*Journal of Islamic Finance*, Vol. 11 No. 1 (2022) 81-93
IIUM Institute of Islamic Banking and Finance
ISSN 2289-2117 (O) / 2289-2109 (P)

# COVID-19 on Performance of Islamic Banks in Fintech and Digitalization Era

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**Abstract**

This study attempts to provide insight on risk and opportunities for Islamic banks arising from COVID-19 pandemic by using document analysis approach. The COVID-19 pandemic has increased banking risk. The paper emphasizes the impact of the crisis on credit risk as historically thought as the most significant risk driver. Increased credit risk in Islamic financial institutions (IFIs) is due to broad-based deterioration of economic conditions affecting multiple sectors, resulting in a general increase of non-performing financing (NPF) balances and charge-offs. Further, it was found that banks have suffered more not only relative to other sectors, but also in comparison with previous crises. In addition, some authors observe that banks that had entered the crisis with the highest level of credit risk, measured in terms of credit default swap (CDS) spreads rise, were most hit. On the other hand, the pandemic has proved beyond doubt the value of digital services that minimize or eliminate direct human contact. The power of digitalization can facilitate outreach to even the most vulnerable population. Islamic financial institutions may seize this opportunity to expedite the digitalization of their operations either using their own resource or by joint venturing with technology companies.

*Keywords: Islamic banking, COVID-19, credit risk, fintech*



## 1. Introduction

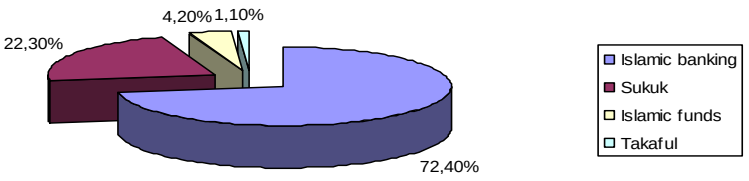
The aim of the study is to analyze the risk faced by Islamic banks due to COVID-19 pandemic with a special attention on credit risk, and at the same time to identify opportunities in fintech technologies for to overcome them. It reviews the Islamic banking landscape, fintech implementations, up-to-date literature and dives into analysis based on the literature review findings and financial data from some of the largest Islamic banks (Maybank Group, Malaysia; Al Baraka banking Group, Bahrain). It stresses the importance of incorporation of fintech-based solutions (blockchain, artificial intelligence, and big data analytics) not only for the Islamic banks to overcome the COVID-19 negative impact, but also for to improve credit risk management and reach the unbanked population and unserved companies.

### *1.1. Islamic banking landscape review*

The total worth of the Islamic financial services industry (IFSI) across its three main segments depicted in Figure 1 (banking, capital markets: *sukuk* and Islamic funds, and *takaful*) has been historically estimated at USD 2.44 trillion in 2019 (IFSB, 2020), with 72.40% comprised by Islamic banking assets.


*Article history*
Received: 30 April 2022
Accepted: 29 May 2022

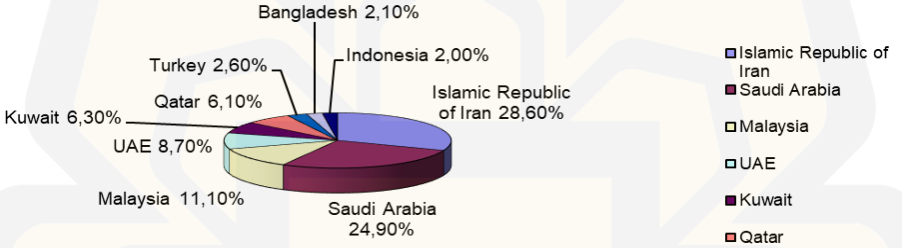
Figure 1: Segmental Composition of the Global IFSI 2019




Source: IFSB (2020)

92.40% of the global banking assets are situated in nine countries: Islamic Republic of Iran, Kingdom of Saudi Arabia (KSA), Malaysia, United Arab Emirates (UAE), Kuwait, Qatar, Turkey, Bangladesh and Indonesia presented with their percentage share in Figure 2.

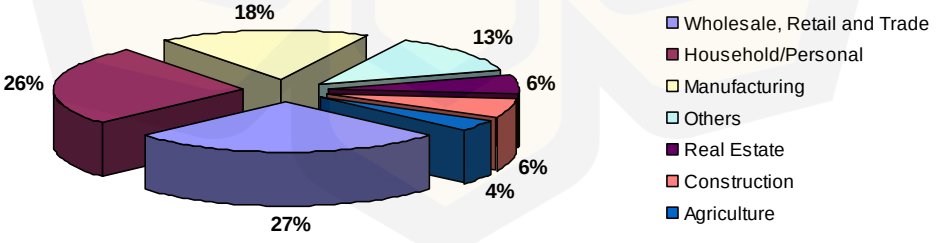
Figure 2: Share of Global Islamic Banking Assets % (3Q19)




Source: IFSB (2020)

As per Islamic Financial Services Board (IFSB) Stability Report 2020 wholesale, retail and trade, and household sectors received 27% and 26% of the total financing in 2019; followed by manufacturing 18%, real estate and construction each 6% and agriculture 4% presented as weighted average in Figure 3. The sectoral composition of financing varies greatly between countries and regions, and it is given for illustrative purpose only. For instance, Malaysian household sector received 60.9%, Saudi Arabian household sector 43.2% and 53.1% in UAE. Further, real estate in Indonesia received 27.8%, and manufacturing sector in Bangladesh received 39.4% (IFSB, 2020).

Figure 3: Financing Exposures of Islamic banks to the Real Sector




Source: IFSB (2020)

As per IFSB (2020), Islamic financial institutions, due to their high exposure to the real economy (87% of total financing for 3Q 2019, presented in Figure 3) are expected to record declined revenue, high pressure on earnings and lower year-over-year growth in 2020 especially as focus will be on preserving asset quality at the expense of business growth. Due to the increased risk from COVID-19 pandemic, it is expected a decline in profitability of Islamic banks, which could be further intensified due to provisions and write downs. Increased pressure on liquidity could also be expected due to the mandatory postponement of repayment of existing financing extended to small and medium enterprises (SMEs) and households in many jurisdictions with Islamic banking activity.

In light of the pandemic crisis to support liquidity, Saudi Arabian Monetary Authority in Arabian Business (2018) is providing guarantees on SME, where Bank Negara Malaysia is allowing Islamic banks to operate

below the minimum liquidity coverage ratio (LCR) and net stable funding ratio (NSFR). The following Table 1 reports actions taken by central banks in the selected countries (depicted in Figure 2) with significant market share of Islamic banking in response to the pandemic crisis. As shown from the Table the authorities in all nine countries are providing relief package for instant relief on borrowers: households and businesses. Except the central bank in Bangladesh, all other authorities provided policy rate cut. In addition, except the central bank in Kuwait, all other central banks included measure on supporting or increasing lending to the private sector. This measure is extremely important for Malaysia, where household sector received 60.9% of the total financing in 2019. Malaysian central bank (Bank Negara Malaysia) and Iranian central bank have introduced only four of the ten measures provided in Table 1. Further, only two central banks implemented foreign exchange policy (KSA; and Indonesia).

Table 1: Central Banks and Supervisory Authorities on COVID-19 Measures

| Measure | Iran | KSA | Malaysia | UAE | Kuwait | Qatar | Turkey | Bangladesh | Indonesia |
|---|---|---|---|---|---|---|---|---|---|
| Policy rate cut | √ | √ | √ | √ | √ | √ | √ | | √ |
| Financing & refinancing facility | | | √ | √ | √ | √ | √ | √ | |
| Deferment and restructuring of loans | √ | √ | | √ | | √ | √ | √ | |
| Promote digital payments | | √ | | | √ | | | | √ |
| Foreign exchange policy | | √ | | | | | | | √ |
| Banking services ease | | √ | | | √ | | | √ | √ |
| Increasing/supporting lending to the private sector | √ | √ | √ | √ | | √ | √ | √ | √ |
| Facilitate export-import sectors | | | | | √ | | √ | √ | √ |
| Relief package for households and businesses (SME, corporate etc.) | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| Islamic Banking related measures | | | | | √ | | | √ | |

Source: IRTI 2020 Excerpt

### *1.2 Review of up-to-date fintech implementations*

Fintech could change traditional banking business models and operations through lowering barriers of entry to the financial services market and transforming the role of data as a key commodity. Further, the young global Muslim population can be seen as a key driver for Islamic fintech. Another key area of opportunity is the role of the multibillion-dollar Islamic social finance pools from charity, and endowments (World Bank, 2020).

