chhateja, J. (2020). Robo advisory and its potential in addressing the behavioral biases of investors — a qualitative study in Indian context. *Journal of Behavioral and Experimental Finance*, *25*, 1-12. https://doi.org/10.1016/j.jbef.2020.100281.

BIS. (2016). *Guidance on Cyber Resilience for Financial Market Infrastructures*. Bank for International Settlements. Available at: https://www.bis.org/cpmi/publ/d146.pdf. Accessed on 17 April 2023.

Bofondi, M., & Gobbi, G. (2017). The big promise of Fintech. *European Economy*, (2), 107-119.

Boutilier, R. (2012). *A Stakeholder Approach to Issues Management*. New York, NY: Business Expert Press.

Cappa, F., Collevecchio, F., Oriani, R., & Peruffo, E. (2022). Banks responding to the digital surge through Open Innovation: Stock market performance effects of M&As with fintech firms. *Journal of Economics and Business*, *121*, 1-11. https://doi.org/10.1016/j.jeconbus.2022.106079.

Carlini, F., del Gaudio, B. L., Porzio, C., & Previtali, D. (2022). Banks, FinTech and stock returns. *Finance Research Letters*, *45*, 1-8. https://doi.org/10.1016/j.frl.2021.102252.

Chen, M. A., Wu, Q., & Yang, B. (2019). How valuable is FinTech innovation?. *The Review of Financial Studies*, *32*(5), 2062-2106. https://doi.org/10.1093/rfs/hhy130.

Chen, Y., & Bellavitis, C. (2020). Blockchain disruption and decentralized finance: The rise of decentralized business models. *Journal of Business Venturing Insights*, *13*, 1-11. https://doi.org/10.1016/j.jbvi.2019.e00151.

Chiu, J., & Koeppl, T. V. (2019). Blockchain-based settlement for asset trading. *The Review of Financial Studies*, *32*(5), 1716–1753. https://doi.org/10.1093/rfs/hhy122.

Chowdhury, M. A. F., Abdullah, M., Nazia, N. N. C., & Roy, D. (2023). The nonlinear and threshold efects of IT investment on the banking sector of Bangladesh. *Economic Change and Restructuring*, *56*, 4253-4283. https://doi.org/10.1007/s10644-023-09541-5.

Christensen, C., Raynor, M. E., & McDonald, R. (2015). *What is Disruptive Innovation?*. Harward Business Review. Available at: https://hbr.org/2015/12/what-is-disruptive-innovation. Accessed on 09 May 2023.

Colfer, L. J., & Baldwin, C. Y. (2016). The mirroring hypothesis: Theory, evidence, and exceptions. *Industrial and Corporate Change*, *25*(5), 709-738. https://doi.org/10.1093/icc/dtw027.

Çinko, M. (2006). Comparison of credit scoring techniques. *İstanbul Ticaret Üniversitesi Sosyal Bilimler Dergisi*, *5*(9), 143-153.

Dai, D., & Chen, Y. (2022). The geography of the fintech industry in China: An analysis of China's city-level patenting. *Growth and Change*, *53*, 1907-1932. https://doi.org/10.1111/grow.12630.

Daud, S. N. M., Ahmad, A. H., Khalid, A., & Azman-Saini, W. N. W. (2022). FinTech and financial stability: Threat or opportunity?. *Finance Research Letters*, *47*(Part B), 1-7. https://doi.org/10.1016/j.frl.2021.102667.

Deloitte. (2019). *Fintech Risk and Compliance Management: A Framework to Empower the Organization*. Deloitte Development LLC. Available at: https://www2.deloitte.com/content/dam/Deloitte/us/Documents/finance/us-fintech-risk-and-compliance-management.pdf. Accessed on 05 June 2023.

Diamond, D. W. (1984). Financial intermediation and delegated monitoring. *The Review of Economic Studies*, *51*(3), 393-414. https://doi.org/10.2307/2297430.

Dorfleitner, G., Hornuf, L., Schmitt, M., & Weber, M. (2017). *FinTech in Germany*. Cham, Switzerland: Springer International Publishing.

Drasch, B. J., Schweizer, A., & Urbach, N. (2018). Integrating the 'Troublemakers': A taxonomy for cooperation between banks and fintechs. *Journal of Economics and Business*, *100*, 26-42. https://doi.org/10.1016/j.jeconbus.2018.04.002.

