INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH IN MULTIDISCIPLINARY EDUCATION

ISSN(print): 2833-4515, ISSN(online): 2833-453

Volume 03 Issue 04 April 2024

DOI: 10.58806/ijirme.2024.v3i4n21, Impact factor- 5.138

Page No. 666 - 672

Reality and Challenges of Adapting Financial Technologies in Islamic Banks: An Overview of The Arab Countries

Nael Sayedahmed[1], Majdi Khalili[2], Shaista Anwar[3]

[1]Modern University College

[2]Arab American University

[3]Liwa College

ABSTRACT: This study aims to explain what Financial Technology (Fin-tech) is, its advantages, and current financial platforms of Fin-tech for Islamic banks. The current study used descriptive methodology to analyze the reality and challenges of Fin-tech in Islamic banks. The study reached several conclusions including: that Fin-tech is important for financial inclusion in Islamic banks as it helps to reach all parts of the world, and all segments of society. Also, that although Islamic banks while suffering from a weak structure, they managed to open electronic windows for advanced services, rather than using traditional windows, where mobile banking was one of the most important advancements in this area. Finally, Islamic banks managed to establish several platforms for Fin-tech based on Islamic Sharia', which are still growing. On the other hand, some problems relating to adapting Fin-tech in Islamic banks in the Arab countries included mainly: the overall weak financial and organizational structures of Islamic banks which limit their ability to keep pace with other industries globally. The study recommended Islamic banks to work on rechanneling their funds into developing their technological infrastructure, the need to further develop financial platforms, additional training and education on crypto-currencies, and further discussions on how to develop these in accordance with Islamic Sharia'.

KEYWORDS: Financial Technology, Fin-tech platforms, Financial inclusion, Islamic banks

1. INTRODUCTION:

Technology has invaded every aspect of human life. Currently, the era of technology is denominating all industries, and a change is considered a must. The financial sector, especially banks are becoming more aware of the need to improve their range of services by adapting a suitable technology to promote the overall satisfaction of customers (Jab-Allah, 2021). Financial Technology (Fintech for short) is the new buzz everybody is discussing, where more recently crypto currency is playing a major role in the financial sector development. Digitalizing the Islamic banking industry in consistent with Islamic Sharia' is becoming even more important, especially after the 2008 financial crisis. This even magnified the amount of interest and funds available for technology investments after the Covid-19 Pandemic, where traditional methods of providing services became a barrier for receiving a certain range of financial services (Sakhri, and Bin-Ali, 2021; Shalor, 2021) . Financial inclusion also became a major issue for banks which try to expand their customer base, as well as reducing costs, and increasing the speed with which to provide access to services. Islamic banks are also part of such change, and continuously seek promote their image with such technological innovations.

2. PROBLEM STATEMENT

Based on the current and future trends in economy, and especially in financial services industry, and the need for Islamic banks to adapt new technology through mobile banking, ATM advanced services, online banking.. etc. as well as the need to overcome many obstacles to keep pace with other industries, the current study aims to identify and shed light on the current reality and future trends of Fin-tech in Islamic banks within the Arab countries. The current study aims to try and answer the following questions:

1. What is Fin-tech in Islamic banks?
2. What is the reality of Fin-tech in Islamic banks?
3. To what extent Islamic banks use Fin-tech ? and how far they have managed to overcome problems in applying recent technologies in their services?

3. SIGNIFICANCE

The study significance is evident in its contribution to both body of knowledge and industry. On the theoretical level, it adds a lot to existing literature on Islamic banks and Fin-tech within this industry, and it helps future research carry forward its recommendations into a practice. On the industry and practice levels, the current study would establish a suitable basis for decision makers within Arab countries to help promote the industry in general, and the use of technology in developing the services provided to current and future customers.

On the other hand, the current study adds to existing literature with regards to narrowing down the gap between educators and practitioners who seek further knowledge of this segment, but lack the time and sometimes the motivation to further learn about it.

4. OBJECTIVES

Based on the brief discussion above, the following are the objectives of this study:

1. To explain what Fin-tech is
2. To review the reality of Fin-tech applications in Islamic banking industry
3. To understand the challenges that Islamic banks face while applying recent technology in their services.

These are expected to be achieved by reviewing recent literature and publications available about the topic within Arab countries and how they have managed to move the experience of more advanced countries into their own industry.