Some of the fintech initiatives of the member countries of Organization of Islamic Cooperation (OIC) are presented in Table 2. Around 33% of startups fintech companies are based in Indonesia, which has the world's largest Muslim population, followed by UAE and Malaysia (DinarStandard, 2018).

Table 2: Selected OIC Initiatives

| Country | Organization | Description |
|---|---|---|
| UAE | Dubai International Finance Center | Dubai International Financial Centre (DIFC), a leading international financial hub announced a $100 million FinTech-focused fund to invest in Fintech start-ups from incubation through to growth stage. |
| Malaysia | Malaysia Digital Economy Corporation | MDEC is a government-owned entity responsible for developing Malaysia's digital business ecosystem. The organization also actively supports halal economy businesses by providing shariah certification and providing a network and link to venture capital investors. |
| Bahrain | Bahrain Fintech Bay | Bahrain's Fintech Bay is a dedicated co-working space dedicated to attract and develop Fintech and particularly works with Islamic Fintechs in partnership with leading Islamic finance institutions that operate in Bahrain and across the GCC. |
| Indonesia | Financial Services Authority (OJK) | While startups are driving Islamic fintech growth in Indonesia Government agencies are realizing their impact and starting to facilitate. The Financial Services Authority (OJK), has established a regulatory framework for P2P lending platforms. |
| Other | UK, Kazakhstan, IDB, Saudi Arabia | UK regulators have been supportive of its domestic Islamic Fintech Panel and startup ecosystem. The launch of Astana International Financial Center is also seeking to develop Islamic finance and fintech. Similarly, Saudi Arabian Monetary Authority has recently launched FintechSaudi. Finally, the multi-lateral Islamic Development Bank has launched a Fintech Challenge supporting Islamic Fintech startups |

Source: DinarStandard (2018)

Table 3 presented core fintech technologies that deliver key end-customer financial services and back-office operational support/efficiencies along with examples of service providers.

Table 3: Core Fintech Technologies

| Fintech Technologies | Fintech Challenger Examples | Incumbent Examples |
|---|---|---|
| Artificial Intelligence | Lemonade, a new York-based insurance startup, has automated the claims process, removing the cumbersome task of filling claim forms, by making a transaction bot takeover all the claim cycles | Sun Life created a virtual assitant, Elia, to send reminders to users regarding their insurance or pension plans |
| Big Data Analytics | Hexanika is a data management and reporting solution for financial institutions. Their software uses an algorithm that can source and ingest data in multiple formats to normalize datasets. It aims to cut regulatory costs and avoid non-compliance. | Standard Chartered has developed its big data analytics, resulting in an enhanced user experience |

| | | |
|---|---|---|
| Quantum Computing | QuintessenceLabs has created a set of data technology products and solutions based on quantum computing technology to enable secure data transfer and storage. | Deutsche Bank Securities partnered with D-Wave Systems to develop "Quantum for Quants" |
| Mobile Payment | N26 is a licensed startup bank based in Germany that has gained 2.3 million retail customers in 4 years. Products include Google Pay and connected debit card by Mastercard. | BTPN Bank in Indonesia has issued "Jenius" to open accounts and make deposits and payments. |
| Open Banking | Enfuce is developing a connectivity layer that enables third parties to communicate with banks for data as well as payments. | Customers of Lloyds Bank, Halifax and Bank of Scotland apps have the ability to view their bank accounts from these banks through an app. |
| P2P Finance | ThinCats Australia aims to link investors to debtors throughout the country and offers financing between 2 and 3 years, with no concealed fees or repayment charges. | Barclays acquired RainFin in South Africa to tap into P2P financing. |
| Distributed Ledger (Blockchain) | Symbiont is a blockchain company developing products in smart contracts and distributed ledgers for capital markets. | Barclays and Citi work with IBM to create LedgerConnect a proof of concept for distributed ledger technology. |
| Cloud Adpotion | Stripe valued at a massive USD 20 billion, enables small businesses to recognize payments online without payment fraud. | ICICI Bank in India uses Microsoft Azure to work with some applications without having physical servers on its premises. |
| Cybersecurity | ComplyAdvantage supports financial institutions to comply with current regulations in Anti-Money Laundering (AML), counter-terrorism financing (CFT), corruption, and bribery. | Monetary Authority of Singapore has offered USD 21.88 million in funds to help local financial institutions improve cybersecurity operations. |

Source: World Bank (2020)

In addition, some of the successful implementations or projects going on in Islamic financial industry are presented below:

- The Central Bank of the United Arab Emirates (CBUAE) and the Saudi Central Bank (SAMA) (2020) have engaged into a project for issuing digital currency to facilitate a cross-border payment system that will reduce costs and transfer time between banks in both states (Islamic Markets, 2020).
- Emirates NBD (Dubai, UAE) applies blockchain technology to improve security standards in banking, particularly to combat cheque-related fraud (Emirates NBD, 2018).
- Al Hilal Bank (Abu Dhabi, UAE) has used blockchain technology for the resale and settlement of a *sukuk*. The bank applied smart contracts to enhance the transactional efficiency (Al Hilal Bank, 2018).
- The Islamic Cooperation for the Development of the Private Sector (ICD) (Saudi Arabia) signed an agreement with I-FinTech Solutions (IFTS) (Tunisia) to develop a blockchain-based real-time transactional platform to facilitate commodity *murabahah* transactions to solve interbank issues in a *Shariah* compliant manner (Reuters, 2018).
- Islamic Development Bank (IsDB) used SettleMint platform for the tokenization of fiat currency, and to distribute the subsidies in a peer-to-peer manner. Using blockchain for a subsidy distribution allows for full control of spending at any time. The automation of the entire contractual process helps

reducing the administrative and legal complexities associated with *Shariah*-compliant financial products (SettleMint, 2019).

- Investment Account Platform (IAP) (Malaysia) is a cross-border multi-currency platform for facilitating financing opportunities for emerging business ventures (IAP, 2019).
- Bursa Suq Al-Sila (BSAS) (Malaysia) is a commodity trading platform specifically dedicated to facilitating Islamic liquidity management and financing by Islamic financial institutions (Bursa Malaysia, 2019).
- Emirates Islamic bank, HR Panda (UAE) an artificial intelligence assistant that can automate more than 50% of the bank's recruitment process, helping choose the right candidates for the right vacancies based on identifying the communication and soft skills of the candidates (MENA Herald, 2016).
- Brunei Darussalam's e-Darussalam Account is a single nationwide authentication key that is linked to an individual's National Identity (ID) number. This provides the fundamental prerequisite for a variety of fintech services including Electronic Know-Your-Customer (Government of Brunei Darussalam, 2020).

Further, examples per type of financial service are presented in Table 4.

Table 4: Islamic Fintech Examples per Type of Financial Service

| Financial Services | Islamic Financial Services (Includes) | Islamic Fintech Examples |
|---|---|---|
| Funding | • Custody-based deposits (can also be based on *Qard*)<br>• Investment accounts<br>• *Shariah* –compliant payment, collection, and liquidity management | • PayHalal (Souqa Fintech Sdn Bhd, Malaysia)<br>• AmalPay (Malaysia)<br>• Investment Accounts Platform (IAP – Malaysia) |
| Trade Finance | • *Murabahah* working capital<br>• *Murabahah/Wakala/Mudaraba*/Letter of Credit | • Waqfe – Bahrain (Digital banking platform provider) |
| Financing | • *Murabahah/ Mudarabah /Musharakah/ Salam/ Istisna'/ Ijarah* Financing<br>• Islamic Microfinance | • Ethis Crowd – Singapore, Indonesia, Malaysia, Australia<br>• Blossom Finance |
| Capital Markets | • Islamic Bank Treasury<br>• *Sukuk* (Islamic Bonds) | • Adab Solution (Crypto exchange) |
| Wealth management | • Shariah – compliant wealth management for retail and HNWIs | • Wahed – US (Robo-advisory investment platform)<br>• HelloGold (blockchain-based gold investment) |
| Insurance | • *Takaful*<br>• Re-*Takaful* | • Uplift Mutuals<br>• Insure Halal |

Source: World Bank (2020)

## 2. Literature Review

### *2.1 Islamic banks' performance and COVID-19*

The crisis occurring at the end of a global credit cycle, suppressed both supply and demand (Laurent et.al, 2020). Banks were found to suffer more not only relative to other sectors, but also in comparison with previous crises (Aldasoro et al., 2020). To deal with the crisis, central banks have announced several measures for liquidity support to the banking sector. These include (i) lowering reserve requirements, (ii) lowering of the regulatory capital buffer, (iii) bond/*sukuk* buying programs, and (iv) availability of central bank credit lines

(reverse repo). This led to enormous fiscal difficulties and limited ability for further support of some countries with Islamic finance share (IsDB, 2020). In addition, IFIs have variable cost of funding, making them generally more vulnerable to a higher (nominal) cost of capital under monetary tightening (IMF, 2020).

As per KPMG (2018) the immediate issues that banks face on the main risk drivers, categorized as credit risk, market risk, operational risk and liquidity risk, due to COVID-19 pandemic are illustrated in Table 5 below.

Table 5: COVID-19 Implications on Financial Risks

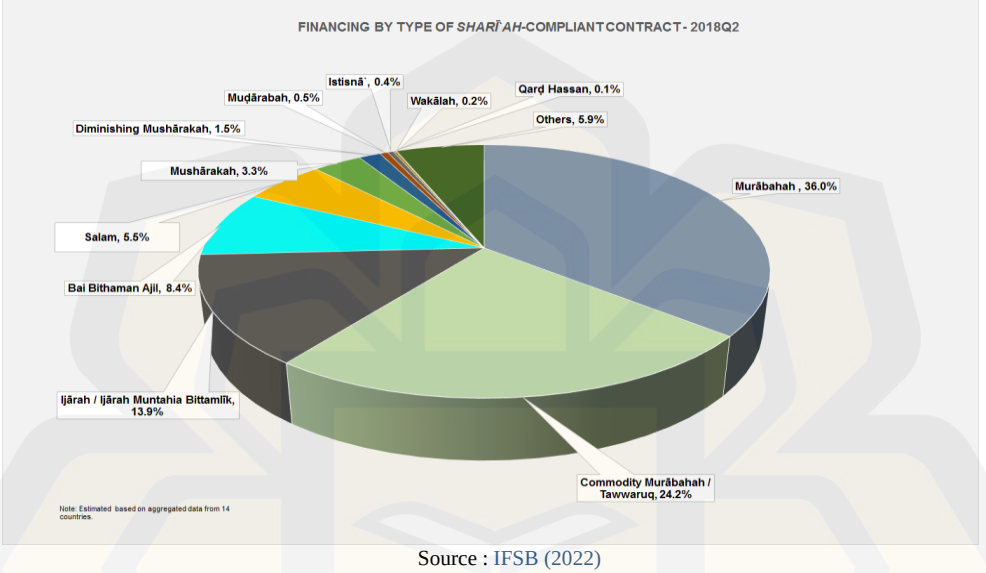
| |
|---|
| Credit risk |
| Obligors seeking liquidity and drawing down their credit facilities.<br>Early warning systems and internal rating systems are downgrading credit, less sensitive ratings of larger companies may need manual analysis on cash flows and ad-hoc treatments.<br>Portfolio early warning triggers: sectors like tourism, hotel, airlines, commodities, etc. will all be put on early warning lists that may have knock-on effects to ECL and RWA.<br>Forbearance measures are requested: banks need to analyse obligor cash flows and process applications in a short period of time.<br>Uncertainty about IFRS 9 stage 2 migration due to relief measures and interactions with SICR2 as well as challenges modelling economic scenarios (including which forward-looking scenarios and probabilities to be used).<br>Default uncertainty about NPL identification, restructuring or recovery approaches. |
| Market risk |
| *Market risk (general)*<br>High market volatility visible across all asset classes.<br>Lower prices for bonds impact P&L and capital, especially liquidity reserve bonds.<br>Limit breaches may occur due to higher exposures in the wake of rising market volatility and may arise due to inability to hedge certain exposures.<br>Inconsistencies in market data due to loss of liquidity affecting valuations and risk model parametrisation.<br>High volatility drives trading frequency and trading costs up, e.g., in delta hedge environments.<br>*Market risk (Internal Model Approach)*<br>New stressed scenarios drive VaR figures upward leading to increased RWAs.<br>Back-testing outliers occur due to a series of strong market movements possibly leading to higher regulatory scaling factors and thus increased RWAs. |
| Operational risk |
| Uncertainties of COVID-19 impacts on operational processes putting strain on operational risks.<br>Striking the right balance between cost cutting and smooth operations.<br>Regulatory and business focus on operational resilience.. |
| Liquidity risk |
| Underprepared for the unexpected liquidity constraints from heavy drawdowns and limited access to alternative funding sources<br>Challenges on practicability and flexibility of existing stress testing and liquidity risk framework.<br>Lack of ad-hoc assessments and effective escalation protocol (e.g., timely reporting and decision-making). |

Source: KPMG (2020)

Historically, credit risk has been thought of as the most significant risk in banks. Credit risk is seen as the most important risk driver in Islamic financial institutions by IRTI & GARP (2015); Mokni et al (2015); Boumediene (2010); Abu Hussain and Al-Ajmi (2012); Al-Tamimi and Al- Mazrooei (2007); and Lassoued (2018). Further, Kabir et al. (2015), and Tafri et al. (2011) find that Islamic banks face higher risk than traditional banks, and that understanding and management of risk are much different from conventional ones in terms of credit risk identification and assessment (Noman et al., 2015).

Khan and Ahmed (2001) reveal the importance of credit risk as the main risk driver in *mudarabah*[1] and *musharakah*[2] contracts. Credit risk exposures in Islamic financing also arise in connection with accounts receivables in *murabahah*[3] contracts (comprising 36% of the financing for 2018Q2 as presented in Figure 4), default risk in *salam*[4] contracts, accounts receivable and default risk in *istisna'*[5] contracts, lease payments receivables in *ijarah*[6] contracts, and default risk in *sukuk* held in the banking book.

Figure 4: Financing by Type of Shariah-Compliant Contracts




Source : IFSB (2022)

Aldasoro et al. (2020) find that the banks that had entered the crisis with the highest level of credit risk, measured in terms of credit default swap (CDS) spreads rise, suffer the most. The CDS spreads of the riskiest banks continued to increase even through the stabilization phase. Dynamics, challenges and potential new approaches related to credit risk are presented in Table 6.

Table 6: Dynamics, Challenges and Potential New Approaches to Credit Risk

| | |
|---|---|
| Dyamics/ Challenges | Changes in credit worthiness at sector and subsector level.<br>Hard to differentiate between borrowers in the same sector or subsector.<br>Pertinent data on crisis conditions are scarce, lagging, and not fed automatically to decision making.<br>Socially responsible collections needed to meet changing customer preferences.<br>A large wave of nonperforming exposures is beginning and must be addressed in new ways. |
| Potential new approaches | Analyze demand shocks and recovery trajectories and translate to probability-of-default multipliers.<br>Go deeper in to borrower financials and business model to estimate resilience to COVID-19 crisis effects. |

[1] *Mudarabah*: an agreement between IFI and its obligor where the IFI contributes a specified amount of capital funds to an enterprise or business activity that is to be managed by the obligor as an entrepreneur (*Mudarib*).
[2] *Musharakah*: an agreement between IFI and its obligor to contribute an agreed proportion of capital funds to an enterprise or to acquire ownership of an asset/real estate.
[3] *Murabahah*: a sale contract by which the owner of an asset or good sells it to a buyer at cost plus markup.
[4] *Salam*: is a forward sale of fungible commodities. The buyer fully prepays the price in return of receiving the object of sale at a certain specified future date.
[5] *Istisna'*: a forward sale contract whereby the buyer commissions the seller to manufacture a product according to certain specifications and quantities in return for an agreed price.
[6] *Ijarah* or leasing: the sale of usufruct of a particular property.

| | |
|---|---|
| | Mine transaction data to derive cash flow, affordability; mine alternative high-frequency data to derive revenue trends; auto-feed results into decision engine. |
| | Shift to customer-assisstance interaction model and make it a priority in a digital transformation. |
| | Develop sector-specific solutions, augment capacity, and evaluate cost-benefit of organic versus inorganic options. |

Source: Koulouridi et al. (2020)

Even though COVID-19 pandemic poses challenges on liquidity, resilience, and capital for the Islamic banking sector, the largest component of the Islamic financial industry (IsDB, 2020), Syed et al. (2020) find that Islamic finance has immense potential to fight any kind of situation/pandemic through *zakat* and *qardh-al-hasan*. Further, Islamic banks have resilience in withstanding the adverse consequences of economic crises (Mirzaei, 2021). In addition, Boubakri et al., (2017) report that healthier banks perform better during crises times.

### *2.2 Islamic banks and fintech*

The biggest advantage of Islamic fintech is that it is transparent, accessible and easy to use (Laldin, 2018; Wintermeyer and Basit, 2017), whereas the biggest obstacle for developing the Islamic fintech has been the lack of clear policy from the government and well qualified human personnel (Rusydiana, 2018). The use of big data, machine learning, and blockchain in Islamic finance will bring more efficiency and transparency for IFIs, regulators, and consumers (Sun et al. 2020; Rabbani, 2020). The growing importance of artificial intelligence (AI) in finance could be summarized with the fact that JPMorgan Chase has more software developers than Google and more technologists than Microsoft (CA technologies, 2014). For example, AI is employed for automatic detection of suspicious loan applications during the loan application process (MyBucks, 2018). It also helps to prevent money laundering, and identify unusual activity (Cheung, 2020). Baber (2019) finds crowdfunding based services to have a positive impact on customer retention for Islamic banks operating in Malaysia and UAE. In addition, Islamic fintech can lead to higher customer loyalty (Aisyah, 2018) and increase in banking transactions and bank's financial resources (Shahabi et al., 2020).

## 3. Methodology

This study performs a descriptive qualitative analysis, by adopting a document reviewing approach and further analysing research results. The stages involve examining data, interpreting it to gain an in-depth understanding, obtaining the meaning contained and scientific development in research. The literature review data that were used for this study were taken from various sources (mainly using Google scholar search engine) including relevant journals, related books, newspapers originated from print and electronic media and scientific articles with main accent on publications in 2019 and 2020. The financial data provided for the selected Islamic banks (such as the Maybank Group, Malaysia; Al Baraka banking Group, Bahrain) is retrieved from their official annual reports and Basel II disclosures. An analytical procedure adopted in this study includes analysis, assessment and synthesis of the data contained in the documents. This research adopts the methodology of Rabbani et al. (2021) and stresses more attention on the practical implication of fintech in Islamic banking risk management.

## 4. Analysis and Findings

The full impact of the prolonged COVID-19 crisis has not been fully obeserved yet due to the wide-ranging policy measures (IFSB, 2021). IMF (2020) found Islamic banks to be vulnerable to three key transmission channels of negative shocks including: changes in pre-impairment income from financing activities; changes in asset quality and; changes in risk intensity resulting from higher unexpected losses.

As per Aldasoro et al. (2020) the pandemic crisis had the worst impact on the banks with highest credit risk. According to Arunkumar and Kotreshwar (2005) credit risk causes 70% of the total risk banks face while the other 30% is shared by market and operational risk. European Banking Authority for year 2018 reveals that credit risk and market risk amount on average 87.3% of risk weighted assets (RWA). The 2019 annual report for Maybank Islamic shows that 87.35% of the total RWA is credit risk's RWA. The same year annual report for Dubai Islamic bank reveals that 74.34% of Islamic financing (124.7 AED billion) for the group for 2019 is in *murabahah* (40.4 AED billion) and *ijarah*, excluding home finance *ijarah* (52.3 AED billion). The

implementation of Artificial intelligence (AI) based solutions could help to provide non-linear, dynamic models for better assessment of credit risk and help to increase banking lending portfolio fully leveraging AI. In addition, the implemantion of blockchain based solutions could help to automate entire contractual process, to alleviate the additional administrative and legal complexities and avoid redundancies associated with *Shariah* compliant financial products which would further enhance risk management process and reduce administrative costs.

Furthermore, the global Islamic banking average non-performing financing (NPF) ratio was 4.96% as of 3Q19. For example, in comparison to conventional banks, the Islamic banking sector's NPF is higher in both European Union and USA, with an average NPF of 2.5% and 1.5%, during the same period (IFSB, 2020). Higher NPF ratio of the Islamic banks could be attributable to vulnerable exchange rate regimes, and/or to economic and geopolitical risks in some emerging markets that are home to a large proportion of Islamic banking activities worldwide. For example, the NPF rates for Islamic banks in Saudi Arabia increased for 2019 (0.84% in 2Q17, 0.95% in 2Q18, and 1.24% in 2Q19). In contrast the NPF rates in UAE was 4.8% in 3Q19. It was forecasted that the Emirati banks may suffer rising impairment in their assets in 2020 due to subdued economic activity and the drop in real estate prices (IFSB, 2020). For example, the average loss rate in case of default for 2019 for Maybank Group, Malaysia (based on their 2019 Basel II disclosure) is presented in Table 7 below:

Table 7: Average loss rate in case of default

| Public sector utilities | Corporate (excluding specialised and firm-size adjustemnt lending) | Retail residential mortgages | Retail other |
|---|---|---|---|
| 41.06% | 42.49% | 14.82% | 32.43% |

Source: Maybank Group (2019)

Further, Al Baraka banking Group, Bahrain in their financial reports for 2018 stems credit risk in non-performing financing from receivables as the most important presented in Table 8 below:

Table 8: Financing from receivables, *mudarabah* and *musharakah*

| Type of Islamic financing contract | Neither past due nor non performing | Past due but performing | Non performing (NPF) |
|---|---|---|---|
| Receivables* | 8,976,524 | 1,142,110 | 751,737 |
| Mudarabah and Musharakah | 2,705,121 | 20,719 | 12,974 |

*Notes: *Receivables includes: murabahah receivables, salam receivables and istisna' receivables; all data in USD'000*

Source: Al Baraka Banking Group (2018)

In addition, total NPF receivables as a percentage of neither past due nor non performing (751,737/8,976,524) is 8.38% and total NPF *mudarabah* and *musharakah* contracts to neither past due nor non performing (12,974/2,705,121) is 0.47%; highlighting the possibility receivables contracts to inherit far more credit risk than *musharakah* and *mudarabah* contracts. That is contrary to the finding of Rahman et al. (2010) that *mudarabah* is the riskiest mode of financing. In the light of the pandemic crisis, these findings call for an urgent re-assessment of the credit risk management in Islamic banks. The implementation of AI based solutions could help in reducing the NPF percentages by detecting automatically suspicious loan applications and predicting customers' next scheduled payment.

Further, World Bank historical estimates were for 1.7 billion unbanked retail customers and more than 200 million potential micro, small, and medium enterprises (MSMEs). Subsequently, nearly 75% of the world's unbanked population live in developing economies, with the highest found in Asia (World Bank, 2020). Almost 50% of the world's unbanked population live in Muslim populated countries. The potential revenue from the unbanked retail and MSMEs market was estimated to be around USD 200 billion (World Bank, 2020). The implementation of AI based solutions could help to allow these customers to open bank accounts with ease and to apply for a loan within minutes. Noticeable example is Benazir Income Support Programme by the

Government of Pakistan who used mobile money transfer to reach more than 6.8 million families in less than a week (Benazir Income Support Programme (2022).

## 5. Conclusion and Recommendation

Governments and central banks all over the world have announced financial assistance and relief packages for the most affected sectors to reduce the impact of health crisis and lockdowns. The monetary policies are loosening; massive plans for cash transfers are distributed; and government-sponsored credit programs are in place in various countries for pandemic-affected small and medium enterprises with the aim to lessen the impact of the pandemic and to get back the economy on-track. At the same time, banks have suffered more, especially the ones with the highest level of credit risk (Aldasoro et al., 2020). In addition, Islamic banks face higher risk than traditional banks, and understanding and management of credit risk identification and assessment is much different (Noman et al., 2015). In the light of the pandemic crisis, these findings call for an urgent re-assessment of the credit risk management of Islamic banks.

On the other hand, Islamic fintech has much to offer – and there is an important role of collaboration between startups and the established Islamic finance institutions. By incorporating FinTech-based solutions, Islamic banks could create financial products that are both *Shariah*-compliant and cheaper, reach the unbanked population and unserved companies with ease, improve their risk management process and overcome some of the negative impacts of COVID-19 crisis, which in turn will increase their efficiency and profitability.

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