EBA. (2021). *EBA Analysis of Regtech in the EU Financial Sector*. European Banking Authority. Available at: https://www.eba.europa.eu/sites/default/files/document_library/Publications/Reports/2021/1015484/EBA%20analysis%20of%20RegTech%20in%20the%20EU%20financial%20sector.pdf. Accessed on 09 April 2023.

Fama, E. F. (1985). What's different about banks?. *Journal of Monetary Economics*, *15*(1), 29-39. https://doi.org/10.1016/0304-3932(85)90051-0.

FCA. (2016). *Call for Input on Supporting the Development and Adopters of RegTech*. Financial Conduct Authority. Available at: https://www.fca.org.uk/publication/feedback/fs-16-04.pdf. 19 April 2023.

Financial Stability Board. (2017). *Financial Stability Implications from Fintech: Supervisory and Regulatory Issues that Merit Authorities' Attentions*. Available at: http://www.fsb.org/wpcontent/uploads/R270617.pdf. Accessed on 15 September 2023.

Financial Stability Board. (2023). *FinTech. Financial Stability Board*. Available at: https://www.fsb.org/work-of-the-fsb/financial-innovation-and-structural-change/ fintech/. Accessed on 14 October 2023.

Frame, W. S., Wall, L. D., & White, L. J. (2018). *Technological Change and Financial Innovation in Banking: Some Implications for Fintech* (October, 2018). FRB Atlanta Working Paper No. 2018-11. http://doi.org/10.29338/wp2018-11.

Freixas, X., & Rochet, J.-C. (2008). *Microeconomics of Banking*. Cambridge, MA: MIT Press.

Frenken, K., & Mendritzki, S. (2012). Optimal modularity: A demonstration of the evolutionary advantage of modular architectures. *Journal of Evolutionary Economics*, *22*, 935-956. https://doi.org/10.1007/s00191-011-0240-6.

Fuster, A., Plosser, M., Schnabl, P., & Vickery, J. (2019). The role of technology in mortgage lending. *The Review of Financial Studies*, *32*(5), 1854-1899. https://doi.org/10.1093/rfs/hhz018.

Geng, H., Guo, P., & Cheng, M. (2023). The dark side of bank FinTech: Evidence from a transition economy. *Economic Analysis and Policy*, *80*, 1811-1830. https://doi.org/10.1016/j.eap.2023.11.020.

Goldstein, I., Jiang, W., & Karolyi, G. A. (2019). To FinTech and beyond. *The Review of Financial Studies*, *32*(5), 1647-1661. https://doi.org/10.1093/rfs/hhz025.

Govindarajan, V., & Kopalle, P. K. (2006). The usefulness of measuring disruptiveness of innovations ex post in making ex ante predictions. *Journal of Product Innovation Management*, *23*(1), 12-18. https://doi.org/10.1111/j.1540-5885.2005.00176.x.

Gozman, D., Liebenau, J., & Mangan, J. (2018). The innovation mechanisms of fintech startups: Insights from SWIFT's innotribe competition. *Journal of Management Information Systems*, *35*(1), 145-179. https://doi.org/10.1080/07421222.2018.1440768.

Grassi, L., & Lanfranchi, D. (2022). RegTech in public and private sectors: The nexus between data, technology and regulation. *Journal of Industrial and Business Economics*, *49*, 441-479. https://doi.org/10.1007/s40812-022-00226-0.

Güçlü, F. (2018). *İslami Hisse Senedi Piyasaları ile Geleneksel Hisse Senedi Piyasaları Üzerine Karşılaştırmalı Bir Analiz: A.B.D., İngiltere, Malezya ve Türkiye Örneği*. Doktora Tezi, Karabük Üniversitesi, Sosyal Bilimler Enstitüsü, Karabük.

Güçlü, F., & Kılıç, M. (2020). İslami finansın dünyadaki gelişimi ve İslami finansa yön veren uluslararası kuruluşlar üzerine bir inceleme. *Uluslararası Yönetim İktisat ve İşletme Dergisi*, *16*(1), 75-91. https://doi.org/10.17130/ijmeb.700891.

Hassan, A. (2009). Risk management practices of Islamic banks of Brunei Darussalam. *Journal of Risk Finance*, *10*(1), 23-37. https://doi.org/10.1108/15265940910924472.

Hayen, R. (2016). *Fintech: The Impact and Influence of Financial Technology on Banking and the Finance Industry*. Seattle: Createspace Independent Publishing Platform.