5. LITERATURE REVIEW

This part extensively reviews literature related to application of Fin-tech in Islamic banks within Arab countries. It starts with explaining what Fin-tech is, its sectors, and features, and its advantages. The discussion is then focused on the use of technology in Islamic banks, and what are some financial platforms for Islamic banks. Finally the discussion is brought about the reality of financial technology and what barriers do Islamic banks face while adapting technological innovations, and how far Islamic banks managed to advance their product range through applying such technologies.

5.1 What technology and Fin-tech is?

Technology is the modern buzz of the world. Islamic banks as well as other financial and nonfinancial industries are adapting digitalizing of their service range. The main aim is to provide customers with convenient services through secure and faster channels of distribution. The Basel Committee defined financial technology as any technological innovation that leads to proposing a product, a service, or a business model which impacts financial markets and institutions (Abdulrahim and Qadourah, 2018). Dublin Institute of Technology also defined Fin-tech as: innovations in financial industry that include digital programs used in banks including: customer transactions, wire transfers, money exchange, interest and profit calculations, and a whole range of technological advancements (Harfoush, 2019).

Amazon and Payfort explained that Fin-tech aims to introduce cheaper and faster solutions to problems related to providing financial services, as well as producing new financial markets through small and recently established companies that interact with other service providers (Abdulrahim and Qadourah, 2018; Yanagawa, 2018).

Based on the many definitions provided for financial technology, the current study focuses on defining it as technology- based financial services that are less expensive, faster, and more convenient to customers.

5.2 Characteristics of Fin-tech:

The recent literature (Harfoush, 2019; Abdalqader, 2013; Yanagawa, 2018) suggests that financial technology is characterized by the following:

1. Fin-tech extends beyond the delivery of services. It includes management of operations and decision making process, as well as the overall vision of the banks.
2. Fin-tech focuses on the introduction of technology-based services and education and training regarding the adaption of technology in a work setting.
3. Banks use Fin-tech to provide cheaper services where the profit is the main motivation for adaption of such innovations.
4. Fin-tech is focused on financial services only. Other technology advancements are not included when using the terminology.

The above characteristics highlight the following components of Fin-tech:

1. Scientific component: which includes the education and training for both financial industry and technology.
2. Infrastructure component: which includes all tools, machines, and technical support needed to implement recent technology in banks.
3. The use component: which includes the uses of both scientific and infrastructure components to provide a technology-based financial service.
4. Innovation component: which focuses on how the use component is advanced and developed, and what set of skills in required to further improve the services provided.

The technology used in financial services extends to delivering financial services to agriculture, tourism, trade, and other sectors that interact with banks. Innovation in providing such services is highly dependent on the interaction with these sectors, and providing their needs in accordance with the regulatory framework within a country. Technology managed to help banks receive much higher levels of profit and extend their customer base beyond their traditional customer base.

5.3 The development of Fin-tech:

Financial services and financial technology have evolved throughout the past few decades. The period within which Fin-tech developed can be summarized as follows:

1. (1866-1967): the first ATM was developed while it was officially introduced in America during 1969
2. (1967-2008): during this period an accelerated innovation was seen in financial services, including the introduction of ATMs, wire transfer, online banking, and clearing houses among others. This was motivated by the introduction of computers and the websites.
3. (2008-current): since the financial crisis in 2008, a new group of companies emerged which specialized in providing financial services based on the recent technological innovations. Introduction of crypto currency and their specialized markets might be the greatest innovation thus far. Financial inclusion became the main objective of financial industry including banks, which aimed to reach all possible customers and the lowest possible costs.

Among the reasons for such expansion in financial industry are the following:

1. Financial inclusion and the introduction of the concept through social networks
2. The huge development in the services range which are now related to introduction of e-payment systems
3. The ease with which such technology is introduced and at lower costs compared to traditional methods of receiving financial services.
4. Cheaper costs of financial services including: interest, fees, and other costs of subscription and use of these services (Harfoush, 2019).

During and after the Covid 19 pandemic, many countries focused on developing the financial services, especially banks (Hassan et al, 2020). Governments explained that this led to minimizing the negative impact of the pandemic on people, and it made it possible for many to receive the services and products they wanted through online payment systems (Unal and Aysan, 2022). Financial inclusion even improved and many were able to receive the services through online systems, which positively impacted on people overall wellbeing.

