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The Islamic fintech potential and role in the post COVID-19 era

إمكانات التكنولوجيا المالية الإسلامية ودورها في حقبة ما بعد كوفيد –19

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Abstract:

The Corona virus (COVID-19) pandemic has significantly destabilized the financial world and caused economic disruptions on an unprecedented scale and speed. The current study's aim is to look into the potential and the role of the Islamic Fintech system in post COVID-19 recovery. The Islamic finance system's underlying ethical principles make it way more qualified and poised to confront the economic repercussions of a pandemic like COVID-19. There has been limited discussions about Fintech, *Shari'ah* compliance fintech and post COVID-19. Therefore, this study is based on the analysis and extraction of information from databases utilizing the Stechemesser and Guenther literature review process. The results of the study suggest that the COVID-19 pandemic has created an opportunity for open and inclusive socioeconomic innovation to provide the globe with a sustainable, rapid, reliable, and feasible alternative. The research also, presents a critical analysis of the Islamic Fintech and the role of Islamic Fintech in creating a more sustainable financial system post COVID. This paper has significant practical and theoretical implications for Islamic financial institutions, allowing regulators and policymakers to address the impacts of the COVID-19 disaster. The results of this study are expected to add the literature of Islamic Fintech.

Keywords: Fintech, Islamic Finance, Islamic Fintech, Shari'ah Principles, post COVID-19.

JEL Classification Codes: G32, G01

ملخص:

تسببت جائحة فيروس كورونا (كوفيد –19) في زعزعة استقرار العالم المالي بشكل كبير كذا في اضطراب اقتصادي على نطاق وسرعة غير مسبوقين. يكمن الهدف من هذه الدراسة في التمعن في إمكانات ودور النظام المالي الإسلامي في التعافي بعد كوفيد –19 ،إذ أن المبادئ الأخلاقية الأساسية للنظام المالي الإسلامي تجعله أكثر تأهيلًا واستعدادًا للتعامل مع التداعيات الاقتصادية لوباء مثل كوفيد –19. كانت هناك مناقشة محدودة حول التكنولوجيا المالية ،التكنولوجيا المالية المتوافقة مع الشريعة الإسلامية والأوضاع ما بعد كوفيد –19. لذلك تستند هذه الدراسة إلى تحليل واستخراج المعلومات من قواعد البيانات باستخدام عملية مراجعة الدراسات السابقة .

تشير نتائج الدراسة إلى أن كوفيد –19 قد خلق فرصا للابتكار الإجتماعي والاقتصادي المفتوح والشامل لتزويد العالم ببديل مستدام، سريع، موثوق ومجدي. يقدم هذا البحث أيضًا تحليلًا نقديًا للتمويل الإسلامي ودور التمويل الإسلامي في إنشاء نظام مالي أكثر استدامة بعد كوفيد –19. لهذه الورقة البحثية آثار عملية ونظرية مهمة على المؤسسات المالية الإسلامية ، وتمكين المنظمين وواضعي السياسات من التعامل مع آثار كارثة كوفيد –19. لابد أن تثري نتائج هذه الدراسة مجال التكنولوجيا المالية الإسلامية.

الكلمات المفتاحية: التكنولوجيا المالية، المالية الإسلامية، التكنولوجيا المالية الإسلامية، مبادئ الشريعة الإسلامية ، بعد كوفيد –19

تصنيفات JEL: G32, G01

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1-Introduction:

The COVID-19 pandemic, also known as the coronavirus pandemic, is a worldwide outbreak of coronavirus disease 2019 (COVID-19) caused by severe acute respiratory syndrome coronavirus 2. (SARS-CoV-2). The novel virus was discovered in December 2019 during an epidemic in Wuhan, China. Ultimately, containment efforts failed, allowing the virus to spread to other parts of Asia and then the rest of the world. The World Health Organization (WHO) declared the outbreak a pandemic on January 30, 2020, and a public health emergency of international concern on March 11, 2020, respectively. As of 11 November 2022, the pandemic had caused over 634 million infections and 6.6 million confirmed deaths, making it one of the deadliest in history.

To prevent the spread of the virus, governments all over the world have implemented a lockdown. The pandemic has caused widespread social and economic disruption, including the most severe global recession since the Great Depression. As a result, economic activity has come to a halt, resulting in a sharp drop in production, disruption in supply chains, loss of income, and disruption in the flow of credit (Fernandes, 2020). Many jurisdictions closed educational institutions and public areas, and many events were cancelled or postponed in 2020 and 2021. Because of two factors, the health emergency has turned into a financial crisis. First, the spread of viruses encourages governments around the world to implement lockdowns, social distancing, and quarantines, resulting in the shutdown of economic activities, financial markets, and so on. Second, the virus's rapid spread causes market panic and uncertainty, encouraging customers to opt for safety in consumption and investment (Ozili, 2020). This virus has already changed the composition of life, and the economic consequences of the virus are difficult to quantify; future academics, academic institutions, governments, and politicians will need to investigate this (Raza Rabbani et al. 2021) in an environment of high uncertainty and uneven outcomes, it is unclear how the recovery will look and how long it will take to recover from the economic damage caused by the pandemic (Hassan et al. 2021).

The rehabilitation process during and after COVID-19 will greatly benefit from the involvement of banks and financial institutions (Hassan, Rabbani, 2020). The foundation of every financial system is made up of the financial institutions, who are in charge of ensuring that the economy runs smoothly and has a lot of liquidity. The financial institutions perform this task by offering credit, managing markets and pooling risk among consumers (Mooney, 2018). The recovery after COVID-19 will be enormous, and Islamic financial institutions will play a vital role, just as they did after the 2008 financial crisis. Islamic finance is the world's only financial system founded on ethical and moral principles. It is the financial system which ensures community participation, social and economic stability, promotes financial inclusion, and supports and encourages comprehensive human development (Hassan, 2011), (Hassan et al. 2011).

Islamic finance is a fast-booming segment of global finance. Serving a core population of 1.8 billion Muslims world-wide (Lipka and Hackett, 2017), and a wider global ethical finance audience, its role is growing in global significance especially as it relates to global social financing needs. One of the consequences of this growing population is an increase in demand for products that adhere to the sources of Muslim law, namely the Quran and Sunnah. As a result, Islamic financial services have a huge potential market. Muslims worldwide are only

24 years old on average, making the vast majority of them "digital natives" ready for digital Islamic financial solutions.

One of the innovations in Islamic finance made possible by technological and internet developments is Islamic financial technology (Fintech). In Islamic Fintech, adherence to *Shari'ah* and digitally delivered financial solutions are related. Fintech positions itself as a solution to ensure that as many individuals as possible have access to financial services. Today, Muslims can more easily obtain savings, investments, insurance, and mortgages that are compliant with their religious beliefs. *Financial organizations are relying on digital channels to make sure customers can access their services, particularly during the coronavirus epidemic when governments apply social distancing measures. Islamic Fintech differs from traditional Fintech in that it is transparent, profitable to both sides, and complies to Shari'ah* (Kelana 2018).

One of the most significant goals of Islamic finance is the establishment of social justice, accountability, solidarity, and the eradication of corruption in business transactions (Elmelki& Ben Arab, 2009). In addition, the above characteristics make Islamic finance more suited to be aligned with the United Nations—Sustainable Development Goals (UN-SDGs) (Lawal, Imam, 2016), (Gundogdu, 2018), (Zhuang et al. 2018).

The structure of this article consisted of five parts: **Part One** briefly introduced the reader to the topic than outlined problems and questions of the study, followed by the objectives and the hypothesis. Finally, explained the methodology used. **Part Two** looked into what Fintech and Islamic Fintech are and compare the two types of Fintech. **Part Three** introduced the results and discussions concerning the potential and role of the Islamic Fintech in the post COVID-19. **Part Four** shows the limitation to the research. **Part Five** presented the conclusions and made some recommendations about the study.