He, D., Leckow, R., Haksar, V., Mancini-Griffoli, T., Jenkinson, N., Kashima, M., Khiaonarong, T., Rochon, C., & Tourpe, H. (2017). *Fintech and Financial Services: Initial Considerations*. International Monetary Fund (IMF), Monetary and Capital Markets, Legal, and Strategy and Policy Review Departments, IMF Staff Discussion Note, pp. 1-49.

Available at: https://www.elibrary.imf.org/view/journals/006/2017/005/article-A001-en.xml. Accessed on 19 May 2023.

He, W., Zhang, Y., & Wang, M. (2024). Fintech, supply chain concentration and enterprise digitization: Evidence from chinese manufacturing listed companies. *Finance Research Letters*, *59*, 1-6. https://doi.org/10.1016/j.frl.2023.104702.

Heath, R. L., & Palenchar, M. J. (2009). *Strategic Issues Management: Organizations and Public Policy Challenges*. Thousand Oaks, CA: SAGE Publications.

Holland, C. P., Lockett, A. G., & Blackman, I. D. (1997). *The Impact of Globalisation and Information Technology on the Strategy and Profitability of the Banking Industry*. In Proceedings of the Thirtieth Hawaii International Conference on System Sciences, 3, 418-427. New York: IEEE.

Hornuf, L., Klus, M. F., Lohwasser, T. S., & Schwienbacher, A. (2021). How do banks interact with fintech startups? *Small Business Economics*, *57*, 1505-1526. https://doi.org/10.1007/s11187-020-00359-3.

Iqbal, Z., & Mirakhor, A. (2011). *An Introduction to Islamic Finance: Theory and Practice*. Singapore: Wiley.

Jacobides, M. G., & Billinger, S. (2006). Designing the boundaries of the firm: From "make, buy, or ally" to the dynamic benefits of vertical architecture. *Organization Science*, *17*(2), 249-261.

Jaques, T. (2009). Issue and crisis management: Quicksand in the definitional landscape. *Public Relations Review*, *35*(3), 280-286. https://doi.org/10.1016/j.pubrev.2009.03.003.

Johnson, K. N. (2015). Managing cyber risk. *Georgia Law Review*, *50*, 548-592.

Jun, J., & Yeo, E. (2016). Entry of FinTech firms and competition in the retail payments market. *Asia-Pacific Journal of Financial Studies*, *45*(2), 159-184. https://doi.org/10.1111/ajfs.12126.

Jünger, M., & Mietzner, M. (2020). Banking goes digital: The adoption of FinTech services by German households. *Finance Research Letters*, *34*, 1-8. https://doi.org/10.1016/j.frl.2019.08.008.

Kalaycı, İ. (2013). Katılım bankacılığı: Mali kesimde nasıl bir seçenek?. *Uluslararası Yönetim İktisat ve İşletme Dergisi*, *9*(19), 51-74.

Kartika, H., Fatimah, Y. A., & Supangkat, S. H. (2018). *Secure Cashless Payment Governance in Indonesia: A Systematic Literature Review*. 2018 International Conference on ICT for Smart Society (ICISS), Semarang, Indonesia, pp. 1-4. https://doi.org/10.1109/ICTSS.2018.8549980.

Kato, K., Skinner, D. J., & Kunimura, M. (2009). Management forecasts in Japan: An empirical study of forecasts that are effectively mandated. *The Accounting Review*, *84*(5), 1575-1606.

Kettell, B. (2011). *Introduction to Islamic Banking and Finance*. Wiltshire: Wiley.

Khan, T., & Ahmed, H. (2001). *Risk Management: An Analysis of Issues in the Islamic Financial Industry*. Occasional Paper No. 5, Islamic Research and Training Institute, Islamic Development Bank, Jeddah.

Kimani, D., Adams, K., Attah-Boakye, R., Ullah, S., Frecknall-Hughes, J., & Kim, J. (2020). Blockchain, business and the fourth industrial revolution: Whence, whither, wherefore and how? *Technological Forecasting & Social Change*, *161*, 1-16. https://doi.org/10.1016/j.techfore.2020.120254.

Kowalski, M., Lee, Z. W. Y., & Chan, T. K. H. (2021). Blockchain technology and trust relationships in trade finance. *Technological Forecasting & Social Change*, *166*, 1-9. https://doi.org/10.1016/j.techfore.2021.120641.

Krichene, A. (2017). Using a naive Bayesian classifier methodology for loan risk assessment: Evidence from a Tunisian commercial bank. *Journal of Economics, Finance and Administrative Science*, *22*(42), 3-24. https://doi.org/10.1108/JEFAS-02-2017-0039.

Lages, L. F. (2016). VCW—Value Creation Wheel: Innovation, technology, business, and society. *Journal of Business Research*, *69*(11), 4849-4855. https://doi.org/10.1016/j.jbusres.2016.04.042.

Langlois, R. N. (2002). Modularity in technology and organization. *Journal of Economic Behavior and Organization*, *49*(1), 19-37. https://doi.org/10.1016/S0167-2681(02)00056-2.

Lapavitsas, C., & Dos Santos, P. L. (2008). Globalization and contemporary banking: On the impact of new technology. *Contributions to Political Economy*, *27*(1), 31-56. https://doi.org/10.1093/cpe/bzn005.

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.

Li, J., Li, J., Zhu, X., Yao, Y., & Casu, B. (2020). Risk spillovers between FinTech and traditional financial institutions: Evidence from the U.S.. *International Review of Financial Analysis*, *71*, 1-13. https://doi.org/10.1016/j.irfa.2020.101544.

Liu, J., Li, X., & Wang, S. (2020). What have we learnt from 10 years of fintech research? A scientometric analysis. *Technological Forecasting and Social Change*, *155*, 1-12. https://doi.org/10.1016/j.techfore.2020.120022.

Lorenzo, L., & Arroyo, J. (2022). Analysis of the cryptocurrency market using different prototype-based clustering techniques. *Financial Innovation*, *8*(7), 1-46. https://doi.org/10.1186/s40854-021-00310-9.

Maier, E. (2016). Supply and demand on crowdlending platforms: Connecting small and medium-sized enterprise borrowers and consumer investors. *Journal of Retailing and Consumer Services*, *33*, 143-153. https://doi.org/10.1016/j.jretconser.2016.08.004.

Martín-Oliver, A., & Salas-Fumás, V. (2008). The output and profit contribution of information technology and advertising investments in banks. *Journal of Financial Intermediation*, *17*(2), 229-255. https://doi.org/10.1016/j.jfi.2007.10.001.

Merello, P., Barberá, A., & Poza, E. D. L. (2022). Is the sustainability profile of FinTech companies a key driver of their value?. *Technological Forecasting and Social Change*, *174*, 1-11. https://doi.org/10.1016/j.techfore.2021.121290.

Nalluri, V., & Chen, L.-S. (2024). Modelling the FinTech adoption barriers in the context of emerging economies—An integrated Fuzzy hybrid approach. *Technological Forecasting and Social Change*, *199*, 1-15. https://doi.org/10.1016/j.techfore.2023.123049.

Omar, M. A., Abduh, M., & Sukmana, R. (2013). *Fundamentals of Islamic Money and Capital Markets*. Singapore: Wiley.

Ozuem, W., Howell, K. E., & Lancaster, G. (2018). Developing technologically induced environments: The case of the Nigerian banking sector. *Journal of Financial Services Marketing*, *23*, 50-61. https://doi.org/10.1057/s41264-018-0043-z.

Pandey, D. K., Hassan, M. K., Kumari, V., Zaied, Y. B., & Rai, V. K. (2024). Mapping the landscape of FinTech in banking and finance: A bibliometric review. *Research in International Business and Finance*, *67*(Part A), 1-24. https://doi.org/10.1016/j.ribaf.2023.102116.

Papathomas, A., & Konteos, G. (2023). Financial institutions digital transformation: The stages of the journey and business metrics to follow. *Journal of Financial Services Marketing*, 1-17. https://doi.org/10.1057/s41264-023-00223-x.

Prahl, A., Duffy, A., & Min, C. L. H. (2023). Commentary is free: Issue management and gaining capital with thought leadership. *Public Relations Review*, *49*(1), 1-8. https://doi.org/10.1016/j.pubrev.2022.102277.

Sanchez, R., & Mahoney, J. T. (2013). Modularity and economic organisation: Concepts, theory, observations, and predictions. In A. Grandori (Ed.), *Handbook of Economic Organisation: Integrating Economic and Organisation Theory*. Edward Elgar Publishing, Cheltenham, pp. 383-399.

Sardana, V., & Singhania, S. (2018). Digital technology in the realm of banking: A review of literature. *International Journal of Research in Finance and Management*, *1*(2), 28-32.

Senyo, P. K., & Osabutey, E. L. C. (2020). Unearthing antecedents to financial inclusion through FinTech innovations. *Technovation*, *98*, 1-14. https://doi.org/10.1016/j.technovation.2020.102155.

Sheng, T. (2021). The effect of fintech on banks' credit provision to SMEs: Evidence from China. *Finance Research Letters*, *39*, 1-6. https://doi.org/10.1016/j.frl.2020.101558.

Shu, W., & Strassmann, P. A. (2005). Does information technology provide banks with profit?. *Information & Management*, *42*(5), 781-787. https://doi.org/10.1016/j.im.2003.06.007.

Singh, S., Sahni, M. M., & Kovid, R. K. (2020). What drives FinTech adoption? A multi-method evaluation using an adapted technology acceptance model. *Management Decision*, *58*(8), 1675-1697. https://doi.org/10.1108/MD-09-2019-1318.

State Bank of Pakistan. (2007). *Draft Risk Management Guidelines for Islamic Banking Institutions*. State Bank of Pakistan, pp. 1-22. Available at: www.sbp.org.pk/ibd/2007/Draft-Risk-Management-Guidelines.pdf. Accessed on 05 May 2023.

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.

Syed Ali, S. (2008). Islamic capital markets: Current state and developmental challenges. In S. Syed Ali (Ed.), *Islamic Capital Markets: Products. Regulation and Development* (pp. 1-19). Jeddah: Islamic Development Bank.

Şekkeli, F. E., & Güçlü, F. (2023). Katılım bankalarının finansal performanslarının entropi tabanlı gri ilişkisel analiz (Gia) yöntemiyle değerlendirilmesi. *Tesam Akademi Dergisi*, *10*(2), 489-511. http://dx.doi.org/10.30626/tesamakademi.1253985.

Tanda, A., & Schena, C.-M. (2019). *Fintech, BigTech and Banks: Digitalisation and its Impact on Banking Business Models*. Cham: Springer.

Taylor, C., Wilson, C., Holttinen, E., & Morozova, A. (2019). *Institutional Arrangements for Fintech Regulation and Supervision*. Washington, DC: International Monetary Fund. Available at: https://www.elibrary.imf.org/view/journals/063/2019/002/article-A001-en.xml. Accessed on 11 April 2023.

Thakor, A. V. (2012). Incentives to innovate and financial crises. *Journal of Financial Economics*, *103*(1), 130-148. https://doi.org/10.1016/j.jfineco.2011.03.026.

Tucker, K., Broom, G., & Caywood, C. (1993). Managing issues acts as a bridge to strategic planning. *The Public Relations Journal*, *49*(11), 38-40.

Vasiljeva, T., & Lukanavo, K. (2016). Commercial banks and fintech companies in the digital transformation: Challenges for the future. *Journal of Business Management*, (11), 25-33.

Vives, X. (2017). The impact of fintech on banking. *European Economy*, (2), 97-105.

Wang, Y., Xiuping, S., & Zhang, Q. (2021). Can fintech improve the efficiency of commercial banks? —An analysis based on big data. *Research in International Business and Finance*, *55*, 1-9. https://doi.org/10.1016/j.ribaf.2020.101338.

Wikipedia. (2023). *Deloitte*. Available at: https://tr.wikipedia.org/wiki/Deloitte. Accessed on 01 June 2023.

Williamson, O. E. (1991). Comparative economic organization: The analysis of discrete structural alternatives. *Administrative Science Quarterly*, *36*(2), 269-296. https://doi.org/10.2307/2393356.

Williamson, O. E. (2005). The economics of governance. *The American Economic Review*, *95*(2), 1-18.

Yanpar, A. (2015). *İslâmi Finans: İlkeler, Araçlar ve Kurumlar*. İstanbul: Scala Yayıncılık.

Yu, D., & Hang, C. C. (2010). A reflective review of disruptive innovation theory. *International Journal of Management Reviews*, *12*(4), 435-452. https://doi.org/10.1111/j.1468-2370.2009.00272.x.

Zavolokina, L., Dolata, M., & Schwabe, G. (2016). The FinTech phenomenon: Antecedents of financial innovation perceived by the popular press. *Financial Innovation*, *2*, 1-16. https://doi.org/10.1186/s40854-016-0036-7.

Zhang, Y., Ye, S., Liu, J., & Du, L. (2023). Impact of the development of FinTech by commercial banks on bank credit risk. *Finance Research Letters*, *55*(Part A), 1-8. https://doi.org/10.1016/j.frl.2023.103857.

Zhu, C. (2019). Big data as a governance mechanism. *The Review of Financial Studies*, *32*(5), 2021-2061. https://doi.org/10.1093/rfs/hhy081.