5.4 The benefits of Fin-tech:

Financial technology provides a wide range of benefits to their customer, including:

1. The ability to reach all customers within different groups and throughout the world. Nowadays, even those with limited income can benefit from the technology-based services.
2. The high flexibility of Fin-tech services which expanded the range of services and alternatives provided to customers. It helped include all customers with different banks' customer base.
3. Data and mobile policies which helped protect customers, as well as improving the services, which enabled business owners make better decisions.
4. The speed with which services are provided. Such speed made it possible to make more accurate decision with less cost and time.
5. Services are designed based on market research which considers the needs of different customers, and the ability to meet these with the most suitable options (Bin Alqamah and Saihi, 2019).

The services are not limited by traditional obstacles, and many countries are cooperating to develop the banking system, while considering customer differences, and maintaining costs at reasonable level (Hassan et al, 2020). The focus is also on including all customers and moving the banking industry from traditional to technology-based era, where technology innovation is utilized to improve the services; i.e. it is becoming a technology-based innovation, rather than financiallybased service range.

5.5 The different segments of Fin-tech:

The following figure (1) highlights the main segments of Fin-tech in banking industry. Each are explained next.

Figure (1): Segment of Fin-tech in banking industry

Investment management

Portfolio management using recent technological innovations is becoming the main tool for businessmen and investors to assess risk-return tradeoff for their investments. It even became more important to use such tools to provide potential investors with advice on suitable alternatives to increase their income. Banks in general rely heavily on technology to show their ability to keep pace with industry and overcome competition (Sidaoui et al, 2022, Bin Faddah and Hasan, 2020). FINERD is an example of companies that were established in different parts of the world to help banks and individuals utilize the benefits of technology for investment assessment and management. Many brokers nowadays are relying on such technology to guide investors into suitable investments based on assessing their needs and risk tolerance levels (Abdulrahim and Qadourah, 2018).

Payments

Recent literature (Najdawi and Talib, 2023) suggest that payment systems witnessed the greatest development within the financial industry. Banks, among other financial institutions; managed to use such innovations to become more flexible in terms of providing solutions to their customers. Payment systems helped banks overcome problems related to income; as fees were relatively low and customer based increased, the overall income increased. Also; banks managed to benefit from such systems to lower risks associated with international money transfer and use of mobile applications rather than using actual cash for satisfying different obligations.

Insurance and risk management

Fin-tech managed to add to banks a lot in this area. The literature suggest that risk management practices improved, and insurance against online risks also improved. Banks are becoming more aware of the need for a specialized technical team to lead the way for future service innovation (Sakhri and Bin Ali, 2021). This also enabled insurance companies to work closely with banks to offer their own services through banks, and helped banks better assess the security needs of their customers.

Block chain and crypto currency

Crypto currency, including Bitcoin and others, are increasing in demand as a result of being less regulated, and with higher chances of earning additional income for investors (Unal and Aysan, 2022). Banks are aware of such investment opportunities and are utilizing block chain technologies to develop their services. Block chain relies on the use of a network that stores information online, where access is provided to everybody through a certain internet protocol. The main advantage of block chain is decentralization of information, as well as speed and ease of access. It helps people wire transfer money without the need for bank accounts, and at a high level of security (Abdulrahim and Qadourah, 2018). Block chain technology is leading the way into a new era of Fin-tech era, where banks have to make sure they understand such trend, and how they could overcome problems related to money laundry and other money scams within the near future.

Financing and lending

This sector includes group lending, where people produce new ideas (products) through three main channels: demanders of funds, suppliers of funds, and intermediaries (banks), who oversee the flow of money from one part to the other. The literature suggest that banks as well as other financial institutions which specialize in lending and financing use this structure as a basis for developing the service range for customers at both ends (Najdawi and Talib, 2023). Some banks are nowadays focusing more on certain customer base, such as small businesses, multinational companies, and even individual investors. This would eventually need to be modified by banks to help extend the service into new beneficiaries within the near future.

5.6 Fin-tech in Islamic banks, and its main platforms:

Financial technology played a major role in Islamic banks. Nowadays, these banks are doing their best the keep pace with technological innovation, as they're adapting technology while not neglecting Islamic Sharia'. Islamic Fin-tech is related to providing Sharia'-based services that adapt recent technology to benefit its customers. Islamic financial platforms are more than 120 (which is %6 of total financial platforms) around the world (Sidaoui et al, 2022), where more than 2000 are found for all services. Although their number is limited, these platforms managed to include Sharia' guidelines as a basis for distinguishing their services from conventional system (Shalor, 2021, Hassan et al, 2020). This increased demand for their services from both Muslims and non-Muslims, where a wide range of services was provided, including: Payment systems, local and international financing, mobile banking, wire transfers for both individuals and businesses (Shehadah, 2021). The global survey of Islamic bankers (2020) revealed that payment systems and mobile banking were the most offered and used Fin-tech services provided by Islamic banks (Shehadah, 2021). Online learning and AI were the least within this list. Islamic banks as other banks managed to expand their regulatory framework to include Fin-tech especially after the 2008 crisis, where a universal shift to financial inclusion was seen. Companies rushed into this market, and helped banks develop their range of services, which included handling big data and reducing risks for these banks (Global Survey of Islamic Bankers, 2020).

Islamic banks are still worried of such innovations, as control is still weak, and anyone can go ahead and develop smarter and much sophisticated applications that would threaten Islamic banks data. Banks are also worried about cheaper innovations which might provide additional benefits to customers including ease of access and higher levels of security (Shehadah, 2021). Thus, Islamic banks are facing a challenge and an opportunity when dealing with Fin-tech companies. The main issue is related to lowering their profit range to attract more customers at a cheaper cost (Hammad, 2020). Amazon, Apple, and Facebook also entered the competition, as these started competing for the main services of Islamic and conventional banks, mainly: money transfer, and online payments. A recent survey in 2018 explained that one of each 3 banks' customers are welling to shift to such companies to receive the same services. This raised additional concern for banks to think again about their competitors and the need to diversify their product range, as such companies might invest much more resources into the financial services industry and overcome banks in their own field of work (Hammad, 2020). These companies have the highest market value nowadays, which imposed a challenge for Islamic banks to move for a full digitalizing process of their services without providing physical offices and branches for their customers. If the world in general, and Islamic banks in specific moved to full digitalizing of their services, it is expected that additional training, flexibility, and investment in innovation is required (Shehadah, 2021).

Fin-tech Sharia' based Platforms:

With the previous innovations and shifts in market, financial platforms with the help and support of governments were established to help provide a wide range of services that are convenient to customers, where the increase in customer numbers and interaction with their needs made it more attractive for Islamic banks to join such movement and trend (Shalor, 2021). The following are some of the most famous platforms that provide sharia'-based services:

LIWWA:

Established in 2013, and operated in 2015, LIWWA was developed in Harvard University labs, where it lent more than $1.6 million in Jordan only. It lends money to small businesses up to $100,000 dollars, and now is operating in Egypt. A total of more than $78 million up to end of 2022 was used to finance small projects in both Jordan and Egypt. The platform is operated using Sharia' principles where no interest is imposed on financing, rather a certain profit margin that is different among projects (LIWWA, 2023).

Nasdaq Dubai:

This Murabaha platform was established through cooperation between Islamic Emirates Company, and Emirates Islamic Financial Brokerage LLC. The platform aims to innovate Sharia' based services for retail and small companies. It also aims to reducing financial risks associated with financing small projects, where flexibility and sound returns are guaranteed. The platform uses Sharia' based investment certificates that are developed under the Sharia' Supervisory Board at the National Sukuk company. The platform was established in 2014 through AIB official platform. Nasdaq Dubai was internationally recognized as a major player in Fin-tech industry, where countries like Malaysia used their model as a basis for creating new Sharia' based platforms for banks operating in Malaysia (Shalor, 2021).

Beehive:

Beehive started its operations in 2014, with the introduction of its services in South Africa and Middle East regions. It is located in United Arab Emirates, where its main focus is on linking smart investors to trustworthy companies to reduce costs, and avoid complications in traditional financing of small businesses, as well as providing financing alternatives through direct financing which is Sharia' based (Ultman and Alian, 2016).

FINTERRA:

It was established in Geneva in 2018, with branches in Hong Kong, Kuala Lumpur, Abu Dhabi, New York, and others. The main focus of FINTERRA is to introduce technology to Waqf through block chain technology. The idea originally was to find and make use of Waqf in countries where it is not used. The platform collects donations from people and redistribute these into charitable and social projects including building schools, mosques, and financing other social program in Muslim countries (Sasi, 2019).

IFIN:

IFIN is an Islamic finance and intermediary company which specializes in helping companies innovate solutions that are Sharia' based. It was established in 2014 under Path Solutions, to develop Islamic services to customers, where flexibility, cheaper costs, and sustainable returns are guaranteed (Abbas, 2018).

I-Dinar:

Islamic finance is based on tangible assets, where investors follow Islamic Sharia' and don't use interest in their operations. Bitcoin, as well other crypto currencies contradict with Islamic principles, where governments of Islamic countries warned investors of dealing with this innovation, which eventually made their financial markets fall back behind other countries. A solution in Dubai, UAE was introduced which is backed by gold, which is called (One Gram), and is linked to gold which is the most stable among currencies in the world, and is accepted by Sharia' (Shalor, 2021). I-Dinar platform is considered one of the most advanced platforms and is widely recognized in many parts of the world, as it provides Sharia' based services that proved their ability to overcome financial crisis. The literature suggest that such currency might be the most suitable alternative to problems of crypto currencies that are not backed by suitable tangible assets (Abbas, 2018).

Reality of Fin-tech in Islamic banks:

After the introduction of crypto currencies, many countries turned their attention to developing the financial services industry, and banks in specific. Recent literature suggest that investment in this sector more than tripled during 2013-2019, especially in Fin-tech companies. The literature also suggest that not all countries invest in this area the same amount. American countries invested almost

50% share of the total investment in this area, which was followed by European countries, and lastly Asian and other countries. Bin Faddah and Hasan (2020), suggested that China, India, and United Kingdom where the biggest investors in Fin-tech, where Canada and Belgium where the smallest investors in this area.

On the other hand, Arab countries witnessed an increase and accelerated expansion in Fin-tech adaption. CAGR indicator showed an increase of more than 40% in number of Fin-tech companies as of 2019 the total number reached more than 320 companies (MAGNiTT, 2019). About 45% of these companies are in UAE, 17% in Egypt, 7% in Jordan and 7% in Lebanon. Other countries like Qatar, Oman and Algeria have 2-3 companies in the same area (Basam and Hakim, 2020).

Islamic banks face problems related to adaption of Fin-tech including: 11

1. The main problem of using technological innovation in financial services is lowering costs. This is the most important factor in choosing certain products, which might limit additional research in the area, and sometimes companies miss out on advancements that could be used in the future to overcome other problems.
2. Financial inclusion is not applied for all customers. Islamic banks still need to open more accounts for customers.
3. Fin-tech helps increase electronic trade, and the use of mobile applications, still this is not the main service which is provided. Online payment is the developed service which is actually utilized by companies to help sell their products and services. There still is a misunderstanding of what Fin-tech actually means.
4. Islamic banks face fierce competition from other conventional banks and other financial institutions. This is evident especially in Arab countries, where companies compete for a limited customer base of less than 400 million customers (Basam and Hakim, 2020).
5. Fin-tech is expected to provide flexibility and security of services compared to traditional services, still; sometimes the innovations are limited by human factors including customer understanding of the services, and the ability to use the service in different countries due to political reasons.
6. An increasing number of customers is using technological alternatives to traditional financial services, where for example, 76% of the customer base in UAE is using technological based services and trust the providers of such services. In the Gulf region, 94% of the area is providing internet services to their citizens, which encourages further adaption of online payment and mobile banking systems (MAGNiTT, 2019). Still, Fin-tech needs to be applied following Islamic Sharia' to make sure banks overcome competition.

Other challenges include the need to move from Islamic windows to fully fledged Islamic banks and Islamic financial institutions which can promote the innovation of this sector with a separate identity. The literature highlights that such change in the industry will improve financial inclusion efforts, as most Arab countries are considered poor and less developed, and lowering costs can aid in the process of gaining additional customers and overcoming competition from conventional financial institutions.

6. RESULTS

Based on the above discussion, and after reviewing recent literature about the topic, the following can be concluded:

1. A shift is seen in Arab countries and the world in general to adapt Fin-tech in financial products. Traditional services are becoming obsolete.
2. Fin-tech derives financial inclusion, as recent innovations helped reach a wider range of potential customers.
3. Arab countries need to speed the process of technological innovation, where additional resources have to be invested in this sector.
4. Islamic banks and financial institutions managed to establish many Shaira' based platforms which helped overcome economic and social barriers. Islamic banks lack infrastructure and require additional investment in this area within the near future to maintain competitive ability.
5. Mobile banking and online services helped introduce Fin-tech in a friendly way to customers, where additional innovations need to focus on such idea to help promote further inclusion in this industry.

7. RECOMMENDATIONS

The current study is an attempt to investigate the level to which Islamic banks in specific managed to adapt Fin-tech in their services. The study recommends additional investment of resources in this area by Islamic banks, as well as financing the development of additional platforms and services to help reach suitable levels of financial inclusion. Fin-tech is a new area that requires additional research and further statistical analysis to understand the trend and help control it. Finally, crypto currency should be heavily investigated to help overcome problems found in Sharia' based alternatives.

REFERENCES

1) Abbas, S. (2018). Technology and Innovation: Redefining providing financial services. FINDEV Gate. Retrieved from https://www.findevgateway.org/ar/interview /2018/12/altknwlwjya-walabtkar-aadtsyaght-tqdym-alkhdmat-almalyt-alasl

2) Abdalqader, M. (2013). Requirements for using technology to create competitive intelligence in Algerian banks. The academy for social and humanitarian studies, Algeria.
3) Abdulrahim, W. and Qadourah, A. (2018). The trend for financial technology adaption in light of successful experience of companies. Journal of economic and legal studies. Algeria, 7 (3), 13-18.
4) Bin Alqamah M. and Saihi, Y. (2019), The role of financial technology in supporting financial institutions and banks services. Journal of financial and banking studies, 26 (1), 15.
5) Bin Faddah, B. and Hasan, H. (2020). The reality of using technology in the Arab countries. Journal of management and financial sciences, Algeria.
6) General Council for Islamic banks and financial institutions. THE GLOBAL SURVEY OF Islamic banks. Retrieved through FI129-CI1977-Arabic GIBS.pdf (cibafi.org).
7) Hammad, I. (2020). Arab banks competing with Facebook, Amazon, and Google. Retrieved through https://www.elwatannews.com/news/details/4354166?t =push
8) Hassan, K. , Mustafa R., and Mahmood A. (2020). Challenges for the Islamic Finance and banking in post COVID era and the role of Fintech. Journal of economic cooperation and development. 41 (3), 93-116.
9) Harfoush, S. (2019). Financial technology is a promising industry in Arab countries. Afaq scientific journal, 11 (3), 727-730.
10) Jab-Allah, H. (2021). Digital technology: A study of some scientific and theoretical terms. Scientific journal of technology and disability studies. 3 (1), 121. LIWWA platform official website. https://liwwa.com/about/our-story MAGNiTT website https://magnitt.com/, 2023.
11) Najdawi, M. and Talib, G. (2023). Technology in Islamic banks: Reality and challenges, International Journal on humanities and social sciences, 43, 157-156.
12) Sakhri, A. and Bin-Ali, S. (2021). Analyzing the reality of financial technology in South east Africa and Middle east countries: A study of challenges and reality. Journal of studies finance and accounting. 6 (1), 402-418.
13) Shalor, W. (2021). Digital economy and Islamic financial platforms: A case of I-Dinar platform. Journal of managerial and financial sciences. Algeria, 5 (1), 403415.
14) Shehadah, M. (2021). Digital transformation of Islamic banks in Jordan: A study from Sharia' perpective, A PhD thesis submitted to Yarmouk University, Jordan.
15) Sasi, H. (2019). The use of block chain technology to improve Waqf: FINTERRA platform as a model. Asian Islamic journal, 16)3(, 152.
16) Sidaoui, M., Ben Bouheni, F., Arslankhuyag, Z. and Mian, S. (2022). Fintech and Islamic banking growth: new evidence. Journal of Risk Finance, Vol. 23 No. 5, pp. 535-557.
17) Ultman, A. and Alian S. (2016).What is direct financing? And does it work in Arab countries. Retrieved through https://www.wamda.com/ar/
18) Unal, I. and Aysan, A. (2022). Fintech, Digitalization, and Blockchain in Islamic Finance: Retrospective Investigation. FinTech 2022, 1, 388–398. Retrieved from https://doi.org/10.3390/fintech1040029 Yanagawa, E.(2018). Digital transformation in Japan's banking industry.
19) Journal of payments strategy and systems,12(4)