

FINTECH

FUTURE OF FINANCIAL SERVICES

JUNE 2019

PREPARED FOR



مؤسسة الكويت للتقدم العلمي
Kuwait Foundation for the Advancement of Sciences



Disclaimer

This document has been prepared by Marmore MENA Intelligence Ltd "Marmore" at the request of and for the use of Kuwait Foundation for Advancement of Sciences ("KFAS») as a general research report that does not purport to provide investment advice or consider KFAS' individual financial position and risk appetite. This document is not an invitation to subscribe to or invest in any investment fund or investment opportunity.

Any research and analysis contained in this document has been prepared / procured by MARMORE for the sole use of KFAS, based on information obtained from public sources believed to be reliable, and NO REPRESENTATION OR WARRANTY, EXPRESSED OR IMPLIED, IS MADE that such information and research and analysis is accurate or complete, and therefore should not be relied upon as such.

Opinions, estimates and projections in this report constitute the current judgment of the author as of the date of this report. They do not necessarily reflect the opinion of Marmore and are subject to change without notice. Marmore has no obligation to update, modify or amend this report or to otherwise notify a reader thereof in the event that any matter stated herein or any opinion, projection, forecast or estimate set forth herein, changes or subsequently becomes inaccurate.

Research and analysis contained in this document are solely for KFAS' information only and are not to be relied upon as authoritative or taken in substitution for the exercise of judgment by KFAS. KFAS should conduct its own analysis and consult its own financial, legal, tax, audit and other professional advisors in making an investment decision relating to the fund or investment opportunity covered by this document. Except where otherwise indicated herein, the information provided herein is based on matters as they exist as of the date of preparation of this document and not as of any future date and will not be updated or otherwise revised to reflect information that subsequently becomes available or circumstances change after the date of preparation.

NO REPRESENTATION OR WARRANTY, EXPRESSED OR IMPLIED, IS GIVEN BY, MARMORE , OR ITS PARENT or any other member of its parent group ,OR ITS RESPECTIVE DIRECTORS, OFFICERS, REPRESENTATIVES AND/OR EMPLOYEES, AS TO THE ACCURACY OF THE INFORMATION OR OPINIONS CONTAINED IN THIS DOCUMENT, AND NO LIABILITY IS ACCEPTED, WHATSOEVER, FOR ANY SUCH INFORMATION OR OPINIONS. BY ACCEPTING THIS DOCUMENT, [CLIENT NAME] AGREES TO KEEP MARMORE INDEMNIFIED AND HARMLESS AGAINST CLAIMS ARISING FROM AN INVESTMENT IN THE FUND OR INVESTMENT OPPORTUNITY COVERED IN THIS DOCUMENT.

Nothing in this document shall limit the ability of MARMORE or its parent or any other member of its parent group to provide similar research and due diligence reports to others or have any business deals with any company covered in the research report or pursue any existing or future interests either of its or their own or of its or their clients. Furthermore, nothing in this document shall give rise to any fiduciary, equitable or contractual duties (including without limitation any duty of trust or confidence) that would prevent or restrict MARMORE or its parent or any other member of its parent group from acting on behalf of other clients or for their own account unless prevented or restricted by law.

This report may provide the addresses of or contain hyperlinks to websites. Except to the extent to which the report refers to website material of Marmore, Marmore have not reviewed the linked site and takes no responsibility for the content contained therein. Such address or hyperlink (including addresses or hyperlinks to Marmore's own website material) is provided solely for your convenience and information, and the content of the linked site does not in any way form part of this document. Accessing such website or following such link through this report or Marmore' s website shall be at your own risk.

For further information, please contact 'Marmore' at **Email: info@e-marmore.com**.



Table of Contents

Section 1 Study Scope and Objectives	07
Section 2 Introduction	09
Section 3 Comparison of systems applied in Local banks With International practices	19
Section 4 Reasons that led to the use of FinTech and Assessing the Related Risks and Benefits	37
Section 5 Comparison between Formal Financial Services and Tech-driven Innovations	53
Section 6 The Role of Regional and International Regulators and their Tools	75
Section 7 Envisioning Future Developments in terms of Regulatory Interventions	105
Section 8 The Growing Influence of RegTech	114
Section 9 Conclusions	121
Section 10 Recommendations	123

GLOSSARY ▶

Term	Comment
Accelerators	Accelerators are programs that support entrepreneurs to bring their technologies, ideas, or products into the marketplace and facilitate entrepreneurs to develop viable businesses.
Incubators	Special facilities for providing new developing companies with office space, infrastructure and a comprehensive range of services and amenities to enhance their survivability and business skills during the initial period of their development.
AI	Artificial Intelligence is a branch of computer science that trains machines to learn from experience, adjust to new inputs and perform human-like tasks by processing large amounts of data and recognizing patterns in them.
AML	Anti-money laundering refers to a set of laws, regulations, and procedures intended to prevent illegally obtained funds from being disguised as legitimate income.
AML/CFT	Anti-Money Laundering/Combating the Financing of Terrorism
APIs	APIs or application programming interfaces are a set of instructions and digital tools that allow software developers to develop applications that can talk to or interact with another company's systems
Big Data	A Collection of data sets that are so vast and complex that it becomes difficult to process utilizing traditional data processing applications
Bitcoin	A digital - or crypto - asset that enables payment in a decentralized peer-to-peer (P2P) network that is not governed by any central authority or other layers of scrutiny
Blockchain	A software that first emerged as the algorithmic system underpinning bitcoin. It is also known as distributed ledger technology (DLT). Essentially, it is a shared record of information that is preserved and updated by a network of computers.
CFT	Combating the Financing of Terrorism (CFT) includes investigating, analyzing, deterring and preventing sources of funding for activities intended to achieve political, religious or ideological goals through violence or threat against civilians.
Cryptoasset	A digital store of value that depends on cryptography to validate and secure financial transactions

Term	Comment
Cryptoasset	A digital store of value that depends on cryptography to validate and secure financial transactions
DLT	Distributed Ledger Technology (DLT) functions as a database that is consensually shared and synchronized across various websites and geographies. Transactions are made to have a public witness, thus making the possibility of cyber-attacks difficult.
Encryption	The process of encoding messages, by which a key is needed to turn that code once again into useful data
Ethereum	It is a type of Blockchain network that can be used to construct decentralized applications.
Financial Inclusion	A term for referring to financial products and services targeted at offering more affordable and mainstream financial options to the underbanked
FinTech	FinTech is a phenomenon describing the intersection of the financial services and technology sectors by which technology-focused start-ups and new market entrants innovate (or disrupt) the products and services provided by the traditional financial services industry
FinTech Firms	FinTech firms are businesses that use technology to transform or enable business and operating models in the financial services sector.
GDPR	General Data Protection Regulation (GDPR) is the primary law on how companies protect EU citizens' personal data by imposing a uniform data security law on all EU members.
ICO	Initial Coin Offering (ICO), or a token sale, is the process through which funds are raised for a cryptoasset venture. In return, contributors receive tokens
InsurTech	InsurTech is the use of technology to modernize and further improve the insurance sector
KYC	Know Your Customer (KYC) is the process through which a business verify the identity of its clients, assess their suitability and potential risks towards the business.
ML	ML or Machine Learning is the deployment of algorithms that can improve their computing or output performance utilizing training or experiential data

Term	Comment
Open Banking	A term for referring to the use of open APIs by banks or incumbents to facilitate third party software developers to develop applications and software utilizing the respective bank's data
P2P Lending	Also called social lending, peer-to-peer lenders operate websites that enables borrowers to secure money straight from lenders
PSD2	Payment Services Directive 2 (PSD2) enables bank customers and businesses, to use third party providers to manage their finances. It aims to enhance customer protection, promote innovation and improve the security of payment services within the EU.
RegTech	Regulatory Technology (RegTech) is the management of regulatory processes within the financial industry with the use of technology. The major functions of RegTech include regulatory monitoring, reporting and compliance.
Regulatory sandbox	'Safe spaces' where innovative FinTech products, services, related business models or delivery mechanisms can be trialed and tested
Robo-advice	Financial advice dispensed via the use of computer algorithms or roboadvisors
SMEs	Small and medium-sized enterprises (SMEs) are businesses that maintain revenues, assets or number of employees below a certain threshold. In the EU, small-sized enterprises comprise fewer than 50 employees, while a medium sized enterprise comprise fewer than 250 employees.
Underbanked	Individuals or businesses that have little or no access to mainstream financial products or services



Section 1

Study Scope, Objectives and Methodology

It is now clear that technological advances influencing financial services (or FinTech) will have a significant impact on everyday life, ranging from facilitating payments to reorganization of digital architecture of banks. Across the GCC, governments are committing themselves to establishing a compelling presence in the FinTech field, spearheading efforts to map out the larger FinTech landscape so that businesses, the investor community and regulators can benefit from reliable research on the rapidly growing sector.

With respect to throwing greater light on how FinTech can be leveraged for national economic competitiveness and sustainable growth, this report has sought to study the latest globally-implemented applications on FinTechs, and the extent on which the domestic banking units (DBUs) are aligned with these applications. Also, developing a strategic vision in this matter, and measuring the readiness of the domestic banking and financial sector to keep pace with such developments.

In order to effectively meet the report objectives, the major scope elements of the report include:

- Study the systems applied at the level of local banks compared to the latest international practices in this regard.
- Identify reasons that led to the use of FinTechs and assess the related risks and benefits.
- Make a comparison between the formal financial services and the tech-driven innovations such as FinTechs. The detailed comparison should be drawn regarding cost, speed, risks, accessibility and the overall orientation of any of them.
- Understand the role of regional and international regulators and their tools used for identifying, monitoring and mitigating the risks from technological innovations pertinent to the different financial and banking services.
- Envisioning future developments in this field and measuring the readiness of the domestic banking sector to keep pace with such developments.

In addition, the report seeks to uncover how the Kuwaiti FinTech ecosystem compares against the regional and global trends. In consequence, analysis has been conducted on the regulatory measures and comparative analysis of regulatory frameworks (global, regional and Kuwait) that optimally need to be in place to support FinTech initiatives. A mix of stakeholders are likely to find this report useful, including banks and financial services; policy makers; technology companies; investors; regulators and government agencies.

The key purpose of this report is to assess how the Kuwaiti FinTech ecosystem compares against regional and global trends. This report provides recommendations for Government agencies, private sector (banks and other financial institutions) and the FinTech sector to help cement Kuwait as a serious FinTech player. The recommendations cover a mix of long- and short-time line actions that will help shape the Kuwaiti ecosystem in terms of skills or talent, critical investments and infrastructure that will help better balance risk and innovation. A modern society’s interest in FinTech is not limited to the implications for the financial sector alone, but rather the potential impact on financial stability and the overall conduct of monetary policy as well.

This report’s methodology contains several steps (including scoping, primary research with various stakeholders, statistical modelling and final synthesis). About 20 stakeholders were interviewed as part of primary research in Kuwait, of which around 60% were banks. Also, technology and FinTech startups were part of the primary research. Key insights were gained from interviews with vital government agencies as well.

The statistical modelling framework and the research methodology use inputs from the primary research and other data collection and analytical efforts to make progressive measuring of impact on stakeholders in Kuwait (like banks) possible. By factor analysis and self-constructed indices, it was identified that the ability of FinTech to impact bank profits would be a factor of FinTech adoption, consumer behavior as related to their willingness to shift from bank channels and the ability of incumbent banks to resist competition through improvements of existing solutions. The impact caused due to loan intermediation on SME, credit card and personal lending could be calculated mathematically as:

1. Loans disrupted = (Existing loans of SMEs, Credit Cards & Retail Loans * FinTech adoption rate)
2. Potential Loss of Income = (Loans disrupted * Estimated interest margin)/Net Income
3. Similarly, for potential loss of income due to impact on fees, payments and transfers;
4. Value of transactions disrupted = (Existing transactions value * FinTech adoption rate)
5. Loss of income = (Disrupted transactions * Difference in Merchant Discount Rate)/Net Income

For this report’s purposes, we have assumed an interest margin of 4%, 120 basis points higher than the average net interest margins of 23.80% (Q3, 20182017-end) considering the riskier nature of loans. Similarly, we have used 0.5% to account for the differential merchant discount rate, usage fees and other charges. This has helped us to clearly map the financial impact of FinTech adoption in Kuwait.



Section 2

Introduction

Advancing technologies have a significant impact on daily life; and in the financial sphere, it influences a range of activities from making payments to providing the infrastructure critical to establishing international financial center.

What exactly is FinTech? It can be taken to refer to the new processes and financial products that become available due to digital technological advancements⁷. The Financial Stability Board (FSB) defines FinTech as “[...] technologically enabled financial innovation that could result in new business models, applications, processes or products with an associated material effect on financial markets, financial institutions and the provision of financial services.”

FinTech holds promise to revolutionize the way we bank and handle our finances by lowering barriers of entry, increasing efficiency, redefining user experience, etc., in a cost effective manner. New entrants including aggregators, payment solution providers, online platforms, established technological companies and financial start-ups influence the industry dynamics while incumbents who are adopting new technologies continuously adopt and reshape the business models.

The latest technologies make it easier for customers to access the market information they need to make multiple decisions, apart from driving down costs and curbing response times. Meanwhile, on the demand side, users familiar with latest communication technologies have come to expect financial services to offer similar benefits (in terms of mobility, personalization, etc.) as the other digital services they use.

Exhibit 2.1: Technology-enabled Financial Services Innovations and Key Fields of Application

Payments and securities settlement	Deposit taking, debt and capital raising	Investment services, asset management and insurance	Support applications
Mobile payment methods, including app-based services Internet payment methods, including payment initiation services	Crowdfunding (crowdlending, peer-to-peer lending) Instant credit	Robo advisors Social trading	Big data Cloud computing Open banking Distributed ledger applications

Source: Deutsche Bundesbank

⁷ Europeye srl

Many countries around the world are in a race to develop a cutting-edge FinTech hub. A number of elements have to come together to achieve one. Some of them are⁸—

- 1. An ecosystem of various financial players competing and collaborating;
- 2. An open architecture national economy that facilitates connectivity and greater innovation;
- 3. A web of international connections to encourage the exchange of ideas and quickly scale solutions;
- 4. A strong talent pool and robust research capabilities;
- 5. A conducive or supportive regulatory environment; and
- 6. A secure and safe cyber environment.

If Kuwait is to fast become a location of choice for firms wanting to establish an international presence in the FinTech domain, a fertile ecosystem for start-ups and various entrepreneurs are mandatory.

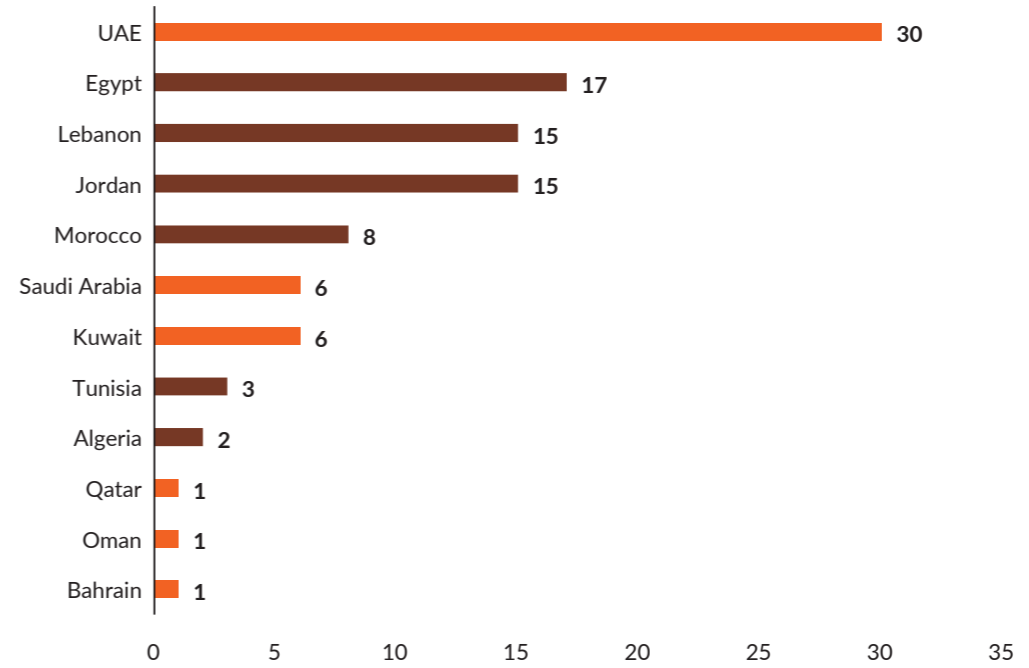
In order to better inform Kuwait’s strategy to meet its international financial center objective, it is vital to map out the domestic FinTech landscape. This will help in the creation of a recognized shared language or discourse on the issue, thus highlighting important trends, drivers and impediments. Kuwaiti FinTech development community is currently facing tailwinds due to the cumulative impact of digital connectivity, client inclination to try various novel modes of accessing financial tools, and general dissatisfaction with slow innovation and investments by incumbents.

In Kuwait, like elsewhere, the key themes impacting traditional banks are the disintermediation of traditional or incumbent models, the slow unraveling of incumbent infrastructure, the focus on data, and the need for ensuring client data and asset security. In terms of boosting FinTech, Kuwait scores highly in terms of availability of capital, though gaps in development capital and at the Initial Public Offering (IPO) level still exist.

From a Regulatory perspective, Kuwait has been conservative in accommodating innovations in financial services when compared to its regional peers. In stark contrast, the UAE and Bahrain have been proactive in introducing regulations, programs and tools, turning them into more attractive destinations for emerging FinTech start-ups.

⁸ Monetary Authority of Singapore

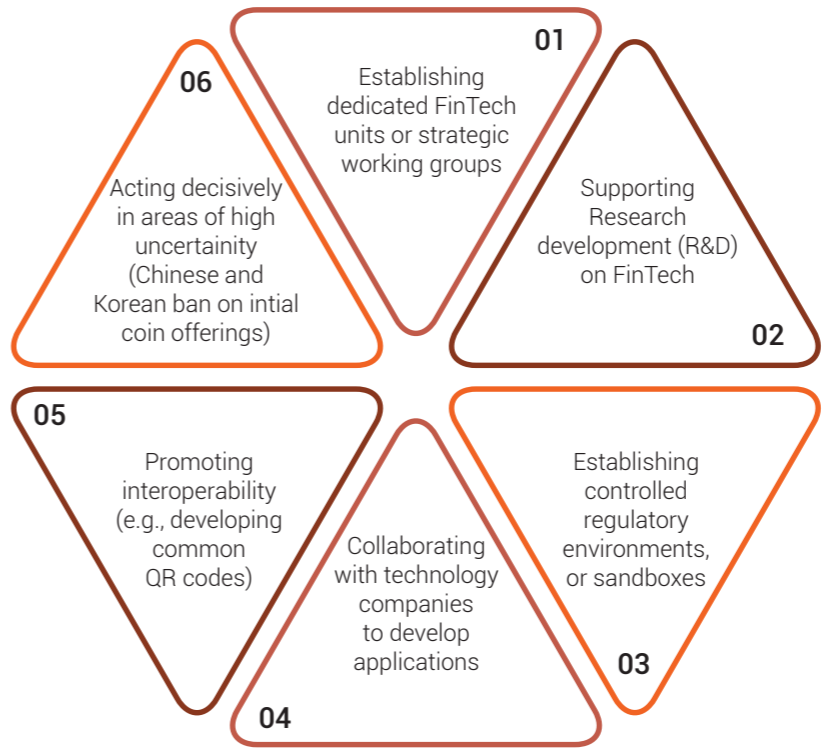
Exhibit 2.2: Four Emerging FinTech Hubs in the MENA (Share by Country, 2015)



Source: Accenture analysis of CB Insights, IC Dowson and William Garrity Associates, EY, TechCrunch, Wamda Research Lab, 2016

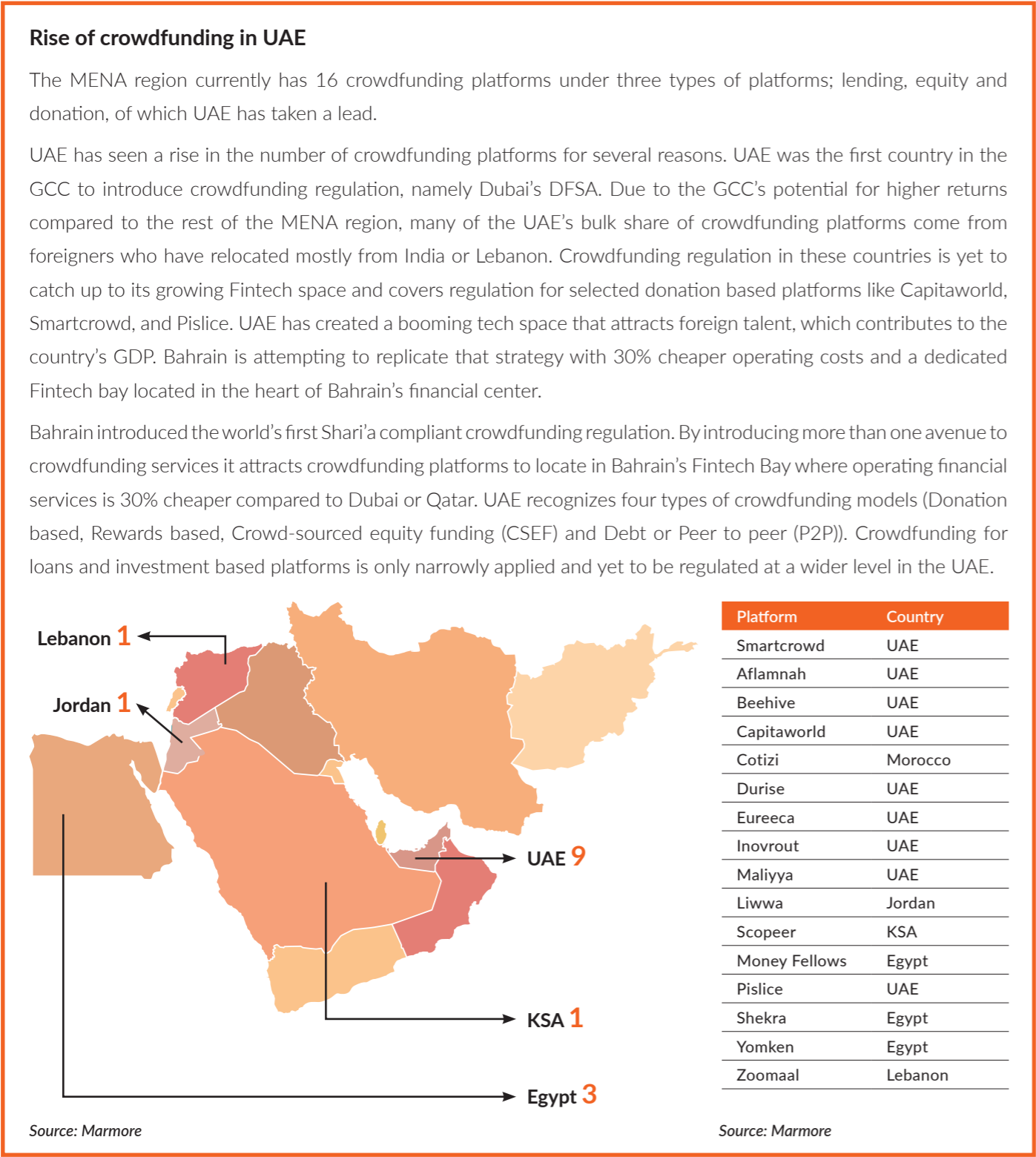
Kuwaiti regulators should consider forward actions to support the nation’s FinTech community, especially in terms of greater access to critical talent; boosting closer collaboration; and data sharing between incumbents and FinTech firms, etc. A championship role is also called for in terms of setting the agenda on data or privacy protection as this issue will gather critical mass as a defining pillar of the financial services sector.

Exhibit 2.3: Some Frequently Witnessed Central Bank Strategies from around the World



Source: Bank for International Settlements (BIS)

FinTech is deeply altering the way consumers pay for various financial services. There is a dramatic shift away from paid subscriptions to alternative models since the richness of data available in today’s financial services industry is greatly vast and complex. Also, younger demographics of banking clients are increasingly frustrated with current financial infrastructures and are freely circumventing those using FinTechs. This includes tools like peer-to-peer networks and cryptographic currencies. Moreover, the rise of concepts like crowdfunding are constantly forcing regulators to innovate and realign their policy matrices.



The UAE and Bahrain are specifically considered as leading the race in the GCC with respect to responding to developments in FinTech. For e.g., on the regulatory front, Bahrain FinTech Bay is expected to have increased regulatory oversight on the FinTech sector. Also, regulatory frameworks are aiming to facilitate smooth operation and consistent functioning of the FinTech operations.

Exhibit 2.4: UAE vs Bahrain FinTech Landscape

	Abu Dhabi Global Market (ADGM) Free Zone	Dubai International Financial Centre Free Zone	Bahrain
FinTech	Created RegLab, in 2016, applies a bespoke regulatory regime to each applicant agreed with the ADGM Financial Services Regulatory Authority (FSRA). It offers developing Financial Technology	The Dubai International Financial Centre (DIFC) announced its FinTech Hive initiative in January 2017. The DFSA offers an Innovation Testing License (ITL) which is similar to ADGM’s RegLab.	The Central Bank of Bahrain (CBB) launched a regulatory sandbox for FinTech companies in Bahrain in June 2017. Enables Licensed firms to test their products and services.
Support Available	Access to co-working space, network of collaborators	Mentorship, network collaborations, workspace among others	Virtual working space, support of Government agencies for setting up business and technical back-up
Licensing Period	Up to two years	Six-12 Months	Upto 9 Months
Islamic Finance	UAE ranked 3rd in Global ranking in Islamic Finance and 1st among the GCC countries in Islamic FinTech innovation.		World’s First FinTech Consortium for Islamic Finance established.
Collaboration	ADGM and Bahrain Economic Development Board Sign Region’s Fintech agreement		
Regional Ranking	UAE alone hosts 29% of the MENA’s FinTech startups, and thriving businesses		
Regulation	Launched Regulatory framework for loan and investment based crowd funding platforms	Crowdfunding regulations for Conventional and Islamic compliant markets	

Source: Clifford Chance FinTech in the Middle East 2017.

Accelerating Kuwait’s FinTech sector will position the country to seize opportunities as consumers increase their buying of consumption-based products and services in Kuwait and elsewhere. This means that developing Kuwait’s FinTech industry will fundamentally support the economic transition underway in Kuwait’s economy. There is little doubt that the spurt in alternative online lending will increase competition to GCC’s traditional

banks. In addition, it will disrupt the conventional business of lending. Thus, future regulatory developments will play key role in the development of the ecosystem.

Also, for regulators and policy makers, the message that is getting clearer is that fighting financial crime will be more effective through embracing innovation. Making meaningful choices with respect to capabilities designed to allow banks and financial services companies to try new modes of working under a collective strategic vision has a greater potential for success. This explains the growing focus on RegTech or Regulatory technology. It is aimed at harnessing the capabilities enabled by new or disruptive technologies such as Cloud computing, Big data, Artificial Intelligence (AI), and Blockchain, etc. for devising solutions to help firms ensure that they comply with prescribed regulatory requirements⁹.

The report aims to explore the transformative potential of the tech driven innovations on the formal financial institutions in Kuwait. The objective of this project is also to create a cohesive and functional roadmap for FinTech in Kuwait and understanding the linkages among the actors involved within the FinTech sphere that includes regulators, banks and the FinTech companies. Moreover, like alluded earlier, the rise of concepts like crowdfunding are constantly forcing regulators to innovate and realign their policy matrices.

Exhibit 2.5: Major Crowdfunding platforms based in Kuwait

Jaribha Reward-based crowdfunding platform where creators can get the financial support to start their projects from the interested people in the market. Jaribha facilitates and manages the process, while the creators maintain full ownership of their ideas.	Propnology Q8 Property crowdfunding platform that links community of investors with the investment opportunities offered by a network of property partners. It reduces the barriers to entry and allows anyone to invest in the Kuwait property market.
---	---

In many nations, especially in the West, the 2008 Financial Crisis is credited in large measure for the surge in FinTech companies, as the focus of mainstream banks shifted to comply with post-crisis regulatory waves and associated cost-cutting measures¹⁰. This created an innovation vacuum in the industry, particularly at a time when smartphones and related disruptive forces, like ecommerce, social networking growth and mobile apps were taking hold.

FinTech companies made their appearance initially to fill the innovation void left unaddressed by banks, but they later took off as a distinct phenomenon. As FinTech developments take hold, the potential impact on banks and their entrenched business models is as yet uncertain¹¹. While some industry observers opine that banking profits are at risk in the future, others claim that mainstream banks will be able to co-opt the new FinTech competitors, thereby strengthening their own efficiency and operational capabilities.

⁹ BBVA
¹⁰ Powered by Fintech--UBS
¹¹ Basel Committee on Banking Supervision

Exhibit 2.6: Top Banks’ Approach Worldwide

Region	Banks	Fintech Innovation Centre	Partnerships	Few Acquisitions & Investments
North America	Citi	Singapore, Dublin, London	IBM, Microsoft, Wonder and Virgin money (API partnership)	  
	JP Morgan chase	Virtual Fintech lab to empower underserved population	On Deck	   
Europe	HSBC	London, Honk Kong	The Floor, Trade Shift	Invested \$200m in Fintech Startups
	Barclays	London, Manchester, New York, Cape Town	Techstars	 
	RBS	London	The Floor, Scottish Financial Enterprise, Oakam, Funding Circle, Assetz Capital	
	ING Group	Belgium, Netherlands	R3, Swift Innotribe	 
Asia-Pacific	OCBC Bank	Singapore	Fundaztic, Cognicor, WellInvest, BlackSwan Technologies, Silent Eight	
	UOB Bank		Funding Societies, Card up, OurCrowd	
	ICBC	Honk Kong	Jingdong (JD Finance), 360 group, Huawei	Invested 10 billion Yuan in China Internet Investment Fund 

Source: Magna carta; Marmore Research.

Regulatory impediments have been universally cited as one of the major hurdles for the development of FinTech. As financial services have evolved rapidly in recent times, the onus is on regulators to keep up with the developments and amend their practices to accommodate the metamorphosis of services and products offered in the financial sector. However, from the perspective of a regulator, the task in hand is not a simple one as tailoring regulations hastily could prove to be a double-edged sword, considering the importance held by financial institutions in upholding the economic and monetary stability of a nation. Regulators must ensure that financial stability and customer safety are not compromised while seeking to create an environment more favorable for FinTech companies.

In order to customize this report for the Kuwaiti context as much as possible, our tactical research on the report focused on the key hypothesis questions underpinning the project. In other words, we have structured our research around the five main thematic questions –

What are the areas the local banks are at the forefront of FinTech adoption?

Action: We have identified the digital initiatives and current adoption level of advanced technologies such as AI, big data in the workflow of the 10 Kuwaiti banks. Based on the analysis, the Kuwaiti banks that are in lead in embracing FinTech were identified. In a broader context, we have also explored the trends and trajectories followed by local and international banks.

What are the reasons that led to the rise of FinTech in Kuwait?

Action: We have considered five key factors for this analysis based on social, technological and regulatory factors that includes digital penetration, demographics, digital infrastructure and the unique characteristics of Kuwait's banking sector.

How will these innovations impact the profitability of Kuwaiti banks?

Action: We have estimated the impact for local banks, across multiple segments such as fee and commissions income, retail lending, SME loans, payments, fund transfers and other services based on the customers FinTech adoption level.

How the different types of innovation interact with formal institutions and what are the impact of these changes?

Action: For this, we have compared the business model of the formal financial institutions and tech driven innovations across the core functions of banks- Lending & Borrowing, Payments and Investment management. We have also assessed the costs, speed, accessibility and the risks associated with the different business models.

What would be the implications of these changes on Kuwait regulators?

Action: The policy approaches to FinTech regulation in Kuwait have been listed by considering a range of scenarios from our global and regional observations. Given the variety of national approaches, we have suggested ways on how Kuwaiti regulators can protect customers, bring in stability and provide a conducive environment for the innovators.

This report has uncovered that Kuwait banks have grown in sophistication and have incorporated advanced technologies such as biometrics capabilities and machine learning algorithms to offer banking service to its customers, albeit in varying degrees. Based on the FinTech initiatives and consequently the products and services rolled out by the Kuwait banks, we could categorize the domestic banks into:

- **Pioneers**
 - » These are those banks, which are characterized through their dedicated focus on innovation. For instance, Boubayan bank has dedicated resources working in an independent and agile unit, to steer forward and position themselves at the forefront of FinTech innovation. Certain banks, cater to the dynamic expectations of the customers and are involved in continuous development of new products and services to enhance their offerings. Kuwait Finance House and National Bank of Kuwait have adopted blockchain technology to offer fund transfer services in partnership with Ripple. While, Gulf Bank has deployed biometric facial recognition in its mobile banking application as a means to authenticate instead of the traditional passwords.

- **Followers**

- » Certain banks that have been tracking the developments and making calculated moves have been classified as 'followers'. They typically partner with a third party service provider to enhance their FinTech offering. Ahli United Bank, has partnered with Arab Financial Services and Ajar Online to provide general payment and property-related solutions, respectively. Warba Bank has been utilizing technology to make it easier for its customers to open accounts without the need to physically visit the bank branches.

Al Ahli Bank of Kuwait recently moved to a robust core banking platform, which shall enable it to launch and adopt various advanced technologies including Artificial Intelligence, Big data and Cloud computing. Recently, it has embarked on automation process using Robotic Process Automation (RPA) and had introduced Electronic Document Management System (EDMS) to improve the efficiency and improve the productivity.

- **Conservatives**

- » Burgan Bank, Commercial Bank of Kuwait and Kuwait International Bank offer digital platforms and banking application to do basic banking transactions. In 2017, Commercial Bank of Kuwait has approved digital banking strategy (2022) while others are yet to adopt advanced technologies.

The Kuwait financial services industry has cautiously approached these challenges. The local banks have increasingly focused on customer centric models and are gradually changing their operating models based on the new demands.



Section 3

Comparison of systems applied in Local banks with International practices

In the global banking sphere, FinTech today has penetrated beyond the retail and customer-facing applications and services, across the front (exchange/trading, portfolio management), middle (data platform, alternate data) and back offices (risk/compliance, Anti Money Laundering/Know Your Customer (AML/KYC)). The technological transformation of business-business and business-customer interactions by FinTech has posed a threat to the incumbent banks, financial and insurance companies. The digitization of financial products and services by the technological innovators and the demand from tech-savvy millennials are leading to the development of new generation of banking services and products.

Banks across the world have redesigned themselves to meet the changing customer needs while retaining its business model. Commercial banks are still internalizing all aspects of channels, product design and operations as well as a fair amount of private infrastructure¹². While incumbents' value added services like wallet solutions, video and chat functions for self-service, and Personal Finance management (PFM) tools are in a mature stage, advanced PFM tools (Peer comparison, Automated product recommendations), video and chat functions for advisory (using Artificial Intelligence (AI)) are in testing and evaluation stage.

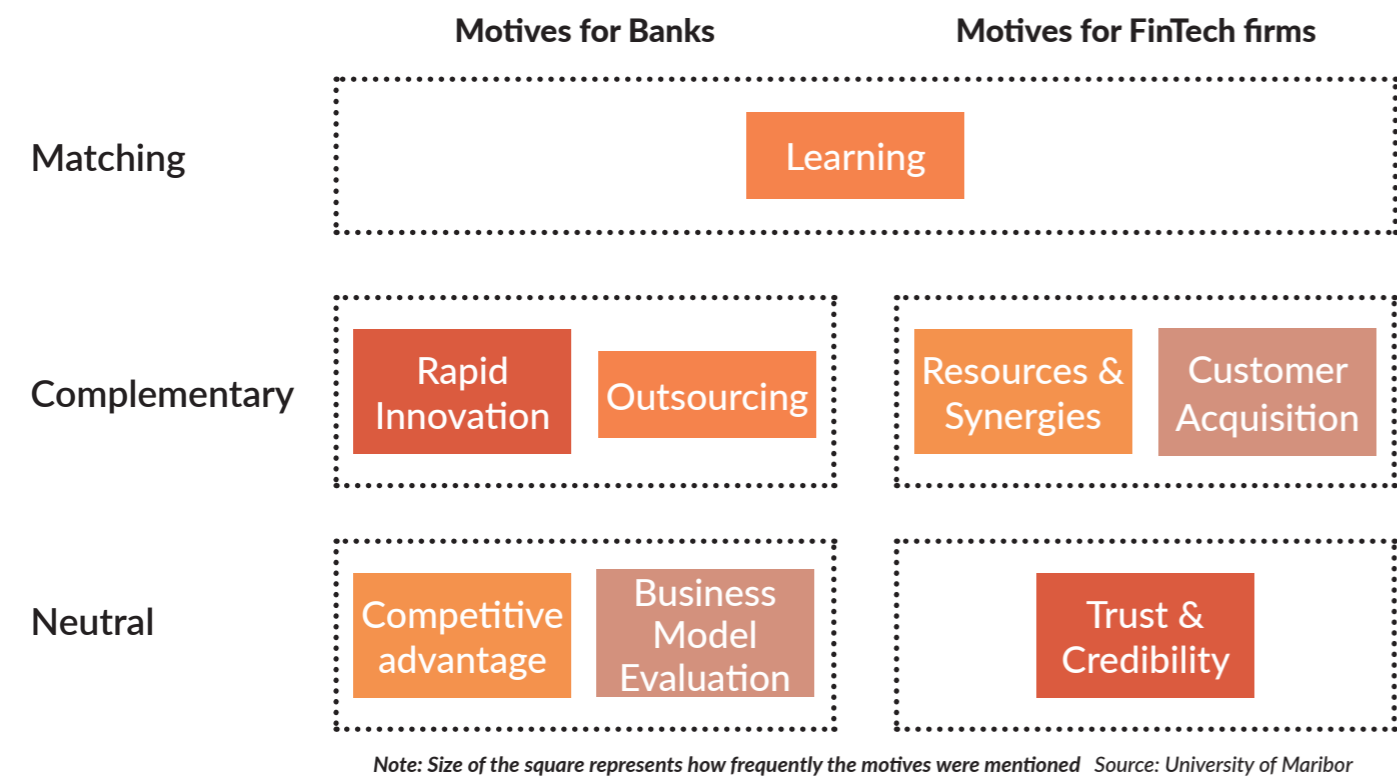
In general enhancements to the product and service portfolio using AI and machine learning are just in the beginning phase. The array of issues that require investment and management attention across financial institutions around the world (maintaining the compliance standards, legacy infrastructure) has caused many of the banks to carefully architect their transformation through partnerships, investments, and exchanges to enhance and reinvent the financial services. Innovation centers for FinTech has been created globally by international banks to connect and share knowledge to create the future of financial services e.g. Barclays has created global FinTech innovation centers in London, New York, Manchester, Cape town, Vilnius; BNP Paribas in Paris, New York; BBVA in Spain, US and Argentina.

¹² International Finance Corporation; Private infrastructure represents services that are in general outsourced like call centres, underwriting and AML/KYC validation.

Banks and FinTech firms are realizing the value of collaboration for them and for the end users¹³. According to the 2017 World Retail Banking Report from Capgemini and Efma, 91.3% of bank executives interviewed were willing to work with FinTech firms and, similarly, 75.3% of the FinTech firms said they would collaborate with banks. The differences in skills and knowledge make banks and FinTech firms to be interesting alliance partners. A recent study by the University of Maribor¹⁴ identifies several motives of partners to form bank-FinTech alliances. The findings show that motives for banks are to speed up innovation and achieve competitive advantage, for FinTech firms trust seems to be the valuable asset obtained in the alliance in addition to the large customer base that incumbent banks could provide.

The comparison of motives for banks and FinTech firms are illustrated in the figure, the horizontal categories represent motives based on neutral (beneficial to only one side of the alliance), complementary (beneficial to both sides) and matching (identical among the alliance partners) schemes.

Exhibit 3.1: Motives for FinTech firms



Financial Institutions have chosen different options while implementing the new digital business model. The options include build, buy, partner, invest or incubate/accelerate.

Build- Building option allows financial institutions to define the scope of their innovation initiatives, design tailor made solutions and solve problems in specific areas. Build option has its benefits only when the financial institution has the right skills, time and investment. Hence most likely preferred by large institutions as they might have the capability to hire or train their resources to build a suitable model. This type of approach also require the banks to inculcate its employees a start-up culture, for example, ING uses a structured process called PACE to accelerate innovation internally. Similarly in 2017, DBS (The Development Bank of Singapore) involved over 15,000 employees in programs like incubators, accelerators and partnership with the FinTech community.

Marcus by Goldman Sachs- An online personal loan platform built by Goldman Sachs offering no-fee personal loans and high-yield savings accounts for consumers. Marcus provides consumers with a transparent and simple approach to consolidate their high interest credit card debt. At the end of 2017, Marcus had more than \$2.3 billion in loans and \$17 billion in deposits¹⁵.

Buy- Acquiring might be an effective way to take advantage of the synergies and shortening the turnaround time over the development process. Though acquiring a FinTech company can quickly bring in a fully functional innovative division, the cost involved would be high. It might be larger than the building or partnering model. Hence this model would be again preferred by larger institutions that have more capital for research and development.

Commonwealth Bank of Australia acquired South African FinTech company TYME. TYME has provided KYC accreditation solutions allowing customers to open bank accounts through mobile phones. According to a report by The Australian newspaper, TYME is signing up 5000 customers every week¹⁶.

Partner- Partnership model brings in a low cost, resource intensive, rapid speed to market for FinTech solutions. Compared to the build or acquisition model, partnering often has advantage over the speed and cost with few challenges confined to choosing the right partner that likely share the common values.

Santander UK partnered with Kabbage a US FinTech company to offer fast loans to SMEs. The online lending platform can potentially access working capital of £100,000 online on the same day. The automated platform for small and mid-sized business lending accelerates the underwriting process reducing the amount of time required for process requests¹⁷.

¹³ Capgemini
¹⁴ The study was based on conducting 18 interviews to understand what motives the individual partners of bank-FinTech alliance within the financial services in Germany.

¹⁵ American Banker
¹⁶ African Business Communities
¹⁷ Financial Times

Invest- Investment model allows the financial institutions to connect with the right skills and capabilities. It avoids the hindrance for the FinTech firms to focus on internal governance and reporting.

The top banks across the world including SBI Group, Bank of America Merrill Lynch, HSBC (\$107 million funding in to R3¹⁸) have invested in FinTech firm R3 to develop an international payment system that allows the existing central bank currencies and any new digital ones to be transacted by Blockchain¹⁹.

Incubate/Accelerate- Allows a close relationship to the funding company enabling internal capabilities, infrastructure and resources to be deployed to help the start-up. Banks like Barclays, Wells Fargo, HSBC have sponsored their own accelerator/incubator programs. However such accelerator programs require some level of equity share from the startup. Also the financial institutions’ incubate/invest route comes with inherent challenges that may include funding restrictions and technology concerns. Incubate/Accelerate allow companies to collaborate with early stage start-ups through either a long and intensive business development process or a short-term structured curriculum. There is constant interaction and exchange of knowledge and other resources between both the parties involved during this period. Invest is the tool that focuses on more mature start-ups and strategic partnerships that enables the introduction of new products and services based upon the mature technology.

The Barclays Accelerator programme, powered by Techstars, is designed to shape and scale the next generation of FinTech businesses. Since 2014, it has connected startups to mentors from across Techstars’ and Barclays’ global network of clients, partners and experts, for creating breakthrough solutions to solve some of the industry’s biggest challenges.

Box 1: API- Bank/FinTech Collaboration

Application Programming Interface (API) is the simplest form of standardized protocol for computer programs to talk to each other and is integral to modern software development²⁰. An API specifies the connection mechanism, the data, and functionality that are made available and what rules other pieces of software need to follow to interact with this data and functionality. The financial institutions can use API to allow third parties to access their data or services in a controlled environment.

While a number of FinTech related development like Blockchain, has enabled collaboration that would benefit across the competitors (R3 a Blockchain technology firm lead to a consortium partnership of more than 50 institutions to design, experiment on advanced DLT), a rapidly emerging interest in collaboration due to the APIs are seen. Understanding the high barriers to entry and the complex regulation to go alone in the market by the emerging FinTechs, a new collaboration due to APIs is developing to drive forward the next era of digital transformation not only benefitting banks, but allowing FinTech developers to plug their technology into real-world problems²¹.

Case in Point

Citi’s API

Through Citi’s new global API developer hub, Citi will grant developers access to APIs across eight usage categories, including account management, peer to peer payments, money transfer to institutions, Citi rewards, investment purchases and account authorization. Citi has collaborated with Virgin money, MasterCard and Wonder to leverage its API²². Such collaborations of leading brands and developers, will be able to offer a complete suite of products, services and experiences to meet customer’s financial needs.

Exhibit 3.2: API enabled collaboration benefitting users

Ordering Food Online and Paying

Could be using Paypal API, or VISA API linked to Citi Bank account

Paying for Uber

Using API MasterCard API or any other Credit Card

Mint Notification

Citi Bank’s API linked to Mint app

Source: Marmore Research

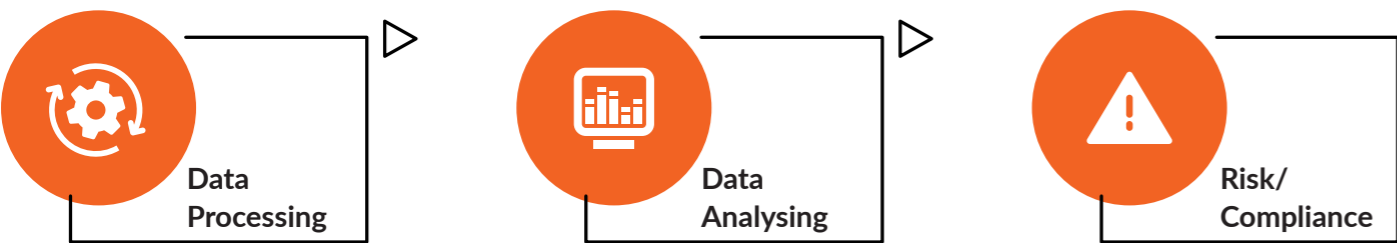
BBVA Compass and Dwolla

BBVA compass with their open API (BBVA API Market) partnered with the FinTech company Dwolla offering real time payments to BBVA users. APIs offer a bridge between two companies while paving a digital path to an increasingly connected financial ecosystem. The holders can thus bypass the conventional networks reducing the time to clear the payments to seconds instead of 2-5 business days.

¹⁸ CNBC
¹⁹ Reuters

²⁰ Banking Tech
²¹ Societe Generale
²² Citi

Traditionally, banks have internalized all or most of the core process like data analysis, processing, compliance and so on. However, when external providers can bring more efficiency and compete with sophistication than individual institutions process externalization can increase the level of efficacy in the traditional financial institutions. Externalization of the core in-house process (Data Processing, Data analysing, Risk/compliance) can streamline work and increase the customer’s digital experience.



Data processing

Though traditional players like banks have advantage over hard information on credit scores, payment history and verification, most banks work with fragmented data architecture, creating massive gaps in storing, retrieving and utilizing the data²³. FinTechs add value to real time information by using every bit of information for creating products and services. New technologies like big data and cloud computing can process data in such a way that products can be designed for different market segments and meet specific customer needs. Thus services that highly rely on the electronic data processing and less financial expertise like payments, brokerage of security and consumer loans are increasingly replaced by the FinTech players.

Data analysis

Services like lending, advisory (corporate finance), asset management and private banking (advisory on estate planning, structured products) though requires considerable financial expertise, innovations like advanced analytics, cloud computing and automation make analyses instant and more accurate, allowing institutions to test a greater number of opinions to support decision making. For example, Kensho deploys scalable analytics software augmenting and powering the decision making throughout the global financial system²⁴.

Regulatory technology- Risk/Compliance

With the rise in financial crime and fraud, financial institutions are seeing an increase in regulatory pressure and an increase in the fines levied against institutions that fail to implement effective crime-deterrence systems. This compliance requirement causes a transformation with heavy implications for risk and finance data and technology. The dimensionality of the data and the costs to support a robust AML process are further amplified because these are large, geographically diverse financial institutions. However the cloud based FinTech services can aggregate collection of changing regulations across geographies (FundApps) providing the solution that can meet institution needs across these varying dimensions. FinTech company like AcadiaSoft has developed collateral management solution that combines disparate sources of information that maximizes organizational

efficiency and meets the increasing financial scrutiny that comes from shareholders, bond holders and regulators worldwide . Ayashdi uses big data and complex data analytics to solve problems as diverse as anti-money laundering, fraud, and cybercrime . A complete analytic structuring of one of the financial markets' largest pieces of legislation, MiFID, was designed by Droit. Its fully-digitized MiFID II trade compliance engine provides the current and complete digitized machine-readable MiFID II rule text and machine-executable implementation. It enables complete verification and auditability of every trading decision, including traceability to the letter of the law. OneSumX Regulatory Reporting uses a single source of data to ensure consistency, reconciliation and accuracy. It also includes the firm’s regulatory update service that actively monitor regulation in approximately 50 countries.

Application in Kuwait banks

In this section we have mapped those applications adopted in Kuwaiti banks which can be compared with the International Banks practices.

Kuwaiti banks have been cautiously approaching the new challenges and are increasingly focusing on shifting towards customer centric models providing omni-channel experiences. New technology enabled value added services to increase the convenience for the customers like wallet solutions, self-servicing and payments are well received in Kuwait and most solutions are showing early signs of consolidation. Major adoption of FinTech are seen in payments and local banks are gradually changing their operating environment. Kuwaiti banks made payments more convenient by leveraging new form factors like NFC (Near-Field Communication; this has been detailed in the payment section).

Kuwait banks have focused on engaging customers and building trust in the key activities of digital banking like account opening, account servicing, and customer onboarding. Kuwait Banks have also streamlined services for customers through digital and mobile enhancements including instant payments via mobile, simplified authentication through a mobile token, fingerprint and facial recognition. The technological advances have pushed Kuwait banks to fasten the digitalisation process, adopting advance level of technologies such as Big Data and Cloud Computing in their workflow. In this context, Al-Ahli Bank of Kuwait (ABK) has been a trendsetter of technology implementation with the launch of its new cloud based digital HR Management system by SAP. Harnessing digital technology like AI and machine learning SAP’s software will increase ABK’s employee engagement, creating a different work environment.

Application in International Banks

Nevertheless, international banks have further deepened the application of technologies to improve the effectiveness of services they provide for customers by deploying platforms like machine learning and big data. For example, Citibank has made significant improvements in response rates, efficiency, and retention of balances and spend through models that helps to understand individuals’ wallet. ICBC (Industrial and Commercial Bank of China) formed an online and offline integrated system of precise marketing with multiple contact points with the

²³ PwC
²⁴ Kensho

²⁵ AcadiaSoft
²⁶ Ayashdi

application of big data analytical technology. Similarly, DBS uses big data analytics and models that can better engage customers in contextual marketing which resulted in garnering incremental deposits in the SME space.

Banks across the world also underline that digitalization drive results. Citibank points that in U.S., about half of the credit card accounts originate through digital channels, lowering the cost to acquire and serve. Similarly, DBS income from the digital customers has grown at a compounded annual growth rate (CAGR) of 27% compared to a decline of 4% for traditional customers. The following exhibit shows the growing digital acquisition of customers by banks across the world.

Exhibit 3.3: Digital customers acquired



The number of digital customers increased from 31 million in 2015 to 35 million in 2017



In 2017, mobile customers reached 282 million.



ING Netherlands' mobile customers reached around 600,000 in 2017



Number of digital customers increased from 2.2 million in 2016 to 2.5 million in 2017

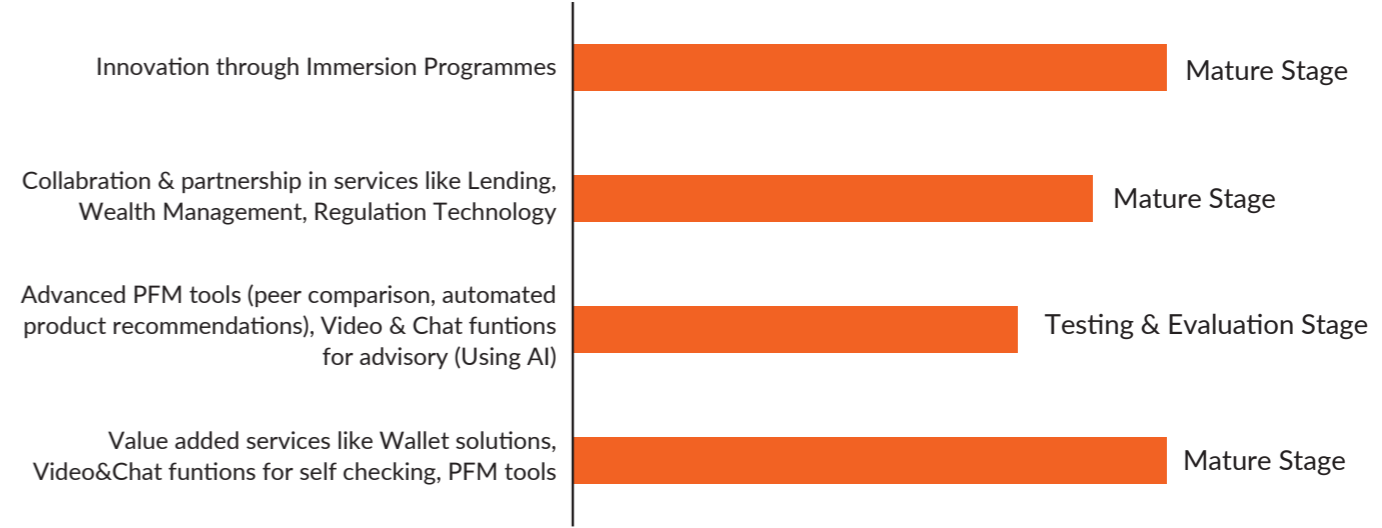


In 2017 the number of digital customers reached about 250,000.

Source: Annual Reports of above-mentioned banks, 2017

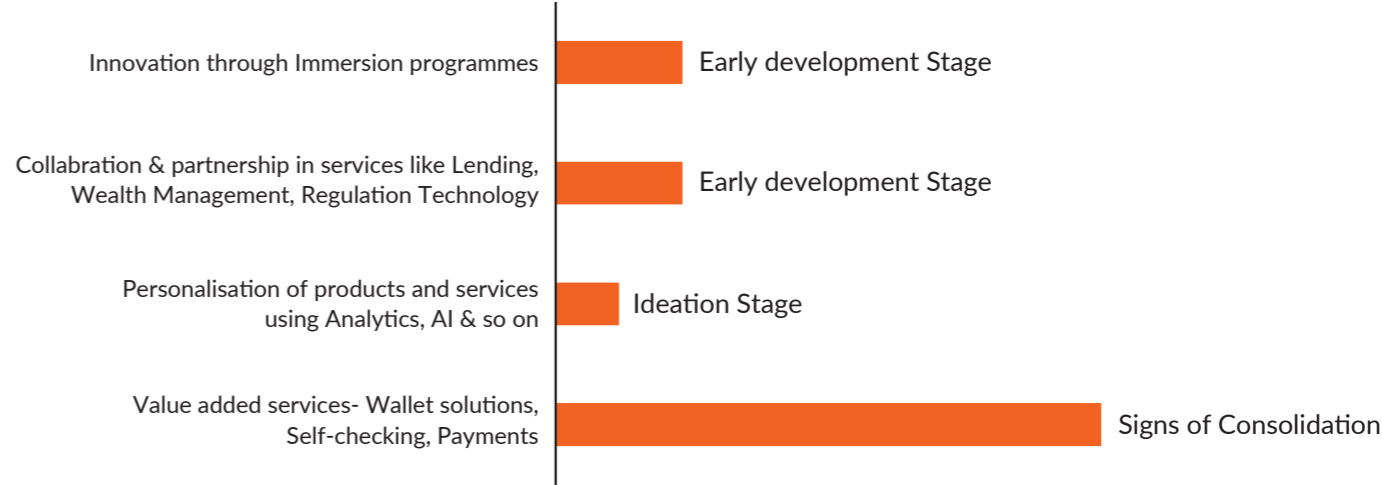
While international banks are trying to increase the digital customers by increasing the user experience in the retail digital platforms, most of the Kuwait banks are trying to increase user experience and the digital services due to the demand from digital customers. In essence, we can observe a varying causal effect in their approach. The following exhibits explain the trends and trajectories followed by the Kuwait banks and International banks on a broader context.

Exhibit 3.4: Trends and Trajectories—International Banks



Source: Marmore Research

Exhibit 3.5: Trends and Trajectories—Kuwait banks



Source: Marmore Research

Digital banking for personalization of products and services using data and analytics, machine learning and so on are acknowledged but cannot be considered mature in the Kuwaiti banking industry. While international banks are beta testing the products, Kuwait banks are in the ideation stage. Developing promising technologies in banking services through collaboration and partnerships in services like lending, wealth management, analytics and regulatory technology remain much limited unlike international banks, such collaborations/partnerships would reduce the turnaround time from development to commercialization. Kuwait banks are highly commensurate with the international banks in retail banking services like *Self-service, Security and Payments*.

Self-service

The Kuwait commercial banks deliver a range of self service capabilities including real time customer enrolment, secure online chat and video functions. *Kuwait Finance House (KFH)*'s *XTM* services provide an alternate delivery channel for a branchless banking experience, all banking services including opening deposits, balance enquiry, instant transfer, instalment payment, and withdrawal up to KD 5,000 are delivered with the opportunity of video conferencing with a KFH operator²⁷. *NBK (National Bank of Kuwait)* has the largest call centre in Financial service in Kuwait and has evolved into a contact centre serving customer needs with a dedicated digital response team offering 24/7 service across voice, social media channels (2015), WhatsApp (2016), and online chat functions (2017).

Boubyan Bank's interactive video tellers allow it to expand into new locations where full-size branches are not viable. ATM-based technology allows customers to talk to a live remote teller who controls the machine to conduct transactions, such as cash deposits, transfers between accounts and cash or check acceptance without a card.

Payments

As finance and technology become increasingly closer, major banks are introducing new payment solutions to ensure that the customers are able to transact in a way that is faster, safer and more convenient. The initiatives towards digital payments by a few prominent international banks are as follows:

The Development Bank of Singapore (DBS): Paylah! a mobile wallet app by DBS allows users to transfer money to anyone instantly with just the recipient's mobile number. Users can make payments at online merchants. DBS PayLah! is the first mobile wallet in Singapore to offer users the means to collect payments through online channels with payment links or QR codes.

Citi Bank: Citi Pay is a tokenized digital wallet provided to Citi's Mastercard members. Citi enables P2P payments with Zelle Network. Citi, in partnership with Nasdaq, developed an integrated payment solution that enables payment processing and automated reconciliation using blockchain technology. This provides a seamless end-to-end transactional process for private company securities and direct access to global payments from Nasdaq's Linq platform using CitiConnect for blockchain and Citi's cross border, multicurrency service, WorldLink Payment Services. Citi and Bank of Thailand introduced QR code payments in Thailand to stimulate its move towards a cashless economy.

Bank of America: Bank of America offers various innovative digital payment solutions to its users. Zelle is a digital payments network under the co-ownership of multiple banks including Bank of America. The Zelle service enables users to electronically transfer money from their bank account to the accounts of other registered users.

²⁷ Kuwait Finance House

HSBC: HSBC SimplyPay App (UPI app) enables its users to link their accounts across banks with the use of a single mobile App. It allows real time funds transfer option to pay and collect money. HSBC collaborated with PayPal to expand their payments network and make it more accessible.

Industrial and Commercial Bank of China (ICBC): ICBC rolled out the first QR code payment product in the banking industry covering catering, shopping, express delivery and other small-amount payment scenarios speeding up the e-commerce payment experience.

Digital payments comprised of online, mobile and contactless cards are on the rise with Kuwait market witnessing high digital penetration. The Kuwait market saw a shift towards POS from ATMs, with consumers going cashless. The POS transactions increased from 40% in 2013 to 44% in 2016 with KD 9.1 bn POS transactions compared to KD 11.5 bn ATM transactions²⁸. The local banks adopt a number of payment innovations leveraging mobile and connectivity to make payments simpler. Value addition is made in the existing POS network with new form factors like NFC and QR code.

Exhibit 3.6: Technological additions in existing payment process



Source: Marmore Research


Some of the digital payment solutions offered by the local banks are


1. The KFH Visa Signature Credit Card comes with Chip and Contactless 'Visa payWave' technology enabling customers to make payments easily and safely with high international standards.
2. With the NBK Quick Pay, money from any NBK account or local accounts can be received with just a few taps on the mobile using the payer's email or mobile number. The NBK recently launched NFC wearables (Wrist band) (1st in MENA) and Stickers (1st in Kuwait) that can be used as wallets.
3. Bouyban Bank's UTap uses the latest NFC technology which allows the card or mobile to communicate with the POS machine or the ATM by simply tapping on it, without having to insert the card into the machine.
4. Al Ahli Bank of Kuwait (ABK) launched the Tap 'n' Go service which uses Visa payWave to enable Prestige, Elite and VIP Debit cardholders to transact with the POS devices by tapping or waving the card on the NFC-enabled POS machine without the need to insert or swipe the card.


²⁸ Arab times

- 5. The Commercial Bank of Kuwait allows customers to pay low value purchases (lower than KD10) without the need to insert the ATM card in the POS terminal.
- 6. In 2017 Burgan Bank introduced the Tap & Pay cards. All the new debit cards of the bank come with the ‘tap and pay’ benefit enhancing the customer experience. Customers would just need to simply wave their card in the proximity of the reader.
- 7. The Gulf Bank’s ePay Services allows customers to receive money immediately using K-Net and pay instalments instantly, settle bills through its online banking website and mobile application.
- 8. KFH wallet: The KFH wallet works similar to the Google and Apple pay where customers can add their cards to the KFH wallet for a faster and secure payment option both locally and internationally.

KFH Wallet



Pay

Google wallet

Customers can add multiple cards including credit and debit cards to the digital wallets (For example, 6 for KFH wallet, 8 for Apple pay and unlimited for Google wallet) and pick and choose a payment card for each transaction with few taps/clicks.

Source: Marmore Research; World Economic Forum

Also, Kuwait banks are trying to reduce the gap between the customer expectations and experience in cross border payments which is traditionally expensive, slow and lacking in transparency on costs and delivery times. Leading examples can be seen in KFH and NBK; Both KFH and NBK have announced the potential adoption of Ripple for faster cross-border payments. RippleNet offers Blockchain solutions for KFH and NBK customers locally and internationally benefitting from a more transparent and friction-less cross-border money transfer. NBK joined the global gpi community by bringing in SWIFT Global Payments Innovation service to Kuwait for greater transparency in cross border payments. The end-to-end payment tracking system developed a tracker database in the cloud that can be updated by FIN message or via API.

Security

The new technological adoptions require customers to share data for regular banking services including payments, while banks are required to share customer’s financial data with third parties securely and in real time through APIs. Legislations are in place to recognise e-commerce solutions covering payments (ET Law). The ET law ensures the safety and security of the customers carrying out e-payments including personal data protection.

Also, technological adoptions like the NBK’s MasterCard’s Identity Check provides an advanced authentication solution that uses biometric identifiers such as fingerprint, facial and voice recognition to verify users’ identity through their mobile devices when shopping and banking online. Gulf Bank uses a combination of fingerprint ID and facial recognition for biometric security. In addition, most of the Kuwait banks use the NFC technology for the payment services which is widely adopted worldwide and is considered the latest and the most reliable banking cards technology. This enhancement will enable frictionless payments for low value transactions in a secure, more convenient and faster way.

Also, KNET (shared electronic banking services company) providing electronic banking services to all banks in Kuwait enhanced the digital security partnering with Gemalto, the global leader for digital security. The platform provides highly customizable and wide range of authentication and signing methods, enabling millions of safe eTransactions in the country via the KNET e-payment gateway and delivering a step change in fraud protection²⁹.

Case study-Boubyan Bank

Boubyan Bank introduced in 2017 a set of innovative digital and electronic products and services such as UTap service, ATM card issuing service, and Murabaha Digital service. UTap is a fast, convenient, and secure service that allows customers to make payments and use Boubyan ATMs by simply tapping the UTap card or the mobile phone on POS machines and ATMs.

Boubyan Bank established a *Digital Innovation Center* to support the implementation of innovative technology services. The Center augments transforming innovative concepts in the pipeline into reality and success stories.

Boubyan Bank also launched “Musaed” service as a part of AI-based conversation management technology, simply known as “Chatbot”. The chatbot was introduced for the first time in Kuwait to manage the relationship between an organization and customers. Musaed answers customers’ queries and completes their banking transactions as per their instructions whether in Arabic or in English³⁰.

Strategically targeting to reduce the cash and paper system NBK has the largest POS network, introduced NFC through Tap and Pay cards (December 2016) and became the largest NFC enabled POS network and the highest number of NFC enabled Cards in Kuwait. The growing contactless payment services through Tap & Pay allows customers to make purchases with wearables and contactless cards.

²⁹ Gemalto
³⁰ Boubyan Bank

Exhibit 3.7: Kuwait banks’ FinTech initiatives

Kuwait Banks	Contactless payments	Digital Assistance	Security	Artificial Intelligence	Fintech Partnership	Mobile wallet	Other important features
Al Ahli Bank of Kuwait	✓	✓					
Al Ahli United Bank		✓					
Boubyan Bank	✓	✓	✓	✓			Digital innovation centre, Digital Murabaha
Burgan Bank	✓	✓					
National Bank of Kuwait	✓	✓	✓		✓		NFC Wearables and stickers, Mobile first strategy
Commercial Bank of Kuwait	✓	✓					
Gulf Bank	✓	✓	✓				
Kuwait Finance House	✓	✓	✓	✓	✓	✓	
Kuwait International Bank		✓					
Warba Bank		✓			✓		

Source: Marmore Research

Note: Contactless- Tap and pay services

Security- Providing additional layer of security (biometric solutions) for online transactions


Artificial Intelligence- AI based features like Chabot, RPA.

Digital assistance- Basic banking assistance through online or mobile services or Kiosks

- Local banks at the forefront of Fintech initiatives

Some Examples of Kuwait FinTechs in action

Tap Payments



Year Launched: 2013


Investors: ITG

Founders: Ali Abulhasan, Ahmed Almunayes, Mohammed Abulhasan

Tap is simplifying online payment in the region, it has brought innovations in different forms depending on the payment sector and the market. For example, its service goPay for customers allows for an easy, quick and secure way to payments. As for goSell, it allows businesses to take full control of their finances, create accounts and accept payments via one seamless and simple interface with strict security standards. goSell also offers API integration with multi development languages³¹. Tap payment systems can accept payments by KNET, VISA and MasterCard and American Express and provides flexible banking options as it is connected with all Kuwait banks.

Tap supports over 1,000 businesses and major corporations like OSN, viva, Bein Sports making transactions easier and efficient for customers all over the world.

One Global



Year Launched: 2005 (As ISYS)

Founders: Mohammed Shamlan Al-Rashidi


Established as ISYS offering mobile services & products across the telecom markets of the MENA region. ISYS rebranded as One Global³² today provides array of payment services to consumers (Og money) and businesses (Og Money Merchant and Og Money dealer) in the Middle East and Africa.

The mobile financial solutions are offered in a smart, easy way for a ubiquitous payment experience. Og Money Transfer system provides domestic and international money transfer services. Through an authorized network of agents, transactions and money transfers are performed in compliance with the rules and regulations of the relevant central banks and the countries they operate in.

The Merchant service system by the company is redefining a new merchant relationship and targeting customers with a personalized online and mobile payment processing which enables Merchants to mobilize their Business at any time.

³¹ Tap Payments
³² Pressreader

Ajar Online



Year Launched: 2016

Investors: Beco Capital, Sharq Ventures

Founders: Shaheen AlKhudhari

Ajar Online is a cloud service designed for the real estate market, offering quick online rent payment and a free property management platform. The service allows tenants to pay their rent online, at anytime and anywhere via SMS and email in less than 60 seconds. The tech innovator simplifies the rent collection process for landlords providing efficient property management tools to save time, reduce cost and take the right decisions³³.

Offering multiple tools such as real time reporting on collections, as well as managing tenants and units, Ajar online partnered with Ahli United Bank to enhance the growth of rent payments to be made through digital channels.

FinTech Readiness of Kuwait Banks

To assess the awareness, preparedness and willingness of banks in Kuwait to meet the disruptive potential of financial technologies we have considered various pillars such as their initiatives in the domain of Fintech, advancements made in the digital space, business-at-risk, operational efficiency of the bank and the cushion offered by the current business. Multiple weights were assigned to each of the pillar to arrive at a weighted average score that gauges the Fintech preparedness of Kuwait banks.

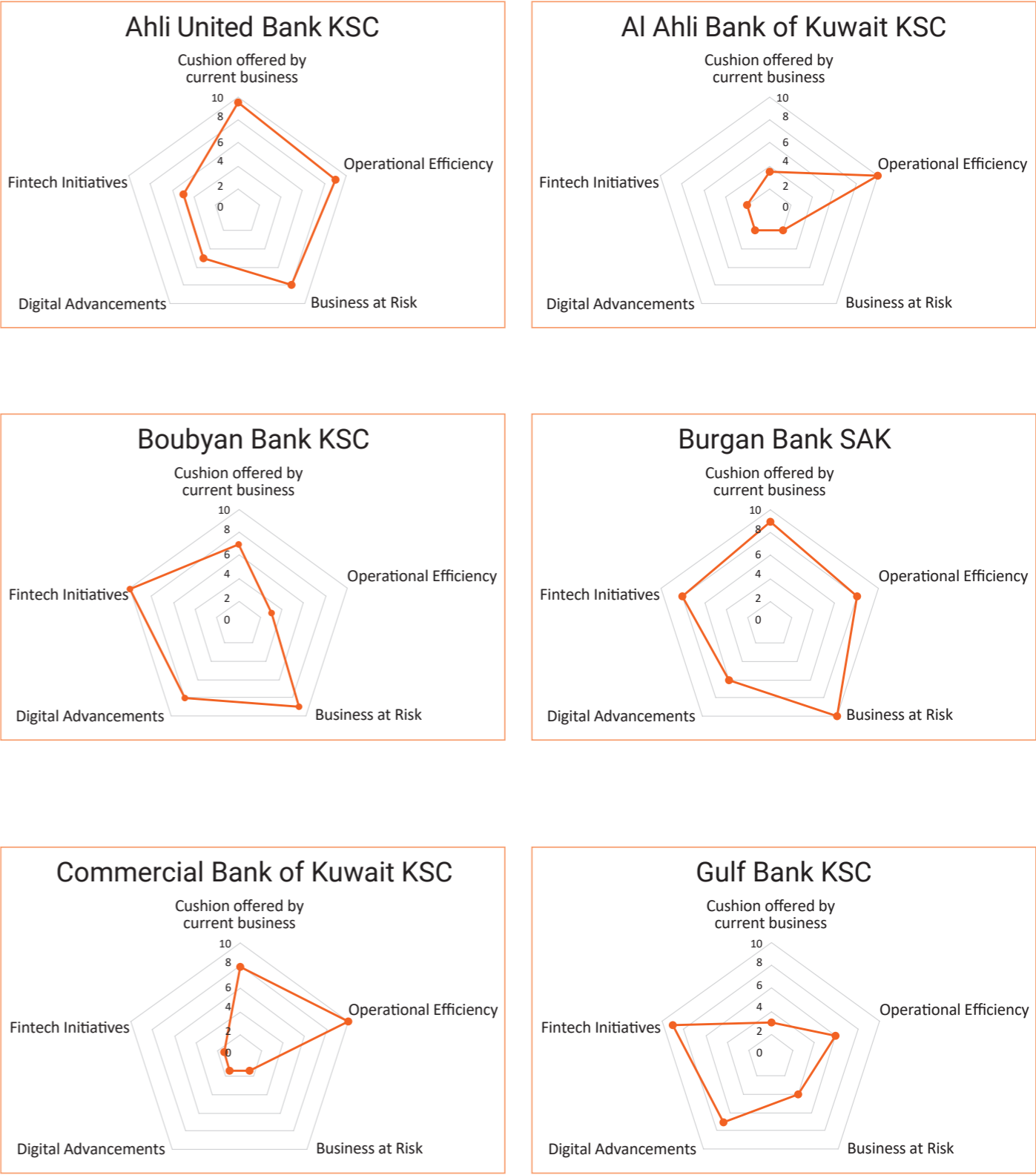
Higher weight was assigned to technological initiatives and the same was measured by the current adoption level of advanced technologies such as Artificial Intelligence, Big Data and Cloud Computing in their workflow; digital initiatives undertaken to offer customer-centric solutions, & management vision for providing future Fintech solutions. Details pertaining to the same was collected during interviews with the management teams; it was further supplemented with information available from their annual reports and press releases.

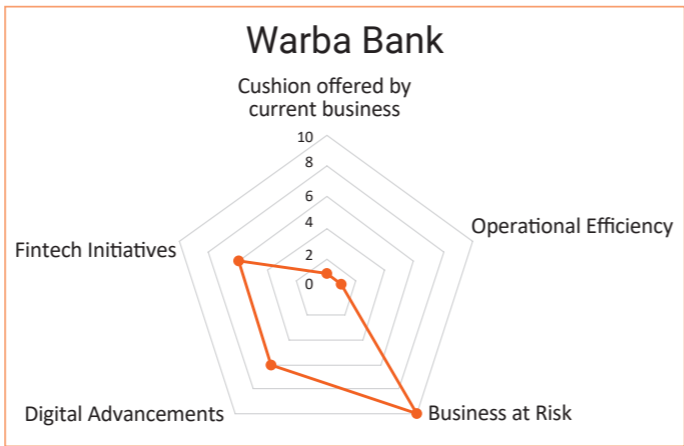
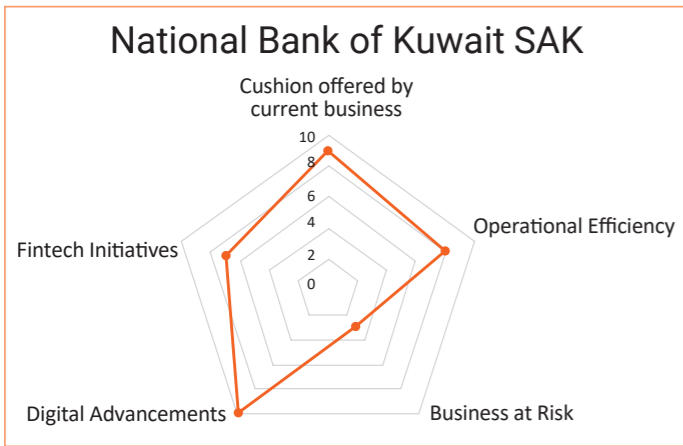
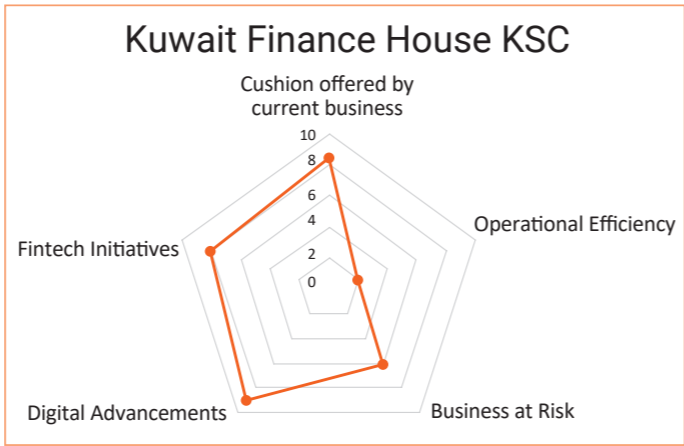
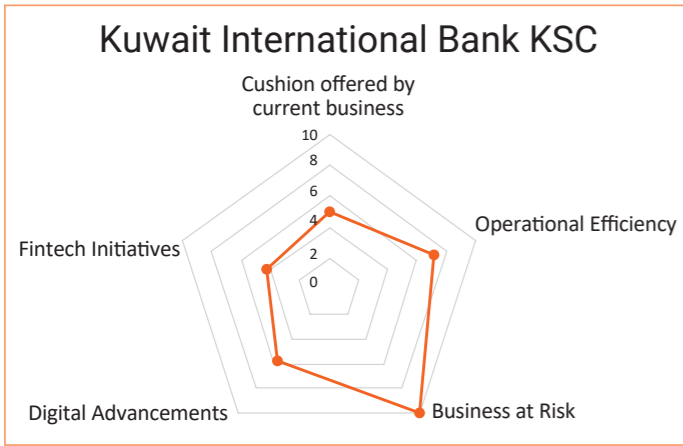
Existing business-at-risk as measured by the proportion of income generated from non-interest sources such as fees and commissions including credit card fees, loan origination & processing charges and others that are least capital intensive and most susceptible to disruption by Fintech was considered. Higher the fee income for banks, the more they are vulnerable to competition from Fintech.

Based on the existing business operations, we have included two other pillars, namely – the current level of operational efficiency, as measured by the cost-to-income ratio and the cushion offered by the existing business activity relative to its domestic peers, as measured by the return metrics Return on Equity (RoE) and Return on Assets (RoA). Higher value of returns and better efficiency of operations could afford relative cushion for the banks to thwart the competition posed by Fintech new entrants and establish their own strategy.

³³ Crunchbase

Exhibit 3.8: FinTech Readiness of Kuwait Banks





Source: Marmore Research

Based on Marmore analysis, Boubyan Bank, National Bank of Kuwait, Kuwait Finance House and Gulf Bank through their various initiatives have taken the lead in embracing FinTech and have started offering beneficial solutions to their customers.



Section 4

Reasons that led to the use of FinTech and Assessing the Related Risks and Benefits

Financial industry continues to operate in various silos such as clearinghouses, exchanges, payment gateways and settlement systems, whereas in other industries the advent of technology has changed the way people interact and communicate with solution providers. Consumer interactions have transformed and are instantaneous, direct, and spans across geographies. Rise of smartphones, wide spread availability of internet, advancements in computing power, and substantial progress in technologies such as artificial intelligence, big data and analytics and cloud computing is redefining the way businesses are conducted and finance industry is no exception.

Financial industry has been at the forefront in embracing technological innovations. In the 1960's Automated Teller Machines (ATMs) were introduced, online banking made its way in 1980s, and the rise of millennials led to widespread adoption of mobile banking. The emergence of FinTech is the latest wave of innovation to affect the financial services industry. FinTech holds promise to revolutionise the way we bank and handle our finances by lowering barriers of entry, increasing efficiency, redefining user experience and in a cost effective manner. New entrants including aggregators, payment solution providers, online platforms, established technological companies and financial start-ups influence the industry dynamics while incumbents who are adopting new technologies continuously adopt and reshape the business models.

Millennials seek instant gratification and the way they seek services is entirely different from the previous generation of customers. They are largely comfortable transacting online and prefer to avail services through social media. As a result, the switching costs for the customers could reduce that could threaten the stability of customer's deposits. New appraisal process and underwriting methods could affect credit quality. While, new age infrastructure and process automation could help drive down costs and improve capital efficiency.

Amidst the changes, the challenge for regulators and policy makers would be to ensure that new financial technologies are allowed to thrive and prosper in a way that maximizes the economic opportunities, minimize the risk and contributes to a robust and sustainable economic growth.

Advancements in technology has changed the relationship that customers have had traditionally with the banks. Customers, over time, have been increasingly less reliant on visiting a branch for their banking needs and have embraced digital options such as ATMs, telephone banking, online banking, mobile banking and digital support services. Pressures emanating from technological competitors would force banks to automate most of their business functions. Digital devices such as mobiles are fast becoming the primary channel of interaction between banks and its customers. Antony Jenkins, former CEO of Barclays, refers to it as an 'Uber moment' for banks and believes that the number of physical branches may reduce by as much as 50% over the years. Bill Gates echoed a similar opinion way back in 1994, "banking is required, banks are not".

Introduction of digital platforms has been a game changer across industries. Video libraries, travel agents, bookstores, have all become redundant or lost their utility value over the years. Shifting of business to digital platforms from physical stores has marginalized the incumbent players. We are witnessing similar digitally disruptive forces at play in financial services industry. E-commerce boom has been instrumental in the development of online payment systems such as PayPal, Alipay, PayTM etc. It has led to the growth of intermediaries who have branched out to offer credit services as well, in the form of peer-to-peer lending. Advent of smartphones has been a game changer in SME and retail finance and payments that allows consumers to make payments through personal devices such as phones, tablets or watches.

Artificial Intelligence (A.I), rise of machine learning and better algorithms has enabled in automation of certain tasks and process. It provides a competitive edge as machines can perform at a high speed and process larger datasets. Robo-advisory services, chat bots that provide product information and virtual assistants that perform the duties of customer service executive are good examples. Further research is ongoing to incorporate A.I at higher and broader level and it has the potential to revolutionise the way we bank.

Big Data, as transactions are digitalized they leave a trail of informational data points. Collating these data and through leveraging the available computing power, faster and comprehensive analysis could be made to glean insights for better and informed decision-making. Large datasets are being utilized to cross-sell financial products and improve credit assessments.

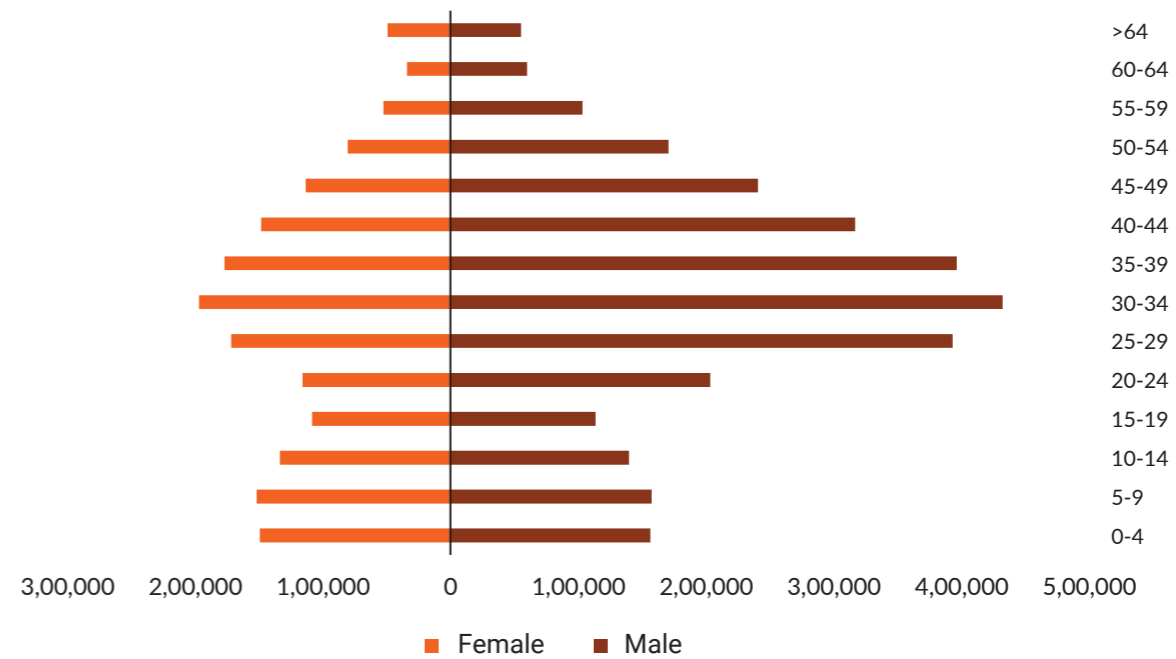
Cloud computing enables access to a shared pool of computer resources via internet that can quickly be deployed to meet the varying demand. Digital infrastructure, online platforms and backend activities are offered as cloud based services. Availability of such services enables start-ups to quickly set-up and scale at a low cost and provide them with the bandwidth to expand/scale up as they grow.

The poster child of FinTech Company, Alipay (Tencent) is neither from U.S nor from Europe but from China. In China, FinTech grew rapidly due to higher internet and mobile penetration, huge e-commerce market that provided ample scope for growth and adoption of payment companies, relatively unsophisticated incumbent consumer banking and accommodative regulations. In India, government initiatives such as opening of 200

million new bank accounts, adoption of national biometric identity and announcement of demonetization policy that entailed extinguishing existing currency notes of higher denomination provided an impetus for FinTech to flourish.

In Kuwait, several factors such as the high level of internet and mobile penetration, favourable demographics (younger, wealthier and digitally savvy population), supportive digital infrastructure, enabling regulations, and unique characteristics of Kuwait banking sector augur well for the development of FinTech in Kuwait. Demographics that has higher proportion of younger population places Kuwait at a sweet spot as their adoption towards digital products is higher than other age groups. Over 50% of the Kuwait population fall between the 15-39 years age group, who are adept at embracing technological changes.

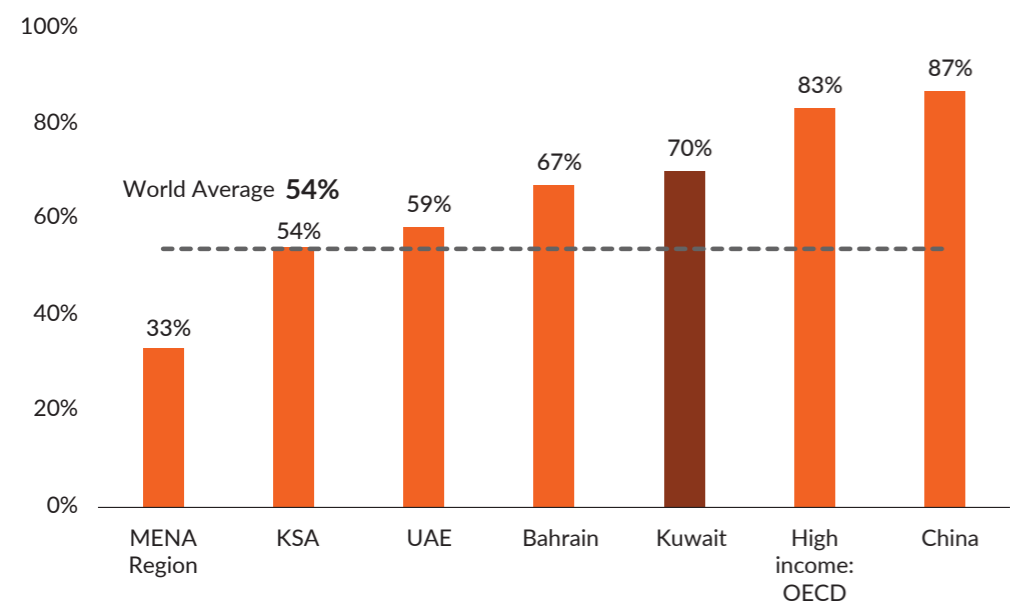
Exhibit 4.1: Kuwait Population Pyramid, 2018



Source: PACI; Data as of December 2018

Further, nearly 70% of those who fall under the age group of 15 to 24 years have a banking relationship as against 33% for the MENA region and world average of 54%. This segment forms a core target market for FinTech offerings as they are open to experiment financial offerings and constantly look for ways to enhance their access in a convenient way.

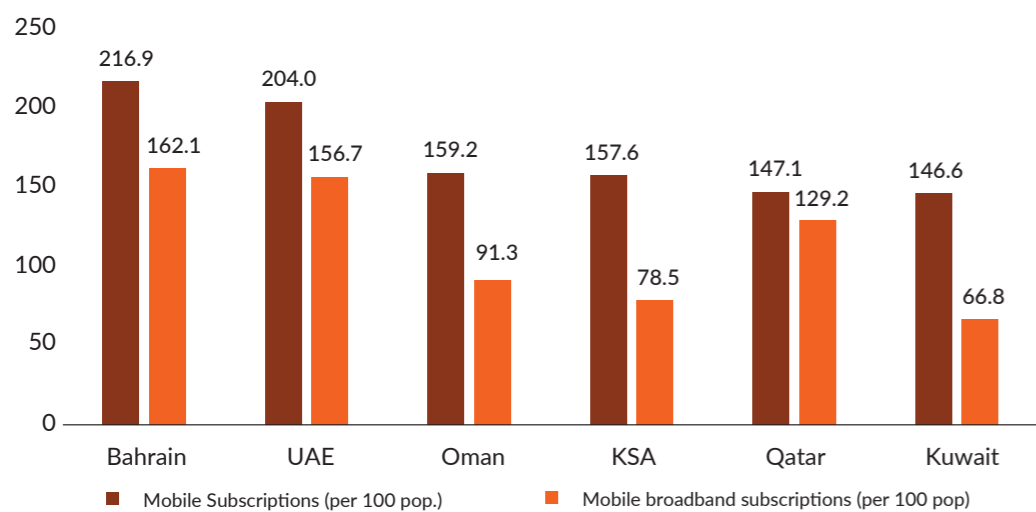
Exhibit 4.2: Youth Population (age 15-24) who Have an Account at a Financial Institution, 2017



Source: Global Findex 2017, World Bank

In Kuwait, mobile penetration stands at 146.6% - though the lowest among GCC countries, it is relatively higher than most developed countries and the world average of 64.5%. Ownership of smartphones is also high in Kuwait at 99.7% of households. Mobile network infrastructure in Kuwait is well developed and 100% of land area and population is covered, while 4G LTE network has 97% coverage⁴⁰. Recently, Zain has introduced 5G network in select areas within Kuwait that shall support advanced capabilities such as Internet of Things (IoT), high volume data transfer and advanced wireless communication capabilities.

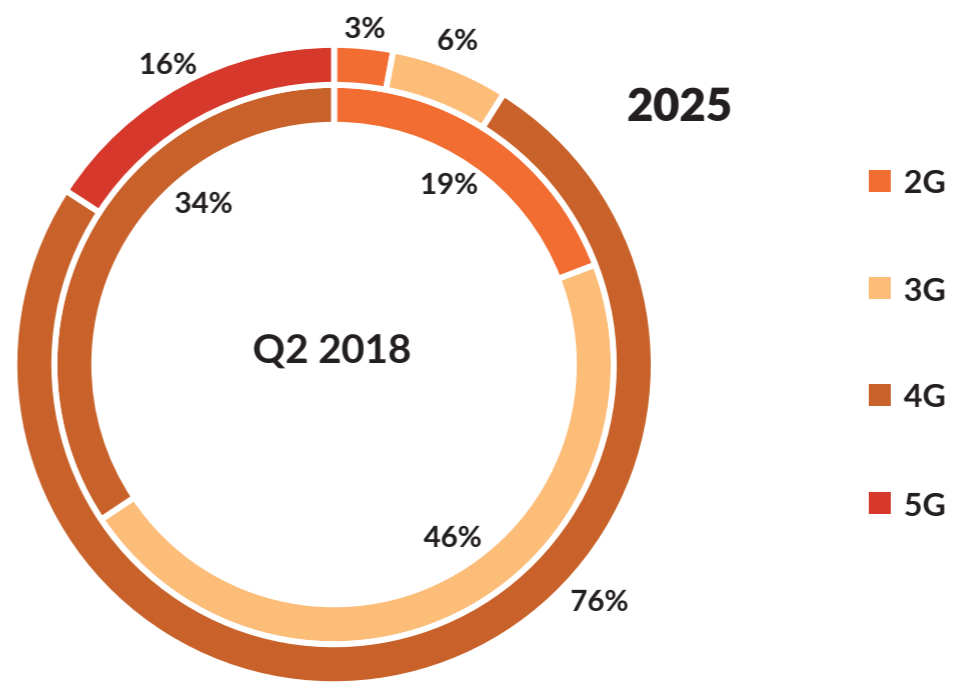
Exhibit 4.3: Mobile & Mobile Broadband Penetration



Source: Global Competitiveness Report 2017-18, World Economic Forum

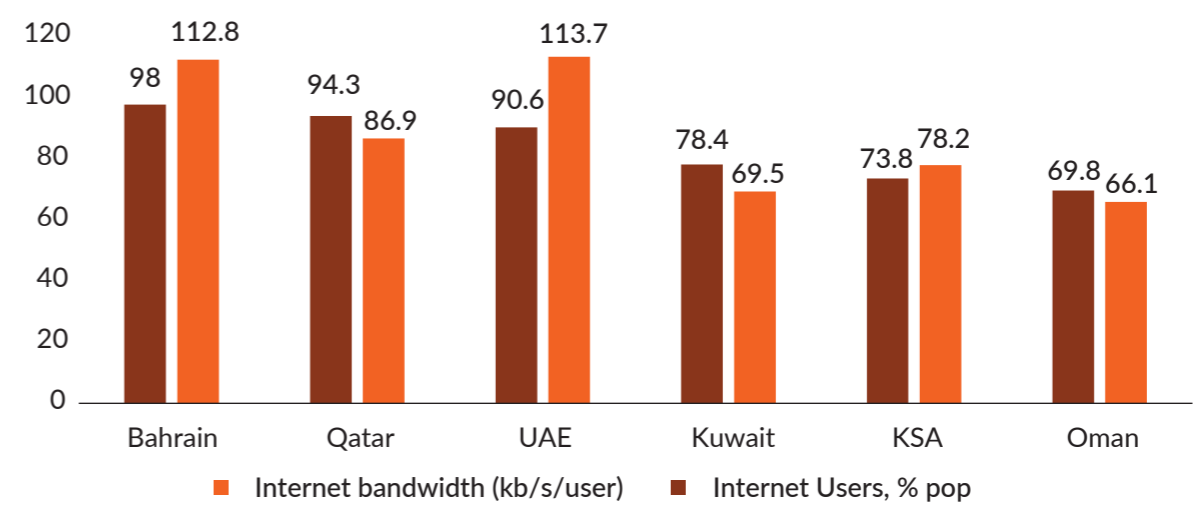
³⁴ Central agency for Information Technology (CAIT)

Exhibit 4.4: Mobile Technology Growth- GCC (Percentage of connections)



Source: GSMA Intelligence, 2018

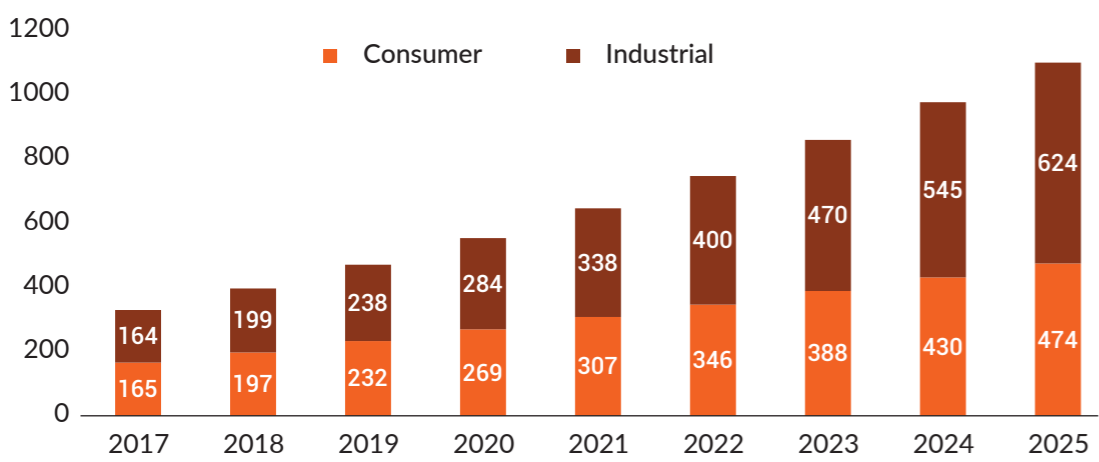
Exhibit 4.5: Internet Penetration and Bandwidth



Source: Global Competitiveness Report 2017-18, World Economic Forum

8 out of 10 households in Kuwait have access to the internet. While, the remaining non-internet households' access internet through their mobile phones. The penetration of mobile broadband in Kuwait is healthy at 66.8%. Most households get their internet access (not including internet from mobile phones) from mobile operators in the form of mobile broadband dedicated access through separate devices such as modem or dongle. Widespread access and availability of internet is crucial for the development and sustenance of FinTech ecosystem. Similarly the number of (Internet of Things) IoT connections in the MENA region is expected to triple between 2017 and 2025, reaching 1.1 billion. With customers placing more and more value on user experience and convenience, many future applications of the IoT require integration of financial services.

Exhibit 4.6: IoT connections in the MENA region (in million)

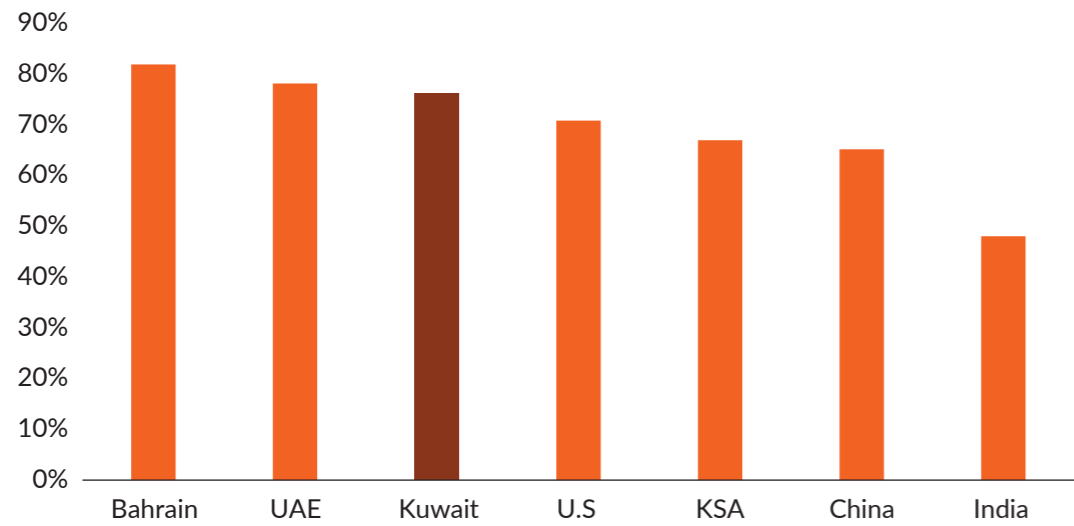


Source: GSMA Intelligence

Usage of social media networks is widely prevalent among Kuwait nationals across all age groups. While most of them use WhatsApp; Instagram, twitter and snapchat are popular among Kuwaitis and Facebook is popular among expats. As per a recent survey, approximately 72 per cent of Kuwaitis spend over five hours per day online browsing websites and using social media applications. Among the various social platforms, WhatsApp had 90 per cent usage, followed by Snapchat and Instagram at 40 and 38 percent³⁵. Among transactional activities, paying bills, e-commerce and online banking were the most popular activities. E-banking is fast catching up in Kuwait. In 2016, digital transactions accounted for 47% share by value of all transactions (e-banking & paper-based combined) from 25% in 2008³⁶.

Banking in Kuwait is concentrated among the top five players who hold approximately 76% of the market. High concentration among few players could lead to low level of competition and higher pricing power over the consumers. This could provide an impetus for FinTech players to potentially disrupt the market by offering efficient solutions at an effective cost.

Exhibit 4.7: Market Share of Top Five Banks



Source: Reuters; Data as of September, 2018 Note: Market share measured by assets

³⁵ Survey by Kuwait News Agency (KUNA) IT Department

³⁶ Financial Stability Report, Central Bank of Kuwait

In 2009, Public Authority for Civil Information (PACI) introduced the Kuwait smart civil ID card program as a means to authenticate the digital identities of all Kuwaiti citizens and its residents. The smart civil ID card hosts data and digital certificate, which shall enable electronic authentication procedures. The public key infrastructure managed by PACI enables to securely exchange data between government organizations and companies to verify and authenticate identities, and sign documents digitally. Smart civil ID cards could play a key role in the development of FinTech as it can make Kuwait “data-rich”.

Creating a set of application of program interfaces (API)³⁷ could allow government, financial institutions, business houses, start-ups and developers to utilize this digital infrastructure to provide presence-less, paperless and cashless delivery of financial services in Kuwait.

Introduction of Law No: 20 of 2014 pertaining to Electronic Transactions (the “Electronic Transactions Law”) whose provisions recognize electronic communications, transactions and commerce on the same basis or equivalent to paper transactions has proved to be a game changer. As a result, the Electronic Transactions Law provides an electronic signature with the same legal effect as a manual signature on a paper transaction³⁸.

Subsequently, the civil ID platform has been leveraged by banks to authorize access and authenticate transactions. For example, government loans with Kuwait Credit Bank could now be applied online through the civil ID without the need to physically visit the branch.

To understand the rise of FinTech it is important to understand the innovations that are taking place across the banking value chain from influencing payment services, customer relationships, retail and commercial banking, and clearing and settlement infrastructure. FinTech products and services that have found their way into current market places include peer-to-peer lending platforms, crowd funding, e-aggregators, digital wallets, and distributed ledgers technology. Along with advancements in big data, analytics, machine learning and cloud computing FinTech products have been able to bring together the lenders and borrowers, seekers and providers of information, with or without an intermediary to effectively offer solutions.

FinTech in Kuwait is primarily driven by banks that have been large investors in technology and have ramped up their investments to procure advanced technology and banking solutions. Boubyan bank has even started a separate division that focusses exclusively on digital innovations. On the other hand, start-ups have emerged from the entrepreneurial ecosystem that have leveraged technology to address existing gaps or/and target particular opportunities within the financial sector. So far, FinTech in Kuwait has largely been about payments. For instance, Ajar Online, makes it easier for tenants to pay their rental dues to their property owners through payment gateways. Og Money (formerly, Payit) provides a payment platform for bills including mobiles, utilities (electricity & water) amongst others. Certain FinTech companies established in UAE have expanded their service offerings in Kuwait. One such service is ‘yallacompare’ that aggregates and allows the users to compare the product offering such as credit cards, personal loans, car loans, and bank account features across Kuwaiti banks.

³⁷ API is a set of code that allow for two applications/programs to communicate with each other
³⁸ Tamimi

Globally, comparison sites utilize open Application Program Interface (APIs) to display real time rates (deposit/ loan) or insurance quotes from the respective financial firms. However, in Kuwait due to lack of open APIs a different approach was followed. To provide insurance quotes to its customers, ‘yallacompare’ built its own rating engine that could incorporate the algorithm and logic of any insurance player and subsequently provide real time quotes on behalf of insurers. This allows onboarding of new financial player into their website in a span of approximately two weeks. Introduction of open banking APIs could prove beneficial in improving the service offering of financial aggregators to the end users.

Exhibit 4.8: FinTech Impact—Risks & Benefits

Category	Fintech	Benefits	Risks
Payment services & Customer relationships	Digital wallets, payment networks	Enhanced customer choices, improved customer experience and reduced transactions costs	Weak customer ties, increased competition for banks profitability pool.
Commercial & Retail banking	Aggregators, peer-to-peer lending, crowdfunding, Big data & analytics	Improved credit assessment, Credit made more affordable	Stability risks for deposits, reduced opportunities to cross-sell
Clearing & settlement infrastructure	Distributed ledgers	Quicker transfers at reduced costs	Operational risk & cyber threats

Source: BIS, Marmore Research

FinTech has attracted interest globally from users and providers of banking services that largely see it as the future of financial sector. Technological firms, telecom companies and start-ups are jostling for a share of pie by offering financial services and in the process altering the landscape through digital transformations.

Payment services have traditionally relied on cash, debit and credit cards. FinTech players have strived to improve the speed and efficiency of payments at a reduced cost, through elegant and user-friendly interface. FinTech solutions have revolutionized the payment services on a significant scale through introduction of digital/mobile wallets and in the process have started capturing key insights on transactions such as value, volume, category, and frequency of consumer spends. Leveraging this data, FinTech companies have been able to cross-sell both banking and non-banking products and services.

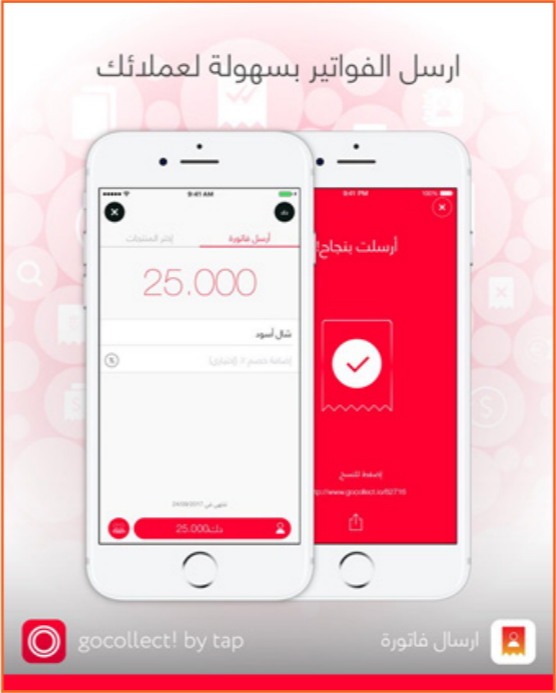
Prominent examples at the global level include Apple Pay and android pay that utilize the existing payment infrastructure and enable the user’s mobile device to perform the role of debit/credit card. Hugely popular m-Pesa in Kenya is built on a new payment infrastructure to provide mobile money services. This enables payments services to be provided by non-banking players that do not fall under the preview of financial regulator. A number

of solution providers have started to offer web-based and mobile-based payment solutions largely focused on improved customer experiences. Growth of e-commerce has fueled the need for integrating payment service within its value chain, the prominent one being Alipay, part of Alibaba group.

In the case of Kuwait, the retail payment settlements, Shared Electronic Banking Services Company (K-net) jointly owned by all 11 banks has been in operation since 1992. Retail payment system handles large volume of low-value payments such as debit and card payments, credit transfers etc. In 2017, K-net processed over USD 3.3billion worth of online transactions. Utilizing this payment network infrastructure, Kuwait banks have deployed various technologies such as card less payments solutions and tap-to-pay services.

FinTech players, leveraging on the high smartphone penetration and retail payment settlement infrastructure have developed applications to facilitate simple and efficient way for payment processing both for businesses and individual users. Tap which started in 2013 is a leading player in the Middle East in the payments space and has over 1,000 organizations as part of their clientele.

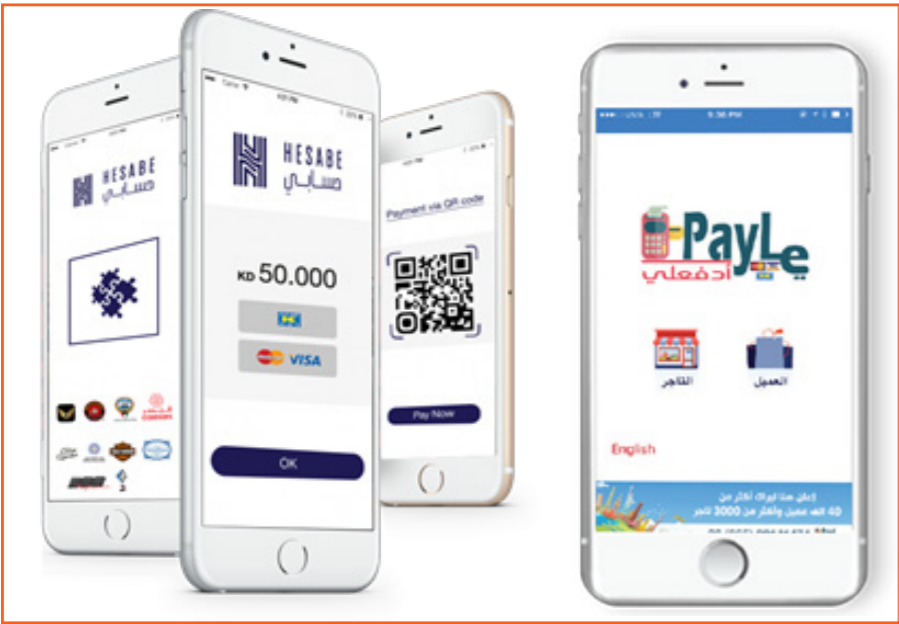
Exhibit 4.9: Tap Payments



Source: Tap Payments

Other Kuwait FinTech players in the payment space include Hesabe that allows businesses to integrate with payment network to ensure easy checkout for online customers, and provision of QR code (Quick Response code) payment services, wherein all that one needs to do is scan the code for payment. PayLe also offers similar payment services that enables one to use their mobile as a wallet.

Exhibit 4.10: Kuwait Payment Solution Providers



Source: Hesabe, PayLe

FinTech payment solution providers have the potential to disrupt traditional bank-based payment services and systems. Availability of multiple choices for payment processing has weakened the existing customer ties. On a positive note, mushrooming of various payment service providers' offers wide variety of choices for the customer, which makes transactions easier and cost effective.

Box: Payment Service Directive & Implications for Banks

Payment Service Directive (PSD) was introduced in 2007 to regulate the payment service providers in European Union (EU) and the European Economic Area (EEA). The major objective was to increase the participation of non-banking institutions in the payments industry, encourage the competition and provide customers with wider choices. PSD2, introduced recently in 2018, builds upon the framework established by PSD. It requires banks to open up their payment infrastructure and customer data assets to third parties who could then develop payment services and offer solutions.

Customer data that so far had been the preserve of financial institutions is being democratized. Pro-competitive policies and regulations such as second Payment Services Directive (PSD2) enable non-banks to access customers' bank account data upon customer authorization. Aggregators through banks Application Program Interfaces (APIs) provide customers with instant comparisons of product prices across players. FinTech has increased the competitiveness in financial services by offering improved customer interface and improved product choices. Acknowledging the international regulatory developments, Central Bank of Kuwait (CBK) has recognized the need for enhanced transparency and security for payment transactions. In September 2018, CBK issued relevant

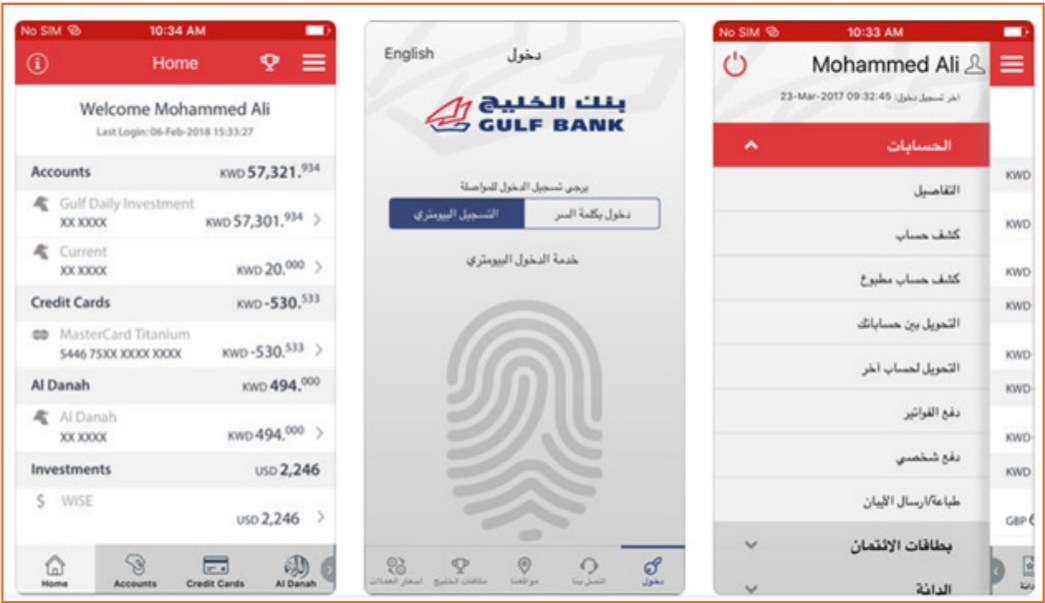
instructions to regulate the digital payment transactions. As per the instructions, all service providers including banks and financial institutions need to standardize their e-payment transactions as per the guidelines issued by the central bank within 12 months.

Digitalization allows the banks to interact with their customers with a very high degree of personalization. For instance, to avail bank loan, the customer traditionally reaches out to Relationship Manager or walks-in to the branch. However, now with the developments in mobile, analytics and digital platforms converging, the banks are better equipped to offer a solution in a short span of time. Based on customer interactions and transaction behavior details such as age group, income levels, credit history are all known before hand and using analytics, a pre-approved loan could get directly delivered to customer inbox.

Say if the customer is planning on an international trip and is seeking travel suggestions on social media, the bank could reach out with a pre-approved loan offer. An appropriate 'display banner advertisement' about the loan, so as to prompt customer, could be placed when the customer logs into internet banking. Thus, in 10 seconds, the solution is conceived, approved and offered to the customer.

In May, 2016 Gulf Bank launched a platform using biometrics for digital banking security. Gulf Bank in collaboration with Daon, biometrics and identity assurance company based in United States allows its mobile banking clients to authenticate themselves using facial biometrics and fingerprint technology, to perform a wide variety of banking transactions.

Exhibit 4.11: Gulf Bank Utilizes Biometrics to Authenticate Customers

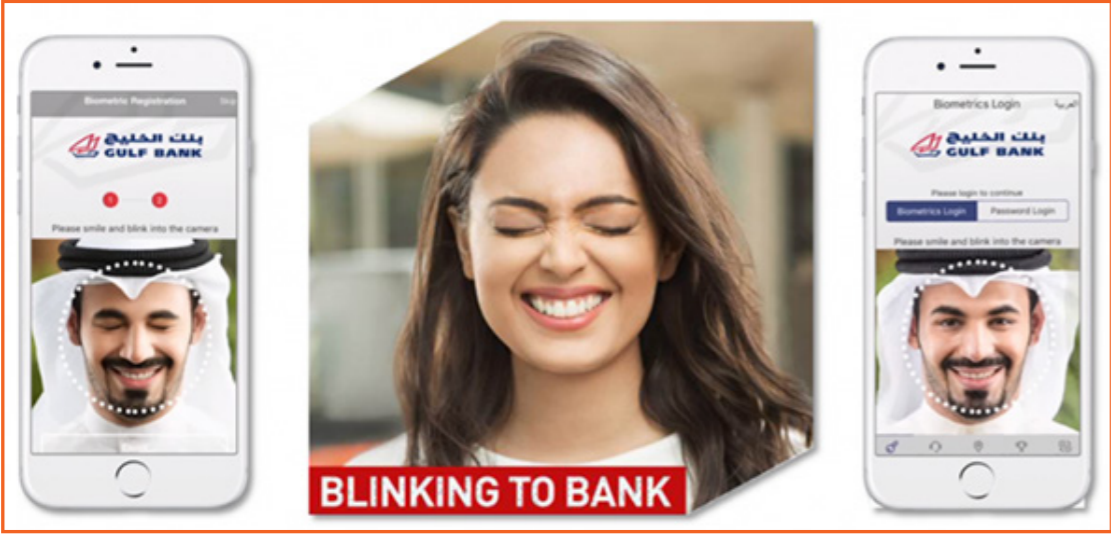


Source: iTunes Store, Gulfbank App

The Bank's customers can access their personal accounts by logging into the App through one of two methods: by blinking their eyes at their smartphone camera ('Blinking to Bank') following their fingerprint recognition (Touch ID), or through the use of a traditional password registration³⁹.

³⁹ Gulfbank

Exhibit 4.12: Blinking to Bank



Source: Gulfbank

E-Aggregators provide retail customers a place to compare prices and features of a range of products including airline tickets, hotel prices etc. Presently, details regarding standardized financial products such as mortgages, insurances and savings accounts are aggregated and presented for the customer to choose. Certain players also offer the choice to switch between offerings and in the process transform into a financial product distributor.

In China, e-commerce transactions are analyzed using algorithms to improve credit scoring. This has resulted in expansion of credit availability with low default rates. In 2014, only around 10% of Chinese adults’ accessed credit from a financial institution and less than one third had a credit score. Government authorized a number of organizations to provide alternative credit scores, including Ant Financial, which since its launch in 2015 has amassed 190million users and made more than 400 billion yuan (c. USD 60bn) of microloans⁴⁰. As a result, customer’s loyalty towards bank is diminishing. Ability to switch financial service providers with ease could make deposits, long considered a stable source of funding, volatile.

Commercial Banking

Innovations in this space include enabling firms to utilize their receivables invoice as a collateral for borrowing. Data drawn directly from the accounting software and digital bill receipts enable to assess the quantum of loan that the firm can avail and based on the quality of vendor the pricing is set. New platforms for lending and borrowing delegate decision-making to algorithms, allowing deposits and loans to be better matched with best available rates in the systems, making it efficient. Insights drawn from big data and advanced analytics further allow for tailoring of products and services.

Beehive is a leading player in the region that facilitates funding between businesses, mostly SMEs and investors in UAE. The firm has over 5,000 registered investors in its platform and has helped raise over AED 110 million for over 20 businesses. It is estimated that the cost of financing for SMEs through this route works out cheaper

⁴⁰ BIS

by 30%. The firm operates in both invoice financing and business financing segments. Upon uploading invoice details, SMEs could avail loan up to 80% of the value. In order to maintain the quality of lending, Beehive maintains specific set of criteria such as minimum revenue requirements and operational & management track record.

Exhibit 4.13: Criteria for SMEs seeking finance

Category	Criteria
Revenue	Minimum AED 2.5million per annum
Profitability	To be currently profitable
Operational Track Record	UAE-registered & operational for at least 24months
Bank Requirements	No case of cheque return in past 12 months Bank statements to show revenue receipts of at least 80%

Source: Beehive

Peer-to-peer lending (P2P) platforms connect lenders and borrowers, using advanced technologies to facilitate effective loan disbursements in an efficient way that reduces the time involved in availing credit facilities. Initially, it devolved by matching individual lenders and borrowers on a one-on-one basis. Presently, it has transformed into a marketplace where depositors can coalesce and contribute to a capital pool that borrowers can access.

P2P has grown at a healthy pace in U.S, U.K and China. In U.K, P2P lending now accounts for approximately 14% of equivalent bank lending to small businesses⁴¹. P2P lending companies have lower overheads compared with traditional banks, as their operations are mostly online in nature, due to which they can provide service in a cost effective manner. As a result, lenders stand a chance to earn higher returns as compared to the typical savings and investment products offered by banks, while borrowers can access capital at lower rates. P2P lending has the potential to enhance the reach of credit to segments, which so far has found it hard to avail credit from formal financial institutions. The common form of P2P loans is an unsecured personal loan, with occasional lending to start-ups and SMEs.

Unlike banks, P2P lending platforms do not perform maturity and liquidity transformations making them less susceptible to contagion and systemic risks. However, the underwriting standards and the lenders propensity to bear losses is yet to be tested in an economic downturn cycle.

⁴¹ Cambridge Centre for Alternative Finance, NESTA

Clearing and Settlement Infrastructure

Distributed ledger technologies (DLT) are widely tested as a substitute to the existing clearing and settlement infrastructure. DLT provides complete and secure transaction records, updated and verified by users, and removes the need for a central authority. Thus, reliable, scalable and efficient fund transfer or peer-to-peer transactions are possible at a fraction of cost over existing technological solutions.

Adoption of DLT offers potential benefits such as faster settlements, minimizes counterparty risk, obviates the need for intermediaries, greater resiliency, reduces the need for collateral and enhances privacy. As a result, DLT is being adopted in various activities including smart contracts, land and credit registries and ubiquitous digital currencies. Many Asian & Japanese banks have adopted Ripple for cross border payments. It is estimated that ripple can help in saving costs by 30-40% per payment over the current system.

Exhibit 4.14: Ripple vs Other Digital Currencies

Digital Currencies	Speed (per transaction)	Cost (per transaction)	Scalability (transactions per second)
Ripple XRP	3.3sec	\$0.0004	1,500
Bitcoins	45mins	\$1.88	16
Ethereum	4.49mins	\$0.46	16
Bitcoin Cash	60mins	\$0.21	24
DASH	15mins	\$0.39	10
Litecoin	12mins	\$0.12	56

Source: Citi Global Research

Though advantageous, they could introduce a new set of operational risks and make banks vulnerable to cyber threats due to interconnected IT systems. Sharing of data, introduces its own set of issues including additional investments to ensure its protection and stricter laws regarding data privacy to maintain the integrity of the system.

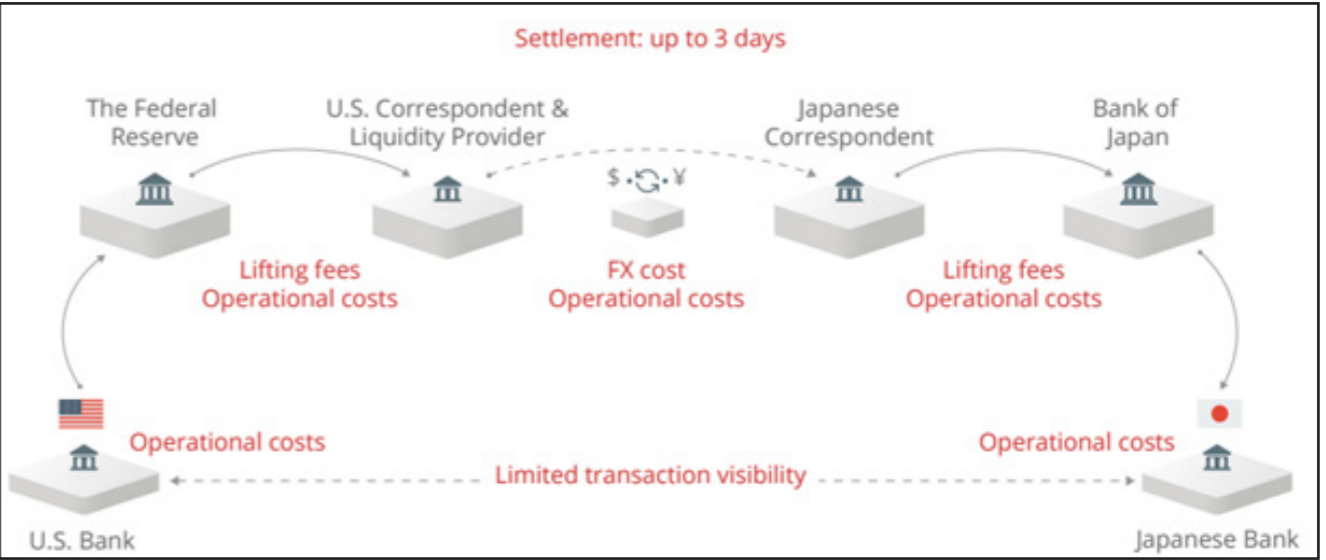
Box 2: How Ripple enables instant cross-border payment

Ripple connects banks and payment providers via RippleNet to provide a reliable, faster and low cost solution to send and receive money globally. RippleNet utilizes the blockchain technology to enable movement of funds *between* financial institutions.

Current process

Before a bank can transfer funds to another country, it first has to establish an account with a bank in the destination country denominated in the local currency. Called a “nostro” account, this account makes it easier to settle international payments. However, this would be for most small-to-mid-sized banks – having to create a nostro account in every possible country the customers may want to send money to. Instead, most banks of this size rely on correspondent banks to fuel their liquidity overseas. *Each step in the process introduces delays and increased fees.*

Exhibit 4.15: Current fund transfer process

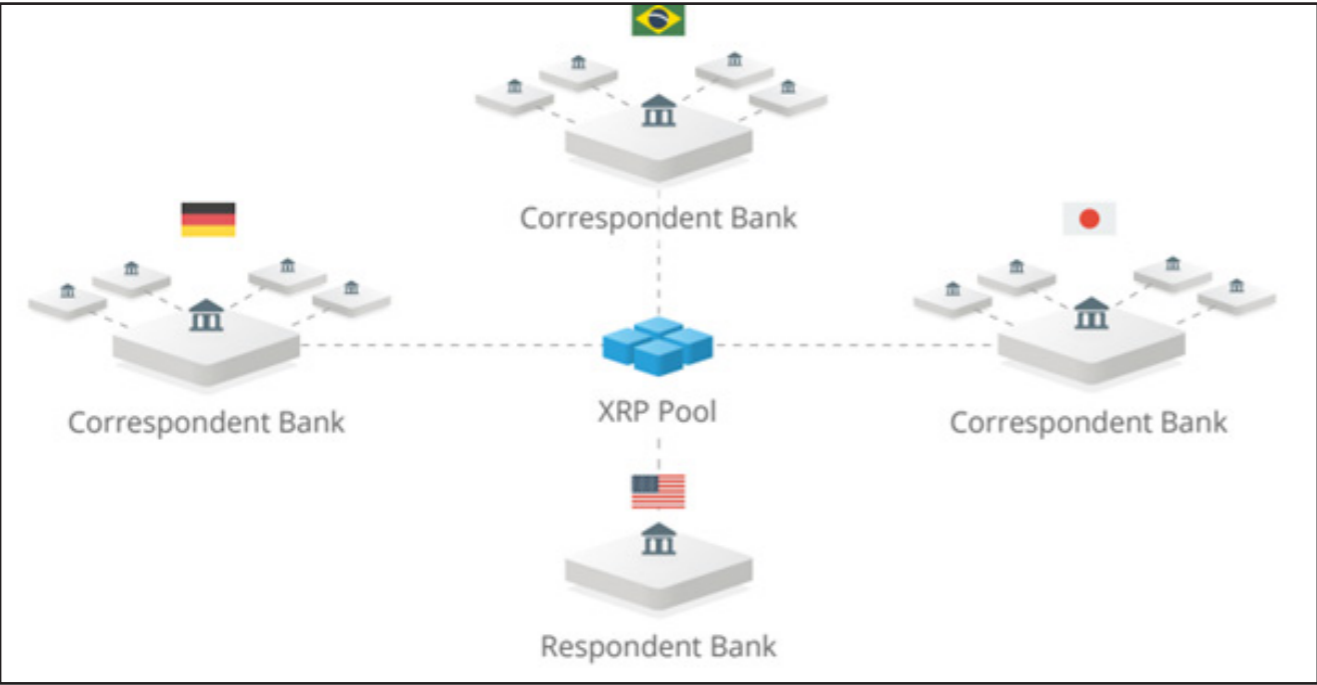


Source: Ripple

Solution offered by Ripple

Instead of holding many nostro accounts and needing to maintain liquidity in many different currencies, a bank on the Ripple Network can maintain one account, with Ripple itself, and hold just enough XRP (the currency of the Ripple Network) to cover its largest expected transfer.

Exhibit 4.16: Fund Transfer using Ripple



Source: Ripple

The bank then needs to maintain a much smaller liquidity pool, free up those funds for other, more profitable uses. In addition, XRP transactions are typically settled in 4 seconds, as opposed to the 3 days needed previously. Ripple claims that banks can save up to 30% in fees by using their network over the traditional system.

With Ripple network (RippleNet) banks can send payments & process payments effectively.

Sending Payments (Ripple Product - xVia)

Banks that rely on external liquidity providers to send payments overseas must establish, maintain and integrate across many correspondent banking relationships. With one access point, banks can use RippleNet to easily send payments around the world at a low cost.

xVia is a direct competitor to SWIFT network offers a standard interface to originate global payments over RippleNet. It provides one simple API to reach new markets, instant settlement and confirmation and complete fee transparency.

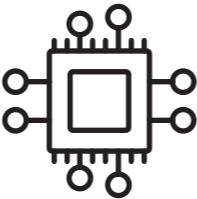
Processing Payments (Ripple Product – xCurrent)

Banks using their own liquidity to send international payments face high operational costs, uncertainty, low visibility into nostro balances and long response times. Ripple allows these banks to improve their customer experience while lowering operational costs.

xCurrent enables banks to message, clear and settle payments with light integration efforts and end-to-end tracking. Bidirectional messaging with rich data, real-time atomic settlement, standardized rules, formats and processes

Section 5

Comparison between Formal Financial Services and Tech-driven Innovations



In the years following the international financial crisis in 2008, banks had to adapt to changed realities⁴². Worldwide, regulators raised capital requirements, created new risk management standards, sewed stricter Know Your Customer (KYC) protocols, and strengthened Anti Money Laundering (AML) provisions. These were accompanied by the following technological and social changes or developments—

1. The Internet redefined the world.
2. Smartphones and new mobile applications rapidly gained popularity and acceptance.
3. Social media exploded at a blistering pace.
4. The Big technology companies (Amazon, Facebook, etc.) developed innovative products and other services that created new standards of user experience quality, speed and comfort.
5. Various stakeholders, like SMEs, were seeking financial inclusion, etc.

The absence of a universal definition for FinTech does not take away from the fact that there are some fundamental forces reshaping the financial services industry. A 2017 World Economic Forum (WEF)-Deloitte report identified multiple forces that possess the capability to swing the competitive architecture of the financial services ecosystem.

Exhibit 5.1: Forces Shifting the Competitive Landscape of the Financial Ecosystem

Disruptive Force	Description
Cost Commoditization	Financial institutions will accelerate the commoditization of their cost bases, removing them as points of competition and creating new grounds for differentiation.
Profit Redistribution	Technology and new partnerships will enable organizations to bypass traditional value chains, thereby redistributing profit pools.
Experience Ownership	Power will transfer to the owner of the customer interface; pure manufacturers must therefore become hyper-scaled or hyper-focused.

⁴² USAID Financial Sector Transformation Project

Disruptive Force	Description
Platforms Rising	Platforms that offer the ability to engage with different financial institutions from a single channel will become the dominant model for the delivery of financial services.
Data Monetization	Data will become increasingly important for differentiation, but static data sets will be enriched by flows of data from multiple sources combined and used in real time.
Bionic Workforce	As the ability of machines to replicate the behaviours of humans continues to evolve, financial institutions will need to manage labour and capital as a single set of capabilities.
Systemically Important Techs	Financial institutions increasingly resemble, and are dependent on, large tech firms to acquire critical infrastructure and differentiating technologies.
Financial Regionalization	Diverging regulatory priorities and customer needs will lead financial services in different regions of the world down distinct paths.

Source: World Economic Forum in collaboration with Deloitte (Verbatim)

The long histories and multiple legacies of the existing banking and financial system leave it vulnerable to several technological and social trends. For e.g., as banks increase focus on digitalization, a recent Bain & Company study discovered that banks can fully handle only 7% of their products digitally (from end to end). This has meant that new digital (or disruptive technologies-based) entrants have identified market opportunities, and are focusing on the pain points or needs of specific customers.

For example, SMEs that face several challenges in terms of access to funds and foreign exchange. FinTechs have demonstrated in various parts of the world to have delivered more bespoke propositions to SMEs, including greater transparency on fees charged⁴³. Thus, many SMEs cite FinTechs as having a better understanding of their unique business needs. It is notable that FinTechs are not the only entities that have become active in spotting gaps and proposing novel financial services⁴⁴. Several large non-financial companies have recently commenced providing financial products and services.

Most notable are the behemoth technology companies (like Google, Amazon, etc.). This is because they possess several features that aid them in successfully overcoming the barriers to entry to the traditional banking market. The essential features are that they have an extant large customer base; sophisticated IT infrastructure; accelerating acceptance, particularly among young people, etc. Currently, technology companies mainly offer payment services to their existing clients. However, several of them take part in lending activities as well.

⁴³ WorldFirst
⁴⁴ The Impact of the Fintech Phenomenon – Radical Change Occurs in the Financial Sector?—Financial and Economic Review, Vol. 16 Issue 3., September 2017

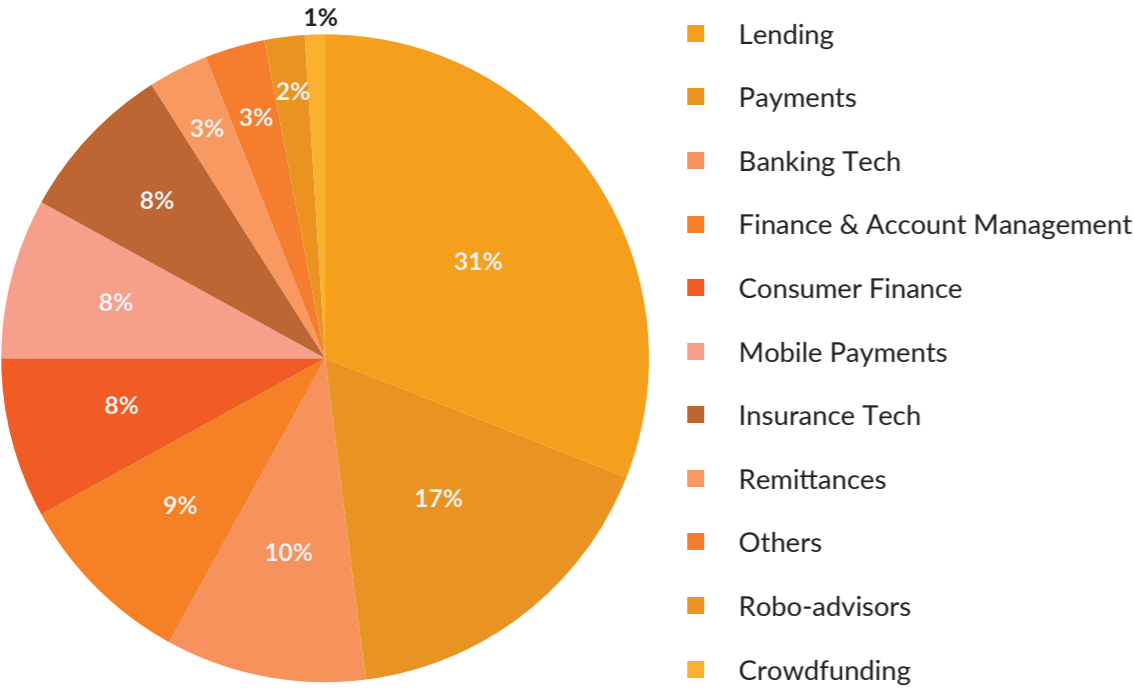
Exhibit 5.2: Examples of Financial services Provided by Big Technology Companies

Company	Financial Product & Service	Launch Year
Google	Google Wallet – mobile wallet and mobile payment solution for storing and using the virtual copy of users’ existing bank cards, credit cards and loyalty cards.	2011
	Android Pay – mobile payment solution enabling tap & pay on mobile phones with a compatible Android operating system.	2015
Apple	Apple Pay – mobile wallet and mobile payment solution. It is currently available in 12 countries, and it is estimated that transactions worth USD 10.9 billion were conducted with this solution in 2015.	2014
	Apple ID – personal ID that, when linked to a bank card or other payment account, users can use for real-time payment without a card for purchasing content on the mobile phone.	2014
Amazon	Amazon Payment – electronic money institution and electronic wallet service that enables users to make payments to several online merchants after opening an electronic money account and registering their card payment information.	2013
	Amazon Wallet – mobile wallet and mobile payment solution for storing and using the virtual copy of users’ existing bank cards, credit cards, loyalty cards and gift cards.	2014
	Amazon Loans – short-term current account loan service for retailers selling on Amazon’s platform.	2012
	Amazon Local Register – mobile POS terminal service that enables merchants to accept cards over a smartphone or tablet.	2014
eBay	Paydiant – mobile wallet service that trading companies and other market participants give their own brand name to.	2010
	Braintree – payment and card acceptance service for merchants for online and mobile payment.	2007
	PayPal – electronic money institution that holds an account for its clients that can be topped up with a bank card payment, bank transfer or collection order from their retail or corporate bank account.	1998
	PayPal Credit – payment service through which merchants can provide trade credit to their customers. Loans are provided by Comenity Capital Bank.	2015
	Venmo – mobile wallet service that enables users to initiate transfers to each other on their mobile phones.	2009

Company	Financial Product & Service	Launch Year
Facebook	Messenger Payments – peer-to-peer, real-time, direct transfer service for the users of the chat service. It is currently only available in the United States.	2015
	E-money license – Facebook has a license to issue electronic money in Ireland, however, it does not offer other services to its clients yet.	2016
Samsung	Samsung Pay – mobile payment solution enabling tap & pay on compatible Samsung mobile phones.	2015

Source: *The Impact of the FinTech Phenomenon – Radical Change Occurs in the Financial Sector?*–
Financial and Economic Review, Vol. 16 Issue 3., September 2017 (Verbatim)

Exhibit 5.3: Global Funding Invested in FinTech, 2017

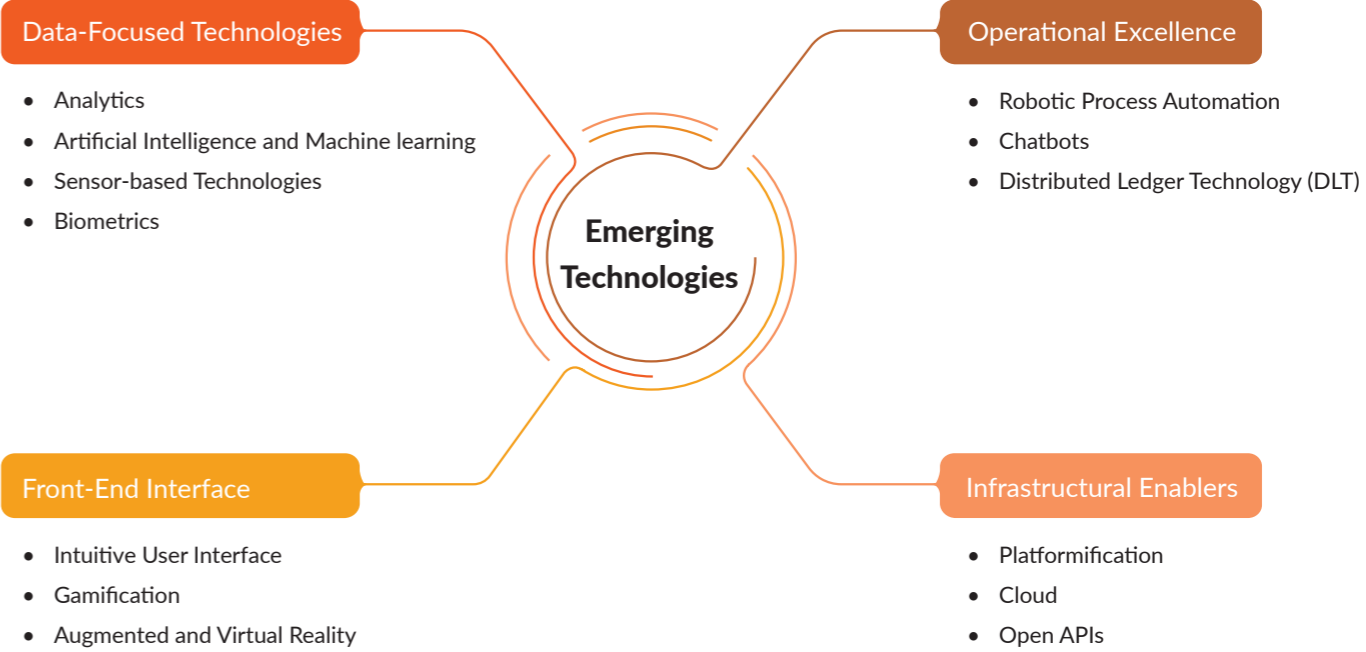


Source: *Global State of FinTech PWC 2017*

FinTechs have been quicker to leverage technologies across data and analytics, creative front-end interfaces, IT infrastructure, and inclusive operating models to boost customer experience aspects like personalization, quick response, and functional simplicity⁴⁵. Put simply, design-based thinking and personalized user-interfaces are making the customer journey seamless, quick and convenient. This is bolstered by insights that are driven by data-focused technologies. Thus, traditional financial services firms are experiencing the FinTech impact, causing many to fold FinTech capabilities into their emergent operational and business models.

⁴⁵ Capgemini

Exhibit 5.4: The Key Technologies behind FinTech



Source: *Capgemini Financial Services Analysis, 2018*

Advanced analytics and latest FinTech capabilities are expected in capital market domain too. For example, in trading, advanced analytical systems predict sources of market liquidity to support customers in placing orders⁴⁶. Risk elements in clearing and settlements are being diminished via automated analysis of counterparties, aided by enhanced and richer analysis of payments flows.

Exhibit 5.5: FinTech Reshaping Capital Markets—Some Examples

Disruptive Force	Description
Access to capital	<ul style="list-style-type: none">• Predict counterparty default: automated rating• Analyze contract terms and related risk
Trade execution	<ul style="list-style-type: none">• Predict market liquidity• Impute implicit cost of trading• Predict margin calls
Post-trade services	<ul style="list-style-type: none">• Identify fraudulent payment instructions• Aggregate reference data
Data, analytics, and Information services	<ul style="list-style-type: none">• Generate predictive trading indicators• Real-time shareholder/trader insights• Trade flow analytics

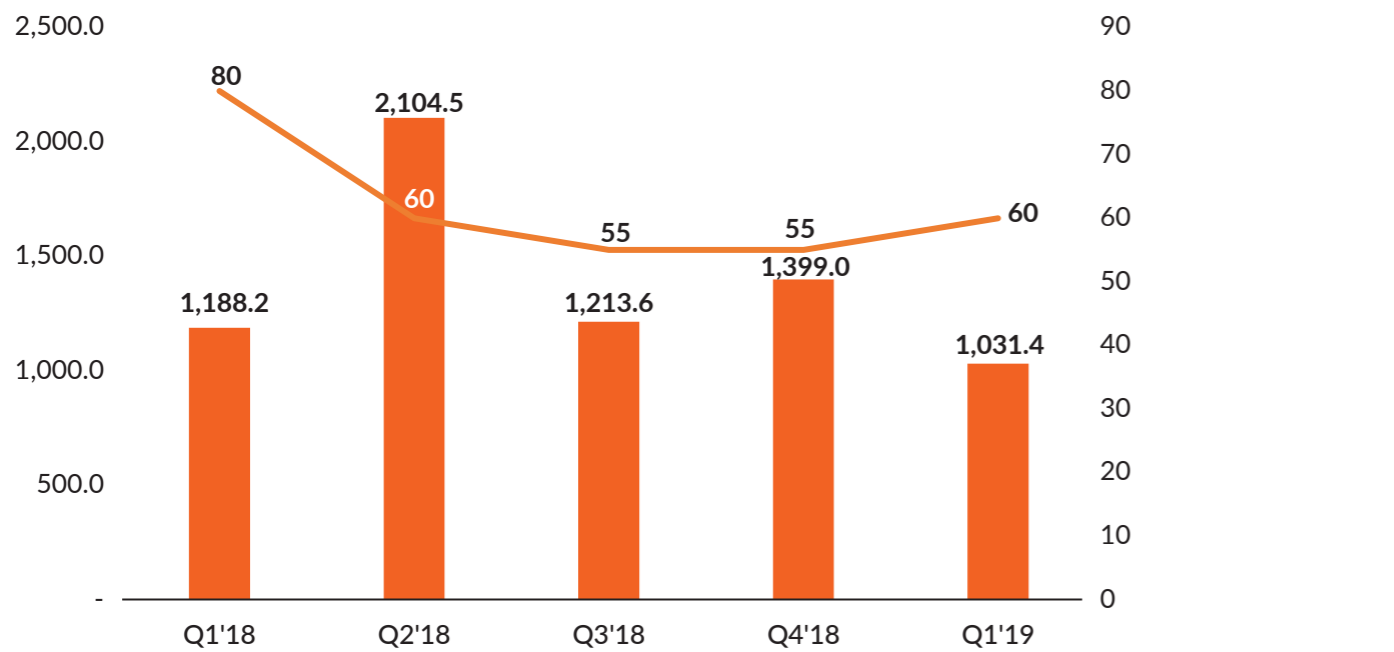
Source: *McKinsey (Verbatim)*

For capital markets, FinTech holds the greatest promise in the area of using machine intelligence for surveillance to ascertain market integrity⁴⁷. Given the type of the supervisory reviews performed and the large data sets that must be assimilated for effective analysis, machine intelligence or AI technology allows prohibited activities to be traced more effectively than the generic classical or rules-based functionalities.

⁴⁶ McKinsey

⁴⁷ Nasdaq

Exhibit 5.6: FinTech in Capital Markets Global VC backed Q118-Q119













Source: CB Insights

Comparison: Traditional Models and Tech driven Business Models

In this section, the comparison of the formal financial institutions and tech driven innovations are made across the core functions of banks- Lending & Borrowing, Payments and Investment Management⁴⁸.

Exhibit 5.7: Business Model- Banks and Tech driven Innovators

Core functions	Banks	Banks
Deposits and Lending	Uses funds from savers and originate the loan to borrowers based on the creditworthiness	Directly matches the lenders to the borrowers providing mere intermediation   
Payments	ATMs, Cheques, Visiting branches, Electronic payments. Secure messaging and clearing bodies (cross border payments)	Digital wallets, default cards. Distributed networks, P2P(Cross border)    
Investment Management	Advisory, brokerage and other value added services delivered in person	Algorithm driven advisory and trading services   

Source: Marmore Research

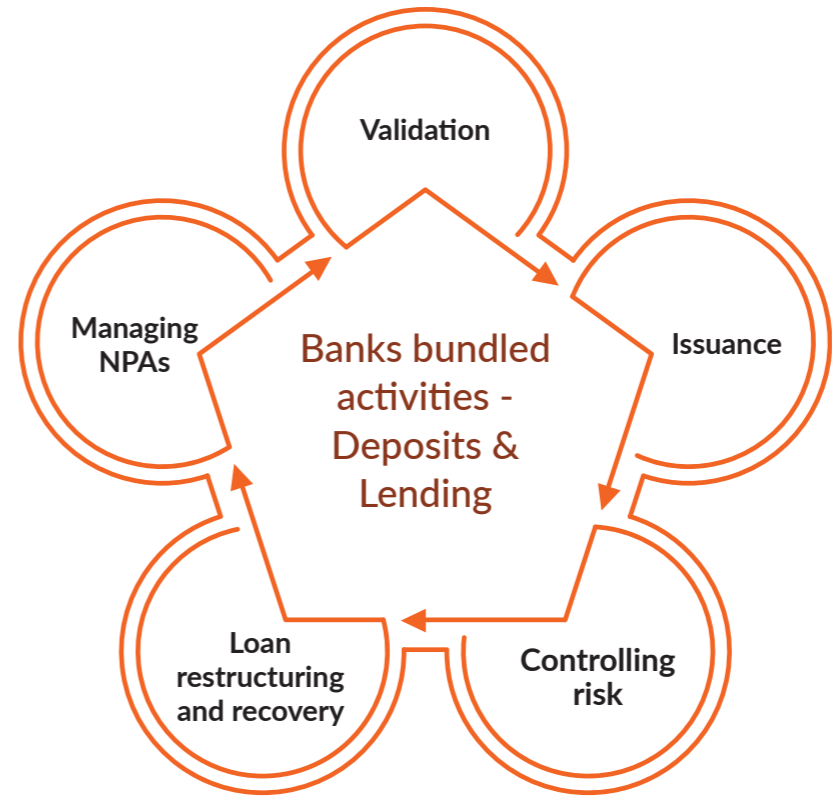
⁴⁸ Europe; and World Economic Forum in collaboration with Deloitte

Lending and Borrowing

Banks- Wholesale Model

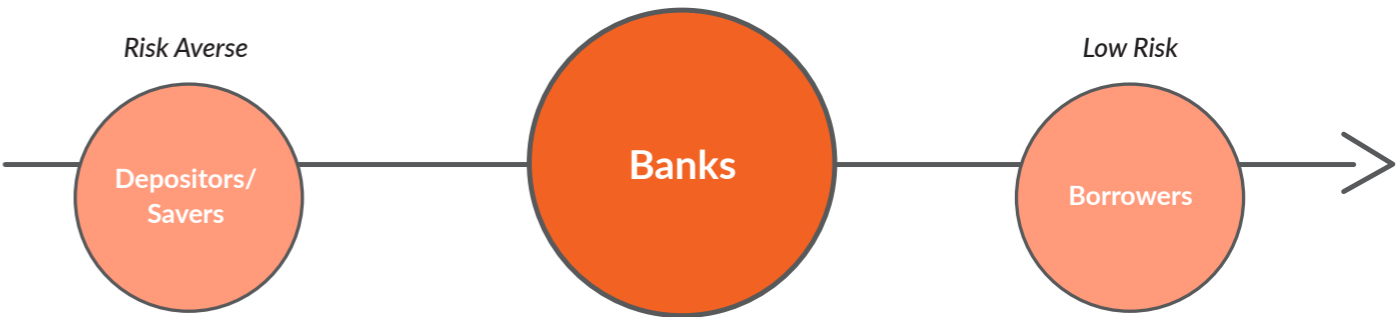
Financial Institutions diversify the large pool of small scale depositors, purchasing funds from lenders and resell them to borrowers, whereby complete pooling of the savings and loans mitigates the individual default risks. Traditional banks have a clear structure on the pricing and the interest rates paid to the lender and the borrower, and makes most of the money through its interest rate margins. The capital buffers and the deposit insurance which is mandated by the regulators protects the credit risk for the depositors thus banks follows a whole sale model of validation, issuance and risk protection.

Exhibit 5.8: Banks bundled activities- Deposits and Lending



Source: Marmore Research

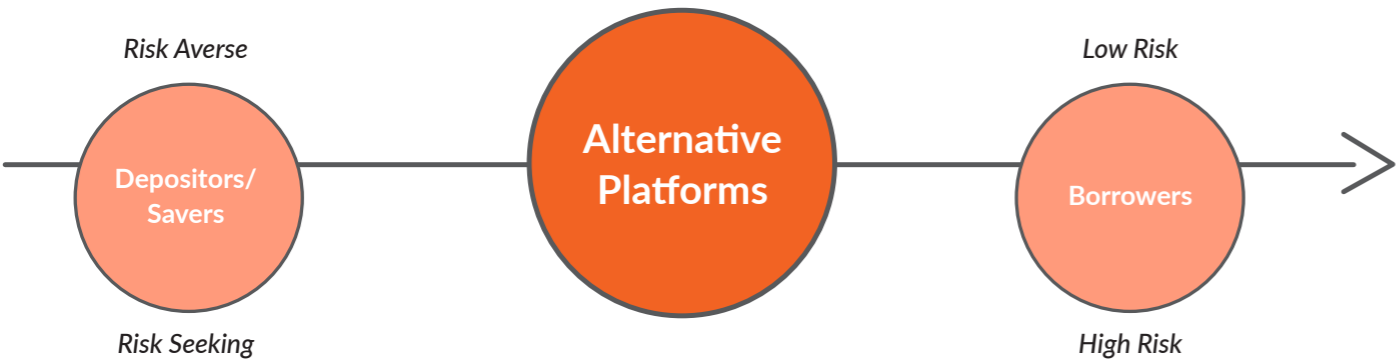
Exhibit 5.9: Banks- Lending and Borrowing flow



Source: World Economic Forum and Deloitte

The exhibit 6.9 & 6.10 compares the lending/borrowing flow between the banks and non-traditional platforms. Exhibit 6.10 illustrates that the alternate platforms connects not only risk averse depositors/lenders with less riskier borrowers but also enables connection between risk seeking lenders with riskier borrowers who are in general not served by the traditional retail banks.

Exhibit 5.10: Non-traditional platforms- Lending and Borrowing flow



Source: World Economic Forum and Deloitte

Digital platforms- Agency Model

Since the global financial crisis, banks have reduced their lending to SMEs, providing many online platforms to act as intermediaries offering capital services to the customers. For example, the new model of P2P lending matches lenders with credit-worthy borrowers, using information beyond the credit scores used by banks (e.g. social data), Crowdfunding provides new sources of finance for start-ups and riskier business which is unsuitable for public listing. However, most of the FinTech’s offering lending services do not retain the risk of the loan and does not interfere with the pricing and therefore operate more as a matching agent to meet the supply and demand in the lending and borrowing mechanism.

Costs

In addition to increasing the user experience, digitalization has reduced the cost of lending at every stage of the process, mainly the transaction costs. The Harvard Business Review magazine points that the transaction costs associated with making a \$100,000 loan are roughly the same as making a \$1,000,000 loan, but with less profit to the bank, which has led to banks prioritizing SMEs seeking higher loan amounts. This could be extensively reduced in the digital platforms which are unburdened by regulators, legacy IT systems, thus reducing the marginal cost and increasing the productivity.

Risks

According to BIS (Bank of International Settlements) banks need to manage the credit risks inherent in the entire portfolio and the risks in individual credits or transactions. Thus banks can identify, monitor, control credit risk and also hold adequate capital to compensate for any risks incurred. And the complete pooling of the savings and loans protect the depositors from any idiosyncratic risks. However, the Fintech enabled alternative lending platforms are sparsely regulated and do not retain the risk of loan they grant. Thus the riskiness of the Fintech liabilities is higher than the bank deposits.

Speed and accessibility

As the loan approval process has been simplified and made efficient compared to the traditional banking system, FinTech companies offer faster delivery speed. Approval times are reduced to minutes by data-driven algorithms that quickly qualify borrowers based on data such as personal credit scores, Demand Deposit Account (DDA) data, tax returns, and bank statements, while traditional banks rely on paper-intensive underwriting process which requires long approval days.

With the new lending models and low barriers of entry, FinTech companies embrace more borrowers including small business owners, low income customers, financially disadvantaged borrowers making it more accessible.

Payments

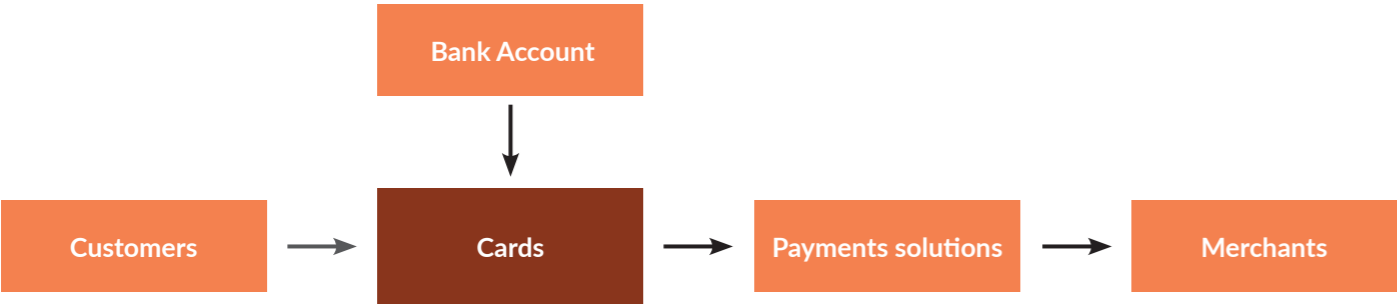
The global payments business is continuing to expand globally across retail, trade, investment, movement of salaries and pensions, payments across borders and so on. The application of FinTech has expanded across many financial services, however according to BIS (Bank of International Settlements), most of the FinTech products and services are developed towards Payments (41%).

Banks

Since the global financial crisis banks were required to meet the high regulatory standards including increased capital requirement and compliance costs⁴⁹. Due to this preoccupation of banks with the regulatory requirements, non-bank tech based entrants have been leading the digital transformation of financial services. Historically, the banking industry requires accounts with fixed nominal values for performing the financial services like the retail deposits, checking the accounts. The payment industry has evolved over time since the introduction of credit cards in 1950s and the rise of e-commerce in 1990s. The payments services of the banks were the essentials for the smooth operation of the economy, as the core functions of banking (lending and deposits) are related to bank’s role in payments. The introduction of cheques and ATMs and POS later were the extension of these services. Thus banks have strong economies of scope by performing such bundle of activities.

⁴⁹ International Finance Corporation (IFC)

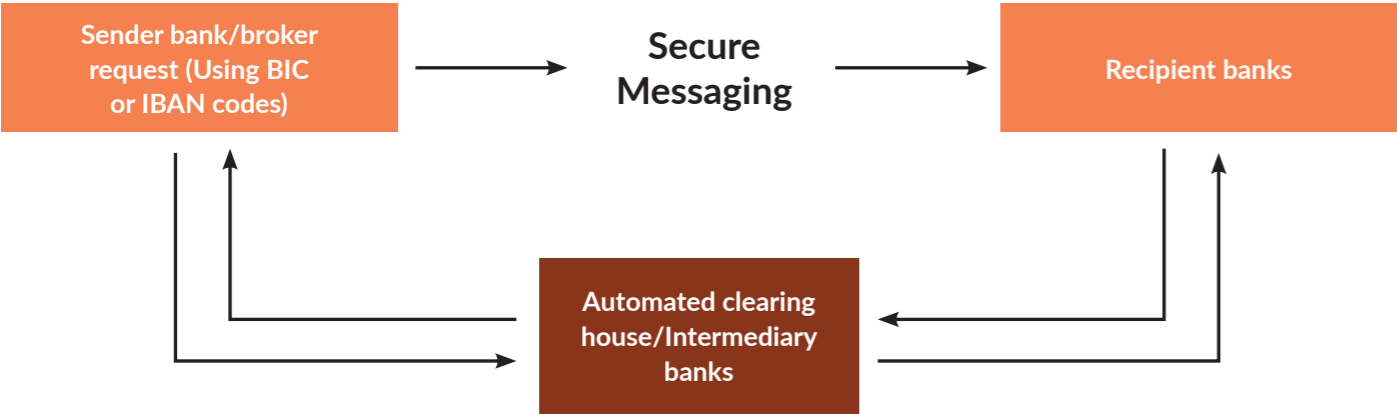
Exhibit 5.11: Banks- Payments



Source: World Economic Forum and Deloitte

In case of payments across borders, the current transfers of value is built on automated clearing houses and intermediary banks for customers to transfer money.

Exhibit 5.12: Traditional cross border transfer

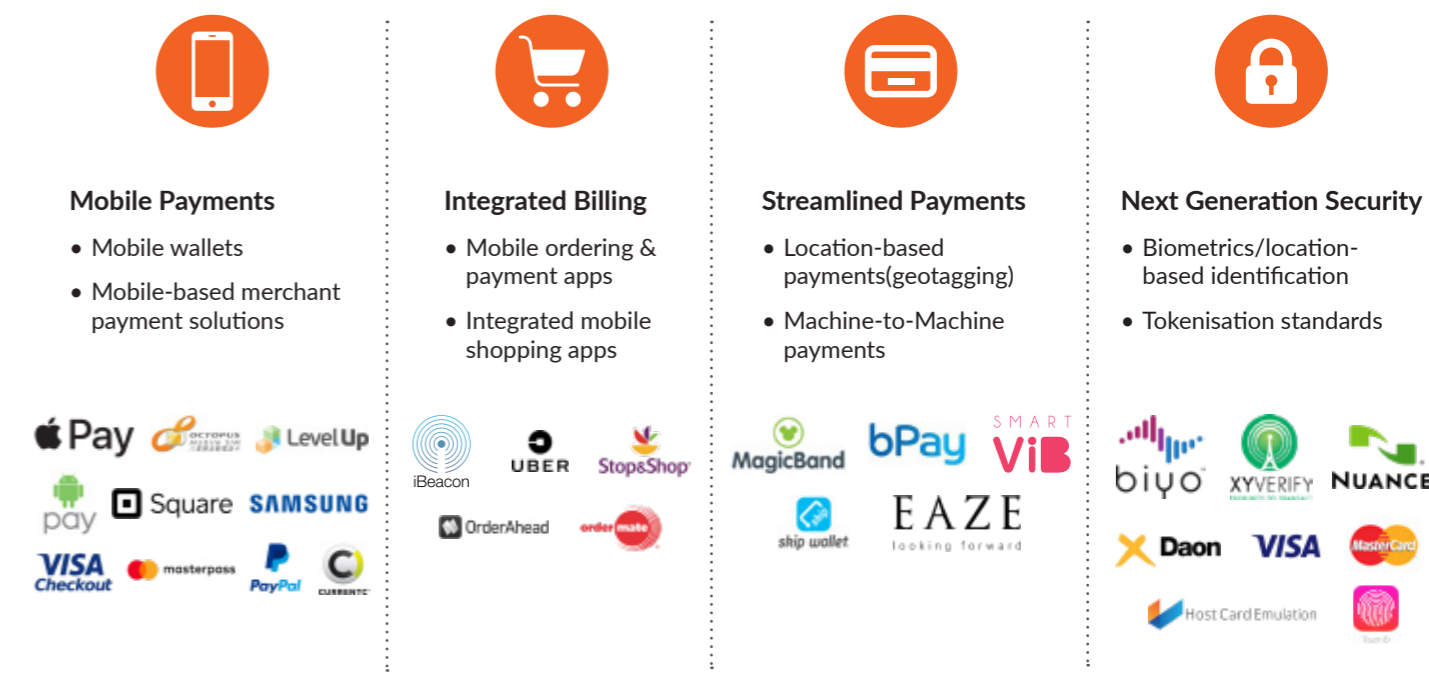


Source: World Economic Forum and Deloitte

Tech driven platforms

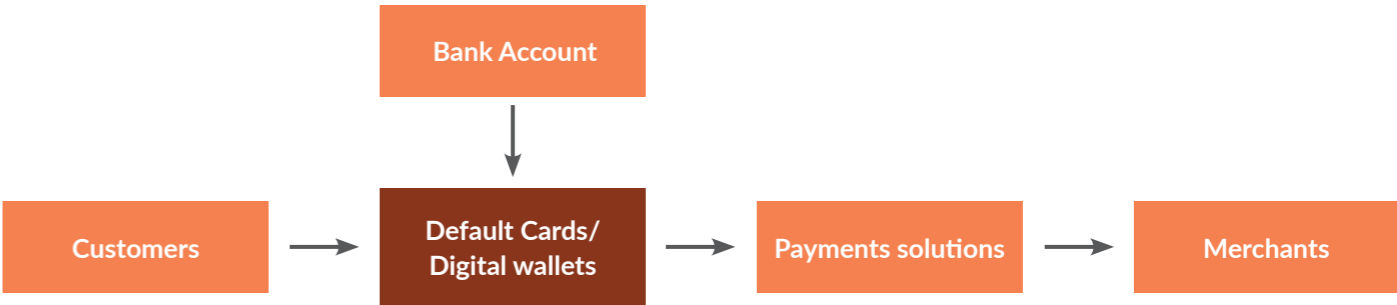
Payments have been the important target for the FinTechs with their innovations across mobile payments, real-time payments and digital currencies. FinTechs are reinventing the payment services by enhancing the user's experience by exploiting smart phone based technology. A number of innovations have emerged using mobile and connectivity, adding value to the consumers.

Exhibit 5.13: Key Innovations in payment services



Source: World Economic Forum and Deloitte

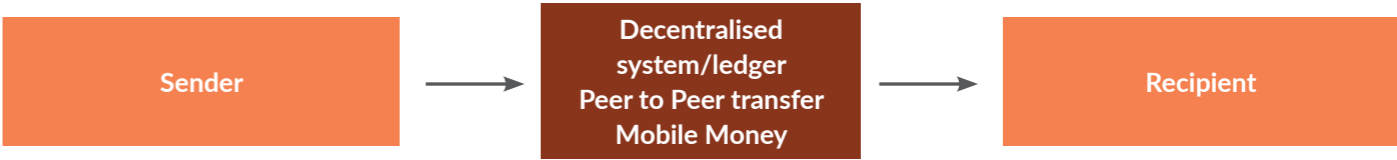
Exhibit 5.14: Payments- Tech Driven Platforms



Source: World Economic Forum and Deloitte

The distributed ledger based payment systems allow to transmit values between the users by secured cryptographic protocols. The other non-traditional payment systems like mobile money services, P2P cross border money transfer services facilitates the transfer at the interbank rates.

Exhibit 5.15: Alternative Platforms for Cross Border Transfer



Source: World Economic Forum and Deloitte

Risks

The traditional payments services were exposed to shortcomings only in cases when the sender’s credentials were known hence has worked well as rarely people had access to personal data to commit fraudulent activities. But in case of international transfer models built by DLT, P2P transfers, the anonymity of accounts might create security threats. The payments through tech driven platforms are though less exposed to conventional fraud the possibility of frauds like large scale hacking may pose a threat.

Cost

The innovative payment solutions offered by the non-traditional players are built on the existing infrastructure, this reduces the variable costs making electronic transfers cheaper compared to conventional transfers. The cost of electronic transactions may also fall as they increase in volume.

Also, the current system of payments across borders is built on several intermediaries, such as automated clearing houses, intermediary banks (corresponding banks), this makes the process slow and costly.

Speed and Accessibility

The FinTech companies allow customers to make payments using a variety of options like credit cards, debit cards or bank accounts making it more accessible. Payments are made in one tap making it simpler and faster, however in regions where the population does not have primary accounts and in case of payments where small denominations are involved, payments through cash is still predominant.

Investment Management Services

Traditional Players

Traditionally, Investment management services are offered by various financial institutions including private banks, bank brokers and registered advisors for high and ultra-high net worth individuals. The services offered by the traditional investment banks include advisory, brokerage and value-added services. The advisory role pertains to the investment allocation strategies, money management and securities analysis. *Brokerage* services deals with distribution of wealth products (e.g., mutual funds, ETFs, annuities, insurance products), access to rare products and assets, the other *Value-added Services* including wealth transfer planning, tax strategies, retirement planning and so on. Traditionally, these financial services are offered by professionals to clients, creating personal relationships and aid the customers in financial planning with reliance on static data.

Non-traditional players

Digitalization in the wealth management industry is providing sophisticated alternatives to traditional wealth managers. The tech driven innovations like big data, machine learning has been widely used in the investment management for unbiased valuation, factor analysis and in improving risk management. A new opportunity has been created by the Robo-advisors to asset managers in targeting the *mass affluent* who look for cheaper alternatives to manage their assets.

Exhibit 5.16: Key Innovations across the Industry



Source: World Economic Forum and Deloitte

Risks

Customers gain greater transparency in pricing and services, hence have more clarity over the services in the tech driven management. However, these platform uses a vast amount of data, hence the availability of qualitative reliable data will be a key for the performance of learning algorithms, and poor inputs might bring both systemic and systematic risks. Also as the new platform redefines the relationship between wealth managers and clients unfavorable situations like market crash may pose a threat to the economy due to the investor’s irrational financial choices.

Cost

Automation reduces the operation costs, and when competition increase, pricing for advisory services might be considerably reduced. Accenture points that when RPA (Robotic Process Automation) is implemented at scale it can deliver a 3-6 month payback.

Speed and Accessibility

The tech driven wealth management allows customers with fewer assets to receive financial advice by reducing the management fees and providing low investment threshold e.g., Wealthfront offers an automated investment service rooted in passive investments. Unlike traditional institutions, it has minimum account threshold (\$5000) and charges 0.25% annual advisory fees which largely reduces the hurdles for entry. Thus the sophisticated management services are made available to wide range of individuals making it more accessible.

Banks Disrupted: Implications and Areas of Immediate Focus for Central Banks?

Fintech has created a situation wherein every banking service can be done digitally. Though the physical infrastructure of banking remains, many of the financial transactions initiated by customers are now digital. According to the Organization for Economic Co-operation and Development (OECD), “although the level and pace of Fintech innovations differs across sectors, products and geographies, their main drivers are similar. These involve efficiency (‘nimbleness’ and speed, and often ‘cutting out the middle man’), simplicity, transparency and streamlined margins stemming mainly from a lower operating cost base and scale effects.”

Exhibit 5.17: Applications of New Technologies to Financial Services

Digital Technology	Payment Services	Advisory & Agency Services Planning	Investment & Trading	Lending & Funding	Insurance	Security	Operations	Communications
Distributed Ledger Technology	✓	✓	✓	✓	✓	✓	✓	✓
Big Data	✓	✓	✓	✓	✓	✓	✓	✓
Internet of things					✓			✓
Cloud Computing	✓	✓	✓	✓	✓	✓	✓	✓
Artificial Intelligence		✓	✓		✓			✓
Biometric Technology					✓	✓		
Augmented/ Virtual reality		✓	✓					✓

Source: OECD

The Kuwaiti financial services industry possess a repository of valuable data about banking customers and their behaviors. The next step would involve making great strides in the ability to utilize this data to arrive at intelligent market decisions about the products that should be provided and to which set of customers.

Exhibit 5.18: Sampling FinTech’s Data Usage Spectrum

Sectors	Products	Activities			
		Front Office	Middle Office	Back Office	
Banking	Consumer	<ul style="list-style-type: none">• Current Account• Payments• Savings Account• Cards• Secured Credit• Unsecured Credit	<ul style="list-style-type: none">• Customer Acquisition and On-boarding• Underwriting	<ul style="list-style-type: none">• Risk Management• Payments• Servicing	<ul style="list-style-type: none">• Security• Collections• Loan portfolio management
	Wholesale	<ul style="list-style-type: none">• Liquidity Management• Payment• Underwriting• Advisory	<ul style="list-style-type: none">• Advisory• Underwriting	<ul style="list-style-type: none">• Risk Management• Treasury• Payments	<ul style="list-style-type: none">• Security• Work out• Loan portfolio management

Sectors	Products	Activities			
		Front Office	Middle Office	Back Office	
Insurance	Personal	<ul style="list-style-type: none">• Liquidity Management• Motor• Home• Health	<ul style="list-style-type: none">• Customer Acquisitions• Underwriting	<ul style="list-style-type: none">• Servicing• Asset Management	<ul style="list-style-type: none">• Claims handling• Risk reporting
	Wholesale	<ul style="list-style-type: none">• Corporate Risk• Specialty• Catastrophe	<ul style="list-style-type: none">• Broking• Underwriting	<ul style="list-style-type: none">• Servicing• Asset Management	<ul style="list-style-type: none">• Claims handling• Risk reporting
Asset Management	<ul style="list-style-type: none">• Active• Passive• Absolute Returns• Balanced• Specialist• Private Wealth	<ul style="list-style-type: none">• Customer Acquisitions• Research and analytics• Investment process	<ul style="list-style-type: none">• Risk Management• Compliance• Trade execution	<ul style="list-style-type: none">• Reporting• Settlement	
Capital Markets	<ul style="list-style-type: none">• Research• Execution• Clearing• Security Servicing	<ul style="list-style-type: none">• Research and analytics• Trade execution	<ul style="list-style-type: none">• Risk Management• Compliance• Clearing and settlement	<ul style="list-style-type: none">• Reporting• Custody	

Source: EY

FinTech will also be instrumental in alliances developing between financial service providers and firms involved in the areas of advanced robotics and AI. For e.g., robots are likely to replace human tellers. The below are some of the areas that Kuwaiti banks are closely focusing upon in terms of FinTech services--

- Account and data aggregation
- Enhanced credit scoring
- Intelligent financial management
- New payment methods
- Automated affordability analysis

Though quite a few industry experts contend that FinTechs pose the greatest threat to traditional banks, the arrival of leading tech companies to financial services can force a complete rethink of the rules of the competitive landscape. McKinsey & Company describes the main risks facing traditional banks in the form of—Disintermediation; Disaggregation; Commoditization; and Invisibility.

Exhibit 5.19: Disruptive Trends Impacting Traditional Banks

Trend	Description
Disintermediation	Banks are losing preferential access to customers as they move to non-banking options and sources.
Disaggregation	Core banking products and services are getting unbundled, as consumers can opt for single service providers.
Commoditization	Banks are now struggling to differentiate their market positions as consumers compare and benchmark banking products online with sharper transparency.
Invisibility	Banks’ brand awareness is eroding and getting increasingly invisible as consumers can obtain financial services without awareness about the brand.

Source: McKinsey

The promulgation of new concepts of banking is coinciding with the technological revolution as well. An example is the concept of ‘Open Banking’. Open Banking facilitates consumers to securely share their personal financial information with approved financial services companies and relevant third-parties besides their account holding bank⁵⁰. The origin of Open Banking as a concept began with United Kingdom, Kingdom’s Competition and Markets Authority (CMA) mandating that the “[...] largest banks in the UK have until early 2018 to develop an Open application programming interface (API) standard and create Open APIs to facilitate data sharing in the banking industry.”⁵¹

General Data Protection Regulation (GDPR) was approved by European Union (EU) Parliament in 2016 and it came into force on May, 2018. The regulation provides control to individuals over their personal data and is applicable to all companies that hold or process personal data of individuals residing in EU, regardless of the company location. GDPR coupled with the emergence of the Payment Service Directive II (PSD2), Open Banking has the latent potential to fundamentally alter the way corporate and retail clients engage with their banks and how they access financial services. The General Data Protection Regulation (GDPR) was adopted by the EU in 2016 and replaced the EU Data Protection Directive 95/46/EC. The GDPR introduces new obligations to data processors and data controllers, including those based outside the EU territory. It is possible that a new environment could get spawned where consumers take ownership control of their financial data and share this critical information with third parties of their choice.

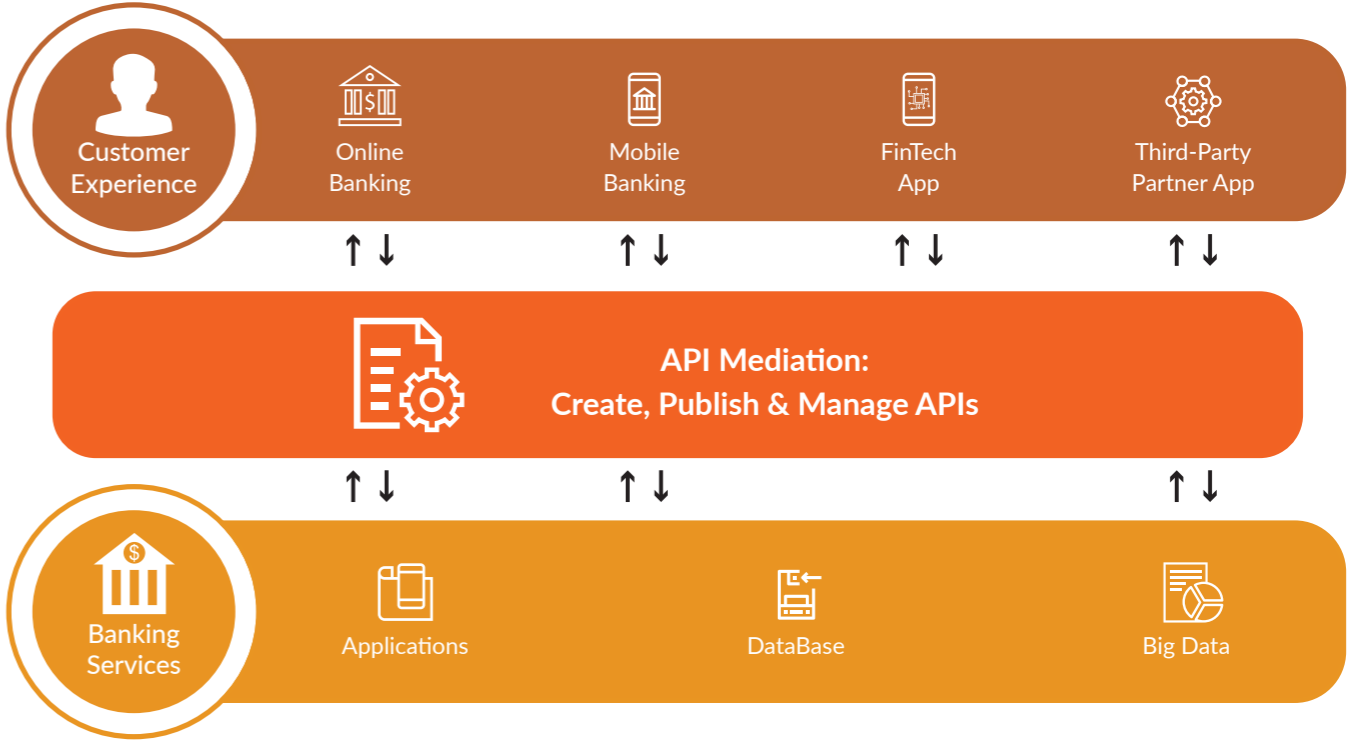
The European PSD2 is aimed at forcing banks in Europe to grant other companies, based on client choice, access to their ledgers⁵². Meanwhile, GDPR is focused upon solidifying and unifying data protection boundaries for all individuals within the European Union (EU) by giving citizens control over their personal data.

⁵⁰ The Australian Institute of Credit Management

⁵¹ EY

⁵² IFZ FinTech Study 2018

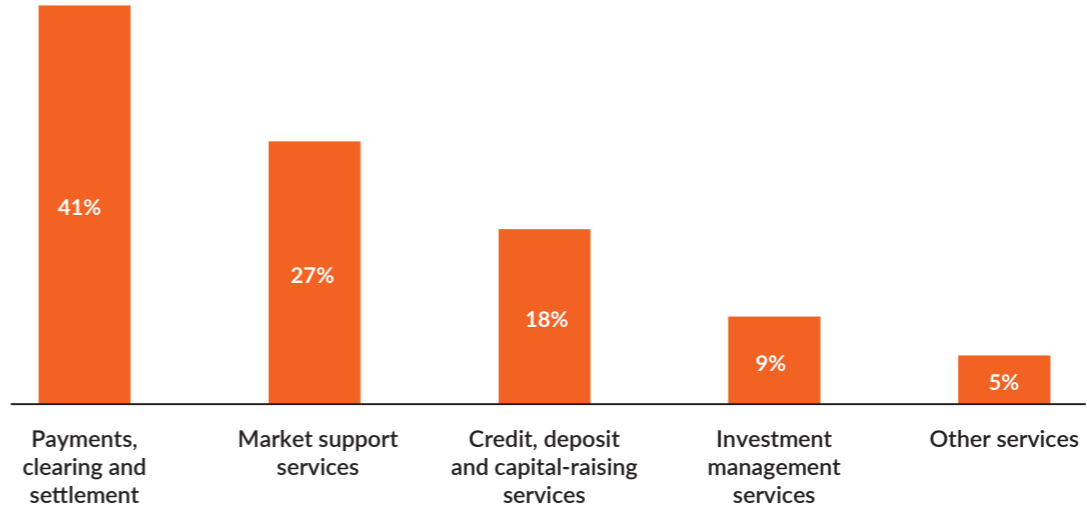
Exhibit 5.20: APIs—Critical Intermediary Role



Source: Dell Boomi

Many of the technologies underpinning the FinTech wave are general purpose technologies that are having economy wide effects impacting multiple industries and sectors. For example, technologies such as big data, machine learning, blockchain, cloud computing, Artificial Intelligence etc. are not specific to financial sector but play a significant role in FinTech developments. According to a BIS (Bank of International Settlements) survey, most of the FinTech service providers are in the payment, clearing and settlement category, followed by the market support services⁵³ (companies that provide support for the FinTech financial services).

Exhibit 5.21: Key providers per FinTech activity

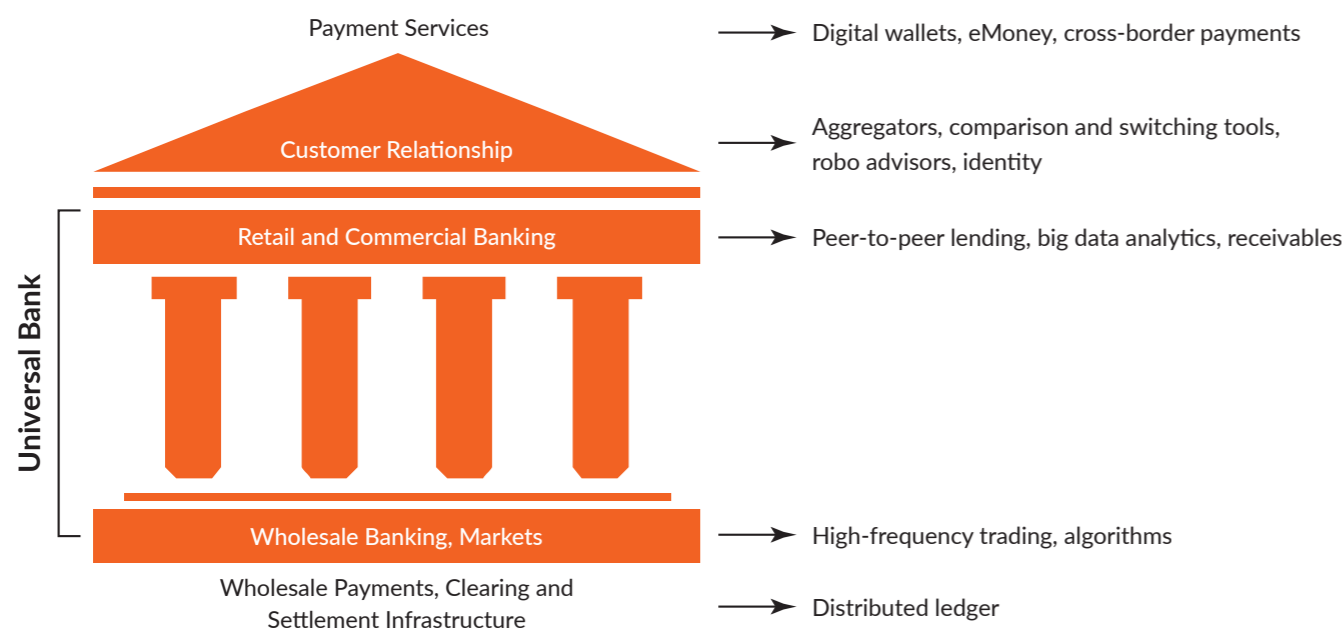


Source: Bank of International Settlements (BIS), 2018

⁵³ Market support services includes portal and data aggregators, ecosystems (infrastructure, open source, APIs), data applications (big data analysis, machine learning), Distributed Ledger Technology (blockchain, smart contracts), security, cloud computing, Internet of Things and Artificial Intelligence (bots, automation in finance, algorithms).

The most significant changes via FinTech are taking place at the front-end part, where innovative payment service providers are providing fresh user interfaces (e.g., digital wallets)⁵⁴. As FinTech are increasingly influential in payments category banks could focus on owning the next generation payments landscape (for example QR code payment). Some of the prominent banks in Asia (ICBC, DBS) have leveraged QR code payment method that can speed up the e-commerce payment experience. Meanwhile, other aspects of the customer relationships matrix are being opened up too. For example, aggregators are providing clients with ready access to price comparisons and switching options in some parts of the world, a trend that will further accelerate due to APIs. But due to the high stakes, FinTech firms, banks, aggregators and regulators are still investigating ways to connect effectively. There are a few alternative approaches in operation today to adapt to the FinTech developments (collaboration/partnerships, immersion programs) with various advantages and drawbacks. As financial services becomes increasingly technology-driven, there will be a potential change in the traditional banking business models, structures and operations in the next decade with banks investing heavily in technology to compete with one other and with the non-bank entrants.

Exhibit 5.22: Impact of FinTech on Financial Services Value Chain on an Illustrative Generic Example called ‘Universal Bank’



Source: Bank of England

The key takeaways for Central Banks in terms of accelerating disruption of banks is as follows with respect to devising regulatory approaches –

1. FinTech is spawning new market entrants including payments providers, peer-to-peer lending entities, robo advisors, novel trading platforms, and innovative foreign exchange nodes⁵⁵. Over time, this could disaggregate traditional banking models and erode the traditional economies of scale and network scope of banks.

2. Thus, the systemic consequences of FinTech on the financial system are complex and its consequences for a Central Bank’s core monetary objectives will not become completely apparent for some time. However, there are low-hanging fruits (such as payments and cross- border fund transfers) that can be regulated with very clear-eyed approaches. While areas like crowdfunding would require a much more nuanced and calibrated regulatory effort.
3. The emergence and rapid diffusion of technology-enabled FinTech capabilities are being driven, on the one hand, by supply-side fundamentals that spur the growth of innovative financial services and, on the other hand, by demand-side developments that accelerate the acceptance of the innovations⁵⁶. One of the key supply-side factors is the greater access to new communication technologies that facilitate people to connect instantaneously. Thus, it is too early to take definitive stances on what the global regulatory outlook on aspects like Blockchain would be. Thus, many central banks may adopt a wait-and-watch approach on the same.
4. Also, from a systemic angle, many central banks around the world are wary that the FinTech wave is a potential source of unpredictable risk to overall financial stability. For e.g., a higher degree of automation via robo advisors, like in the taking of investment decisions, can accentuate procyclicality if it strengthens taking of similar risk positions (herding behavior). Thus, FinTech raises challenges for regulators in terms of the need to balance regulation of new players against stifling innovations through regulatory overreach.
5. Crucially, FinTech firms, which principally operate through the Internet, are not constrained by borders⁵⁷. This raises critical questions as to the effectiveness of new regulations that will still be largely based on national or residency criteria (e.g., consumer protection rules). The cross-border aspect of technological innovation in finance may call for supranational regulatory mechanisms. In other words, the growing reach of borderless technologies on the financial system will likely necessitate international coordination efforts.

Development and adoption of FinTech could be disruptive to existing incumbent Kuwaiti banks unless they adopt and evolve their business models to the changing needs of the customers. The key question that shall concern all stakeholders including banks and regulators would be on the potential of FinTech to impact bank revenues and its subsequent impact on profitability. To assess the quantitative impact, we envision multiple scenarios with regard to the disintermediation abilities of the FinTech players. We estimate the impact for banks, across multiple segments such as fee and commissions income, retail lending, SME loans, payments, fund transfers and other services.

⁵⁴ Bank of England
⁵⁵ Ibid

⁵⁶ Deutsche Bundesbank
⁵⁷ Banque de France

Banking revenues and net interest income, accruing from deposit taking and lending business, are capital intensive. Moreover, corporate banking is a relationship-driven activity that shall pose an additional barrier of challenge for FinTech startups. Banks could build their own digital capabilities and can thwart potential threats from possible competitors. SMEs that are often credit starved and find it hard to avail credit through traditional banking channels could rely on potential solutions offered by FinTech such as crowd funding and direct lending. Similarly, in personal loans segment, borrowers with bad credit history and urgent cash needs could rely on Person-to-Person (P2P) lending solutions. Thus, we believe the personal and SME lending has a high possibility of being disrupted by FinTech; while the possibility is low for other segments such as corporate lending and mortgage business.

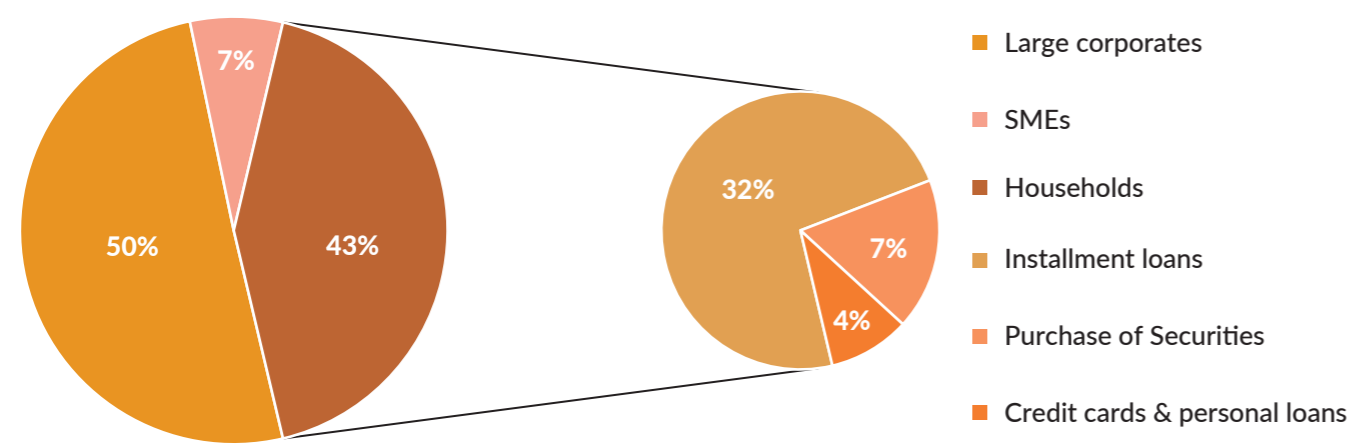
Exhibit 5.23: Credit Segments Susceptible to FinTech Impact

Category	Value in KD million	Share in overall credit	Impact by Fintech
Large corporates	18,459	50%	Low
Households, of which	15,822	43%	n.a
- Installment loans	11,723	32%	Low
- Purchase of Securities	2,676	7%	Low
- Credit cards & personal loans	1,423	4%	High
SMEs	2,580	7%	High
Overall	36,861	100%	

Source: Central Bank of Kuwait, Marmore Research; Data as of 2017-end

In Kuwait, of the overall credit outstanding, large corporates account for 50% of the share followed by lending to households at 43% (Financial Stability Report, CBK). Credit to SME amounts to 7% of overall lending. Among households, credit cards and personal loans share is minimal at 4% of overall loans outstanding, while installment loans occupy the majority share at 32% of overall loans outstanding. Thus, the effective target market, comprising SME segment and credit cards and personal loans, which could potentially be impacted by FinTech in the short-term amounts to 11% of overall credit outstanding.

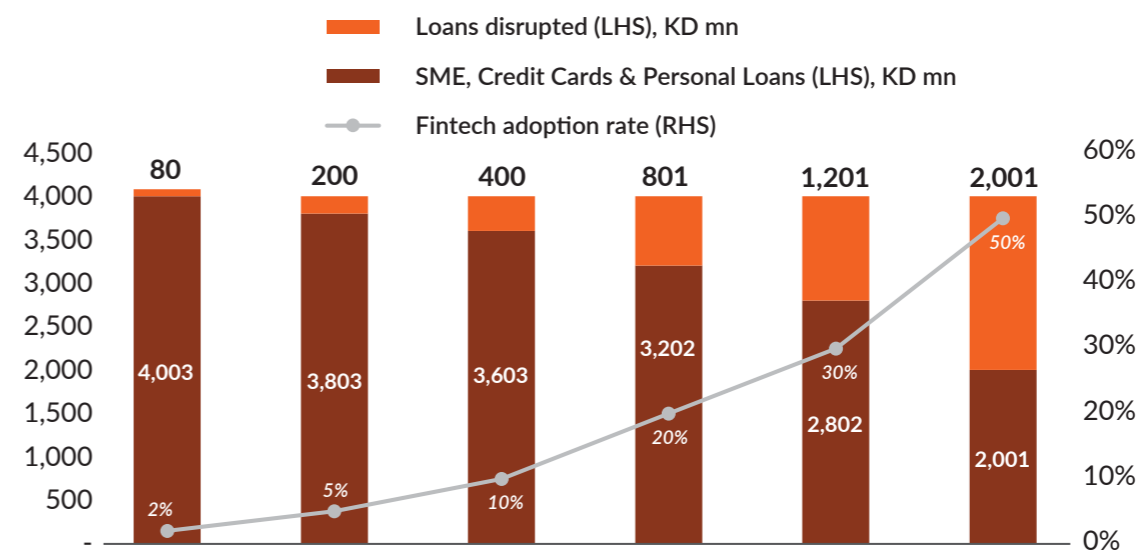
Exhibit 5.24: Kuwait Credit Outstanding by Various Segments



Source: Central Bank of Kuwait; Data as of 2017-end

We assess the impact of FinTech adoption under multiple scenarios. Under each scenario, based on the adoption level we assess how much of the existing SME loans, credit card and personal loans would be usurped by FinTech players.

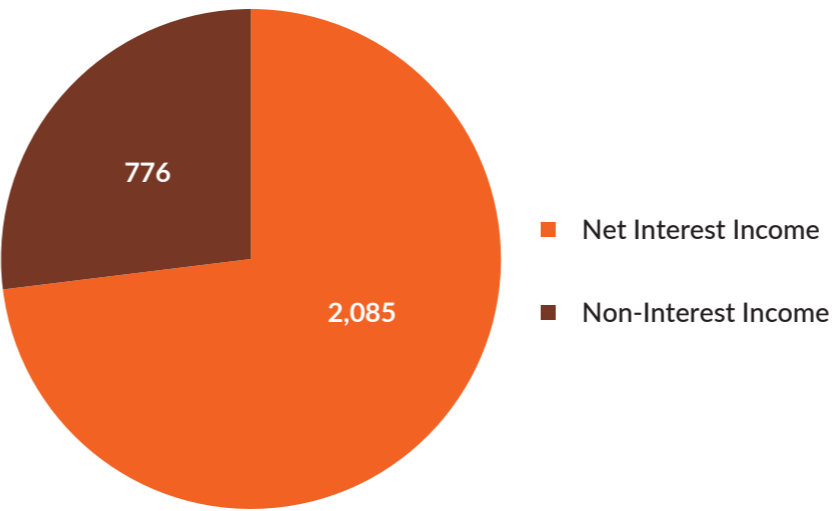
Exhibit 5.25: Potential Impact of FinTech on Credit Segment



Source: Marmore Research; 2018

There are likely to be significant impact on fees income, payments and transfers too. Non-interest sources of income include fees and commissions, investment and foreign exchange gains, and sale of investments among others. Of these, fees and commissions that arise out of debit and credit cards, client origination fees, loan processing charges, and advisory services are susceptible to FinTech developments. Non-interest revenue constitutes 27% of overall bank revenues. Fee and commission income amounts to KD 475 million as of 2018-end. Value of transactions taking place through Point-of-Sale (POS) terminals stood at KD 11,478 million while ATM transactions stood at KD 12,378 million.

Exhibit 5.26: Bank Revenue Streams (in KD million)



Source: Reuters; Note: Data as of 2018-end based on the financials of publicly listed Kuwait banks

FinTech companies through provision of various options for payments and fund transfers would stand to compete largely with the usage of debit and credit cards. Introduction of direct lending and person-2-person lending could also reduce the share of client origination fees and loan processing charges. Customer switching over to FinTech payment channels and their preference for the same over traditional payment mechanisms such as debit and credit cards for utilities bill, vendor payments, online shopping and merchant bills could affect bank fee revenues. Alternatively, banks through digital advancements and provision of services such as tap & pay, tap & go, wearable devices could pose stiff competition with the emerging players.

In addition, the potential impact on net income has to be understood. The ability of the FinTech to impact bank profits would be a factor of FinTech adoption, consumer behavior as related to their willingness to shift from bank channels and the ability of incumbent banks to resist competition through improvements of existing solutions. The impact caused due to loan intermediation on SME, credit card and personal lending could be calculated mathematically as:

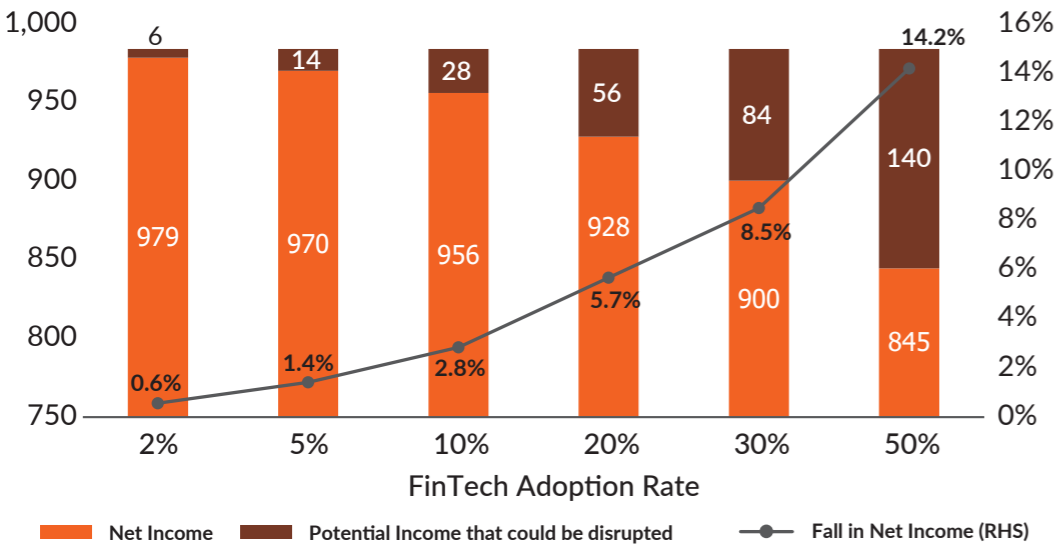
$$\text{Loans disrupted} = (\text{Existing loans of SMEs, Credit Cards \& Retail Loans} * \text{FinTech adoption rate})$$
$$\text{Potential Loss of Income} = (\text{Loans disrupted} * \text{Estimated interest margin}) / \text{Net Income}$$

Similarly, for potential loss of income due to impact on fees, payments and transfers;

$$\text{Value of transactions disrupted} = (\text{Existing transactions value} * \text{FinTech adoption rate})$$
$$\text{Loss of income} = (\text{Disrupted transactions} * \text{Difference in Merchant Discount Rate}) / \text{Net Income}$$

For our calculations, we have assumed an interest margin of 4%, 120 basis points higher than the average net interest margins of 3.0% (Q3, 2018) considering the riskier nature of loans. Similarly, we have used 0.5% to account for the differential merchant discount rate, usage fees and other charges.

Exhibit 5.27: Impact on Net Income

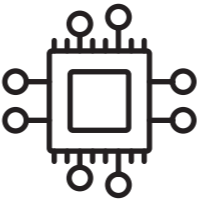


Source: Marmore Research, 2018

On an overall basis, we estimate the net income of Kuwait banks to decrease by 14.2% in the case of customers embracing FinTech, assuming adoption level of 50%. On the flip side, a mere 2% adoption of FinTech could result in minimal impact for the incumbent banks wherein their net income could witness a decline of just 0.6%.

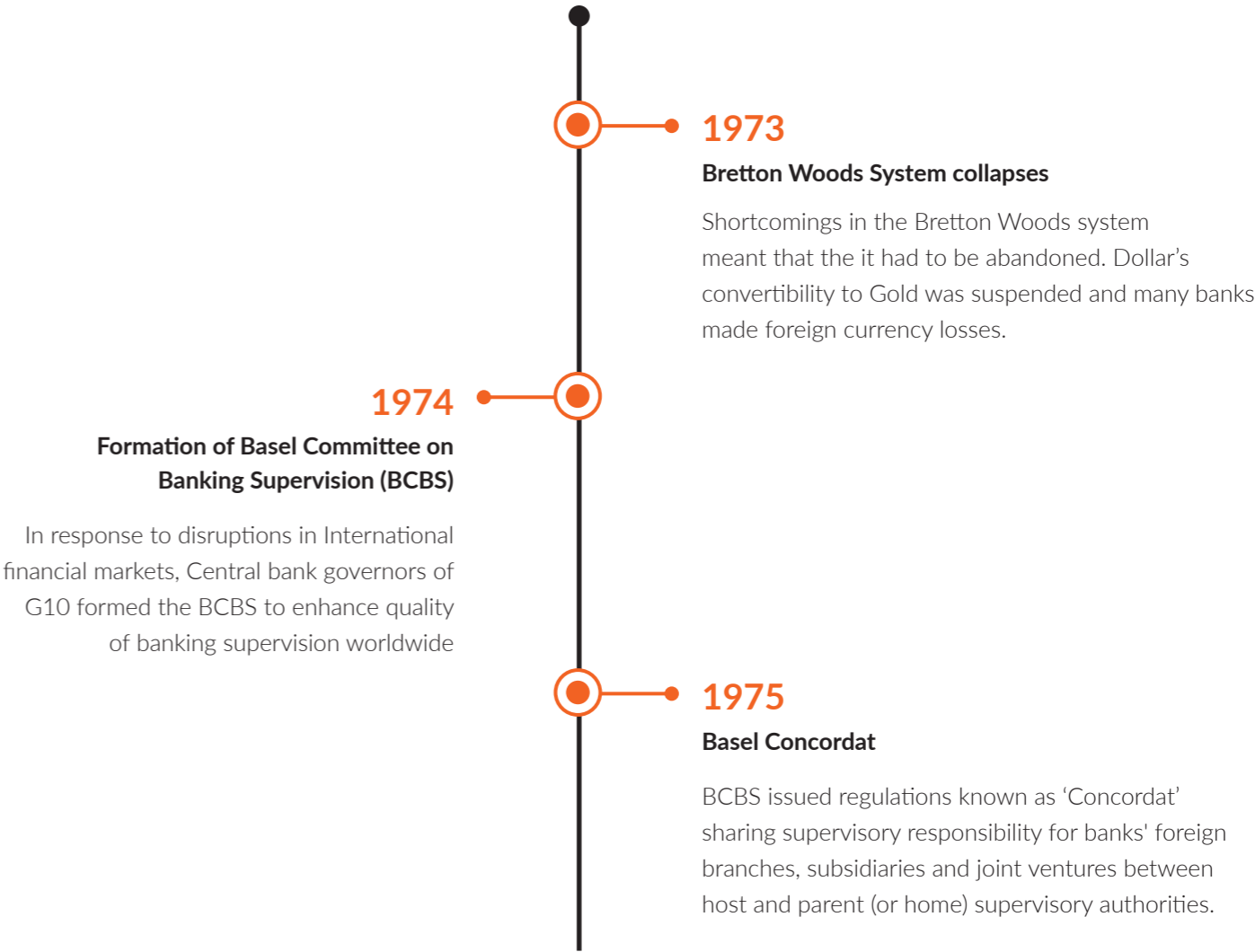
Section 6

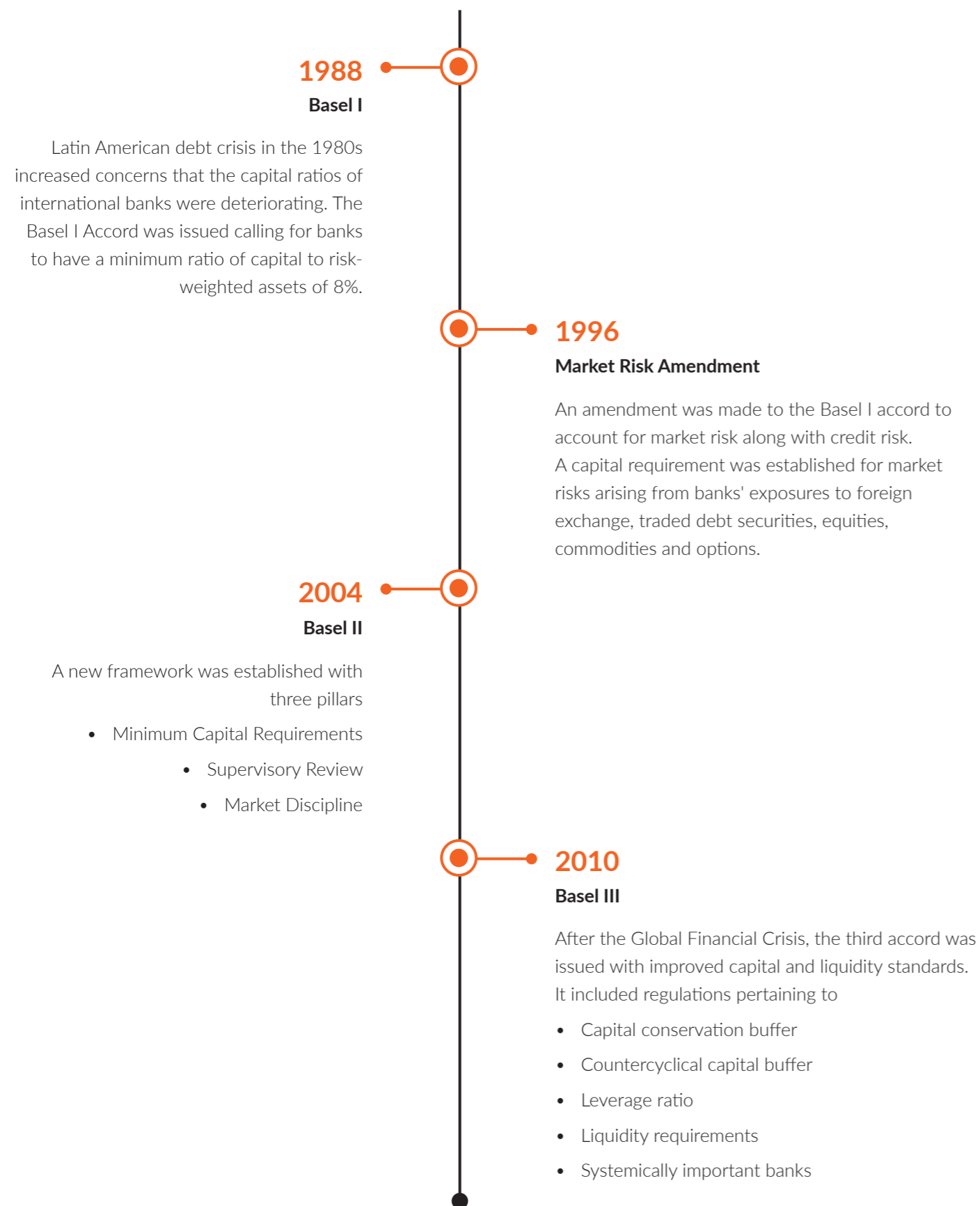
The Role of Regional and International Regulators and their Tools



The evolution of global financial regulations has historically been reactive in nature, bringing in major changes only after a crisis. Changing customer needs and the harmonious overlap of technology and financial services in recent times have given rise to the rapid development of innovative financial products that add more value to customers when compared to traditional services. The pace of development of these products has been so rapid that the cycles of innovation have become smaller as time has progressed. This has in turn had imposed additional pressure on regulations that have struggled to match the speed of innovation.

Exhibit 6.1: Evolution of Global Banking Regulations





Source: Bank for International Settlements, Omega Finance

The increasing pressure on regulators can be easily gauged by the surge in number of regulations, publications and amendments enforced by regulators worldwide. From a regulatory viewpoint, it is imperative to balance the environment such that it neither becomes too protective, thereby reducing the scope for existing and upcoming players to pursue innovations nor expose the stability of the financial system to potential vulnerabilities. FinTech possesses the ability to both support and undermine the stability of the financial system. The FinTech industry has still not achieved a state of maturity, which makes it difficult to establish the exact implications of the ongoing developments. The involvement of technology complicates the existing challenges while also bringing a new set of benefits and risks for the system to deal with. Therefore, the role of a regulator becomes imperative to find a balance and tailor the system in such a way that risks could be effectively mitigated without compromising on the benefits.

Emergence of smaller FinTech players is likely to fragment financial services and bring forth the shift from large institutions offering multiple services into smaller institutions offering specialized services. This shift will diversify the risks involved and end the presence of 'too big to fail' institutions, as the failure of a single institution would no longer derail the stability of a system. The involvement of technology allows regulatory authorities to monitor transactions in real time and reduces information asymmetry. This helps regulators to assess the risk exposure of financial instruments quicker and allows for greater regulatory control.

Increased competition from emerging FinTech start-ups will force FinTech players to make their processes more efficient and offer better services to the end customers. The inclusion of productivity enhancing technologies like Robo-advisors, predictive algorithms and machine learning would improve back office operations and reduce settlement time, which would in turn reduce the time for which one counterparty would be exposed to the other. Improving ease of access would help in financial inclusion of households and SMEs into the system, allowing sustainable growth of the industry and bring more transactions under the purview of the regulator.

Micro level risks include those that would make individual institutions or sectors susceptible to shocks

- **Run Risk:** Mismatch in liquidity characteristics of assets and liabilities handled by Mobile wallets and other payment systems as opposed to well-regulated traditional institutions such as banks could result in a run risk and lead to the premature selling of illiquid assets thereby disrupting the market.
- **Cross-sectoral Risks:** Entities that may be involved in financial activities but fall outside the purview of regulators due to their cross-sectoral involvement might not be subject to the same amount of scrutiny and oversight when compared to the ones that do. This may give rise to ineffective governance and regulatory breaches.
- **Cyber security Risks:** Increased dependency on technology opens up the risk of exposure to cyber threats that could destabilize an entire system if proper security protocols are not in place. FinTech companies whose reliance on technology is far more than traditional institutions and sometimes have better interconnectivity with other institutions, pose more risks to destabilizing the system than traditional ones.

- **Third-Party Risks:** Some FinTech companies leverage support from third-party sources for some of their key functions like cloud storage, robo-advisory etc. When a number of institutions depend on the same third party, the latter's failure could bring forth a systemic instability.
- **Regulatory Risks:** Owing to the innovative nature of FinTech services, some sub-functions or services that are offered, would not be able to be effectively governed through existing legislations. These uncertainties might eventually lead to some of them circumventing the framework and disrupt the system.

Macro level risks are those that affect the financial system as a whole thereby posing greater risks to the stability of the overall system

- **Contagion:** More often than not, people are tuned in a way to react to any change with resistance. The case is similar for FinTech services, which are different when compared to how services were provided traditionally. When an individual FinTech firm fails due to a micro-level issue, there are very high chances that the customer would interpret that as a systemic failure, thereby affecting customer confidence in FinTech firms that offer similar services.
- **Pro-cyclicality:** Certain FinTech activities could be prone to pro-cyclical dynamics. In the case of lending, there is greater visibility for the investor in terms of who the actual borrowers are when compared to traditional lending institutions. This could have a multiplied negative effect on retail investors when non-performing loans rise, resulting in funds drying up. Similar instances in the provision of other financial services carry this risk.
- **Volatility surge:** FinTech services are generally set up to challenge traditional services by offering better efficiency through increase in speed and decrease in cost of services. The ramping up of speed would make the markets more sensitive to any positive or negative event, resulting in excess volatility than warranted. The excess volatility may cause liquidity or solvency problems that could destabilize the system when too many institutions have common exposures.
- **Systemic Importance:** As FinTech companies are highly interconnected and operate with greater efficiency, there is a risk that they might eventually displace a majority of traditional institution through predatory pricing and ultimately enjoy an oligopoly in future, having a bigger say on policy and regulations through their increased systemic importance.

Due to growing insecurities among customer, regulators are keen to demonstrate that FinTech companies also come under intense regulatory scrutiny. Emerging areas like distributed ledger technology and crypto assets are perceived to be too risky, to the extent where their usage is prohibited in certain markets. As the negative publicity gained through a potential regulatory breach might affect the confidence of the customer and investors, FinTech companies are forced to allocate a relatively major part of their resources towards compliance.

Regardless of the size of the institution, regulatory and compliance cost for financial institutions form a sizeable part of their operating costs. FinTech companies, which usually are SMEs, have smaller budgets and lesser employees compared to banks or other traditional institutions. The size of a firm is a key determinant of the regulatory cost of doing business in some markets. The level of regulatory oversight is higher for bigger firms as they tend to have a bigger market share compared to smaller players. Also in several markets, when smaller FinTech firms partner with larger institutions like banks to develop products, the oversight on the FinTech companies, which are now third party partners of bank become higher. While the benefits of collaborating with the bank would be high for the FinTech firm in the long-run, the short-term compliance cost becomes a burden for them.

The dearth of FinTech-specific regulations and the inability to classify FinTech firms into existing frameworks results in a lack of clarity. Therefore, it becomes difficult for the FinTech firm to identify which authority would be governing their regulations. This causes a delay in getting approvals and establishing processes. In an industry that progresses at a rapid pace, the delay in bringing a product to the market would nullify its impact.

One of the key inferences made from the challenges suggest that a majority of problems from a regulatory standpoint arise because FinTech products and services that are still at a nascent stage and are exposed to the same amount of regulatory scrutiny as compared to ones that are at a much more mature stage of their lifecycle. However, the regulator also needs to keep the safety of the customer while relaxing any regulations in place. Therefore, regulators need to make use of innovative tools in order to assess regulatory risks of FinTech companies without laying undue pressure on them.

RegTech, otherwise known as Regulatory Technology, is often perceived as a sub-group of FinTech that was created to address regulatory challenges prevailing in the financial service industry. RegTech, much like FinTech involves the influx of technology into traditional services to reduce the costs and improve efficiency. RegTech has remained in existence roughly since 2010, but gained prominence only by around 2015. Rising number of regulations along with the increased focus on regulatory activities in the financial services domain has brought RegTech into the limelight, with several RegTech firms emerging to solve regulatory challenges faced by companies in the financial sector.

During the initial phase, which is termed as 'RegTech 1.0', RegTech companies established themselves into the FinTech ecosystem by providing solutions to challenges faced by Banks and other financial institutions. After the Global Financial Crisis (GFC), the compliance costs of banks witnessed an increase due to the toughening of regulations. RegTech firms launched during this phase had to deal with regulations like PSD2 (Open Banking), MiFID II and GDPR. However, the biggest shortcoming of RegTech 1.0 was that the understanding of RegTech companies were not holistic, which made it difficult for banks to work with them. During this phase, regulatory bodies were primarily observers of the developments happening across the FinTech and RegTech space. Some regulators launched Regulatory sandboxes and Accelerator programs to monitor the developments closely.

RegTech 2.0 emerged to rectify the shortcoming of its previous iteration, addressing the challenges in a heavily regulated post-GFC environment. This phase has seen the emergence of a new branch of RegTech namely

‘SupTech’, which will see regulators working closely with technological players to find solutions to their impending challenges. SupTech will enable regulators and financial supervisors to adopt a data-driven approach to their processes and assist them in the transformation of their approach from reactive to a forward-looking one. SupTech is also expected to streamline data collection, management and analytics, thereby improving response times and reducing compliance costs.

Central Banks around the world have started looking at tools developed out of SupTech, with an eye to employ them in critical regulatory areas. These tools are designed to work with regulatory staff in tandem and help in allocating work force in critical areas, while also reducing time and cost in the process. The introduction of cutting-edge technology like Artificial intelligence, Machine learning, Big Data Analytics and APIs in areas of regulatory supervision will enable regulators to keep up with the emerging FinTech firms and allow them to manage risks in a more vigilant and efficient manner.

Risk indicator dashboards, centralised data warehouses for supervisory reports and early warning systems are some of the tools that are used by global supervisory agencies that have potential to be further developed by the inception of SupTech. However, there are impediments to involving technology in regulatory areas. One would be the inherent risks that technology carry (such as cyber risks). The other would be that these institutions are large and run by the state, which restricts the pace of adoption of technology when compared to a regular privately run financial institution. Developing a compressive snapshot of technologies used by Central Banks across regulatory areas would thus be useful.

Exhibit 6.2: Comparison of technologies used by Central Banks across regulatory areas

Technology used	Regulatory Authorities									
	Australian Securities and Investments Commission (Australia)	Bank of Italy (Italy)	National Bank of Rwanda (Rwanda)	Bangko Sentralng Pilipinas (Philippines)	National Banking and Securities Commission (Mexico)	Netherlands Bank (Netherlands)	Financial Conduct Authority (United Kingdom)	Monetary Authority of Singapore (Singapore)	Central Bank of the Republic of Austria (Austria)	Securities and Exchange Commission (USA)
Data Collection										
API	✓			✓						
Data input approach	✓								✓	✓
Data Pull approach	✓		✓	✓			✓			
Machine-readable regulation							✓	✓		
Cloud Computing	✓				✓	✓	✓			✓
Chatbots				✓			✓			

Technology used	Regulatory Authorities									
	Australian Securities and Investments Commission (Australia)	Bank of Italy (Italy)	National Bank of Rwanda (Rwanda)	Bangko Sentralng Pilipinas (Philippines)	National Banking and Securities Commission (Mexico)	Netherlands Bank (Netherlands)	Financial Conduct Authority (United Kingdom)	Monetary Authority of Singapore (Singapore)	Central Bank of the Republic of Austria (Austria)	Securities and Exchange Commission (USA)
Data Analytics										
Big Data	✓	✓			✓	✓	✓	✓		✓
Artificial Intelligence					✓	✓	✓	✓		✓
NLP	✓	✓			✓		✓	✓		✓
Machine learning	✓	✓			✓	✓	✓	✓	✓	✓
Supervised learning	✓	✓				✓	✓			✓
Unsupervised learning	✓					✓	✓		✓	✓
Topic Modelling							✓			✓
Image Recognition							✓			
Neural Networks						✓			✓	✓

Source: Bank for International Settlements; Note: The table is indicative and based on publicly disclosed activity and does not attempt a complete overview.

With respect to specific international trends, the Central banks of USA, UK, Singapore and Australia have been the most advanced in adopting SupTech tools either on an experimental basis or in mainstream applications. Incidentally, these markets are those that are perceived to be some of the major FinTech hubs around the world. Big Data and Machine learning are among the most widely used technologies in the regulatory space.

Regulators are currently in different phases of progression in terms of using SupTech applications. Risk evaluation and fraud detection applications are still under development or in the proof of concept stage. Their applicability have been largely tested on historical data so far. They will have to be tested with a forward-looking approach or in real-time to assess their applicability in real-time scenarios. However, progression is taking place at a rapid pace as FinTech players and applications have been on the rise.

Exhibit 6.3: Stage of implementation of Suptech technologies across regulatory areas



Source: Bank for International Settlements

Experimental Stage In development Operational

The progress witnessed among regulatory authorities in major FinTech markets around the world highlight the potential of SupTech tools and applications to help improve the regulations in the financial sector. However, as majority of them are still in an experimental stage, newer challenges are expected to emerge when they go mainstream. In addition, most of these tools are operational in areas of low criticality or in applications that involve a lot of manual intervention. In time, things are expected to progress further with more Central Banks adopting technological tools to assist them in managing the risks posed by the evolution of FinTech within the financial services space.

Regulatory regimes can usually be classified into Rules-based regimes or Principle-based regimes depending on the broader way of rulemaking. In a rule-based approach, regulations tend to be detailed and prescriptive while on a principle-based approach, they tend to be broad and outcome-focused. Most regulatory regimes around the world would fall under either of these categories. When it comes to the FinTech industry, there are benefits and challenges to both approaches. Ultimately, the decision to pursue either of the approaches should be taken considering its suitability to the nuances of a particular market and its existing protocols.

Exhibit 6.4: Features of Rule-based and Principle based approaches

Rules-based approach	Principles-based approach
<ul style="list-style-type: none">Brings certainty, uniformity and predictability	<ul style="list-style-type: none">As boundaries are not rigidly specified, it gives rise to uncertainties and sometimes also results in bias
<ul style="list-style-type: none">Communication to stakeholders regarding compliance is clear	<ul style="list-style-type: none">Regulatory deterrents might be inadequate in some cases
<ul style="list-style-type: none">Loses control over entities which strategically bypass the purpose of the regulations	<ul style="list-style-type: none">Provides room for innovation due to its flexibility
<ul style="list-style-type: none">Deters innovation to an extent	<ul style="list-style-type: none">Time to market in brining regulation is shorter
<ul style="list-style-type: none">Tends to become obsolete after a period of time and causes a disconnect between the purpose and outcome of the regulations	

Source: Fintech: Building a 21st-Century Regulator's Toolkit

The approach in which rules are applied to market participants is as important as forming regulations and setting standards. Methodologies across different categories fall under two broad categories. One would be an enforcement approach where the rules are imposed on FinTech businesses while the other involves a more engaging approach where rules are made with proactive engagements between the regulator and market participants. The engagement approach is more of a steering approach where the regulator constantly engaged several participants and ensure that they stay within the regulatory approach whereas the enforcement approach leans towards judicial enforcement of regulations.

Exhibit 6.5: Features of Engagement and Enforcement based approaches

Engagement approach	Enforcement approach
<ul style="list-style-type: none">• Open communication between regulators and FinTech businesses	<ul style="list-style-type: none">• Clear demarcation between regulators and Fintech businesses
<ul style="list-style-type: none">• More favourable to innovation and market development	<ul style="list-style-type: none">• Deters risk taking activities and ensures stability
<ul style="list-style-type: none">• Poses the risk of biasedness towards favoured entities	<ul style="list-style-type: none">• Poses the risk of avoidance of industry participants
<ul style="list-style-type: none">• Renders greater flexibility and adaptability to rulemaking	<ul style="list-style-type: none">• Deters innovation and focuses on rigid compliance

Source: Fintech: Building a 21st-Century Regulator's Toolkit

The Financial Conduct Authority (FCA) in the U.K. has successfully adopted an engagement-based approach towards rulemaking for FinTech. Through their ‘Project Innovate’, they have been able to successfully collaborate with FinTech start-ups constantly and establish an engagement culture in the regulatory ecosystem.

Globally, several cities such as London, San Francisco, Zurich, Singapore, Hong Kong, Amsterdam etc. have emerged as renowned FinTech hubs due to the combination of several factors. Regulations is one among them. Despite having broad similarities in terms of forming dedicated teams, regulatory sandboxes and other supportive programs, there lies a difference in approach from each regulator in order to equip themselves to tackle changes brought forth by FinTech. The change in approach is generally due to the nature of the market and the underlying objectives of the regulator. Two representative markets, the US and the UK have been discussed in greater detail below.

In the past decade, the United Kingdom has grown into one of the world’s leading FinTech hubs despite encountering issues like Brexit. One of the primary reasons for the rise in stature could be attributed to the strong policy environment and supportive regulations. In FinTech circles, the United Kingdom is widely considered as the benchmark in terms of regulations. Financial Conduct Authority (FCA), the primary conduct regulator in the UK for financial services, has played a pivotal role in improving the policy environment in a complex market like the UK through high impact innovation programmes, business friendly regulatory changes and a unified policy approach designed to promote innovation.

The regulatory approach of the FCA stems from the aim of the UK government to ensure support for developing new business models and disruptive technologies. After Brexit, encouraging innovations in the financial services sector has risen in importance. Therefore, the regulatory direction given from the government is to give importance to promote innovation rather than to limit it. FinTech is now one of the fastest growing markets in the country, attracting over USD 2 billion in investments from Venture capital in 2017.

One of the main hinderers to growth of FinTech was that FinTech enabled services were also subject to the same regulations as traditional services, thereby stifling the ability of FinTech firms to provide innovative solutions. To resolve this, the FCA launched ‘Project Innovate’ to specifically engage with new FinTech firms to remove regulatory obstacles to innovation. ‘Project Innovate’ was launched in October 2014 along with an ‘Innovation Hub’ with a mandate to foster competition among FinTech firms and help them navigate the regulatory framework and finally apply for a license. The Innovation Hub also aimed to encourage the entry of innovate overseas FinTech firms into the UK.

The Innovation Hub has assisted over 300 businesses to launch innovative products and services into the market. In addition, the firms admitted to the hub receive dedicated supervisory support for the first year of their business. The Innovation hub also proactively monitors areas that require regulatory changes to promote innovations. Currently, Project Innovate operates primarily in London, and has regional hubs in Manchester and Glasgow. The project has also created ‘regulatory surgery’ sessions to address specific regulatory issues of individual firms. The FCA has signed operating agreements with the Australian Securities and Investments Commission (ASIC) and Monetary Authority of Singapore (MAS) in favor of International collaboration and development.

The FCA was the world’s first regulator to launch a regulatory sandbox to provide FinTech companies a safe space where they could test innovative products, services and business models. The move proved to be a successful one, elevating the UK’s status as a FinTech hub and set a precedent for other regulators worldwide to adopt a similar approach.

As non-traditional institutions have started offering easily operable digital payment solutions, they came under the purview of different regulators. In order to have a unified regulatory system to monitor these payments, the Payment Systems Regulator (PSR) was created in April 2015 to specifically oversee the payment systems industry. The PSR created a Payment Strategy Forum in October 2015 to give the payment industry players an opportunity to contribute to policy discussions. The creation of a single body to oversee regulations has created more clarity to the industry players, enabling them to pursue their innovations without major hindrances.

Tech Nation is a tool, which captures the strength, depth and breadth of digital tech activity in the UK and provides it in the form of a report. It helps digital companies overseas to understand about the business landscape in the UK. HQ-UK is a programme operated to showcase why foreign digital companies should set up their headquarters in the UK.

The UK has been increasingly active in opening up the FinTech sector, improving access to common infrastructure, which include Payment infrastructure, Government Data and Customer data that are relevant to FinTech businesses. For example, the UK adopted the EU’s open banking regulations, which came into effect from January 2018. Banks were asked to make customer account information available to approved third party providers, which allows the latter to develop innovative FinTech solutions.

Government programs to support the FinTech ecosystem have been successful in removing barriers to competition. The UK has been a benchmark in terms of progressiveness of the regulatory regime. Through their 'Project Innovate' initiative, the FCA has been able to successfully simplify regulatory complexities and open up the financial services sector, encouraging participation from across the globe.

Meanwhile, the US is home to some of the major FinTech hubs in the world including San Francisco and New York. The US has always been a global leader in terms of technological innovations, both in the financial and non-financial space. Being the largest economy in the world, its financial system is large and stable. Hence, the US market has all the key ingredients to promote the growth of FinTech. However, from a FinTech regulatory viewpoint, the country trails its European and Asian counterparts. The regulatory environment for FinTech is fragmented and lacks a unified strategy. Several FinTech businesses operating in the country have cited regulations as a major hurdle for innovation. FinTech companies in the U.S. are often subject to regulations both at the federal and state level. Despite the efforts of the regulators to launch initiatives, the initiatives are often caught between different levels of regulations. The end product resembles a patchwork between both regulations lacking a common unified strategy.

The overall policy stance of the government is to promote innovation in the financial space without compromising on the protection offered to the customer. Considering the size and complexity of the financial system in the country, upholding financial stability takes precedence over promoting FinTech innovations. Regulatory authorities in the country have organized several outreach programs that help in promoting FinTech.

One of the major initiatives taken by the Commodity Futures Trading Commission (CFTC) was the creation of Lab CFTC in 2017. The program was created to improve collaboration between the CFTC and FinTech players. The program has two components namely Guidepoint and CFTC 2.0. Guidepoint is responsible for enabling communication between the CFTC and companies about regulations and how to bring the products to the market. CFTC 2.0 provides a networking service to promote collaboration between FinTech players.

The Office of the Comptroller of the Currency (OCC) created an 'Office of Innovation' in 2017 to help FinTech services on issues relating to new technologies and monitor ongoing trends. This was part of OCC's approach to promote responsible innovation in the federal banking system. The office of innovation also serves as a hub for technical innovations, conducting meetings between banks and providers of innovative technologies.

The Consumer Financial Protection Bureau (CFPB) introduced a set of non-binding principles in 2017 to protect customers from data privacy challenges. The principles were established to address challenges posed by consumer-authorized data sharing. Despite the principles falling short in supervisory enforcement, displays CFPB's intent in ensuring that the customers are protected.

Despite the prowess of both the US and the UK in terms of drawing FinTech investments and developing FinTech hubs, the regulatory trajectory taken by both countries move in different directions. The UK has adopted a more unified and committed approach towards fostering innovations in the financial sector. Their approach leans towards a principle based regulatory regime favoring constant communication between regulators and businesses. The role of FCA is clearly defined and their regulatory initiatives have had a greater impact on FinTech companies in their home markets. On the other hand, regulations in the U.S. are still complex and fragmented across regions. In several cases, FinTech companies are exposed to the same regulations as traditional institutions, stifling their progress.

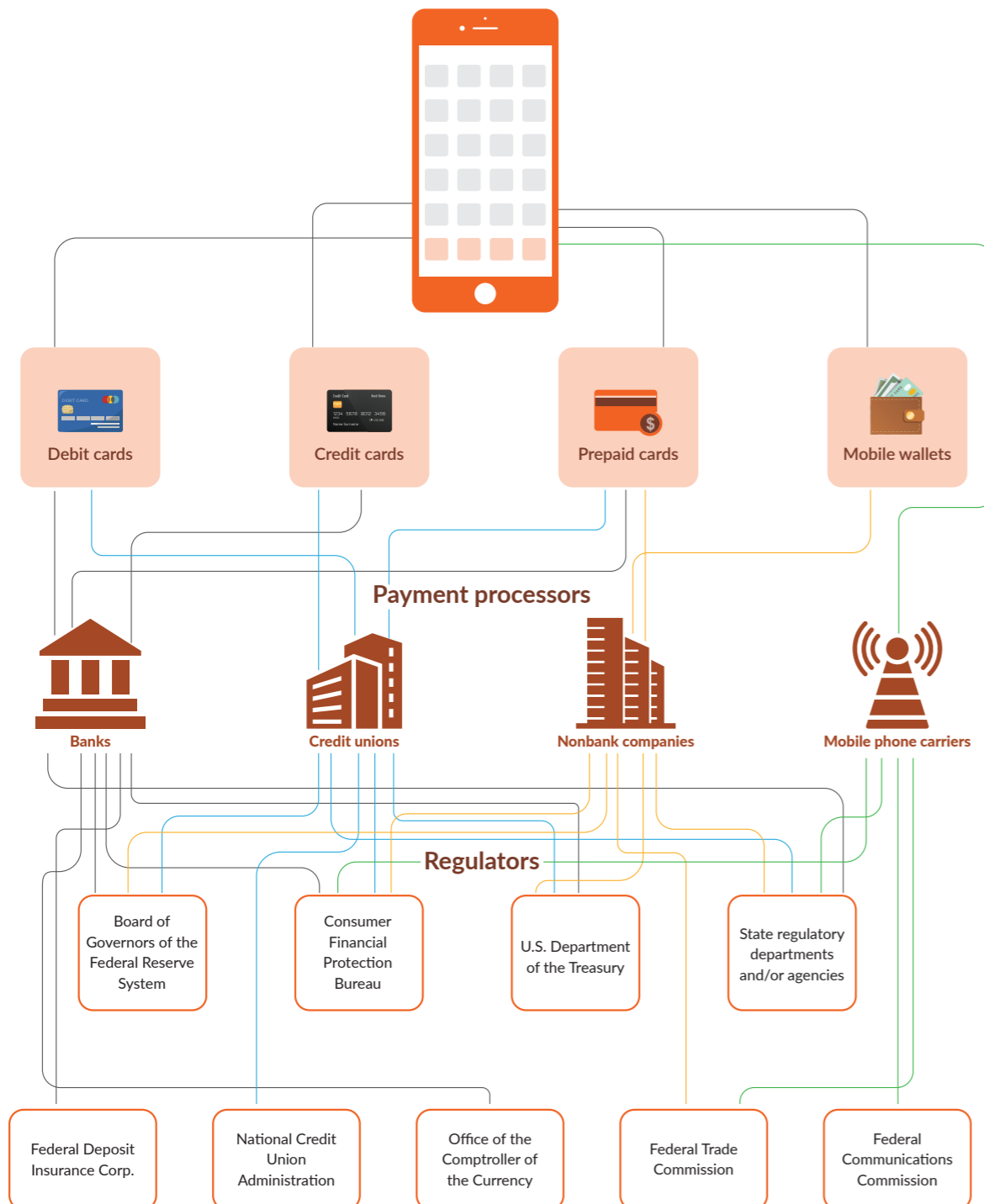
In addition, there is limited collaboration between different domestic regulations. A rule-based regime is still followed in the U.S., where the primary emphasis is still on ensuring the stability of the overall system. The role of the regulator in developing the FinTech industry remains minimal. Moreover, innovation in the FinTech space is affected by the complexities in the dual regulatory system adopted by the U.S. Banks are Chartered either at the national or state level. Office of the Comptroller of the Currency (OCC) regulates national banks, while the regional banks are regulated at the state level. Credit Unions are Chartered either at the national or state level. National Credit Union Administration regulates national credit unions while others are regulated at state level.

Example

Payment systems in the U.K. vs. the U.S.

The UK has a single unified payment systems regulator while the U.S. has eight federal level and 50 state level regulators for mobile payments.

Exhibit 6.6: Regulating Mobile payments in the U.S.



Source: The Pew Charitable Trusts

In the U.K., the regulators are more open to tailor their regulations when compared to the U.S. The level of scrutiny and strictness of measures to prevent fraud and money laundering is significantly higher in the U.S. A common norm such as the Know Your Customer (KYC), which is present in markets across the world is enforced with greater depth in the U.S. Therefore, the U.K. shines as a far more rewarding regulatory environment for FinTech companies to showcase their innovations.

It is notable that major FinTech hubs across the world have an innovation-friendly ecosystem that enables upcoming FinTech businesses to flourish. The role of the regulator in creating such an ecosystem cannot be understated, as the initiatives and policy direction taken by them often help in removing barriers of entry for FinTech players and promote development. Regulators achieve these objectives through different initiatives that include creation of dedicated FinTech teams, innovation hubs, entering into international collaborations to study global best practices.

As FinTech is still an upcoming industry that has not reached a stage of maturity, the creation of dedicated teams and hubs that support and study the developments in the FinTech space would benefit both the regulator and FinTech companies. The insights gained by the regulator would help them in modifying their existing regulations and creating new frameworks in line with their objectives. FinTech companies would also benefit from working with dedicated units and teams that understand their requirements that often differ from traditional businesses that operate in the financial sector.

Examples - Dedicated Fintech teams and Innovation hubs

Fintech & Innovation Group – Monetary Authority of Singapore

The MAS formed a dedicated team called the 'Fintech & Innovation Group (FTIG)' to develop strategies and regulatory policies that facilitate the use of technology to better manage risks, enhance efficiency, and strengthen competitiveness in the financial sector. The MAS earmarked SGD 225 million for the FTIG to be used in areas such as Payments & Technology Solutions, Technology Infrastructure & Technology Innovation between 2016 and 2021.

Source: Monetary Authority of Singapore

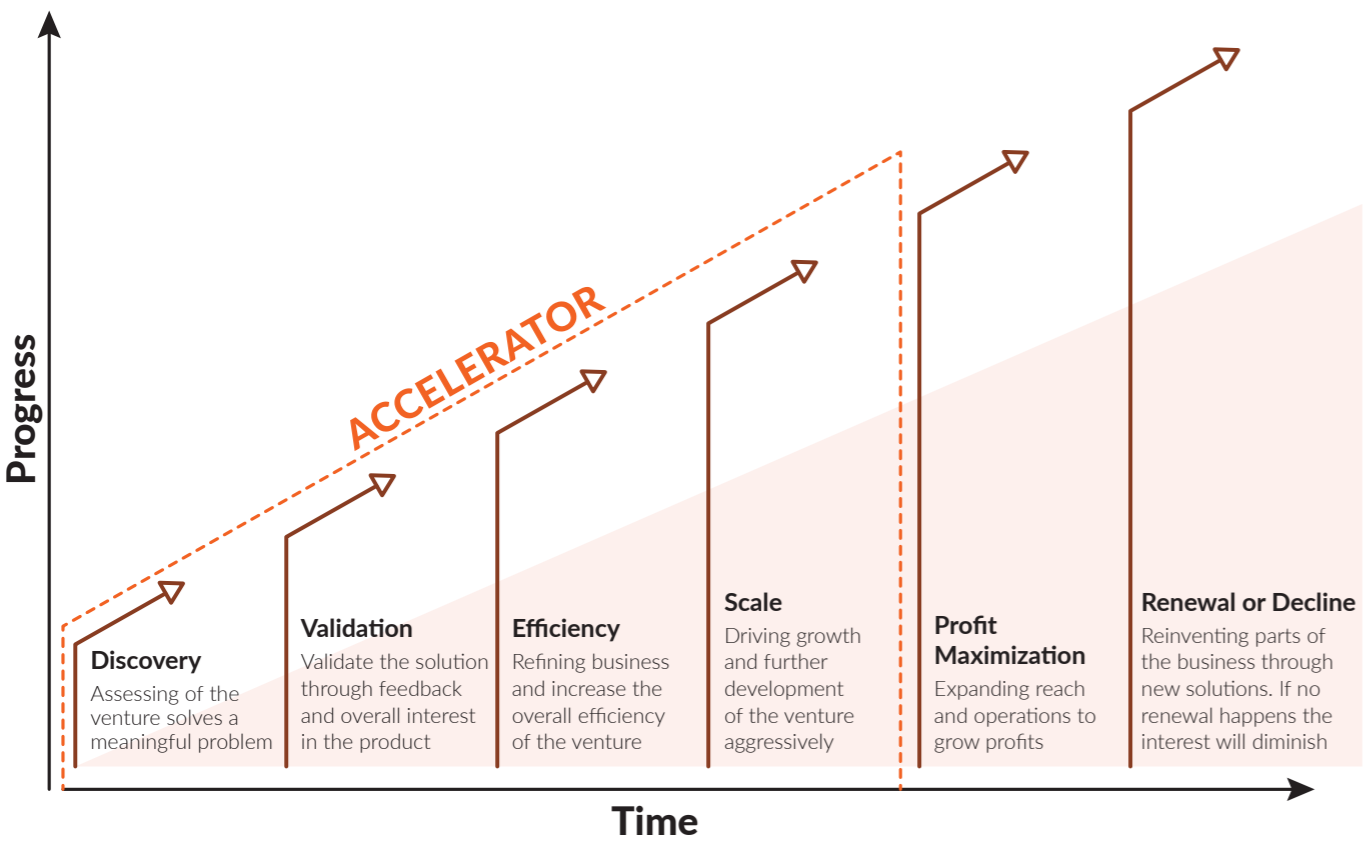
Innovation Hub – Australian Securities and Investments Commission

In March 2015, ASIC launched an Innovation Hub to help Fintech businesses navigate the regulatory system without compromising investor and financial consumer trust and confidence. The Innovation Hub has spearheaded the development of regulatory guidance to help entities in new areas such as providing digital financial product advice to retail clients and Marketplace lending (peer-to-peer lending) products. They have also been instrumental in the creation of a regulatory sandbox for testing Fintech products and services without holding an AFS or credit license.

Source: Australian Securities and Investments Commission

Accelerator programs are designed to support early-stage startups by providing them mentorship and financing. Their contribution towards FinTech would be immense as most FinTech firms are still in the start-up phase in terms of development. FinTech start-ups enter the accelerator for a fixed period time either individually or as a part of a cohort of companies. The ideal objective of a FinTech accelerator is to guide the start-up through its early stage and accelerate their early stage growth by compressing their learning phase by providing them with years' worth of expertise.

Exhibit 6.7: Stages of a start-up lifecycle where an accelerator supports



Source: Alexander Bergfield

Regulators provide institutional support to FinTech start-ups through accelerator programs in collaboration with private sector entities to quicken the growth of emerging FinTechs and reduce the early wind-ups of such start-ups. Regulators use these accelerator programs as tools to identify the strategic needs and challenges for FinTech startups in the region. Being part of the development ecosystem enables them to introduce or update necessary regulations to support FinTech adoption and achieve better regulatory efficiency.

Collaboration between regulators across different regions can be highly productive in gaining valuable insights with respect to tackling the changes pertaining to the inception of technology in financial services. Regulators in different markets around the world adopt different approaches and tools to tackle issues encountered in their domestic markets as the nature of their respective markets, stage of maturity of financial services and regulatory objectives vary from country to country. Therefore, studying proven methods and working on joint initiatives will enable regulators to fast track their FinTech initiatives and gauge risks better.

Examples – International regulatory collaborations

Collaboration between U.K.'s Financial Conduct Authority (FCA) and U.S.A.'s Commodity Futures Trading Commission (CFTC)

In February 2018, the FCA and the CFTC signed a deal to collaborate on Fintech innovation. The organizations will support each other's Fintech initiatives Lab CFTC and FCA Innovate. The partnership will involve studying of best practices of each other's Fintech initiatives, sharing information about Fintech market trends and developments, and offering referrals for Fintech companies that want to enter each other's markets.

Source: Financial Conduct Authority

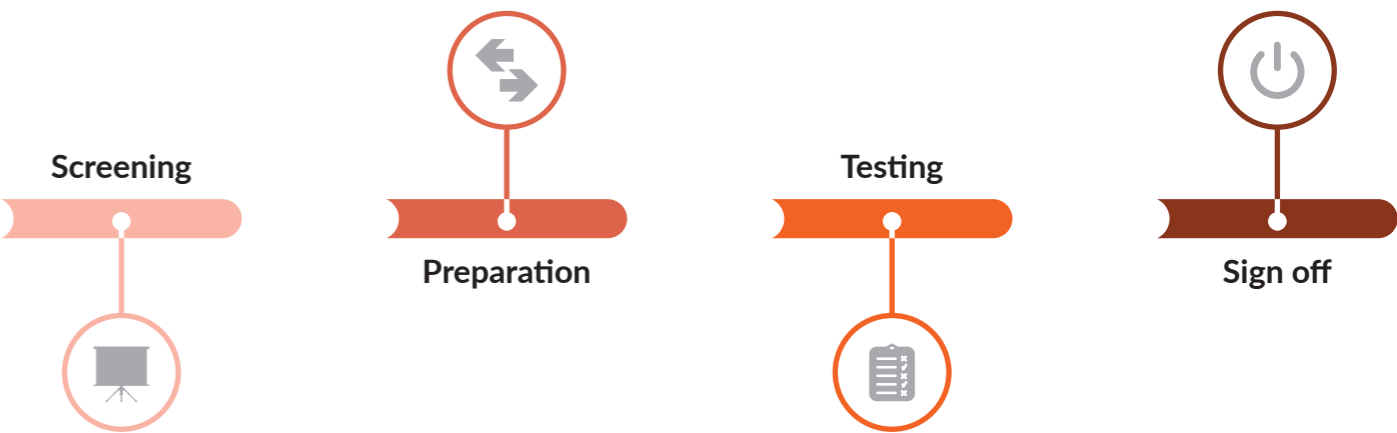
Collaboration between Monetary Authority of Singapore (MAS) and Dubai Financial Services Authority (DFSA) to strengthen ties

The MAS and DFSA signed a Fintech Agreement in August 2018, allowing referrals of innovative businesses between the two authorities. As part of the initiative, both institutions will be sharing information on the financial sector innovations in their respective markets and work together on joint innovation projects on the application of key technologies like distributed ledger technology, Big data etc.

Source: Monetary Authority of Singapore

Regulatory Sandbox is an innovative platform that can support innovation in the FinTech space. Regulators can use a regulatory sandbox for testing innovations and regulations. A sandbox, in general is an isolated testing environment for safely experimenting with a new technology or software. The concept, which was commonly seen in the IT space, has found its way into the FinTech universe in the form of regulatory sandboxes. A regulatory sandbox is a closed environment set up by a FinTech regulator to allow small scale, live testing of innovations by private firms in a controlled environment under the regulator's observation. The key objectives of introducing regulatory sandboxes are to encourage innovations, help regulators keep up with the change in technology and reduce the time and cost for innovations to reach the market.

Exhibit 6.8: How Regulatory Sandboxes work



Source: EY

Initially, the participants who need regulatory assistance to test the prototype of their product/service apply for entry into the sandbox. After applications are received, the regulatory body screens the applicants based on several parameters that include the level of innovation of the product, its commercial feasibility, financial backing, applicability and scope for the product in the market where the regulator is based out of and the robustness of the product in pre-empting and mitigating legal and regulatory risks.

Once the application to enter the sandbox is approved, the product goes through a preparatory phase. The regulator and the product owner design a framework for the product to be tested inside the sandbox. Due to the fragmented nature of financial products, it would not be productive to use a ‘one size fits all approach’ in terms for applying regulations. Hence, a broad framework is customized while applying some regulations and relaxing some based on mutually agreeable terms so that a balance between regulatory compliance and product flexibility is achieved. In addition, the criteria for success or failure of the product are determined and an appropriate exit strategy is formulated in the event of failure. Finally, the period for testing is determined along with a transition plan for proceeding with the product post-testing.

During the testing phase, the FinTech product is rigorously tested and made to undergo several testing scenarios. Test results are periodically monitored to gauge the progress of the phase in accordance to pre agreed timelines. Assistance from external auditors and cybersecurity professionals are sought by the regulator to assess the risks involved with the product and evaluate the preparedness of the regulatory system.

The sign off phase involves validating the testing phase and determine the success or failure of the product. Depending on the performance of the product, improvements are suggested and ultimately it results in either applying for a full-time license with the regulatory body or winding off the project. Before signing off the product into the real world, compliance to standards from all perspectives are duly noted and used in either shaping up new regulations for a different class of products or revising to the existing frameworks to make them future-proof.

Regional Sandboxes could also be created through the collaboration of regulatory authorities of a particular region, promoting the sharing of best practices and gauging the cross-border impact of certain FinTech products. Moving forward, regulatory sandboxes are expected to grow in importance and act as a vital tool for regulators to frame regulations in a transformed environment that has seen technology and financial services come closer every passing day.

Example – Regulatory Sandboxes

U.K.’s Financial Conduct Authority Sandbox

The FCA was the first financial regulator to create a regulatory sandbox in 2016 as part of its ‘Project Innovate’ launched in 2014. The sandbox was created with a mandate to promote competition among Fintech players in the United Kingdom. Regulatory clarity and guidance was given to participants of the sandbox, who are selected by the FCA after a screening process. Customized regulatory environments and a dedicated case officer are provided to each of the participants. At the exit stage, the participants are asked to submit a report that highlights the results of the tests conducted in the sandbox. The FCA has also announced its interest to create a global sandbox that would allow the participants to test their innovations under the purview of more than one jurisdiction.

Exhibit 6.9: Observations from the first cohort of FCA Regulatory Sandbox (Nov ’16- Apr ’17)

Participant	Category	Product Idea / Description	Takeaways
Luno (previously BitX)	Payments	A cross-border remittance service enabled by Blockchain.	Learnings obtained from the testing period were beneficial in drafting regulations to legitimize digital currencies.
Blink Innovation	Insurance	An insurance product with an automated claims process that allows travelers to instantly book a new ticket on their mobile device if a flight is cancelled.	Working in the sandbox helped improve the product efficiency. Blink innovation was later acquired by CPP Group, an Insurance company with strong footprint in Asia
Issufy	Capital Market	A web-based software platform that digitalizes equity capital market processes, such as IPO for banks, issuing companies and investors.	Working with the regulator and the client together helped to drive automation in financial processes, which firms hesitated to adopt due regulatory concerns.
Oval Money	Wealth Management	An app that helps users to build up savings by putting aside small amounts of money through simple rules.	The FCA sandbox allows for better understanding of the regulatory environment for innovative idea. Oval Money’s founders despite being Italian chose to open their firm in the UK due to a friendlier Fintech environment.

Source: EY - ‘As Fintech evolves, can financial services innovation be compliant?’

Developing proof of concepts can also provide an effective platform to supplement FinTech growth. By definition, a proof of concept (POC) is a demonstration, the purpose of which is to verify that certain concepts or theories have the potential for real-world application⁵⁸. As FinTech is predominantly an emerging industry, it involves the implementation of new and innovative concepts to replace legacy processes. Concepts, which are discussed on paper, need to be reproduced practically while also checking for its feasibility in the real world. Due to this nature, a proof of concept methodology would prove to be a vital tool for FinTech regulators to fund emerging FinTech companies to promote innovation.

Despite mainly being a tool to promote the development of concepts to prototypes, POCs can also be used by regulators to identify the risks and benefits of the technology. As FinTech POCs are predominantly employed by regulatory authorities, they get first-hand knowledge of an emerging technology and therefore have the opportunity to prepare themselves at an early stage. Regulatory bodies are also leveraging technology by themselves to drive efficiency within their processes through the introduction of technology like digital currencies and Blockchain. Regulators anticipate that these POCs will help them in testing of use cases and collecting empirical data to amend regulations in the future.

In certain cases like the FSTI Proof of Concept Scheme introduced by the Singapore Financial Centre there are additional incentives for PoCs that help the regulator overcome regulatory uncertainties. They classify the applicants for POCs into two categories namely Investigative Projects and Technical Equivalence Trials. As per their definition, Technical Equivalence Trials are those that aim to definitively answer regulatory uncertainty about risks and benefits from replacing legacy processes with innovative ones. In the case of Technical Equivalence Trials, 70% of the qualifying costs are funded by the regulator as against 50% in the case of Investigative projects that are focused on resolving industry problems⁵⁹. Similar approaches can be adopted by other regulatory bodies to use POCs to gauge the risks and benefits of emerging FinTech ideas.

The GCC region too has adopted International best practices in terms of assessing risks and providing regulatory support for FinTech innovation. Adoption of regulatory sandboxes in the GCC has been quick in region with the Abu Dhabi and Bahrain leading the way. Abu Dhabi Global Market (ADGM) launched the RegLab, which is designed to allow FinTech innovation to be tested without being subjected to the full suite of regulatory requirements that would otherwise apply to traditional financial services firms, by creating a regulated environment to contain the specific risks and impact of any particular test. It was followed by introduction of a regulatory sandbox in July 2017 by the Central Bank of Bahrain (CBB) aimed at enabling firms to test and develop their products in a virtual space. It positioned Bahrain as only the second state within the GCC to implement such a framework. Kuwait published new guidelines to govern payment systems providers in the country and instructed them to comply with the regulations within twelve months. The regulations aim to make e-payment transactions more secure and provide opportunities for innovations in that area to flourish. In addition, the Central Bank of

⁵⁸ Techopedia
⁵⁹ In some cases, Investigative projects also fetch 70% funding, with the decision under the purview of the screening committee

Kuwait launched its own Regulatory Sandbox in November 2018. The establishment of GCC FinTech working group will provide a platform for knowledge sharing and cooperation between GCC countries on developments pertaining to FinTech. The working group could actively engage with the regulators, publish briefing notes that shall highlight ongoing global developments pertaining to FinTech and help strengthen the ecosystem. It shall help to keep abreast of latest regulatory initiatives to nurture the sector and capture best practices.

Exhibit 6.10: GCC FinTech Regulation Snapshot

Country	Cryptocurrency / Blockchain enabled services	Presence of Regulations		
		Electronic Payment Services / Mobile Wallet	Crowdfunding	Regulatory Sandbox
UAE	ADGM's cryptocurrency regulations came into force in June 2018. Issued framework for ICO in Oct 2017	UAE Central Bank published the regulatory framework for stored values and electronic payment systems in Jan 2017	DFSA launched a regulatory framework for loan and investment-based crowdfunding platforms in August 2017	ADGM's RegLab and DFSA's Innovation testing license are present in the UAE
Saudi Arabia	SAMA deems cryptocurrencies illegal (Aug 2018). However, working on a local joint digital currency with UAE.	'Sadam' electronic payment system was developed in 2004, followed by 'Sadam Account' in 2016 for e-payments.	No separate crowdfunding regulation in place	SAMA began designing a Sandbox regulatory environment in Feb 2019. Permission to work granted to 11 local and international banks, 7 payments related companies
Kuwait	Ministry of Finance does not recognize bitcoins. CBK may launch a digital currency along with Kuwaiti National Payment System (KNPS).	Central Bank of Kuwait (CBK) issued instructions to all service providers for regulating electronic payments in Sep 2018. All e-pay methods are subject to the scrutiny of the CBK.	No separate crowdfunding regulation in place	CBK CBK issued Regulatory Sandbox framework in November 2018 to provide testing ground for innovative products ⁶⁰ .
Qatar	Qatar Central Bank warns against trading in Bitcoins in Feb 2018	Qatar Central Bank provides regulatory oversight	No separate crowdfunding regulation in place	Does not have a regulatory sandbox in place. Said to be working on a regulatory framework and Sandbox.
Bahrain	Central Bank of Bahrain (CBB) issued the final rules on activities relevant to Crypto-assets in Feb 2019. It followed the regulations issued by CBB pertaining to Open banking in Dec 2018	Central Bank of Bahrain launched an E-wallet in June 2017	Central Bank of Bahrain issued financing-based crowdfunding regulations for conventional and Sharia compliant markets in August 2017	Central Bank of Bahrain launched a Regulatory Sandbox in June 2017

⁶⁰ The sandbox consist of four phases. Representatives from central and local banks will collaborate to assess the products and services that are proposed.

Country	Presence of Regulations			
	Cryptocurrency / Blockchain enabled services	Electronic Payment Services / Mobile Wallet	Crowdfunding	Regulatory Sandbox
Oman	Cryptocurrencies are legal but not regulated. Central Bank of Oman cautioned public against investing in cryptocurrencies (Dec 2017)	Central Bank of Oman launched its mobile payment clearing and switching in June 2017	No separate crowdfunding regulation in place	Does not have a regulatory sandbox in place

Source: Marmore Research;

Abu Dhabi and Dubai, the two major emirates of the UAE, envision establishing themselves as prominent global financial hubs and transform the financial services sector to become a chief contributor to the country’s GDP in future. They plan to achieve their vision through regional and international collaborations to provide businesses with cutting-edge infrastructure and robust governance.

The business landscape of financial services in the UAE consists of two main jurisdictions. One includes mainland UAE, which is considered as onshore and the other includes special free zones. The Abu Dhabi Global Market (ADGM) and the Dubai International Financial Centre (DIFC) are two specific financial free zones that have their own regulations and do not fall under the purview of the onshore regulator.

Onshore regulators

- UAE Central Bank
- Securities and Commodities Authority (SCA)
- Insurance Authority (IA)

Regulators in the financial free zones

- Financial Services Regulatory Authority (FSRA) – ADGM free zone
- Dubai Financial Services Authority (DFSA) - DIFC free zone

In the UAE, the majority of regulatory activity concerned with FinTech has been taking place in the dedicated financial free zones as the country wants to promote them as centralized financial hubs. The ADGM and DIFC have been instrumental in the emergence of UAE as a dominant FinTech player in the region by providing a conducive environment for upcoming FinTech start-ups to flourish while also learning to gauge risk associated with the development of technology simultaneously.

Through initiatives such as the FinTech Hive and RegLab, they have been providing a simulated environment for FinTech participants that encompasses real world regulations without carrying the risk of their failure destabilizing the whole system. This kind of a set-up allows the regulatory authorities to stress test their regulations against technologically advanced financial services.

FinTech Hive is a first-of-its-kind accelerator program in the MENA region, developed by DIFC in collaboration with Accenture. It allows FinTech companies to apply for a restricted class of financial services license known as an Innovation Testing License (ITL) to test their innovative financial products and services, without being subject to the complete set of regulations that would be applicable for a normal business. The FinTech Hive encourages innovations in areas such as DLT, crowdfunding, P2P lending, Digital identification, InsurTech, RegTech, AI & Machine learning, Predictive analytics, cybersecurity, Islamic finance, big data, Robo advisors, etc.

Exhibit 6.11: First Cohort of DIFC FinTech Hive

Participant	Country	Category
Bridg	UAE	Offline Mobile Payment Platform
Delio	UK	Institutional Connectivity Platform
Labiba	Jordan	Artificially Intelligent Chat Bots
Maliyya	Azerbaijan	Sharia compliant P2P financing and investment
Middleware	USA	Shared access to money on cards
Norbloc	Sweden	DLT based regulatory application
Sarwa	UAE	Automated Investment Management
Semantify	USA	Data Analytics Tool
Starling	USA	Predictive Behavioral Analytics
Theme Chain	India	Blockchain based Trade Finance application
WelInvest	Singapore	Digital Wealth Management
Smart Crowd	UAE	Blockchain based Real estate investing

Source: DIFC

The initial cohort of the program, announced in January 2017, consisted of 12 finalists who got the chance to display and promote their ideas developed, during a 12-week program, to the investor community. The second iteration of the program in 2018 had a broader focus to include companies beyond FinTech. It featured 22 participants across the disciplines of FinTech, InsurTech, RegTech and Islamic FinTech, reinforcing DIFC’s commitment to shaping the future of financial services in the MENA region.

The AGDM followed the successful practice adopted by several regulators worldwide to assess FinTech risks, by launching the GCC region’s first regulatory sandbox. Reglab, which was launched in November 2016, is a tailored regulatory regime that is designed to promote FinTech innovations. ADGM takes the business model of the FinTech innovator into account and customizes the regulatory requirements accordingly so that the participants can test their product in a safe environment while not being subject to undue regulatory burden.

The evaluation process checks whether the participants’ product/service is feasible for implementation and whether it can contribute to the development of ADGM. Additionally, the product/service is checked for its ability to support the progression of the financial industry, promote the formulation of better risk management

solutions and improve the welfare of the clients. Post evaluation, in order to become authorized under the RegLab framework, the applicant must also demonstrate the following:

- Ability to satisfy threshold conditions pertaining to financial resources and technical expertise
- Ability to define test parameters
- Ability to propose an acceptable reporting schedule to report to the regulator
- Gauging potential risks to clients
- Formulating a proper exit strategy for clients
- Ability to satisfy conditions laid out by ADGM

ADGM's RegLab has been successful in attracting innovative FinTech companies from across the globe. In its initial round of applications, five participants were shortlisted and admitted into the sandbox from 11 available applicants. The second round that commenced in May 2017 saw an increase in applications by 50% compared to the previous round. 22 local and international participants applied for an entry into the sandbox, out of which 11 were shortlisted. The RegLab's popularity among FinTech start-ups continued to grow as the third round of applications, which commenced in 2018 witnessed, a 70% rise in applicants amounting to 36. The RegLab has been successful in attracting participants from diverse geographical backgrounds.

Exhibit 6.12: Comparison between AGDM and DIFC initiatives

	ADGM - Abu Dhabi	DIFC - Dubai
Initiative	RegLab (Regulatory Sandbox)	FinTech Hive (FinTechAccelerator Program)
Date of commencement	November 2016	January 2017
Type of support	<ul style="list-style-type: none">• RegLab provides a sandbox environment governed by mutually agreed rules between the participant and the ADGM Financial Services Regulatory Authority (FSRA)• RegLab serves as an audition to apply for a full term license from the ADGM FSRA	<ul style="list-style-type: none">• Follows a similar incubator model to that of the ADGM RegLab.• Applicants should have a minimum alpha or beta product to demonstrate and are prepared to share access to program partners under a confidentiality agreement.
License period	Up to 2 years (extendable)	Six to twelve months (extendable)

	ADGM - Abu Dhabi	DIFC - Dubai
Application requirements	<ul style="list-style-type: none">• Established FinTech startups cannot apply. To be licensed, firms must be ready for either a live test or an enhancement of an existing operation.• Applicants are expected to either apply for a full FRSA license or wind down once the two-year contract with RegLab gets over.	<ul style="list-style-type: none">• Applicants must have a well defined prototype or service implemented in at least one market, and be looking to grow in the Middle East, Africa and South Asia region.
Collaborations	<ul style="list-style-type: none">• Signed MoUs with several global organizations such as MAS in Singapore, R3 consortium, Techpreneur Africa, Qianhai Authority in Hong Kong, Australian Securities and Investments Commission to work together on FinTech initiatives	<ul style="list-style-type: none">• International banks such as Citi, HSBC, Standard Chartered and UAE banks such as Emirates NBD, RAKBANK and Mashreq are directly involved in the FinTech Hive.• DIFC also has joined various international associations, such as the Global Blockchain Council, and sought to cross-integrate with other initiatives such as its support of Islamic finance.

Source: Clifford Chance 'FinTech in the Middle East' report, ADGM, DIFC

The Dubai Financial Services Authority (DFSA) in 2017 launched its regulatory framework for loan and investment-based crowdfunding platforms, the first such framework among GCC countries. These regulations ensure clear governance for crowdfunding platforms that are increasingly becoming a popular way of raising funds for small and medium enterprises (SMEs). Regulating crowdfunding platforms becomes vital for the development of SMEs in the country as their contribution to the economy is expected to grow amidst the efforts to diversify from oil.

The Financial Services Regulatory Authority (FSRA) of the Abu Dhabi Global Market (ADGM) launched a framework to regulate crypto asset activities in the free zone. The framework that comes into force from June 2018 is designed to cover risks related to money laundering, financial crime, consumer protection, technology governance, custody and exchange operations that would involve stakeholders including exchanges, custodians and intermediaries.

Dubai has also been very open in embracing cryptocurrencies. In fact, they are expected to launch Emcash, which would be a state-backed cryptocurrency for people living in Dubai to make payments for goods and services. This move is expected to encourage other governments in the region to explore the option of digital currencies.

The UAE is also the first GCC country to release guidelines for Initial Currency Offerings (ICOs). In October 2017, the FSRA published guidelines for ICOs and virtual currencies to regulate the pace in which cryptocurrency start-ups are raising capital. ADGM's regulations are expected to set the boundaries for cryptocurrency offerings and ensure that the risks involved are reduced. Under the regulations, any first party who wishes to execute an ICO or any intermediary would have to obtain FSRA's permission in order to do so. Companies would also be required to publish a prospectus as in the case of any IPO on a stock exchange. The ADGM's openness to regulate ICOs instead of banning them outright shows their motive to embrace technological advancements in the financial services sector and creating a favorable businesses atmosphere without compromising on customer protection.

Similar to its neighbors, Bahrain has also been looking to develop its non-oil sectors with the financial services industry being the epicenter. The country has been developing the FinTech industry through the collaboration of different governmental authorities to position itself as a FinTech hub in the Arab region. The Central Bank of Bahrain (CBB) and Bahrain Economic Development Board (EDB) are the primary authorities who have been the driving force behind FinTech initiatives in the country.

The Central Bank of Bahrain (CBB) set its sights on digital transformation of the country's financial industry. The apex financial regulator has been striving to achieve it through supportive policies and products to consolidate Bahrain's position as a regional financial hub. CBB's efforts are aimed to enhance the quality and competitiveness of services and products offered in the financial sector. Some of the key initiatives taken by the Central Bank in this regard include the formation of a regulatory sandbox, a separate hub to foster FinTech innovation, a national digital payment system and creating a regulatory framework for crowdfunding.

CBB launched a regulatory sandbox in June 2017 for emerging FinTech companies to test their innovative products and services. Bahrain's Regulatory Sandbox was only the second of its kind in the GCC region at the time of its launch. The inception of a regulatory sandbox was in line with the Central Bank's FinTech ambitions to promote competition in the financial services industry and embrace technology. The sandbox would also prove to be an effective medium to encourage financial inclusion and improve customer experience in the long-term while also ensuring continuation of CBB's policy safeguards on consumer protection, anti-money laundering and level playing field to all market players. Entry into the Sandbox is open to both local and foreign participants who wish to test products in the financial services, technology and telecom sector. The sandbox, which is now functional, has provided licenses to innovative companies such as crypto exchanges.

Bahrain is also only the second in the region after the UAE to introduce a regulatory framework for crowdfunding. The framework which was unveiled in August 2017 is applicable to both conventional and Sharia compliant platforms. Primary benefits of allowing crowdfunding operations in Bahrain include reduced cost of raising capital, increased competitiveness and additional investment opportunities. It laid out rules that cover minimum capital requirements for crowdfunding platforms, qualifying conditions for SMEs who can raise funds, quantitative limitations on how much funds could be raised in addition to the maximum exposure a lender can have to a borrower.

The CBB announced the establishment of a dedicated unit to oversee the development of FinTech. The unit was mandated to ensure that customers in the financial sector are provided with the best-in-class services. The FinTech and Innovation unit will be taking care of the approval process to participate in the regulatory sandbox in addition to supervising the operations of licensed companies in the country that use technology in providing financial services. The introduction of an independent unit will speed up the development of FinTech companies in the country and bring in foreign investments into the sector.

The CBB has been proactive in embracing Open Banking and have announced a set of regulations regarding the same in December 2018. The regulation seeks to provide access of customer bank account information to third-party payment initiation service providers and account information service providers, in order for them to develop innovative payment services. The regulations are along similar lines to the customer authentication and common secure open standards of communication seen in EU's second Payment Services Directive (PSD2). These regulations will facilitate service providers to develop services such as making payments without the use of credit/debit cards and consolidation of account information from different providers in a single platform.

In February 2019, the Central Bank also published a set of regulations pertaining to activities related to crypto-assets. The regulations were designed to bring all crypto-asset related activities under the regulatory purview of the CBB. It covers licensing, governance, minimum capital, control environment, risk management, AML/CFT, standards of business conduct, avoidance of conflicts of interest, reporting, and cyber security for crypto-asset services.

The Bahrain Economic Development Board (EDB) has been proactive in maintaining a competitive environment for emerging FinTech companies to flourish. They have been supportive in establishing several incubator and accelerator programs in the country to foster the growth of FinTech start-ups. The following domestic incubators and accelerators are currently in place.

Meanwhile, Saudi Arabia is one of the most potent economies in the Middle East for FinTech to flourish. The presence of enormous financial backing, a large young population and high smartphone penetration are all ideal for the country to make a push towards FinTech adoption. One of the highlights of Saudi Arabia's FinTech ambitions would be the upcoming King Abdullah Financial district that is present at the heart of Riyadh. On completion, it is expected to be similar to Dubai's DIFC and Abu Dhabi's ADGM. The country has also been keen on making FinTech investments worldwide.

Saudi Arabia relaunched its Public Investment Fund, the world's largest sovereign wealth fund as part of its Vision 2030. One of its biggest investments in 2017 was in the Softbank Vision fund, which is likely to be a key investor in FinTech initiatives moving forward. The Softbank fund made a USD 1bn investment in the US FinTech startup SoFi and a USD 1.4bn investment in the Indian FinTech firm PayTM.

Saudi Arabia’s regulatory initiatives follow a similar approach to its neighbors UAE and Bahrain, who are ahead of Saudi in terms of FinTech development. The kingdom has been in discussions with the Central banks of UAE and Bahrain towards adopting a coordinated approach to develop a FinTech ecosystem in the region. The impetus provided by Saudi Vision 2030 which sees Financial services as a key sector is expected to kick start an array of regulatory initiatives to develop the FinTech sector, which has been relatively nascent until now. In line with other GCC Central Banks, SAMA announced in Feb 2019 that it has begun designing its own regulatory sandbox that allows them to assess the impact of new technologies on financial services. They have provided permission for 11 local and international bank in addition to seven payment services related companies to work in their sandbox.

In 2018, Saudi Arabian Monetary Authority (SAMA) signed an agreement with Ripple to create a pilot program that will provide Saudi banks with a sandbox platform to use xCurrent, a Blockchain based platform to instantly settle cross border payments. SAMA is also developing its own regulatory sandbox to test and regulate FinTech innovation. Saudi Arabia’s Capital Market Authority has also been looking to regulate crowdfunding, as it provided FinTech licenses to several crowdfunding investment services on a trial basis. This mirrors trends elsewhere in the region, like in the case of Qatar, where efforts are ongoing for strengthening the national credit information infrastructure.

During Feb 2019, the Central Banks of Saudi Arabia and the UAE announced their interbank digital currency that they have been developing together. The currency, which was called ‘Aber’, would be a trial project that aims to help financial settlements between the UAE and Saudi Arabia using blockchain-based technology.

Exhibit 6.13: Comparison of crowdfunding regulations by CBB and DFSA

Bahrain (CBB)	UAE (DFSA Dubai)
Definition: Conventional Financing Based Crowdfunding (CFC): FC Person to Business (P2B) is a lending e-platform which takes place on an online portal, on which people lend money to businesses, for the purpose of gaining a financial return in the form of interest payment and a repayment of credit over a pre-specified period of time.	Definition: Crowdfunding is the practice of funding a project by raising money from a large number of people through licensed online platforms. Typically, crowdfunding consists of three parties <ul style="list-style-type: none">• The person raising funds• The party providing the crowdfunding platform• The public providing funding through the platform.
Shari’a Compliant Crowdfunding (SFC): A Shari’a-compliant Financing Crowdfunding Platform Person to Business (P2B) is a financing platform, which takes place on an online portal, on which people finance other businesses on a Shari’a-compliant basis, for tthe purpose of gaining a financial return over a pre-specified period of time.	

Bahrain (CBB)	UAE (DFSA Dubai)
Highlights: <ul style="list-style-type: none">• Minimum capital requirement for crowdfunding platform operators is BD 50,000.• Only Person to Business (P2B) lending / financing is permitted.• Small and medium sized businesses with paid up capital not exceeding BD 250,000 can raise funds through crowdfunding platforms.• If a borrower/fundraiser is unable to raise at least 80% of its crowdfunding offer size, the attempt would be considered unsuccessful and any monies received would have to be refunded within seven calendar days.• A borrower/fundraiser can raise a maximum of BD 100,000 through crowdfunding in a year; the financing tenure should not exceed 5 years.	Highlights: <ul style="list-style-type: none">• Crowdfunding offers are capped at USD 5 million• Retail investors may not lend more than USD 5000 to a single borrower• In any given calendar year an investor may lend USD 50,000• Equity crowdfunding offers – the crowdfunding operator must maintain effective systems and controls to ensure that retail clients do not invest more than USD 50,000 in any calendar year using the platform’s service• Platform operator must also provide and ensure retail clients complete a risk acknowledgement form for each investment that it makes using the platform.

Source: Government authorities

Elsewhere in the GCC regulation regarding crowdfunding platforms are yet to be introduced but the region as a whole presents an opportunity with potential to grow in terms of aiding towards contribution to national GDP, plus fostering the growth of SMEs.

Exhibit 6.14: Crowdfunding regulations - GCC

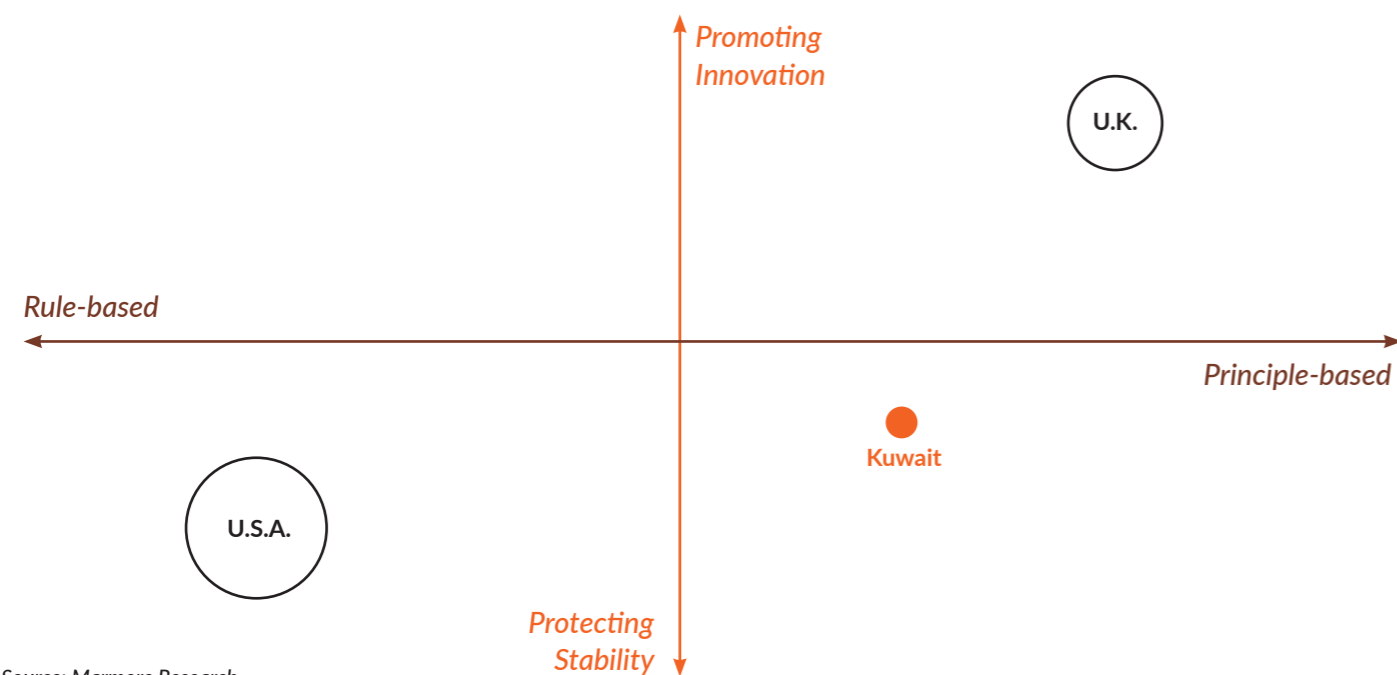
Type	Bahrain	UAE	Saudi Arabia	Kuwait	Qatar	Oman
Lending	✓	✓		×	×	×
Investment	✓	✓	*	×	×	×
Donation		✓	×	×	×	×

Source: Marmore Research **Note:** *= Experimentation

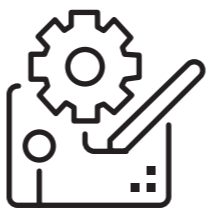
Developments in the financial services sector worldwide have shown that FinTech is on course to revolutionize the financial industry. Therefore it becomes imperative for Kuwait to adapt its regulatory system sooner rather than later. Following its neighbors, Kuwait has also taken strides to develop its FinTech ecosystem. The launch of a regulatory sandbox by the Central Bank of Kuwait and the progress of Kuwaiti National Payment System (KNPS) are steps in the right direction. However, the FinTech landscape in Kuwait is still at a very nascent stage. As observed from global cases, the best approach for Kuwait to develop the domestic FinTech market would be

to create a unified strategy and action plan for FinTech development like in the case of London, Singapore and Hong Kong. A principle-based regulatory approach would be best suited for regulating FinTech innovations, as they are highly dynamic in nature.

Exhibit 6.15: Suggested approach for Kuwait



A unified strategy involves the collaboration of all domestic regulatory bodies to work towards a common goal of promoting FinTech development. A dedicated FinTech unit must be set-up to closely work with emerging start-ups in the region and help them to understand and operate within the regulatory boundaries. As funding is a key requirement for the development of start-ups, Kuwait must set-up a dedicated fund to promote the emergence of domestic FinTech companies. A portion of the national fund for SME development that currently exists in Kuwait could be channelized specifically to FinTech companies or an entirely new fund could be created under the dedicated FinTech unit to specifically support domestic FinTech start-ups. Incentives could also be provided to domestic and foreign start-ups that work in collaboration with the regulatory bodies, as this allows Kuwaiti regulators to better understand the developments from close proximity. Also, through International inter-agency collaborations, Kuwait could study and adopt these tools for better regulatory oversight to keep up with the developments in the financial sector.



Section 7

Envisioning Future Developments in terms of Regulatory Interventions

Given the latest stage in the evolution of Kuwait’s financial services sector, the need for the country’s central bank to orchestrate suitable regulations is greater than ever. For clients, access to payments and financial infrastructure is rapidly changing. For e.g., contactless payments are being explored with greater intensity in Kuwait. In this regard, the Central Bank of Kuwait (CBK) has issued instructions Regulating Electronic Payments of funds on September 30, 2018

Regulating electronic payments- Central Bank of Kuwait (CBK)

CBK’s guidelines regulating electronic payments were issued under the Law No. 20/2014 concerning the electronic transactions. It require all service providers including companies and institution to register on its electronic payment system. This regulation mandates that all e-pay methods are scrutinized by CBK. This is within the motive of boosting the banking sector by providing safe and secure payment operations and offering more opportunities in the local economy. The regulations are set in article 25 and are divided into seven sections including payment methods, data protection, and sanctions.

The supervision begins at the stage of listing at the registry. E-payments can be made only after obtaining the license from the CBK, which has complete authority to stop the practice of any institution if it does not obtain the license. Banks will be listed automatically while other institutions are required to apply for a registration.

Nevertheless, adapting the latest technologies to the demands of customers poses considerable challenges. For e.g., balancing the robustness, performance and critical privacy features of DLT is not an easy area to resolve. It is important to be cognizant that the rise of FinTech, while offering multiple economic benefits, also creates a number of regulatory dilemmas. This study reveals that FinTech has the potential to produce economic benefits by reducing the load of inefficiencies and bolstering competitive forces; however, systemic risk and unexpected failures have to be anticipated. Thus, appropriate regulatory safeguards to contain the risks at institutional and systemic

levels is key. Good regulations will arise from industry-wide analysis with an array of incumbents and Kuwaiti start-ups that would help to support and seed financial innovation.

FinTech is symptomatic of the fact that disruptive technologies have made entry costs lower across industries. Being an effective traditional bank requires access to sophisticated and expensive dedicated infrastructure systems and communications support, which has ensured the longevity of a patchwork of legacy hardware and software ecosystems⁶¹. However, the growth of secure internet communication networks, open-source code, etc., means that FinTech is being seen as a significant tool to improve overall quality and financial inclusivity.

The nature of FinTech is such that its benefits and risks can transcend national borders relatively easily, necessitating recognized collective frameworks for data sharing, modes of cross-border investments, etc⁶². It is also the case that national authorities can catalyse FinTech growth by investing in necessary financial infrastructure. Examples include online payment services set up by the Chinese Central Bank and the Mobile Payments Platform setup by the Argentinean Central Bank.

Central banks in many parts of the world are becoming cognizant of what is called the ‘distributed bank scenario’⁶³. As financial services becomes increasingly modularised, the capability of FinTech’s to “plug and play” on the customer’s digital interface will expand, causing banks and new players to compete to own the client relationship. However, in the emergent distributed bank scenario, incumbents and FinTech firms may operate as joint ventures or collaborating partners, leading up to a situation of clients using many financial service providers; instead of staying fully loyal to one financial partner.

It is vital to monitor closely the developments in innovations in digital payments and multiple payment and settlement systems. This has to be done from multiple perspectives that cover the safety of payments, the systemic efficiency of payment services and assured convenience to end users, apart from stability of the overall financial system. It is also vital to recognize that effective FinTech regulations can only follow if there is close communication and sharing among many entities across both the public and the private sectors⁶⁴. In this respect, many Central Banks are opting for two ecosystems--Innovation Hubs and Regulatory Sandboxes⁶⁵.

Exhibit 7.1: Common Central Bank Tools to Build FinTech Ecosystems

Innovation Hubs	Regulatory Sandboxes
Support, advice or guidance offered to regulated or unregulated companies in navigating the regulatory framework or ascertaining supervisory, policy or legal matters and issues is generally known as ‘innovation hub’	Virtual testing of new financial products or services in a controlled testing environment is called a sandbox. In it, the regulator provides necessary regulatory support or infrastructure by relaxing specific legal and regulatory mandates, which the company will otherwise be obligated to. It is typically for the duration of the sandbox and is valuable as an experimental approach for generating insights.

Source: Reserve Bank of India

⁶¹ Bank of England ⁶³ Ibid ⁶⁵ Reserve Bank of India
⁶² Bank for International Settlements ⁶⁴ Bank of Japan

The exploration and experimentation stage with respect to FinTech R&D work and trialling of industry-wide FinTech solutions requires collaboration across multiple stakeholders. Innovation hubs and sandboxes can be considered as neutral grounds where different stakeholders can collaborate to safely innovate⁶⁶. Apart from devising and trying new FinTech solutions for evaluation, such facilities can help in conducting proof-of-concept trials. This will help in gaining an early understanding of the applicability of creative FinTech solutions for banking and financial services.

Exhibit 7.2: How Sandboxes and Innovation Hubs can help

Function	Illustrative Example
Testing solutions that require participation of multiple stakeholders	Testing interoperability for Fintech solutions that try to use the Blockchain or DLT in facilitating cross-banks financial services.
Demonstrating Fintech solutions that require extensive computing resources	Conducting live demonstrations of research and proof of concept outcomes before stakeholders (like interested banks and investors).
Conducting interactions between the industry and central banks on emerging technologies	Central banks can seek inputs or usable feedback on a new technological development at an early stage.
Testing solutions for adoption by central banks	Exploration with Fintech companies on the use of innovative RegTech solutions.
Organizing workshops and training sessions for industry participants	Industry and other stakeholders can learn about various Fintech solutions, particularly those that require specialized infrastructure.

Source: Adapted from Hong Kong Monetary Authority

It is vital for a Central Bank contemplating a FinTech sandbox to ensure that companies that operate within the sandbox are able to conduct timely live tests of their various FinTech initiatives before the formal launch⁶⁷. This provides the immense benefit of being able to gather real time data and immediate user feedback on the products or services in a controlled environment. Not only are refinements possible, but ready identification and addressing of any risks or concerns pertinent to regulated activities can be immediately flagged.

⁶⁶ Hong Kong Monetary Authority
⁶⁷ Baker McKenzie

Exhibit 7.3: What Companies Using a FinTech Sandbox be made to adhere to

Condition	Description
Boundary	Clear definitions about the scope and phases of the pilot trial, timelines and termination frameworks.
Customer protection measures	Adequate measures for protecting the interests of customers during the period of trial, including a rigorous process for vetting customers for understanding of associated risks.
Risk management controls	Compensating controls for mitigating the risks rising from less than complete compliance with prevailing supervisory requirements.
Readiness and monitoring	Operational preparedness of all the systems and processes connected to the trial and detailed monitoring of the trial.

Source: Baker McKenzie

A FinTech sandbox should not be seen as the total panacea for developing regulatory frameworks. It is a tool, among others, that regulators and policy makers can deploy to craft resilient regulations and sound policies that seek to balance the tensions between legacy regulations and need for financial innovation⁶⁸. In order to reconcile the various needs of stakeholders, a FinTech ecosystem has to incorporate a few useful measures.

Not only is FinTech developing fast, but given the sheer number and variety of FinTech innovators, Kuwaiti entrepreneurs will have to work even harder to differentiate their products and services positioning. Sandboxes allow for experimentation by allowing FinTech startups to try live innovations in a controlled environment under the gaze of a regulator’s supervision. It is expected that Kuwait’s FinTech Sandbox will provide necessary safeguards to ensure that the FinTech companies comply with required legal and regulatory mandates. This ensures that in case of failures, the larger financial system is not adversely affected.

The growth of a FinTech ecosystem will also depend on the quality of actual physical infrastructure available. For e.g., co-working spaces made available at affordable rates to FinTech firms can underpin a hub and spoke model with government facilities acting as the hub around which other stakeholders like academia and bank innovation units can act as the spokes. From the perspective of RegTech, such facilities can help regulators to pilot several projects using Blockchain and DLT across multiple sectors. That is, the expertise of smart FinTech firms in areas like Blockchain, AI, etc. can be leveraged with respect to facilitating regulatory compliance ease.

Also, FinTech innovations that depend on data sharing may create security, customer privacy, and data-ownership risks⁶⁹. As the multitude of data sets that financial institutions use expand beyond traditional credit histories, data privacy will surface as a growing concern, along with data ownership questions. Slowly, the situation of whether or not a consumer has any significant say over how their data points are used or shared will crop up.

Traditionally, incumbents are used to developing their infrastructure and financial applications in-house or in collaboration with select outsourcing partners. However, the arrival of FinTechs is forcing incumbents to open themselves up in terms of scrutiny from customer satisfaction, cost-efficiency and process innovation aspects.

⁶⁸ Milken Institute
⁶⁹ The Federal Reserve-U.S.

Banks will have to learn to direct greater executive focus and resources into FinTech, covering collaboration with startups too.

Ignoring the FinTech wave is not a feasible option. The appropriate way forward is to offer a mechanism that encompasses fiduciary responsibility; while simultaneously providing an ecosystem for innovation. The fast pace of disruption and the large number of stakeholders raise challenges about how to effectively conduct overall regulatory and supervisory functions. Regulators need to constantly keep the perspective that any drive for rapid profits by various firms, through FinTech activities, can lead to distrust enveloping the financial system.

Regulators will have the difficult task of instilling firms with a sense for considering the long-term social consequences of the financial products and services that they offer. For e.g., consumers will need to understand and decide who they are doing business with, what data assets of theirs is being utilized by whom and the purpose, how to rescind data access, etc. Thus, consumers and the wider market will appreciate if regulators provide more unified subject matter expertise and support the evolution of shared standards.

As policymakers and regulators engage more deeply with the FinTech ecosystem, data-driven analysis should be used to inform their decisions⁷⁰. For example, in 2016, the U.S. Treasury created an interagency working group on the subject of marketplace lending to share information, interact with industry participants and public interest stakeholders, and assess where further regulatory clarity could protect investors and borrowers. The growing number of complex and autonomously operating digital systems will generate fundamental questions on who is the operator, actually.

Moreover, innovations in the FinTech sector can be hampered by regulatory uncertainties and an excessively conservative approach by regulators. Regulators need to factor the possibility that as technologies develop even further, they will enable significantly greater transparency to function in the financial system. Also, questions around who is to be held responsible in the event of malfunctions or problems within an ecosystem of connected systems will arise.

For e.g., for Central Banks, the emergence of cryptoassets poses several challenges in the form of monitoring of money aggregates; the possible damaging volatility in exchange rates; the wider risk of volatility via fixed or unexpected changes of money supply; and the potential risk of runs because of losses of confidence when cryptoassets coexist with legal tender and other deposit-taking banks⁷¹. Thus, FinTech should be governed by a similar regulatory framework as traditional incumbents or entities; however, girding the regulations with relevant innovations to meet the needs of the 21st century financial industry.

Developing robust regulatory frameworks is now a preoccupation with respect to FinTech in many parts of the world. For e.g., in early 2018, UAE’s Securities and Commodities Authority (SCA) made an agreement with PricewaterhouseCoopers (PwC) to advance a regulatory framework for financial and regulatory technology in the capital markets of the UAE. PwC will, under the agreement, provide services for creating a regulatory framework for financial technology for UAE’s capital markets. There are four stages to the process.

⁷⁰ U.S. National Economic Council
⁷¹ Central Bank of Chile

Exhibit 7.4: Developing a FinTech Regulatory Framework in the UAE



Source: UAE Securities and Commodities Authority

It is also likely that cooperation between central banks of different countries may increasingly proliferate in order to expand on their collective and individual FinTech competencies. For e.g., in 2017, the Monetary Authority of Singapore (MAS) and the Danish Financial Supervisory Authority (Danish FSA) signed a FinTech Co-operation Agreement designed to help FinTech companies in both the countries to expand into each other's territories.

Moreover, the agreement will enable both the national regulators to refer FinTech firms to their counterparts, apart from collaborating on joint innovation projects and sharing information on emerging trends and their impact on FinTech regulations. Similarly the UK and Australia entered into a 'FinTech Bridge' in March that deepens ties between the Australian and British Governments and financial regulatory agencies, in an attempt to position the two countries as leading FinTech centres⁷². The key responsibilities of the Bridge are –

1. Identify emerging FinTech trends and related policy issues, thereby enabling better FinTech policy responses.
2. Sharing of British and Australian regulatory expertise, facilitating the entrance of FinTech start-ups into the other's regulatory sandbox. Also, faster license processing for FinTech firms that are already authorized in the partnering country.
3. Promotion of bilateral trade and investment flows through national trade and investment promotion agencies facilitating FinTech companies looking to expand abroad.

4. Encouraging engagement between Australian and British FinTech sector bodies to explore collaboration opportunities between their FinTech companies.

It is clear that FinTech is at the confluence or nexus of various digital technologies, financial regulatory challenges and the growing entrepreneurial landscape. For Kuwait to increase its role in FinTech so that Kuwaiti start-ups can quickly scale-up across the region and internationally, it is important to facilitate domestic interactions between FinTech innovators, the private sector and regulators, among others.

In response to rapid FinTech developments, Kuwait could consider bringing together a cohort of regulatory or supervisory entities, and other relevant bodies to explore novel approaches for testing creative FinTech solutions, assessing risks, and supporting the operations of FinTech companies that desire to grow internationally. Building capacity and expertise with respect to new technologies and FinTech models to facilitate early understanding for national regulators will also be important for developing fact-based policies. At some point in the future, supporting cross-border networking of FinTech ecosystems will become important, too.

The barriers to market entry for Kuwaiti FinTech firms are many and should be reduced if there is an overarching interest in achieving industry competitiveness with respect to Kuwait becoming a leading financial hub. Though the economic opportunities are plentiful due to FinTech, it is vital to be mindful of potential risks as well. Wider customer and investor engagement with new FinTech models without fitting understanding of the risks involved raises the likelihood of undesirable outcomes. For e.g., the growing utilization of various technologies to capture, store and analyze multiple data assets increases the risks of those data assets being fundamentally misused.

One potential strategy for growing the FinTech sector in Kuwait under the aegis of capable regulations is to explore public-private partnerships (PPPs). FinTech PPPs may help better in addressing the gap between the laws overseeing traditional financial products and services and the evolving sophisticated technologies that deliver them. By focusing on FinTech regulatory sandbox's ability to provide a live regulatory context, FinTech products can be deployed and tested with specified parameters and timelines. Sandboxes can also act as public-private partnership (PPPs) that can provides co-working space, accelerator program and a startup academy for FinTech startups.

Otherwise, a persistent disconnect can breed conflicts of interest and policy paralysis. At some point, Kuwait will have to consider cementing the acceptance of various digital forms of identification and authentication. This indicates the necessity to not create statutory and regulatory standards that cannot expand and evolve with the times.

There are risks that data will be stored, manipulated and shared with third parties against the wishes, or trusting expectations of those freely providing the data. Moreover, as machine learning and AI play a greater role, there is the need to monitor the algorithms behind these sophisticated services. The complex algorithms used will have to be transparent so that their decisions can be interpreted, and not just be considered unverifiable or opaque blind spots. Kuwait's policy makers can also help in enhancing the competitiveness of Kuwaiti technology-based industries through focus on core R&D competences across areas of information and communications technology (ICT).

⁷² The Treasury of the Australian Government

Since a dynamic FinTech ecosystem can contribute considerably to the quality of Kuwait's financial centre competitiveness, not only barriers to market entry for innovative providers should decrease, but the regulatory certainty for the overall sector should get elevated too. Kuwait, similar to many other countries, is experiencing early stages of interest in terms of Blockchain innovation too. As activity in crypto assets trading is increasing worldwide, there is the risk of their exploitation for ambiguous or illegal purposes⁷³.

Crypto assets may provide a platform for activities like money laundering, facilitating transfers to be made directly between two people without need for identification or monitoring of the transaction volumes. Participants can, if they wish to, bypass the conventional anti-money laundering (AML) systems and possess an extensive level of anonymity in comparison with traditional payment channels.

Moreover, crypto asset transfers can be instantaneous and are irrevocable. Once a remittance is done, it cannot be revoked, converted or even transferred. Thus, the recovery or interdiction of an illicit or unlawful financial outflow are impossible. This is further exacerbated by the fact that crypto assets are useful in transmitting across national borders, allowing the flows to be free from any government intervention or formal exchange control regulations.

There are also arguments that crypto assets should not be over-regulated during its nascent phase of conceptual development. Some experts opine that companies need to be offered requisite space to experiment and attempt new technologies and other related FinTech applications without the undue burden and cost that excessive regulations may impose. For regulators, it is now vital to understand what they are attempting to regulate and where any innovative regulatory adjustments are needed. A fundamental challenge for Kuwaiti regulators will be to facilitate new FinTech players while simultaneously supporting incumbents to transform their legacy business models.

Another area calling for close attention is automated financial advice. It is important to monitor and thoroughly test the advanced algorithms underpinning the financial advice being provided. There is a close connection between data protection and personal privacy norms. With respect to data protection, as consumers absorb more technologies and increasingly transact their financial services business through digital means, it is likely that complications in the 'client journey' will surface, especially in a fragmented landscape of multiple service providers.

Establishing dedicated FinTech liaison platforms to broaden communications with the FinTech ecosystem will help regulators to handle pertinent enquiries from the industry; while simultaneously offering information on connected regulatory requirements. This will help in enhancing the industry's understanding of FinTech regulatory requirements and help in ascertaining that the market balances between consumer demands and risk tolerance threshold.

Central banks not only have a public policy incentive in understanding and monitoring rapid developments in FinTech, but it will help in the process of determining when any FinTech innovation could become a cause for

serious concern. According to the Bank of Canada, a central bank should ask itself four key questions in terms of determining when to intervene—

1. Does the FinTech solution help solve an economic pain point or friction?
2. Is the FinTech solution better than any other currently available technology?
3. Does the FinTech company providing the solution hold a competitive advantage?
4. Does the solution impact the governance aspects of central bank's mandate in balancing the national economy?

The answers to the questions will help understand whether a central bank should closely monitor a FinTech solution. For instance, a “no” answer to any of the questions would mean that the FinTech innovation considered should not be a critical concern. A “no” reply to each question implies that the solution is (i) not a critical concern to central banks; (ii) will not impact the industrial organization of the nation's financial intermediaries, (iii) will not achieve mass adoption and, finally, (iv) should be under the oversight of other branches of the government. In other words, the FinTech solution is largely a secondary innovation that may eventually evolve into something that the central bank should actively track.

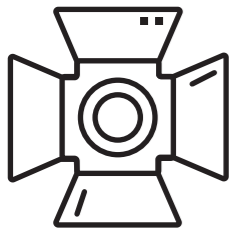
One of the main challenges to central banks as regulators in terms of FinTech is the fluidity that it introduces into the system. The conventional or typical regulatory framework assumes well-defined institutional architecture. For instance, the usual understanding or definition of a bank is a recognized institution that takes deposits and makes loans. However, in the age of FinTech, an alternative model would be to regulate activities regardless of the type of institution carrying out such activities.

Central banks face a trade-off between innovation and risk when framing their regulatory approach to new FinTech firms and activities. Fixing the right approach is a difficult task since the fruits of innovation are sometimes complex to be evaluated quantitatively; while associated risks are relatively clear (like consumer protection, financial and monetary stability, etc.). The hardest challenge will be assessing the new applications of FinTech and new institutional forms of intermediaries. Sandboxes can help both policy-makers and FinTech stakeholders to evaluate, to a certain degree, the implications of regulation on companies as well as the occurrences in which new FinTech applications stray out of accepted regulatory provisions.

The policies of the Central Bank of Kuwait will help in terms of addressing the short supply of skilled IT specialists and financial talent; addressing gaps in communication between incumbents and new entrants; percolation of best practices; and stimulating investment in the Kuwaiti FinTech space. Kuwaiti policy makers and regulators will need to identify the appropriate tools to restructure the regulations governing financial services to suit the market innovations of the 21st century. In this context, shifting from mere prescriptive rules to a more principles-based rules will allow both regulators and industry stakeholders to stay agile and relevant as financial products and services grow and accumulate greater complexity.

⁷³ The inaugural Intergovernmental Fintech Working Group of South Africa

The Growing Influence of RegTech



The functionality of RegTech in terms of assisting in regulatory and compliance requirements in the face of growing complexity of compliance requirements merits greater understanding as it promises efficiencies and cost savings⁷⁴. RegTech can operate in several clusters. According to the CFA Institute, “RegTech [...] primarily concerns the digitization and datafication of regulatory compliance and reporting processes. Not only does it represent a natural response to the digitization of finance and the fragmentation of industry participants, but it also has the potential to minimize the risks of the regulatory capture that occurred before the GFC,”

Examples of areas for effective RegTech development include (1) application of big data approaches, (2) the strengthening of cybersecurity, and (3) the facilitation of macroprudential policy (CFA Institute). With respect to the big data phenomenon, regulators are starting to consider technological solutions for the management of AML/ KYC information generated by industry participants—especially, suspicious transaction reports. Robust IT capabilities for collating and analyzing data provided in response to various reporting requirements are key if regulators are to achieve a toolkit that is commensurate with the modern information age.

Exhibit 8.1: RegTech Clusters

Cluster	Usual Activities
Identity validation	<ul style="list-style-type: none">Counterparty due diligenceKnow your customer (KYC) proceduresAnti-money laundering (AML)Anti-fraud detection and screening
Monitoring	<ul style="list-style-type: none">Solutions for real time transaction monitoring and auditingEmployee behavior surveillance and analytics
Regulatory Reporting	<ul style="list-style-type: none">Data aggregation and reporting mandated by regulations
Risk Management	<ul style="list-style-type: none">Assessment of risk exposuresAnticipation of future threats
Compliance	<ul style="list-style-type: none">Monitoring and tracking of current state of compliance against upcoming regulationsTraining and awareness modules

Source: Australian Securities & Investments Commission (Lightly Edited)

The three main benefits for financial services firms in terms of applying RegTech are that it can help in building preventive compliance architectures or systems; monitor various moving elements in real time; and help improve better supervision or governance through utilization of a great variety of data assets and information⁷⁵.

Exhibit 8.2: The Working of Regulatory Compliance through RegTech

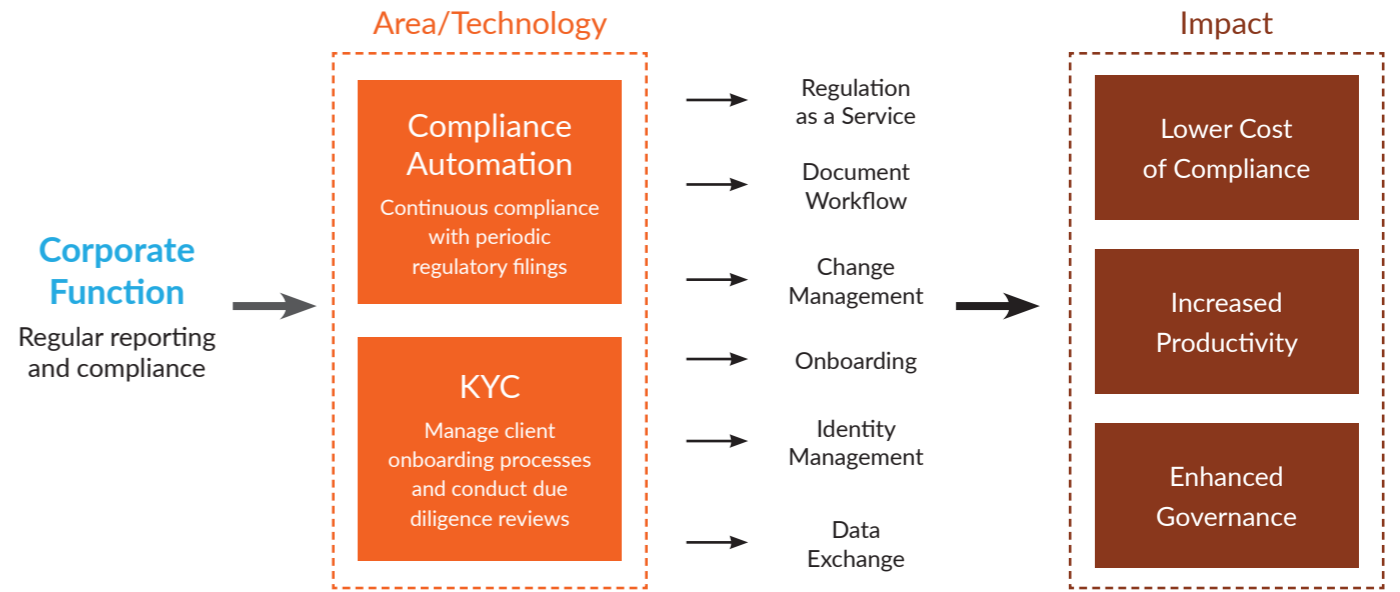


Track, Analyze and Benchmark Regulatory Requirements

Source: IBM

For regulators, RegTech also provides opportunities to mix behavioral analytics with cognitive computing or machine intelligence to help automate workflows and to reduce the complexity and cost of regulatory supervision. It is notable that RegTech can prove to be a compelling tool for enhancing customer protection and overall market stability. It can support fuller review through real-time tracking of various market participants in terms of fraud prevention and that of prohibited practices.

Exhibit 8.3: Applying RegTech in the Compliance Function



Source: World Government Summit in collaboration with Accenture

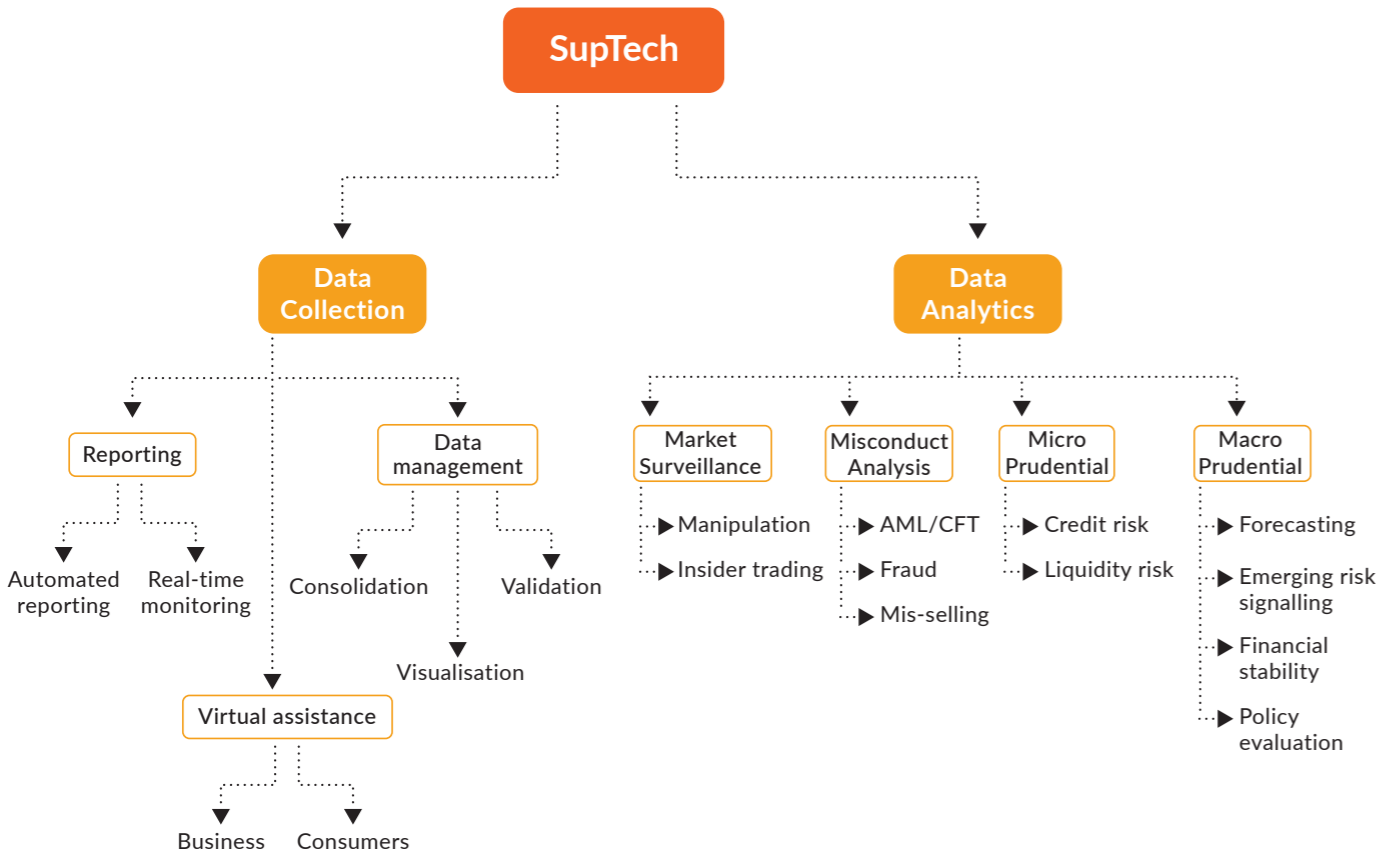
⁷⁴ The Association of Compliance Officers in Ireland (ACOI)

⁷⁵ World Government Summit in collaboration with Accenture

Regulators searching for deeper granularity and precision in using data aggregation and information analysis are currently exploring wider applications of RegTech. It is now almost default understanding that digitization and ‘datafication’ (or evidence-based analytical rigor) of processes will empower regulators to tackle more effectively the increasing types and larger volumes of data reported by various entities, including companies⁷⁶.

Closely connected to RegTech is Supervisory technology (or SupTech)⁷⁷. It is the use of innovative technologies by supervisory agencies to support supervision. It aids supervisory agencies to digitize reporting and regulatory processes. Key areas where SupTech applications may find usage could be broadly classified as in data collection and data analytics, which encompass a variety of regulatory functions.

Exhibit 8.4: Areas of financial supervision in which suptech applications are used



Source: Bank for International Settlements

Tasks that are associated with data collection usually consume large amounts of resources. Data collections tasks involve collection of large amounts of data sent to the regulators through different channels, assimilating them in a structured format, removing redundancies, validating for errors and presenting them in a visually meaningful format. The functions also stretch to reporting activities. These activities are the most susceptible of being automated, as they are usually repeatable.

However, the significance of these activities are high, as they act as the primary source for providing meaningful insights for regulators. Regulatory institutions are trying to bridge the gap between their IT systems and the IT systems of those who fall under their supervision so that data flow can happen more efficiently.

⁷⁶ CFA Institute Research Foundation

⁷⁷ Innovative technology in financial supervision (suptech) – the experience of early users (Bank for International Settlements)

On a macro angle, SupTech applications can be utilized to identify signals for emerging risk and policy evaluation. Their ability to pre-empt the risks at a far earlier stage gives invaluable time and flexibility for Central banks to act accordingly. However, most applications are in an experimental or proof of concept stage in majority now. Regulators have been using SupTech technologies to forecast macro indicators such as housing prices. This in turn gives an indicative measure of inflation for regulators and policymakers. Empirical studies are also being conducted to collect data from social networking sites like twitter and then analysing it through Neuro linguistic programming (NLP) to assess the macro sentiment of markets. Together with tonality analysis methods, the inferences are used to predict whether the market perceives an information with positivity or negativity.

Identifying signals of emerging risk - Netherlands Bank (DNB)

Identifying macro prudential risks well in advance through the incorporation of regulatory technologies is now becoming a reality. Researchers at the Netherlands Bank (DNB) identify quantitative risks in financial market infrastructures by converting transaction level data into indicators that provide information on operational risk, changes in the network structure and interdependencies. Using traditional econometric methods, algorithms are developed to pick up relevant transaction types from the large amount of transactional data fed into big data applications. Indicators based on globally defined principles for financial market infrastructures and machine learning are initially generated and then corrected for cyclical patterns. The indicators can be used by overseers and financial stability experts to get meaningful insights and identify emerging risks at an early stage.

Source: DNB Working paper - Risk indicators for financial market infrastructure: from high frequency transaction data to a traffic light signal, Bank for International Settlements

Detecting Liquidity Risks - Netherlands Bank (DNB)

The Netherlands Bank (DNB) has been conducting research on using an auto-encoder to detect anomalies in payments data taken from a real-time gross settlement (RTGS) system. The auto-encoder is a neural network that makes use of unsupervised learning methods to observe irregular data patterns. In this case, it analyzes and learns the main characteristics of the data related to payments systems fed into it and looks out for anomalous liquidity flows. The results of an experiment conducted on historical large value payment system (LVPS) data show that the auto-encoder is capable of detecting liquidity problems at a bank in anticipation of a bank run. A series of tests were conducted, where different types of artificially generated bank-runs were simulated. In those tests, artificially generated tests were easily identified, with a very low number of outliers.

Source: Anomaly Detection in Real-Time Gross Settlement Systems, Bank for International Settlements

Data push and Data pull approach are followed by regulators to create specific SupTech platforms. These platforms extract data directly from the supervised institutions, streamline them and highlight critical information to the regulators. SupTech firms have been developing API based data input approach to extract reports directly from the database of banks. Development of such applications would enable regulators to monitor institutions in real-time, examine for anomalies and provide alerts when they observe suspicious activity.

Several Big Data Analytics applications are also being extensively used to assimilate large volumes of data and identify patterns among them based on customized computer algorithms. Through these applications, complex dashboards that present the findings in an easily interpretable way (say a heat map or traffic lights) can be created. Data management through SupTech frees up a lot of manpower, which can be deployed in more critical tasks and also reduces the lead time for collecting and consolidating data.

Example

Data pull approach – National Bank of Rwanda (BNR)

The National Bank of Rwanda (BNR) operates an electronic data warehouse (EDW) to pull data directly from the IT systems of more than 600 supervised financial institutions, including commercial banks, insurance companies, microfinance institutions, pension funds, forex bureaus, telecom operators and money transfer operators. The data-pulling process is automatic and occurs once in every 24 hours. The system has been operational since 2017. The introduction of an EDW system to retrieve data directly has reduced the time for data retrieval. The new process is more flexible for reporting and more efficient to maintain.

Source: Bank for International Settlements

Data Analytics involves four key focus areas that include market surveillance, misconduct analysis, micro prudential supervision and macro prudential supervision. Market surveillance pertains to examining suspicious trading activity such as market manipulation and insider trading. Surveying and identifying suspicious trading activity has been challenging for regulators, as huge amount of data processing is required to filter through large volumes of trading data generated on a daily basis. With the help of Big data and machine learning techniques, the amount of manual processing required is greatly reduced, where the surveillance application developed through SupTech highlights suspicious patterns based on pre-set algorithms and sends it across to regulatory experts for investigation. This reduces data processing efforts and helps in spotting patterns that are sometimes missed by humans.

Example

Market Surveillance - Australian Securities and Investments Commission (ASIC)

The Market Analysis and Intelligence (MAI) system is the suptech platform for market surveillance of the Australian Securities and Investments Commission (ASIC). The platform is designed to identify market anomalies in real-time and send alerts. Data from the primary and secondary capital markets for equity and equity derivatives are fed into the platform in real-time. The output derived is of two forms. One of them highlights the irregularities in daily trading activity and is sent for further investigation and analysis. Another output is aggregated for the assessment of large and complex thematic risks. The technology underpinning the MAI system and the post-trade analytics environment comprise of KDB/Q column-oriented in-memory database, R, Python and MS-Excel. In addition, Big data platforms enable visualization of the output data and provides support for machine learning, alert generation and data retrieval. The analytics obtained from the platform will provide ASIC valuable insights into the country's financial markets and highlights entities and trades of interest.

Source: Bank for International Settlements

Misconduct analysis focuses on AML detection, fraud detection and mis-selling. AML detection is one area where many regulatory institutions are using different types of innovative technologies. These include natural language processing and Machine learning techniques that run through filings of different institutions with the regulator to uncover suspicious money laundering transactions. In some cases, the activity is done in real-time as soon as the reports are being filed. Supervised learning and Random forest techniques are experimentally used to predict the probability of advisors mis-selling financial products to customers.

Money laundering detection - Monetary Authority of Singapore (MAS)

The Monetary Authority of Singapore (MAS) has been working to use data analytics for detecting anti-money laundering (AML) violations. A data analytical system to search through the 3,000 monthly Suspicious Transaction Reports (STR) on money laundering and terrorist financing risks that financial institutions file with MAS has been created. The system makes use of natural language processing and machine learning techniques to conduct analyses of the reports. Post-analysis, the system creates a suspicious money laundering sub-STR-network. