CHAPTER 4

Central Banks and Financial Authorities: Towards the Advancement of I-Fintech

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Abstract In the year 2007 British banks witnessed the first run on to their very own banks due to various scandals that tarnished the trust and reputations of the banks and the banking industry. Simultaneously, the subprime crisis was happening to major banks in the US, France and some other countries that were sharing a high systemic risk. When a systemic risk is high and at the same time if banks don't keep enough reserved capital to compensate their clients during a crisis period, this situation could lead to a recession, high unemployment, and eventually economic collapse. Since then, stakeholders lost their trust in the banking system globally and were demanding for a more socially responsible, ethical, and systemic stable form of banking. True enough, in the wake of the 2008 global financial crisis (GFC), Islamic finance banking and the Fintech industry were proliferating to fill the existing void in the finance industry by their innovation and a different approach to business transactions. At that time, the faith inspired in the form of ethical banking was enjoying

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steady growth. Advancement in technology was also facilitating the rapid growth of revolution in Islamic-Fintech (i-Fintech) industry.

Keywords Fintech • Central Bank • Authorities • Regulation • Shariah

Introduction

Needless to mention that, Islamic finance and i-Fintech are blooming and evolving rapidly. The reality is that the combination of Islamic finance and i-Fintech which is based on trust and moral creates efficient and satisfactory financial services for the customers. The main reason behind the evolution of Islamic finance and i-Fintech is its business model that proved its worth and value by avoiding situations like a sub-prime crisis. Losing trust on the conventional banking industry, penetration of internet and technology globally, lack of accessibility of funds to everyone no matter with or without track record with banks, speed of transactions, and transaction cost along with clients' craving for a trustworthy financial system among other reasons are key enticements behind the growth and expansion of the i-Fintech. The system that has an ethical principal embedded in it. The system that looks after the benefits of both sides, borrowers and lenders, equally and fairly.

A system-wide crisis is able to destroy and tarnish public confidence. For instance, financial crises also raise borrowing costs, leading to a credit crunch and recession. The spread and advancement of Fintech can bring more depositors and borrowers across the nation together, which consequently financial institutions can better diversify their sources of funding and lending opportunities and this makes them safer. For example, M-Pesa in Kenya, Alipay in China and Paytm in India have brought financial services literally to our fingertips.

On the other hand, any innovation in technology is accepted in Islam as long as it complies with the Shariah rules. But what is i-Fintech? Wintermeyer and Basit (2017) define i-Fintech as follows:

1. The DIGITAL delivery of i-Finance
2. The use of Fintech utilities: KYC[1] / AML, Blockchain, and DLT, Cyber, Payments, Big Data & Machine Learning in i-Finance

[1] KYC: Know Your Customer, AML: Anti Money Laundry, DLT: Distributed Ledger Technology.

3. Any Fintech in Muslim market demography that delivers an unmet financial need and or financial inclusion objective
4. Any Shariah-compliant Fintech fund investing in digital infrastructure or economic development anywhere in the world.

Indonesia, followed by the US, the UAE, and the UK, holds the most significant number of i-Fintech startups. Indonesia, by having the world's largest Muslim population, has the highest number of startups, which is more than 30, with a readily increasing number of i-Fintech establishments registering with the country's i-Fintech Association. The United Arab Emirates (UAE) and Malaysia follow as the next two largest Muslim-majority countries by some startups, reflecting the broad Islamic economy strategies that both countries have put in place (DinarStandard, 2018). All these progress in i-Fintech would be impossible without the support of the Central Bank and financial authorities of the respective countries.

Worth mentioning that Islamic finance and i-Fintech not necessarily go hand in hand. Digitisation and disruption are an undeniable fact for existing business and finance environment. Given this, i-Fintech can be considered a rival to the Islamic finance market which potentially is able to cannibalise its market.

Central banks and financial authorities by supporting the i-Fintech due to its benefits towards society are able to smoothen the development, expansion, and penetration of it. Drawing upon this argument, some of the success factors for i-Fintech that could be considered and practised by central banks and financial authorities are highlighted. Islamic-Fintech's role is to expand technology innovation into the Islamic banking product and services. If i-Fintech is positioned appropriately among its stakeholders due to its inherent ethical values, it is able to outperform its rivals and gain significant sustainable competitive advantages. The advancement and accessibility of technologies are one of the determining factors in this rivalry. High and fast-growing Muslim population that needs financial products and services is another advantage and opportunity for promotion, expansion, and penetration of i-Fintech into the Muslim society (Bakar & Rosbi, 2018). The median age of Muslims worldwide is 24 years as opposed to 32 globally, 15 of the top 50 countries with smartphone penetration are Islamic economics and 72% of the unbanked population lives in the Organisation of Islamic Cooperation (OIC) member countries (main Islamic finance markets) compared to 49% worldwide (DinarStandard, 2018). Relying on these factors, i-Fintech should be able to accelerate and take off more rapidly than its rival, conventional Fintech, but of course, it needs the continuous supports of central banks and financial authorities.

Additionally, central banks and financial authorities can initiate collaboration with other central banks in order to promote those Islamic banks that are advanced in i-Fintech and are capable of quickly and efficiently advertising their new products and services globally. Hence, this can entice clients to engage with Islamic banking and i-Fintech products and services. Study of Alaabed and Mirakhor (2017) on the role of Fintech in accelerating the implementation of risk-sharing Islamic finance shows that i-Fintech is closer to the spirit of Shariah as it eradicates two main risks in the banking industry, explicitly uneven maturity and leverage. Another example of i-Fintech that could be backed by central banks and financial authorities is the Shariah-compliant P2P lending. The Shariah-compliant P2P lending such as crowdfunding, remittance, and mobile wallet are predominantly suitable for the needs of a considerable portion of the population in Islamic countries and also is able to accommodate part of the population that is left out of the possibility to transact with a conventional banking and financial institution. Shariah-compliant P2P lending provides the facility to engage in financial transactions, for example, pay their bills or send money abroad.

On the other hand, the biggest and main problem of i-Fintech stakeholders is how to come up with innovative Islamic products rather than imitating the existing products that are aligned with the utmost ethical values that are shared by so many. Currently, the Islamic finance market is too far behind in a total number of clients and the level of sophistication of the products and services accessible in its portfolio (Todorof, 2018). This is where central banks and financial authorities need to intervene and assist and support local banks to encourage them to come up with innovative Islamic products consistent with i-Fintech.

Study of Firmansyah and Anwar (2019) related to Indonesian and Singaporean i-Fintech companies show that most of the i-Fintech firms are able to raise fund and finding sufficient skilful human resources for their operations. Besides, they mention that most of the participating firms agreed that they have enough support from the government. In general, the lack of regulations is one of the challenges faced by i-Fintech firms (Firmansyah and Anwar, 2019). In a nutshell, the governments, central banks, and financial authorities of mostly different Islamic countries or the International i-Fintech organisations need to provide supportive regulations for the i-Fintech sector, not too loose or too strict. The too lax i-Fintech regulations will not protect the customers and investors right and will deprive them of investing in or using the i-Fintech products and services. On the other hand, the too rigid regulation in a country may hamper the development of i-Fintech. Consequently, the i-Fintech regulations should protect all parties involved in the i-Fintech practice, the firms, customers, and investors.

The i-Fintech landscape maps over the wide range of products and services globally from Islamic Exchange-Traded Fund (ETFs) to cryptocurrencies, to name but a few: Islamic RoboAdvice with access to Shariah-compliant ETFs, Islamic alternative asset market place such as property, Islamic trade finance play; Shariah-compliant initial coin offering (ICO) that allows for fees and risk sharing backed by halal instruments using a token, Shariah-compliant universal payment system backed by grains, and EthisCrowd Fintech company that is using e-Wakalah (agency contract) and Istisna (contract to construct an asset) contracts that allow for crowdfunding of new real estate developments in Indonesia (Wintermeyer, 2017).

In addition to this, other key emerging trends in i-Fintech that are worth mentioning are such as Islamic Digital Challenger banks and Sukuk (bond) ETFs, Murabaha (asset-backed interest free loan) instruments around buying and selling goods in addition to Takaful (insurance), Blockchain; these are revolutionising Islamic banking by incorporating standard Islamic finance contracts to smart contracts and reducing the service cost up to 95% with an unchangeable record of ownership and assets.

The i-Fintech industry will be able to see steady and robust growth soon if it is ensured that the provided services and products have at least a few important attributes. Hence, the offered services and products of the i-Fintech in order to provide high customer experience need to be accessible, more automated, user-friendly, packaged decently, and transparent. The accessibility of the i-Fintech can be fulfilled by smartphones, internet, and developed applications. At the same time, the new offered package to clients should be able to add value by mitigating frictions, convenient to use and most importantly serve the purpose. For i-Fintech products and services to be transparent, it needs to be certified by authorities that are recognised and respected by both consumers and institutions. Generally, i-Fintech services are able to benefit the unbanked to create a new form of credit history, and moving from there, at the next phase, they can be enjoying the benefits of borrowing and lending and some other services via i-Fintech.

Study of Saksonova and Merlino (2017) highlighted if i-Fintech industry intends to advance rapidly, the main strategies and foundations that are required in the framework of i-Fintech development are, "ability to manage and analyse big data, technological infrastructure improvements, creating a reliable transaction system, human resources in digital marketing, establishing cooperation, collaboration and investment with relevant stakeholders and Fintech product innovation." Furthermore, governments and regulators, educational institutions such as universities, and also existing banks and financial institutions play an important role in the i-Fintech ecosystem. The lesson needs to be learned is that the rapid advancement in i-Fintech should be considered and supported seriously by central banks and financial authorities.

Report of DinarStandard (2018) specifies that i-Fintech has an ample room for growth, but beforehand it needs to address its unaddressed opportunities in various areas rapidly. According to the report of DinarStandard (2018), the three most major unaddressed areas of which are: "1) the leveraging of big data and AI in providing Islamic banking services, 2) the use of Blockchain in facilitating the growth of Islamic trade finance, which at the US$186 billion is a fraction of the global US $12 trillion trade finance industry, and 3) the use of AI in facilitating investments, in particular addressing institutional investor needs." Practically speaking, if the i-Fintech industry expects to grow and develop quickly and have a higher market share in the worldwide finance industry, a rigorous strategic effort is needed across government entities, financial investors, and financial institutions, to fill the numerous gaps in the i-Fintech ecosystem.

Fintech technologies are aggressively enhancing and disrupting twentieth-century i-Fintech services, operations, business models, and customer engagement. DinarStandard (2018) report outlines the Islamic finance services segment into 12 categories (Shariah deposit and investment account, sukuk, ijarah financing, Islamic private equity, musharaka and mudaraba, muharaba working capital/supply chain, wakalah LOC, bank treasury, Islamic retail private wealth, Islamic institutional fund, and takaful and re-takaful), correlates to the six broad service areas (deposits, business and consumer financing, treasury, trade financing, wealth management, and insurance) identified globally, serving the same underlying needs of retail consumers and businesses, as well as the institutional needs of financial service providers, adjusted of course for the Islamic faith-based requirements of customers.

In order for the i-Fintech industry to proceed more rapidly on those aforementioned service areas, it needs to manage its operations, including back, middle, and front office by utilising and incorporating the big data, artificial intelligence (AI), quantum computing, P2P finance, open banking, mobility, blockchain, cloud adoption, and cybersecurity in its daily operation activities (DinarStandard, 2018).

Most notably, to support i-Fintech firms, additional dedicated accelerators and incubators are needed globally. Currently, there are a few in Singapore, Turkey, and the UAE to facilitate the adoption of financial technology among Muslims. And the more, the merrier. Promoting and establishing additional incubators is the role of central banks and financial authorities. If Islamic banking institutions (IBIs) intend to stay competitive, the rational response to the existing and evolving revamp in banking and financial services industry would be to find ways to collaborate with i-Fintech rather than acknowledging them as a threat.

As one of the application of the i-Fintech, Shariah-compliant P2P lending is helping to close or narrow the massive credit gap existing in Muslim countries, by preserving more of the local money within the local financial market and allow local banks to generate more profit at a price, which will be lower for all stakeholders (Todorof, 2018).

Moreover, technology is able to offer readily available standardised contracts to mitigate the risks of some financial products. The neutrality of Fintech can contribute to the success of i-Fintech segment too. The neutrality component of Fintech is one of its attractive aspects as the making of the Islamic finance framework more up-to-date for its clients and also it can prevent the accusations of blindly copying the Western system.

Interestingly, Fintechs can be applied and utilised with the same success rate in conventional and Shariah-compliant settings by allowing i-Finance practitioners to pick which Fintech components to include or develop in their practice in order to upsurge their efficiency and inclusion while still are sticking to Shariah and Islamic values.

But on the other hand, technology and innovation in the financial market should be able to bridge the gap between i-Fintech and conventional financial market instruments and products. Furthermore, technology advancement can provide greater transparency to bankers, Islamic courts, and clients, which would ultimately enable all stakeholders to scrutinise the transactions that take place in a Shariah finance/banking environment.

One of the main critiques against i-Finance is that whether Islamic finance is ethical by reference to the *Maqasid* due to the design of synthetic products using a form over substance method to imitate the economics and risk profile of conventional products. It is expected from Shariah Supervisory Boards to ensure Islamic finance products meet both the spirit and the letter of the law to attract more investors and clients for Islamic finance and Fintech products and services. Meanwhile, central banks and financial authorities can facilitate the process by supporting the i-Fintech.

The underlying ethical and Islamic values under the Islamic finance and i-Fintech are identical, but on the flip side, growth and flourishing of i-Fintech will cannibalise the Islamic banking institutions (IBIs) existing and potential future market share. Even though i-Fintech is able to serve the unbanked segment of the society, the growth of i-Fintech is considered a threat to IBIs. For instance, with the formation of i-Fintech firms, it can potentially serve the less creditworthy companies, individuals and small and medium Enterprises (SMEs) by proposing simple, low-cost alternative financing instead of tedious and lengthy procedures offered by IBIs. Due to several disadvantages of conventional and Islamic banking institutions, such as lengthy procedures and processes, high finance cost and a limited amount of available cash and credits, in which this can cause a credit crunch for clients, bank clients are reducing their dependence to the banks as the primary sources of financial service providers. Bank clients are increasingly relying on Fintech providers instead. In a nutshell, Fintech and i-Fintech are both a threat and an opportunity to both conventional and IBIs.

Islamic finance and i-Fintech may be a nascent sector, but its fast growth has led to skills shortages. In this regard, Samina Akram, managing director of London-based Islamic and ethical finance consultancy Samak Consultants, explains, "One of the major challenges the industry faces is a shortage of adequately trained talent. So because it's such a young sector, the right talent can flourish, no matter what their gender" (Everett, 2018). This point should be taken care by central banks and financial authorities in conjunction with the education industry.

The road ahead presents a balance of opportunities and challenges to i-Fintech. By the year 2100, 50% of the world's population will be living in MENA and Sub-Saharan Africa (SSA). Not to mention that the potential existing customers of the i-Fintech are about 1.8 billion, globally (Wintermeyer & Basit, 2017). These markets consist of a large portion of the unbanked populations, people without having access to the bank accounts. On the other hand, smartphones penetration's rate is high in these societies. Needless to highlight that, these societies are profoundly underserviced and diverse while both the needs and the rewards for servicing these markets are pronounced. This serves as an impetus for i-Fintech in addressing financial inclusion. With the availability of Shariah-compliant crowdfunding and P2P financing tools, this creates opportunities for individuals and SMEs that require financing but thus far do not qualify for the funding from traditional IBIs.

In view of this, among others, one of the supreme and profound future developments, to expand the access of the i-Fintech mostly to Islamic regions and also to other non-Islamic regions, is to introduce i-Fintech passport scheme. For instance, the Gulf Cooperation Council (GCC) could introduce regional Fintech passporting to drive certification schemes to offer more considerable client access to i-Fintech. Furthermore, the i-Fintech passporting scheme could be extended to MENA and Sub Saharan Africa as well as the rest of the world to provide access to certified Shariah-compliant products. This service could be initiated and collaborated among the MENA, Sub-Sahara, and GCC countries by their central banks and financial authorities.

The i-Fintech sector cannot just isolate itself from non-Islamic Fintech institutional and capital markets. While there are developments in the institutional and capital markets, i-Fintech also needs to catch up simultaneously and speed up its innovations and developments; otherwise, it will lose its market share to conventional Fintech firms and easily would be substituted with non-Islamic Fintech services and products.

Drawing upon our earlier argument, i-Fintech has an ability to transform the lives of millions of people around the globe and to help turn the i-Fintech hubs into Fourth Industrial[2] Revolution digital leaders (Klaus, 2016). Thus, there is a substantial need and there is a gap for digital infrastructure investment, especially in countries with emerging economies. Therefore, the global requirement for digital infrastructure investment is

[2] The term 'Fourth Industrial Revolution' was coined by Klaus Schwab, the founder and executive chairman of the World Economic Forum. It is characterised by a fusion of technologies that is blurring the lines between the physical, digital, and biological spheres collectively referred to as cyber-physical systems. It is marked by emerging technology breakthroughs in a number of fields, including robotics, artificial intelligence, nanotechnology, quantum computing, biotechnology, and the internet of things (IoT).

an opportunity for Islamic banks, asset managers, and investors to harness through i-Fintech both in Islamic and non-Islamic economies.

Dubai, Malaysia, and Iran as a number of key Islamic Finance hub together account for more than 80% of the industry's total assets, followed by the UK (Everett, 2018). Drawing on that, the i-Fintech industry is young and has been predicted to continue growing, the Muslim world population is young too, and they fit in the middle- to low-income (countries) bracket. Further to this, the 2008 Global Financial Crisis (GFC) created interest in non-Muslims population to search for more ethical and transparent means of investment. This has created an expectation that the i-Fintech industry to become the go-to option for different classes of investors due to religious and non-religious reasons. Generally, as awareness of these sector's ethical approach continues to grow, most probably its acceptance also will rise among millennials and women. Subsequently, if countries that intend to grow and penetrate faster to dominate the i-Fintech market need to work on an adequate and practical regulatory framework for the i-Fintech sector. Islamic Fintech is the future of the Islamic finance industry.

If i-Fintech wishes to offer its ethical values to more non-Muslim population and protect more clients against financial crisis such as 2008, it requires to quicken its digital infrastructure's development by collaborating more with Fintech companies or establish its own i-Fintech department. No matter whether it is a digital solution or Blockchain technology, i-Fintech must ensure their back office is rightly real-time and adaptable.

The current disruption in the banking and finance industry could be perceived as a win-win situation for both IBIs and i-Fintech firms. Through suitable and planned collaborations, the i-Fintech industry will be able to acquire the innovative practices of the newly emerged i-Fintech start-ups and also are able to learn the pros and cons of doing business with established and reputable IBIs. Therefore, with proper and effective collaborations, and after considering all of the aspects of the business such as threats and opportunities that must be in accordance to Shariah, collectively they will be able to benefit from the growth multiplier that Fintech can bring to the table. The future of i-Fintech is bright.

With around 1.8 billion existing Muslim population globally, Islam is the fastest-growing religion in the world, and the population of Muslim is expected to surpass Christians in not far future (Lipka & Hackett, 2017). Thus, i-Fintech could position itself as a solution providing financial inclusiveness to as many people as possible, including non-Muslim who are looking for a more efficient and ethical financial system. The main advantages of i-Fintech over its conventional counterpart are its transparency, being beneficial to the two parties, and Shariah-compliant component (Kelana, 2018).

Moving forward, in order for i-Fintech to flourish, authorities such as central banks and financial authorities need to set the policy instruments guarding the Fintech work process from upstream to downstream (Pollari, 2016), proactively train specialist and qualified human resources for i-Fintech, secure the system from malware attacks (Saksonova & Merlino, 2017), clarify the legal certainty of online-based clients (Rusydiana, 2018), reaching to low-income clients, educate people about Shariah and last but not the least providing comprehensive framework in governance, accounting, and Shariah auditing.

Unlike the i-Fintech, since a few decades ago, the Islamic Finance industry has begun experiencing extraordinary innovation and expansion. True enough, according to Thomson Reuters, assets under the Islamic finance are expected to rise to $3.9 trillion by 2023 (DinarStandard, 2018). To the contrary, i-Fintech has started its baby steps, and it is at the very beginning of an exciting, transformative journey for the industry. On the positive side, the primary driver and backbone for the growth of the i-Fintech are young, digitally native Muslim demographic that is on average younger than the worlds non-Muslim population.

For instance, Rusydiana (2018) points out that only 36% of Indonesia's population as the world's largest population Muslim country having a bank account. On the other hand, the smartphone's penetration rate in Indonesia is about 70% which provides fertile terrain for i-Fintech's rapid boost. Given the importance of such a vast opportunity in Indonesia, the prospects for i-Fintech in Indonesia seem very bright. Hence, the i-Fintech industry by the support of central bank and financial authorities should be able to grab the current opening and provide accessible financial services to the unbankable population in Indonesia which traditional financial institutions are not able to provide.

The number of countries that are joining the i-Fintech/Fintech league is increasing everyday—along with several other newcomers such as the Maldives and Sri Lanka—which intend to issue a sovereign Islamic paper. The Asian continent is anticipated to be the leader of the international Shariah-compliant debt and equity markets by leveraging on progressive, practical, and sophisticated regulations, and attracting potential global investors into the region.

Furthermore, moving forward digitisation could bring savings for banks and their clients in terms of time, effort, and money. In addition, technology enables the i-Fintech industry both to lower its overheads and to reduce transactional risks, for instance, by using blockchain. Islamic-Fintech is capable of driving the Islamic Finance industry to its next phase of evolution and opportunity. The followings are a few suggestions to i-Fintech developments for different stakeholders, namely *Government agencies, Financial institutions & startups, and Investments*, by DinarStandard (2018).

Government agencies need to increase the number of 'regulatory sandboxes' to facilitate the test and evaluation of the i-Fintech products and services before authorising it to be populated. Increase in the number of regulatory sandboxes allows the i-Fintech segment to be able to compete with the conventional Fintech markets. Central banks and government agencies by developing 'Fintech innovation hubs & knowledge sharing' platform can encourage i-Fintech firms to share their best practices that can promote to develop consistency and generate best-in-class operating models. Government agencies need to recognise and assess cybersecurity, money laundering (ML) and know-your-customer (KYC) risks associated with Fintech firms and technology providers. Government agencies in order to pave the way for i-Fintech firms are urged to promote the General Data Protection Regulation (GDPR) compliance and other trust factors to support consumers right and simultaneously promote for consumer awareness of i-Fintech's practicality and credibility.

'Incumbent financial institutions' need to engage more with i-Fintech startups and 'innovation hubs' for the future of their organisation and growth. They need new approaches to drive change and deliver innovation to their existing clients. On the other hand, i-Fintech 'startups' in order to have access to capital and clients need to effectively engage with incumbent financial institutions too. If i-Fintech startups intend to gain more market share they need to enhance their customer experience, engagement, and Islamic finance's social impact potential through Fintech adoption.

Going forward, the i-Fintech segment for its development and opportunity creation relative to conventional Fintech industry needs more attention and 'investments' from venture capitalist and private equity entities. While the positive news is that corporate investors such as established Islamic banks are now investing in i-Fintech projects, the scale and scope of the investment need to be scaled-up intensely.

To sum up, moving forward, new disruptive technologies are able to play a vital part in removing obstacles for both inhabitants and financial institutions. Given this, central banks and financial authorities have a key role in providing the right infrastructure; physical infrastructures such as payment and settlement systems and soft infrastructures like rules and guidelines. In line with this, in order to move towards financial inclusion, it is necessary that central banks fulfil their main mandate. Central banks and innovators relationship is reciprocal; one is unable to achieve financial inclusion without the other's help. Policymakers, central banks, and financial authorities can help address the market-failures and risks posed by innovation.

References

Alaabed, A., & Mirakhor, A. (2017). Accelerating Risk Sharing Finance via FinTech : NextGen Islamic Finance. In The 1st International Colloquium on Islamic Banking and Islamic Finance, 1–10. Tehran.

Bakar, N. A., & Rosbi, S. (2018). Robust Framework Diagnostics of Blockchain for Bitcoin Transaction System: A Technical Analysis from Islamic Financial Technology (i-FinTech) Perspective. *International Journal of Business and Management, 2*(3), 22–29. https://doi.org/10.26666/rmp.ijbm.2018.3.4

DinarStandard. (2018). *Islamic Fintech Report 2018: Current Landscape & Path Forward*. Retrieved from https://www.dinarstandard.com/wp-content/uploads/2018/12/Islamic-Fintech-Report-2018.pdf

Everett, C. (2018). Islamic Finance Growth Means New Opportunities for Women – Raconteur. Retrieved March 28, 2019, from https://www.raconteur.net/finance/islamic-finance-growth-means-new-opportunities-women

Firmansyah, E. A., & Anwar, M. (2019). Islamic Financial Technology (FINTECH): Its Challenges and Prospect. *Advances in Social Science, Education and Humanities Research (ASSEHR), 216*(Assdg 2018), 52–58.

Kelana, I. (2018). Here Are Some Advantages of Using Fintech Syariah. Retrieved May 14, 2019, from https://republika.co.id/berita/ekonomi/syariah-ekonomi/18/08/28/pe58om374-ini-beberapa-keuntungan-gunakan-fintech-syariah

Klaus, S. (2016). The Fourth Industrial Revolution: What It Means and How to Respond | World Economic Forum. Retrieved April 3, 2019, from https://www.weforum.org/agenda/2016/01/the-fourth-industrial-revolution-what-it-means-and-how-to-respond/

Lipka, M., & Conrad Hackett, C. (2017). Why Muslims Are the World's Fastest-Growing Religious Group. *Pew Research Center*. http://www.pewresearch.org/fact-tank/2017/04/06/why-muslims-are-the-worlds-fastest-growing-religious-group/.

Pollari, I. (2016). The Rise of FINTECH Opportunities and Challenges. *The Finsia Journal of Applied Finance*. Retrieved from https://search.informit.com.au/documentSummary;dn=419743387759068;res=IELAPA

Rusydiana, A. S. (2018). Developing Islamic Financial Technology in Indonesia. *Hasanuddin Economics and Business Review, 2*(2), 143–152. https://doi.org/10.26487/HEBR.V2I2.1550

Saksonova, S., & Merlino, I. (2017). Fintech as Financial Innovation – The Possibilities and Problems of Implementation. *European Research Studies Journal, XX*(3), 1. https://doi.org/10.1021/ja00368a049

Todorof, M. (2018). Shariah-Compliant FinTech in the Banking Industry. *ERA Forum, 19*(1), 1–17. https://doi.org/10.1007/s12027-018-0505-8

Wintermeyer, L., & Basit, A. B. (2017). The Future of Islamic FinTech Is Bright. *Forbes*. https://www.forbes.com/sites/lawrencewintermeyer/2017/12/08/the-future-of-islamic-fintech-is-bright/#15165ed65faf