1-1 Research Problem and Questions

Islamic finance has the potential to play a more decisive and crucial role in the post-COVID-19 resurgence. As a result, by answering the research questions listed below, this research seeks to address the following research gaps using literature review:

1. Is there a potential for Islamic Fintech in the post-COVID-19 period?
2. Can Islamic Fintech provide a sustainable solution?
3. What are specific Islamic financial services that can be combined with the Fintech based innovative solutions and meet the needs of the COVID-19 affected Islamic finance customers?

1-2 Research Objectives

The article explores Islamic finance's sustainability of Islamic Fintech in the post-COVID-19 era. It also emphasizes the significance of the Islamic financial system in combating the economic effects of COVID-19, as well as the function of Islamic Fintech in overcoming COVID-19 aftershocks.

1-3 Hypothesis

H: Islamic Fintech has the potential to play a significant role in the post COVID-19 period.

1-4 Methodology

Fintech is a recent innovation and limited literary evidence exist on its integration in the Islamic finance industry. The current study is highlighting the role of the Islamic financial system in combatting the economic consequences of COVID-19 and supporting the role of Islamic Fintech in overcoming the aftershocks of COVID-19. The significance of Islamic-based Fintech and its role in open innovation, social inclusion, and entrepreneurial innovation during and post COVID-19 were highlighted in the current study using a qualitative content analysis through discourse analysis. The importance of Content analysis is the most widely used tool for extracting useful content in social science research (Neuendorf, Kumar, 2015). It is defined as the systematic objective and quantitative analysis of text characteristics (Scott, Kosslyn, 2015), (Massaro, Secinaro, Dal Mas, Brescia, Calandra, 2021).

We have used a systematic literature review process proposed by Stechemesser and Guenther (2012). There are three stages in the literature review process applied by Stechemesser and Guenther (2012). The first stage includes establishing the research objective and collection of papers from databases. This stage enables us to identify relevant literature focusing on Fintech and Islamic Fintech following COVID-19. In our literature review, we included both theoretical and conceptual papers. The primary goal of this research is to identify secondary data regarding the role of Islamic social financial tools in combination with Fintech technology during the COVID-19 period, and the study proposed a suitable framework to meet the requirements of the study aim. As part of the content analysis process, several search engines and databases were used to find relevant publications. In this search finance, keywords such as Fintech and Islamic Fintech, Fintech, *Shari'ah* Principles, COVID-19, innovation, open innovation, social inclusion, entrepreneurial innovation, and post COVID-19 were used. For the literature search, we used the databases Elsevier, Emerald, Scopus, Springer, and Google Scholar.

In the second stage, we established screening criteria to identify relevant papers for the content analysis process. Primary data was collected using a self-administered tool in conjunction with several previous research studies. We considered the limited supply of relevant journal articles on Fintech and Islamic finance, and thus included journal articles, books, reports published by governmental and professional bodies, books, book chapters, and conference proceedings. Following the findings of Morrison et al. (2012), we limited our study to papers published in English. The review process incorporates both empirical and conceptual articles.

In the final stage, Author conducted content analysis protocol proposed by Krippendorff (2013) after obtaining a sufficient number of selected documents in order to extract the required information for a new structure of the Islamic Fintech and post COVID-19. We have also reviewed the citation score of all documents to improve the reliability of findings presented through the literature review process.

2- Overview of Fintech and Islamic Fintech

The financial services industry has evolved through several stages, beginning with bookkeeping and progressing to the formation of central national banks and payment systems, and then to the introduction of complex asset markets and other financial products (Arthur, 2017). Innovative payment systems like advanced wallets have been developed and the internet, retail and telecom industry have started offering financial services. With increasing digitalization, specialization and decentralization, the financial service industry has established more effective and improved methods of utilizing a wide variety of information

(Cuesta, Ruesta, Tuesta, & Urbiola, 2015). In the past decade many technological developments have taken place which are being applied innovatively in all functions of finance from payments to savings, borrowing, risk management and financial advisory (Forbes, 2018).

Throughout this century, technology and automation have played a significant role in the development of the global financial services sector. ATMs, digital stock exchanges, and bank mainframe computer networks are examples of early financial services technology. Thanks to advanced technologies such as blockchain and artificial intelligence, a new generation of technology enablers is driving a disruptive revolution in the financial services sector. This interruption is redefining consumer experiences, operational methods, and business models for financial services, opening up new opportunities to meet the modern world's changing financial needs. The global Fintech revolution is having a similar effect on Islamic finance through the development of a fledgling Islamic Fintech ecosystem. *Shari'ah*-compliant Fintechs are emerging in both Islamic and non-Islamic countries, promising to attract millions of young Muslims while also providing financial services to the unbanked. In light of the coronavirus pandemic, Islamic Fintech is becoming increasingly important.

2-1 The definition of Fintech

Fintech is characterized as the financial services of the twenty-first century (Todorof, 2018). However, according to the Financial Stability Board (FSB), of the BIS1, “Fintech is technologically enabled financial innovation that could result in new business models, applications, processes, or products with an associated material effect on financial markets and institutions and the provision of financial services” (Reserve Bank of India, 2017). The phrase "fintech," which combines the words "financial" and "technology," is relatively new and frequently ambiguous. It refers to any developing technology that enables consumers or financial institutions to supply financial services in newer, more rapid ways than were previously possible. It is also described as brand-new technological developments and applications that seek to introduce fresh and enhanced approaches to the provision of financial services. Another approach to define fintech is as a business that aims to offer financial services by utilizing software and contemporary technologies.

Financial technology is the technology and innovation that aims to compete with traditional financial methods in the delivery of financial services (Van Loo, Rory, February 1, 2018), (Chen, Chiu-Chin; Liao, Chia-Chun, September 15, 2021). Artificial intelligence, Blockchain, Cloud computing, and big Data are regarded as the "ABCD" (four key areas) of Fintech *(Lai, T. L.; Liao, S.-W.; Wong, S. P. S.; Xu, H. (2020).* The Fintech industry is an emerging industry that uses technology to improve activities in finance (Schüffel, Patrick, 2016).

Therefore, Fintech is regarded as a disruptive technology, which affects completely how something is conducted. This also means that consumers won't go to traditional banks to manage their financial affairs anymore; instead, they'll use apps and mobile devices.

2-2 Fintech Users

There are four main categories of Fintech users: **1)** B2B (Business to Business) for banks, refers to commerce between two businesses rather than to commerce between a business and an individual consumer. With the advent of Fintech, businesses can easily get loans, financing, and other financial services through mobile technology. Additionally, cloud-based platforms and even customer-relationship management services like Salesforce (CRM) - Get

Salesforce Inc. **2)** Business clients. **3)** B2C (Business to Client**)** for small businesses, Fintech has many businesses to clients, or B2C, applications. Cash apps like PayPal, Venmo and Apple Pay all allow clients or customers to transfer money via the internet or mobile technology, and budgeting apps like Mint allow customers to manage their finances and expenses. Much of the banking industry's first forays into Fintech were focused on B2C applications like lending and payment services (ANNE SRADERS, MAR 8, 2019). **4)** Consumers. Trends toward mobile banking, increased information, data, and more accurate analytics and decentralization of access will create opportunities for all four groups to interact in heretofore unprecedented ways (JULIA KAGAN, Updated August 27, 2020)

Furthermore, non-finance players such as retail, telecommunications, technology, and social media, as well as power and utilities, are becoming competitive participants in this ecosystem. These companies offer innovative financial services to their existing customers while also offering Fintech as a supplement. Fintech start-up challengers, incumbent financial services providers, and non-financial services players have collaborated to create a Fintech ecosystem that is rapidly displacing traditional financial institution alliances.

2-3 Fintech Industry's Importance and Benefits

Financial technology is known as fintech. As the financial sector develops toward modernity and globalization, technology is unavoidable.

Today, the effects of Fintech can be divided into two categories: disrupting the existing financial services market and innovating new services. Disruption can be defined as providing the same service as incumbents or existing financial institutions, but with greater convenience, lower fees, better pricing, or improved features, whereas innovation in new services refers to solutions that were not previously available but have been made possible by technological advancement. Examples of innovation include Peer-to-Peer (P2P) financing and tokenized assets using Blockchain. In addition to the disruption of traditional financial markets (Lee & Shin, 2018), Fintech can ensure operating efficiency, improve (Gomber, Kauffman, Parker, & Weber, 2018) customer-centric services and lead to better transparency in the financial service sector. Loo (2018) is more optimistic about the role of Fintech in the financial service industry and believe that this revolution can positively improve the growth of the financial service industry by reducing the probability of a financial crisis. Such results can be achieved if financial service providers are allowed to compete freely (Hasan, Hassan, & Aliyu).

Fintech services adoption today has shifted upward from 16% in 2015 into 64% in 2019, with 96% of customers aware of at least one Fintech service (EY, 2019). In fact, according to data from 2016, people use between one and three apps to manage their finances. According to CNBC, Fintech investment soared up 18% in 2017 alone. The tools provided by Fintech are changing the way many consumers track, manage, and facilitate their finances. Currently, there are two billion people worldwide without bank accounts (acuant, 25, Nov 2020), Fintech provides a nimble option to participate in financial services without the need for the brick-and-mortar. And, to a large extent, that is precisely what Fintech has been developed to do - give consumers direct access to their financial lives through easy-to-use technology.

Just like other industry verticals, Fintech is also progressing in leaps and bounds. New and most advanced technologies have taken over the finance world by improving the overall financial services and are also very useful for retail investors to manage the stock market, small businesses, financial systems, and the insurance industry. The most thriving need is fulfilled by custom software development methods. Many businesses have been digitally transformed as a result of the growth of cashless payment systems and other advanced technologies such as machine learning, blockchain, automation, bank lending, and consumer lending. Fintech, or financial technology, is having a significant impact on many finance start-ups and enterprise-level businesses. Some of the benefits of Fintech innovations are: Customer Services and Revenue; Reduced Costs; Greater Convenience; Speed; Faster Rate of Approval; Robo Advisors; Efficiency; Financial, Governance, Risk Management, And Compliance Expectations; Advanced Security.

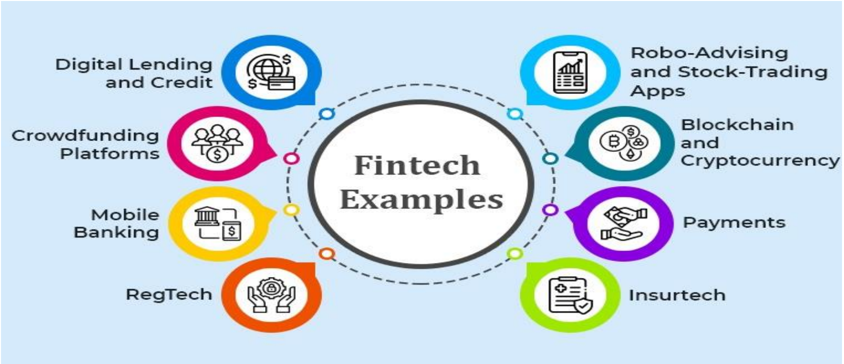
Furthermore, through Fintech, various opportunities are created. For example, financial transactions will become more automated, user-friendly, and more convenient leading to a better customer experience and wider reach to more segments of society, including even the unbanked or under-banked. The use of smartphones for mobile banking, investing, borrowing services (Sanicola, Lenny,February 13, 2017) and cryptocurrency are examples of technologies aiming to make financial services more accessible to the general public. One could simply say the list is endless and such should be the general understanding of Fintech rather than confining it to the most prevalent applications such as blockchain technology and cryptocurrencies.

Fintech’s growth is due in large part to the opportunity it provides for small players to compete on the same playing field as traditional banks and financial institutions. Because of Fintech, it's no longer about who is the biggest, but who is the quickest and most responsive to changing consumer demands. Additionally, the solutions offered by Fintech companies are no longer “one size fits all.” Instead, they offer targeted – often niche – services that fill the gap of a particular financial need, sometimes at much lower costs than those offered by traditional financial providers. As consumers become more knowledgeable and connected, the Fintech companies that thrive will be those that continue to innovate in bringing new solutions to old problems.

2-4 Fintech Tools Examples

Companies are now taking the payment industry to the next level with Fintech tools. Examples include the recent use of smartphones for mobile banking, international money transfers online, credit scoring services that leverage social media, and so on. Fintech should be understood to include all aspects of using technological advancement to deliver, facilitate, or enable financial services. Figure 1 shows some examples of Fintech tools.

Figure1: Examples of Fintech tools.



Source : https://www.tatvasoft.com/outsourcing/2022/04/examples-of-Fintech.html

2-5 Islamic Fintech Definition

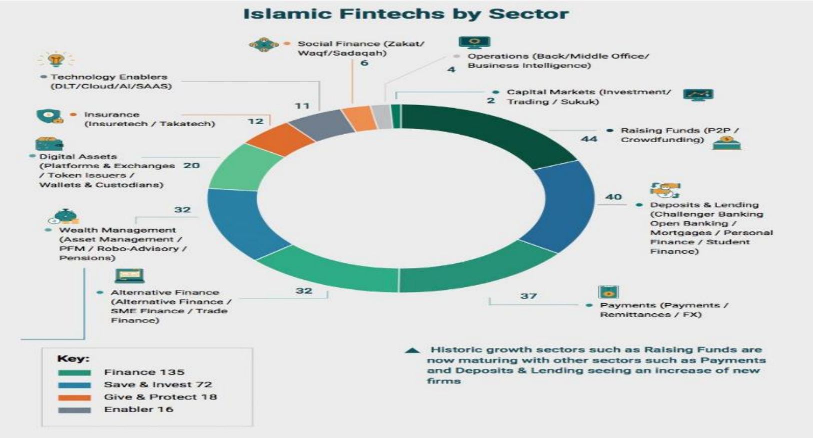
Islamic financial services go beyond traditional banking, hence fintech should be broadly interpreted in this context. The range of Islamic financial services includes Islamic banking, Takaful (Islamic insurance), capital markets, and money markets. From a transactional standpoint, the understanding of Fintech in Islamic finance encompasses all elements of a typical Islamic financial services transaction, starting with negotiation, credit scoring/checking, documentation, execution, and ending with post-transaction issues like managing defaults, addressing disputes, and enforcing contractual terms, court rulings/arbitral tribunal decisions, or settlement agreements (Umar A. Oseni and S. Nazim Ali, July 2019).

Islamic Fintech is one of the innovation in Fintech. Some reports separate Islamic Fintech as one of the business model in Fintech and some reports put Islamic Fintech as similar like any other Fintech, except that the business model of Islamic Fintech following *Shari'ah* guidelines. They are also known as *Shari'ah* -compliant Fintech, *Shari'ah* Fintech, or *Halal* Fintech which are all bring the similar meaning. Basically, Islamic Fintech carry the same jurisdiction as products in Islamic finance; which must be free from '*Maghrib*' elements; *Maysir* (gambling), *Gharar* (uncertainty) and *Riba* (interest) (Muthiah, et al., 2017).

Islamic Fintech refers to new technologies that are capable of enhancing the ways Islamic financial services are delivered. These technologies include artificial intelligence, biometrics, blockchain, distributed ledger, 5G, internet of things (IOTs), robotics, quantum computing etc. The wider accessibility to internet in recent years and the outbreak of Covid pandemic have accelerated the advancement of these 4th Industrial Revolution technologies to disrupt traditional financial services, operations, business models and customer engagement (Siti Muawanah Lajis, February 17, 2022).

Although it is notable that Islamic Fintech is still positioning themselves around the world, its starts-up are growing tremendously all around the world, particularly in Muslim-majority countries like Malaysia, Indonesia, and United Arab Emirates. Surprisingly, non-Muslim countries like US and UK also have some numbers in this profitable digital business as reported by IFNFintech, RedMoney (2018). Recently, Islamic Fintech has seen ventures from Kenya and Switzerland. This is due to the fact that consumers, particularly Muslims and those who identify as religious, are aware of financial technology and desire to use it in accordance with their beliefs.

Figure 3: Islamic-Fintechs-by Sector



Source : https://www.consultancy-me.com/illustrations/news/detail/2022-01-16-110553912-Islamic-Fintechs-by Sector.jpg

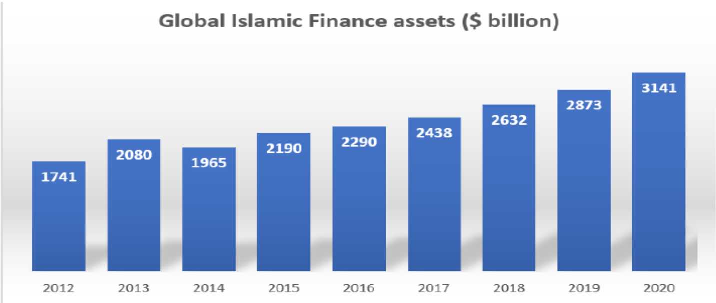
On the other hand, Todorof (2018) argued that Islamic Fintech is falling behind and losing large populations of Muslim consumers. This is due to the strong compliance to *Shari'ah* principles, which makes gaining wealth quite difficult. This is because, according to *Shari'ah*, wealth should be acquired through risk and labor. However, Todorof (2018) also stated positively that technology can improve Muslims' economies, particularly in the Fintech industry, particularly in P2P, remittance, crowfunding, and mobile wallets. This can be done by having harmonization of standards and guidelines to minimize the risk. Although Islamic Fintech is still in its infancy, its market will be robust and wide. This is because Islamic Fintech also provides transparency and flexibility, which are essential components of *Shari'ah* guidelines and *Maqasid al-Shari'ah*, in addition to efficiency in mobile banking and low transaction costs (objectives of *Shari'ah*).

Consequently, the Islamic Fintech business has grown significantly since 2010.

As of year 2020, Islamic Fintech has reached the size of USD49 billion despite the unprecedented pressures from the global COVID-19 pandemic, experiencing an annual growth of 21%, Looking ahead, the segment is set for a bright future – the Islamic Fintech market within OIC countries is expected to reach 21% CAGR to $128 billion by 2025. This development is indeed commendable when compared with the performance of conventional Fintech which is growing at 15% annually. In other words, Islamic Fintech represents a significant growth opportunity for banks and financial technology companies. Development of Islamic Fintech varies from country to country. A lot depends on the state of readiness of enabling institutions such as the legal and regulatory frameworks, innovation and creative centres as well as talents. According to DinarStandard, as of 2020 there are 93 Islamic Fintech companies in the world. They are predominantly in financing services, followed by wealth management and funding. Indonesia is leading with the most companies offering Islamic Fintech (i.e., 31 companies), followed by the US, UAE, UK, and Malaysia. Islamic Fintech operators' presence by region, SEA has 62, MENA-GCC 58, Europe 51, North America 18, South & Central Asia 17, MENA-Other 12, and Sub-Saharan Africa 7.

In terms of transaction volume effected via Islamic Fintech in 2021, DinarStandard has ranked Saudi Arabia, UAE, Malaysia, Turkey, and Kuwait as the top five OIC countries. Collectively, these five markets make up 75% of the OIC Islamic Fintech market size. The COVID-19 pandemic paved the way for Fintech to emerge and grow. The prolonged epidemic served as an effective testbed for app-based finance to win over customers and change people's way of life. Therefore, it is not unexpected that Fintech would overtake other commercial and financial transactional models post COVID-19.

Figure 2: Global Islamic Finance assets ($ billion)



Source: World Bank report 2020.

Figure 1 above shows that even after the financial crisis, Islamic finance maintained its steady growth and its assets were growing rapidly. It is projected that the Islamic finance assets will reach to 3472 Billion by 2024 (DinarStandard, State of the Global Islamic Economy Report 2020/21). The COVID-19 pandemic has given another opportunity to the Islamic financial system to show its resilience with social financial services and prove its mettle again and emerge as the true contender to the conventional financial system (Raza Rabbani, Asad Mohd, Rahiman, Atif, Zulfikar, Naseem, 2021), (Hassan, Rabbani, Abdullah, 2021), (Hassan, Rabbani, Ali, 2020). It is argued that Islamic finance has an important role to play post COVID-19 as the open social innovation of the financial system.

2-6 Fintech and Islamic Fintech Differences

Nearly all differences between Fintech and Islamic Fintech can be attributed to their similar definitions; nonetheless, the fundamental difference between the two is the requirement that *Shari'ah* (Islamic Law, specifically the branch dealing with economic transactions) rules be followed in the latter. For instance, every Fintech-based innovation is welcomed and accepted as long as it complies with *Shari'ah*'s tenets; if there is convincing evidence that it does not, it is unacceptable and impermissible. It is important to remember that, from an Islamic perspective, all commercial operations, including Fintech, are regarded as legal unless expressly forbade by a clear text.

Islamic Fintech is a relatively new concept and only a few studies have been conducted in this regard (Khan, S., Rabbani, M.R. 2020) (Baber, H. 2020). Fintech based financial services are mainly *Riba* (interest) based innovation and Islam strictly prohibits the transactions with an element of *Riba* (transaction based on the interest), *Maysir* (transaction involving high degree of speculation or gambling), or *Gharar* (high uncertainty, deception and risk) (Nawaz, S.S.; Hilmy, H.M.A.; Gunapalan, S. 2020). Islamic Fintech is different from its conventional counterpart as it is more inclusive, transparent, ethical, beneficial to both the parties, and complies with the principles of *Shari'ah*.

Both Fintech and Islamic Fintech have essentially same in meaning, but the difference lies in the *Shari'ah* compliance. Islamic finance is the only financial system in the world, the principles of which are based on ethics and morality. It is the financial system which ensures community participation, social and economic stability, promotes financial inclusion, transparent, ethical, beneficial to both the parties and supports and encourages comprehensive human development (Hassan, M.K., 2011) (Hassan, M.K.; Sanchez, B.; Yu, J.S., 2011). Islamic finance places great importance on improving quality of life, equal distribution of income, and social justice for everyone. The above characteristics make Islamic finance more suited to be aligned with the United Nations—Sustainable Development Goals (UN-SDGs) (Lawal, I.M.; Imam, U.B., 2016) (Zhuang, Y.; Chang, X.; Lee, Y, 2018).

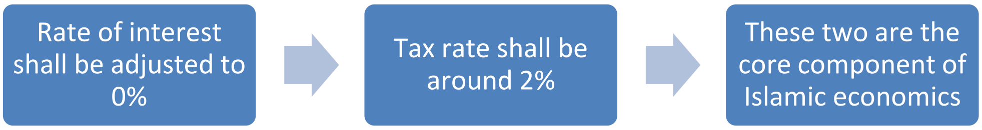
Islamic finance places great importance to the quality of life for all, social justice, and fair-trade relations (Chong, B.S.; Liu, M.H., 2009). Islamic finance prohibits the trade and financial transactions with excessive risk, speculation and uncertainly to safeguard the interest of everyone concerned (Hamidi, M.L.; J. Ekon. Malays, 2018) (Akoum, I.; Haron, J. Glob. Bus, 2011). To safeguard the interest of one and all, Islamic finance prohibits several practices such as ambiguity in contracts (*Gharar*), gambling, and contracts with high degree of uncertainty and probability (*Maysir*), fraud, and all types of interest (*Riba*) based transactions (Porzio, C.; Starita, 2013) (Khorshid, A., 2004). The traders are not allowed to trade in the goods and services which are prohibited (*Haram*) by Islam such as pork, unlawful illegal goods declared by the state, certain weapons, illegal drugs, pornography, etc. (Ariff, M., 1988) (Lewis, M.K., 2014). It is projected that the Islamic finance assets will reach to 3472Billionby 2024 (DinarStandard, 2020).

3- Results and Discussions

As previously indicated, the 2008 global financial crisis, in which Islamic finance was viewed as a potential rival to the traditional financial system, has nothing to do with the current problem (Ahmed, 2010). Our hypothesis, "H: Islamic Fintech has the potential to play a significant role in the post-COVID-19 period," is validated in a positive way. This logic is supported by various theoretical and practical considerations. Let's talk about how Islamic finance will dominate the financial world after COVID-19 in the struggle against the COVID-19's negative economic repercussions.

Islam prohibits interest (*Riba*). Islam considers money as a medium of exchange and it must not be used as a commodity. Muslim legists who contributed to the development of Islamic finance considers *Riba* as 'interest' and 'predetermined return on capital', as it literally means an increase, expansion or growth or benefit accrues to the lender in a loan transaction. Prohibition of *Riba* in Islamic finance maintains that Islamic finance is interest free financial system and is based on the principle of profit and loss sharing (Saeed, 1996). The interest free loan is the need of the hour as during the global financial crisis Nobel prize winner economist 'M. Allais' suggested to bring the interest rate to zero in order to overcome such a crisis (Mohammad, Mustafa, 2020). He proposed the idea that Islamic Fintech-based *Qardh-Al-Hasan* can reach individuals and SMEs to provide immediate relief in the short run. *Qardh-Al-Hasan* can be provided to anyone with need as it has no conditions as in the case of Zakat (Zauro, Saad, Ahmi, Mohd Hussin, 2020). As it is depicted in the Figure 1 below, zero or non interest based financial services and tax rate of around 2% (2.5% in case of Zakat) is the core competency of the Islamic economics. He proposed the idea that There are many other economists and cotemporary researchers who believe like Allais that, structural reforms are the way to go forward, and Islamic finance is naturally positioned to do so (Hassan, 2010; Poon, 2018).

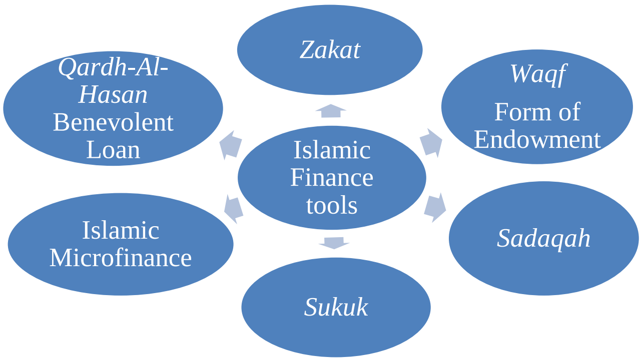
Figure 4: Core competencies of the Islamic economics.



Source: prepared by the author.

Islamic social finance has the tools and financial services suited for a situation like these. Islamic social finance tools such as *Zakat*, *Qardh-Al-hasan*, *Awqaf*, Islamic microfinance, *Takāful Ta'awuni*, etc. must be coordinated and provided with the fiscal and monetary policies of the government in terms of pro-poor initiatives to help the affected and vulnerable sections of society. Islamic social finance refers to the provision of valuable financial services to poor and vulnerable sections of society to achieve a socioeconomic objective. The instruments of Islamic social finance are depicted in Figure 5 below.

Figure 5: The instruments of Islamic social finance.



Source: prepared by the author.

Based on the content analysis, the following Islamic Social Finance Tools are helpful in combating the aftershocks of COVID-19:

Zakat: Zakat is one of the five obligations made on Muslim Ummah, who meet certain criteria to donate 2.5% of its wealth each year for the social cause. It is believed that with the payment of *Zakat*, Muslims purify their yearly earnings (Mohammad, Mustafa, 2020). *Zakat* has been made obligatory to serve a very specific purpose and avoidance of it attracts a very strong penalty. *Zakat* can play a huge role in a situation like the current pandemic where millions of people have lost their jobs and are on the verge of extreme poverty (Raza Rabbani, Asad Mohd, Rahiman, Atif, Zulfikar, Naseem, 2021), (Rabbani, Khan, Hassan, Ali, 2021). (Mohammad, Mustafa, 2020). It is the duty of a Muslim to help their Muslim brothers and sisters in the time of need and COVID-19 has badly affected the poor and daily wage labourers and the best of application of Zakat would be to help COVID-19 affected people. A recent development at global level include GiveZakat App launched in 2020 by the United Nations High Commissioner for Refugees (UNHCR). The mobile app allows doners to donate both *Zakah* and *Saddaqah,* calculate *Zakah,* select location of their *Zakah* and track their donations.

Qardh-Al-Hasan: *Qardh-Al-Hasan* is a form of benevolent loan which is provided by the lender to the borrower free of interest charge. In Islamic social finance, *Qardh-Al-Hasan* has a special mention as it is an interest free loan, without interest, markup, or share in profit in case of business loan and the borrower has flexibility regarding repayment. It is extended on a goodwill basis mainly to extend a helping hand to the poor and needy for the purpose of benevolence (kindness) (Raza Rabbani, Asad Mohd, Rahiman, Atif, Zulfikar, Naseem, 2021). The basic purpose of Islam is eradication of poverty by helping the poor and vulnerable and *Qardh-Al-Hasan* can prove to be a valuable financing tool for the vulnerable and COVID-19 affected poor (Selim, Hassan, 2020), (Selim, Hassan, 2019). *Qardh-Al-Hasan* is the Islamic social finance tool used to reinforce to social harmony, integrity, cooperation, and the ethical principle of social justice. It can be used during and post COVID-19 to help and empower the poor and needy to please Allah Almighty (Raza Rabbani, Asad Mohd, Rahiman, Atif, Zulfikar, Naseem, 2021). The proposed *Qardh-Al-Hasan* Lending (QAL) model uses artificial intelligence and its subfield machine learning and natural language processing to develop a Fintech model for bringing together a small and medium enterprise (SME) (borrower) which is going through bad financial times because of the external factors arisen after a natural disaster such as flood or a pandemic like COVID-19 or riots etc. and a person or investor who is willing to help (lender). The proposed model is compliant with Islamic principles and follows *Shari'ah* law in its implementation.
Social Sukuk: Social Sukuk is another Islamic social finance extremely important tool to fight the economic adversities of COVID-19 during and post COVID-19 (Uddin, Kabir, Kabir Hassan, Hossain, Liu, 2020). Social *Sukuk* is the new and innovative way to fund social services for redistribution of wealth and achievement of social justice (Paltrinieri, Hassan, Bahoo, Khan, 2020) (Hassan, Paltrinieri, Dreassi, Miani, Sclip, 2018). Social *Sukuk* brings the social sector into the discourse of Islamic finance, which has largely been ignored compared to the private, business, and government sectors. Islamic Development Bank (IsDB) has issued a COVID-19 related Social Sukuk in the market showing the contribution of banks in the capital market to help COVID-19 affected people. The intention of issuing the social Sukuk is to minimize the economic damages caused due to COVID-19 and build resilience against future shocks. The IsDB *Sukuk* is serving as the starting point in the Islamic capital market as other Islamic financial institutions follow suit in the coming months and these Sukuk serve as a boost to the struggling industries due to COVID-19 (Raza Rabbani, Asad Mohd, Rahiman, Atif, Zulfikar, Naseem, 2021), (Hassan, Rabbani, Abdullah, 2021).
Islamic Microfinance: Islamic microfinance is a relatively new market in the Islamic finance market. Islamic microfinance is like the conventional microfinance, providing financial assistance to the people excluded from the traditional financial system with only difference being the *Shari'ah* compliance of the financial services (Ashraf, Hassan, 2014) (Adeyemi, Hassan, UK, 2014). One of the objectives of microfinance as a concept itself is to provide valuable financial services to people and small and medium enterprises (SMEs) excluded from the mainstream financial system (Sun, Rabbani, Ahmad, Sial, Cheng, Zia-Ud-Din, Fu, 2020), (Jaziri, Alanazi, 2020). Microfinance institutions, Islamic banks, governments, and

other Islamic financial institutions can play a significant role and make a substantial difference by making small amounts of collateral-free loans available to the poor and COVID-19 affected SMEs.

Islamic finance has the potential to overcome any challenge posed by the economic disruption, such as financial crises and COVID-19 individual and corporate levels (Haider et. al., 2020; Kayed and Hasan, 2011; Hassan and Kayed, 2009). COVID-19 has ominously slowed down the core of the Islamic economies including Saudi Arabia, Iran, and Malaysia. Social instruments under Islamic finance, such as *Qardh-Al-Hasan*, *Zakat*, Social *Sukuk* and *Waqf* are viable options to be used by the Islamic banks and IBs during and after COVID-19 to help the affected individuals, SMEs, and corporations by providing direct cash transfer and giving access to the health care and education facilities (Haider et. al., 2020). Islamic finance is based on the principle of social justice and equitable distribution of income and these two characteristics make it as the suitable path under crisis (Smolo & Mirakhor, 2010).

The role of Islamic finance in post COVID-19 era can be explained in the following points: **1.** Use of Fintech for *Waqf* crowdfunding, *Zakat* etc. Fintech has already changed our day to day lives with its disruptive technological innovations in the field of finance (Rabbani, 2020). Our daily lives are now being knotted to the technological innovations where financial services are delivered through the artificial intelligence-based technologies (Haider, 2020) and, robots are the financial advisors (Khan and Rabbani, 2020a; Khan and Rabbani, 2020b). Most of the financial services are now tied to technology for its delivery. The use of Blockchain and artificial intelligence has already revolutionized the finance world (Hasan and Hassan, 2020). The use of Fintech in delivering Islamic financial services such as *Waqf*, Crowdfunding, and *Zakat* etc. will make it more transparent, efficient, innovative, attractive, and user friendly to deliver the financial services to the customers (Todorof, 2018). **2.** Increased role of Islamic Microfinance institutions: The concept of Microfinance comes from a Bangladeshi economist, Dr. Mohammad Yunus, founder of Grameen Bank Bangladesh and Nobel peace Prize winner in 2006. Dr. Yunus describes microfinancing as, “the mode of finance for providing money to the poor to assist them and become self-employed and independent” (Tevanti, 2013). Many researches have proved that poverty alleviation can be achieved by providing assistance to the last man standing in the queue or by fulfilling the social needs: extending credit to the more potential recipient, poorer in the far reaching, hard to reach geographical location (Amran et. al., 2014; Hassan and Ashraf, 2010; Choudhury, 2014). Islamic Microfinance Institutions (IMFIs) are considered as a successful tool in financing the interest free loan to the poor in the form of *Qardh-Al-Hasan* (Amran et. al., 2014). As the number of poor around the world is expected to increase post COVID-19, IMFIs are going to play the huge role in healing the damaged caused by the COVID-19 on the poor and vulnerable. The financing activities performed by the IMIs do not involve anything prohibited under *Shari'ah* law like, *Riba*, *Maysir*, or *Gharar*. Moreover, visualizing the post COVID-19 scenario, it is a more practical and appropriate financing method as the loan is given without interest, no guarantor required. **3.** Education, health and food: Some of the more important areas that need immediate attention during and post COVID-19 are education, health, and food security to the poor and vulnerable section of society (Deai, 2020). Islamic considers these three as fundamental rights of human beings besides the other rights, such as right to justice, right to respect, and right to freedom (Hassan, 2003). Islamic finance is positioned to play a decisive role in providing food, health, and education to the society. For Muslims, Holy *Qur'an* being the god's own word and is the principal and most trustworthy source of information as Qur'an powerfully supports and encourages the ultimate human rights (Hassan, 2003). **4.** Social responsibility and solidarity: The accelerating social and economic problem posed by the globalisation and growth of technologies has elevated new questions regarding the corporate social responsibility, ethical, and moral compass where business is being done. Corporate Social Responsibility (CSR) has emerged and developed into a field of study and a lot of western scholars' have given theoretical groundings for the CRS initiative. The concept and theory of Islamic finance related to social responsibility has gained popularity and acceptance among the western scholars and policy makers (Hassan & Harahap, 2010). Among the most important objective of Islamic finance is the creation of social justice, responsibility, solidarity, and the purging of corruption in the business transaction (Elmelki, 2009).

Islamic Fintech is focused on providing financial products, services, and investments while adhering to *Shari'ah* in the most cutting-edge manner possible at a price that is both reasonable and smooth. Islamic Fintech has developed prominence in recent years, and COVID-19 has given an additional motivation to expand its reach to the millions of affected Muslims and non-Muslim customers. With roughly more than 1500 Islamic financial institutions operating across the globe in more than 80 countries, the prospect for Islamic Fintech looks promising (World Bank., 2020). (Atif, Hassan, Rabbani, Khan, 2021) established an Islamic Fintech model called "IslamicFintech4SD" (Islamic Fintech for Sustainable Development) with the goal of forming an alliance between Islamic financial institutions, multinational corporations, start-ups, and new disruptive crowdfunding and P2P lending institutions, all while adhering to *Shari'ah* compliance. They created a five-stage Fintech model for long-term development. First being the simplified account opening and the electronic Know Your Customer (eKYC) and Anti-Money Laundering (AML) process along with digital ID, second being the use digital payments system, third the introduction of new innovative Artificial Intelligence **(**AI) and Blockchain-based Islamic financial services, fourth the use of first three to deliver the government services to achieve financial inclusion, and finally the fifth and last pillar to ensure the *Shari'ah* compliance of all four pillars of sustainable development in Islamic finance.

A robo-advisory service involves using digital platform to profile the customer risk and reward appetite, select the right *Shari'ah* - Compliant equity to trade in. It is one of the simple and high impact Fintech types for individuals who do not have the expertise of online equity trading. As per statistics from statista.com, assets under Robo Advisors segment will reach USD 1.4 billion by end of 2021 and reach USD 2.8 billion by 2025 with a compound annual growth rate (CAGR) of 20 %. This area has a very good acceptance from the Islamic consumers, as such conventional Robo Advisors have also started offering such product. Notably, the biggest valued Islamic Fintech to date is Wahed Invest - a Robo advisor Fintech platform operating across three jurisdictions US, UK and Malaysia. In the Arab world, Sarwa in the UAE, a conventional Robo advisor platform started offering *Shari'ah* -compliant products recently.

4- Limitations of Research

As Fintech itself is relatively new, only a few studies in Islamic Fintech were conducted recently. The study identifies its limitations as the Islamic Fintech is still at its growth stage unlike its conventional counterpart which has taken the innovation to another level. We have followed strict ethical principles while conducting the research study. The main limitations will be faced during the research due to the lack of literature evidence on this issue has motivated us to conduct a systematic literature review. We have reduced the sample size due to the lack of time and cost. The lack of efficient previous studies will also induce research limitations. It is also observed that topic has both side (Fintech and Islamic Fintech post COVID-19) requires further improvement and to some extent maturity in research work.

5- Conclusion and Recommendation

This study supports the trend of current research on Islamic financial concepts to apply at different stages of the crisis. It is evident that neither the socialist nor the capitalist strategies have been able to end the crisis. As a result, we can sum up our research by making the following suggestions:

- Concepts like as *Zakat* and *Sadaqah* can help to sustain economically marginalized communities by generating a flow of money to stimulate consumption.
- The concept of ijarah is one of the most significant factors applicable to all stages of the pandemic.
- The *Mudharabah* and *Murabahah* encourage start-ups and small and medium-sized businesses to find work or launch a business. This encouragement boosts an individual's morale and fosters employment, resulting in increased productivity.
- Adherence to *Shari'ah* law and various investments in various infrastructures such as real estate, machinery, and other actives may contribute to economic growth.
- The Islamic financial system promotes societal development by distributing and sharing a portion of excess wealth through the *Waqf* and *Sukuk*.
- *Qardh-Al-Hasan*, *Zakat*, Social *Sukuk* and *Waqf* are viable options to be used by the Islamic banks and IBs during and after COVID-19 to help the affected individuals, SMEs, and corporations by providing direct cash transfer and giving access to the health care and education facilities
- Disruptive innovation, such as Islamic Fintech, provides an equal playing field for Islamic finance to compete and grow. We are expected to see an increase in digital Fintech based operation because of the COVID-19 issue.
- The role of Islamic Fintech and adoption of Fintech by the Islamic finance customers will be significant in recovery post COVID-19.

One can conclude that the COVID-19 provides an opportunity for Islamic Fintech to develop and provide a financial alternative system. Furthermore, Islamic Fintech has a strong potential for inclusion, stability, and sustainability. And also, to serve underserved people through financial inclusion and poverty reduction. Microfinance, *Zakat*, *Sadaqah*, *Waqf*, and *Qardh-Al-Hasan* are examples of Islamic financial services supplied by Islamic financial organizations that can be efficiently exploited in the fight against the COVID-19's economic difficulties.

References

Books and journals:

1. Adeyemi, A.A.; Hassan, M.K. Islamic microfinancing. In Handbook on Islam and Economic Life; Edward Elgar Publishing: Cheltenham, UK, 2014.
2. Adnan, N.I.M.; Kashim, M.I.A.M.; Hamat, Z.; Adnan, H.M.; Adnan, N.I.M.; Sham, F.M. The potential for implementing microfinancing from the zakat fund in malaysia. Humanit. Soc. Sci. Rev. 2019, 7, 524–548.
3. Akoum I, Haron A, "Islamic banking: Towards a Model of Corporate Governance.", Journal of Global Business Advertising, 2011, pp.317–335.
4. Ahmed, H.; Asutay, M.; Wilson, R. Reflecting on Islamic banking and financial crisis: Risks, reputation and stability. In Islamic Banking and Financial Crisis: Reputation, Stability and Risks; Edinburgh University Press: Edinburgh, UK; Durham University: Durham, UK, 2013; pp. 1–20.
5. Ahmad, S.; Rahim Abdul Rahman, A. The efficiency of Islamic and conventional commercial banks in Malaysia. Int. J. Islam. Middle East. Financ. Manag. 2012, 5, 241–263.
6. Alam, M.; Rabbani, M.R.; Tausif, M.R.; Abey, J. Banks' Performance and Economic Growth in India: A Panel Cointegration Analysis. Economies 2021, 9, 38.
7. Alhomaidi, A.; Hassan, M.K.; Zirek, D.; Alhassan, A. Does an Islamic label cause stock price comovements and commonality in liquidity? Appl. Econ. 2018, 50, 1–14.
8. Ariff M, "Islamic Banking", Asian-Pacific Economic Literature, 2005, pp.48–64.
9. Arner D.W., "FinTech: Evolution and Regulation", Asian Institute of International Financial Law University of Hong Kong.
10. Ashraf, A.; Hassan, M.K.; III, W.J.H. Performance of microfinance institutions in Muslim countries. Humanomics 2014, 30, 162–182.
11. Atif, M.; Hassan, M.K.; Rabbani, M.R.; Khan, S. 6 Islamic FinTech. In COVID-19 and Islamic Social Finance: 91; Routledge: London, UK, 2021.
12. Azrak, T.; Saiti, B.; Kutan, A.; Engku Ali, E.R.A. Does information disclosure reduce stock price volatility? A comparison of Islamic and conventional banks in Gulf countries. Int. J. Emerg. Mark. 2020.
13. Baber H, "Fintech, Crowdfunding and Customer Retention in Islamic Banks.", Vision: The Journal of Business Perspective, Vol 24, 2020, pp.260–268.
14. Belkhir, M.; Grira, J.; Hassan, M.K.; Soumaré, I. Islamic banks and political risk: International evidence. Q. Rev. Econ. Financ. 2019, 74, 39–55.
15. Chong, B.S., Liu, M.H., "Islamic banking: Interest-free or interest-based?", Pacific-Basin Finance Journal, 2009, Vol 17, pp.125–144.
16. DinarStandard. State of the Global Islamic Economy Report 2020/21; Thriving in Uncertainty", 2020.
17. Dinarstandard, "Islamic Fintech Report 2018: Current Landscape and Path Forward", Global Fintech Framework, 2018, p9.
18. Firmansyah E.A, Anwar M, "Islamic Financial Technology (Fintech): Its Challenges and Prospect", Advances in Social Science, Education and Humanities Research (ASSEHR), volume 216, 2018.
19. Global Fintech Adoption Index, EY, 2019.
20. Gundogdu, A.S. An Inquiry into Islamic Finance from the Perspective of Sustainable Development Goals. Eur. J. Sustain. Dev. 2018, 7, 381–390.
21. Hamidi, M.L., Worthington, A.C., "Islamic social banking: The way forward /perbankan sosial Islam: Langkah kehadapan?", Journal Ekonomi Malaysia, Vol 52, 2018, pp. 195–207.
22. Hanim Tafri, F.; Abdul Rahman, R.; Omar, N. Empirical evidence on the risk management tools practised in Islamic and conventional banks. Qual. Res. Financ. Mark. 2011, 3, 86–104.
23. Hassan, M.K.; Paltrinieri, A.; Dreassi, A.; Miani, S.; Sclip, A. The determinants of co-movement dynamics between sukuk and conventional bonds. Q. Rev. Econ. Financ. 2018, 68, 73–84.
24. Hassan, M.K., "The Global Financial Crisis and Islamic Finance.", SSRN Electronic Journal, 2011, Vol 53, pp.551–564.
25. Hassan M.K, Rabbani M.R, Mohd.Ali M.A, "Challenges for the Islamic Finance and banking in post COVID era and the role of Fintech", Journal of Economic Cooperation and Development, Vol 41, 2020, pp.93-116.
26. Hassan, M.K., Sanchez, B., Yu, J.S., "Financial development and economic growth: New evidence from panel data", The Quarterly Review of Economics and Finance, 2011, Vol 51, pp. 88–104.
27. Hassan, M.K.; Rabbani, M.R.; Abdullah, Y. Socioeconomic Impact of COVID-19 in MENA region and the

Role of Islamic Finance. Int. J. Islam. Econ. Financ. 2021, 4, 51–78.
28. Hassan, M.K.; Rabbani, M.R.; Ali, M.A. Challenges for the Islamic Finance and banking in post COVID era and the role of Fintech. J. Econ. Coop. Dev. 2020, 43, 93–116.
29. Hassan, M.K.; Shaikh, S.A.; Kayhan, S. Introduction to Islamic Banking and Finance; World Scientific: Singapore, 2020.
30. Hassan, M.K.; Rabbani, M.R.; Atif, M.; Shaikh, S. Shariah Indices and Implied Volatilities of S&P, Oil and Gold. Eurasian Econ. Rev. Spec. Issue 2021, in press.
31. Hasan R, Hassan K, Aliyu S, "Fintech and Islamic Finance: Literature Review and Research Agenda", IJIEF: International Journal of Islamic Economics and Finance, Vol 1, 2020, pp.75-94.
32. Ibrahim, M.H.; Shahid Ebrahim, M. Islamic Banking and Finance: Beyond Comparison and Investment Opportunities. Pac. Basin Financ. J. 2018, 52, 1–4.
33. Jaziri, R.; Alanazi, A.S. Islamic Equity-Based Crowdfunding Regulatory Model: A Legal Analysis in Saudi Arabia. Eur. J. Soc. Sci. 2020, 48, 90–102.
34. Julia Kagan, "Financial Technology – Fintech", Investopedia: Financial technology and Automated Investing, Updated August 28, 2020, Reviewed by Eric Estevez.
35. Khan, S., Rabbani, M.R., "Chatbot as Islamic Finance Expert (CaIFE): When finance meets Artificial Intelligence", In Proceedings of the 2020 International Conference on Computational Linguistics and Natural Language Processing (CLNLP 2020), Seoul, Korea,17–19 July 2020, pp.1–5.
36. Khorshid, A., "Islamic Insurance: A Modern Approach to Islamic Banking", Routledge Curzon Taylor & Francis Group: Abingdon, UK, 2004.
37. Lai, T. L., Liao, S.-W., Wong, S. P. S.; Xu, H., « Statistical models and stochastic optimization in financial technology and investment science", 2020, Annals of Mathematical Sciences and Applications, Volume 5, Number 2, pp. 317–345, 2020.
38. Lawal, I.M., Imam, U.B.," Islamic Finance: A Tool for Realizing Sustainable Development Goals (SDG) In Nigeria.", International Journal of Innovative Research and Advanced Studies, 2016, Vol 3, pp.10–17.
39. Lewis, M.K., "Principles of Islamic corporate governance", In Handbook on Islam and Economic Life, Edward Elgar Publishing Ltd.: Cheltenham, UK, University of South Australia Business School: Adelaide, SA, Australia, 2014, pp.243–267.
40. Massaro, M., Secinaro, S., Dal Mas, F., Brescia, V., Calandra, D., "Industry 4.0 And Circular Economy: An Exploratory Analysis of Academic and Practitioners' Perspectives."; Business Strategy and the Environment, 2021, Vol 30, 1213–1231.
41. Mkadmi, J.E.; Halioui, K. Impact of Islamic and conventional corporate governance mechanisms on financial performance of Islamic Banks: Evidence from Malaysia. In Ethical and Social Perspectives on Global Business Interaction in Emerging Markets; IGI Global; University of Gafsa: Gafsa, Tunisia, 2016; pp. 186–203. [Google Scholar]
42. Merdad, H.; Hassan, M.K. Islamic Mutual Funds' Performance in Saudi Arabia. In Contemporary Islamic Finance: Innovations, Applications, and Best Practices; 2013.
43. Mohammad, K.S.; Mustafa, Y. An Artificial Intelligence and NLP based Islamic FinTech Model Combining Zakat and *Qardh-Al-Hasan* for Countering the Adverse Impact of COVID 19 on SMEs and Individuals. Int. J. Econ. Bus. Adm. 2020, 8, 351–364.
44. Moh'd Ali, M.A.; Basahr, A.; Rabbani, M.R.; Abdulla, Y. Transforming Business Decision Making with Internet of Things (IoT) and Machine Learning (ML). In Proceedings of the 2020 International Conference on Decision Aid Sciences and Application (DASA), Online, 8–9 November 2020; IEEE: New York, NY, USA, 2020; pp. 674–679.
45. Mooney, C.W., Jr. Fintech and secured transactions systems of the future. Law Contemp. Probl. 2018, 81, 1–20.
46. Navaretti G.B, Calzolari G and Pozzolo A.F, "Fintech and Banks: Friends or Foes?", European Economy: Banks, Regulation and the Real Sector, Vol 3, 2017.
47. Nawaz, S.S., Hilmy, H.M.A., Gunapalan, S., "Islamic banking customers' intention to use mobile banking services: A Sri Lankan study", Journal of Advanced Research of Dynamic Control System, 2020, Vol 12, pp.1610–1626.
48. Neuendorf, K.A., Kumar, A., "Content Analysis.", 2015.
49. Noor, M.A.N.M.; Ahmad, N.H.B. The Determinants of Islamic Banks' Efficiency Changes: Empirical

Evidence from the World Banking Sectors. Glob. Bus. Rev. 2012, 13, 179–200.
50. Paltrinieri, A.; Hassan, M.K.; Bahoo, S.; Khan, A. A bibliometric review of sukuk literature. Int. Rev. Econ. Financ. 2020, 5, 7.
51. Porzio, C., Starita, M.G., “Islamic banking contracts and the risk profile of Islamic banks.”, In Islamic Finance in Europe: Towards a Plural Financial System, Edward Elgar Publishing: Cheltenham, UK, Parthenope University of Napoli: Napoli, Italy, 2013, pp.79–95.
52. Ozdincer, B.; Yucef, A. Stakeholder Returns of Islamic Banks Versus Conventional Banks. Emerg. Mark. Financ. Trade 2018, 54, 3330–3350.
53. Rabbani M.R., Abu Bashar H.R, Nawaz N, Sitara K, Mahmood A.M.A, Alam M.S, “Exploring the Role of Islamic Fintech in Combating the Aftershocks of COVID-19: The Open Social Innovation of the Islamic Financial System.”, Journal of Open Innovation: Technology, Market, and Complexity , Vol 7. p136, 2021.
54. Rabbani, M.R.; Khan, S.; Hassan, M.K.; Ali, M. 7 Artificial intelligence and Natural language processing (NLP) based FinTech model of Zakat for poverty alleviation and sustainable development for Muslims in India. In ICOVID-19 and Islamic Social Finance: 104; Routledge: London, UK, 2021.
55. Rabbani, M.R. COVID-19 and its impact on supply chain financing and the role of Islamic Fintech: Evidence from GCC countries. Int. J. Agil. Syst. Manag. 2021, in press.
56. Raza Rabbani, M.; Asad Mohd, A.M.; Rahiman, H.U.; Atif, M.; Zulfikar, Z.; Naseem, Y. The Response of Islamic Financial Service to the COVID-19 Pandemic: The Open Social Innovation of the Financial System. J. Open Innov. Technol. Mark. Complex. 2021, 7, 85.
57. Rudegeair P, Scism L., "The Surprising Way Startups are Disrupting the Life-Insurance Business", Wall Street Journal, 2019.
58. Sanicola, L., "What Is Fintech?", Huffington Post, 2017.
59. Selim, M.; Hassan, M.K. Qard-al-Hasan-based monetary policy and the role of the central bank as the lender of last resort. J. Islam. Account. Bus. Res. 2020, 11, 326–345.
60. Selim, M.; Hassan, M.K. Interest-free monetary policy and its impact on inflation and unemployment rates. ISRA Int. J. Islam. Financ. 2019, 11, 46–61.
61. Shahnawaz, KHAN.; Kabir HASSAN, M.; Mustafa Raza, RABBANI.; Mohammad, ATIF., An Artificial Intelligence-Based Islamic Fintech Model on Qardh-Al-Hasan For Covid 19 Affected SMEs.
62. Sun, H.; Rabbani, M.R.; Ahmad, N.; Sial, M.S.; Cheng, G.; Zia-Ud-Din, M.; Fu, Q. CSR, Co-Creation and Green Consumer Loyalty: Are Green Banking Initiatives Important? A Moderated Mediation Approach from an Emerging Economy. Sustainability 2020, 12, 10688.
63. Schüffel, P., “Taming the Beast: A Scientific Definition of Fintech”, Journal of Innovation Management, Vol 4, 2016, pp. 32-54.
64. Scott, R.A., Kosslyn, S.M., “Emerging Trends in the Social and Behavioral Sciences: An Interdisciplinary, Searchable, and Linkable Resource”, Emerging Trends: Culture and Emotion, 2015.
65. Schwab, K., “The Fourth Industrial Revolution: What It Means and How to Respond.”, World Economic Forum, 2016.
66. Siti M.L, “Islamic Fintech: Trends and Implications to Islamic Finance Professionals”, Phd in Islamic Finance, CPIF. February 17, 2022.
67. Uddin, M.H.; Kabir, S.H.; Kabir Hassan, M.; Hossain, M.S.; Liu, J. Why do sukuks (Islamic bonds) need a different pricing model? Int. J. Financ. Econ. 2020.
68. Wakil, N.A.B.A.; Saleh, M. The Role of Islamic Finance Institution to Enhance Halal Industry: Issues and Challenges. In Proceedings of the First International Conference On Islamic Development Studies 2019, ICIDS 2019, Bandar Lampung, Indonesia, 10 September 2019.
69. Wilhelm A.,"Insurtech Startups are Leveraging Rapid Growth to Raise Big Money", Techcrunch, 2021.
70. World Bank. Leveraging Islamic Fintech to Improve Financial Inclusion; 2020.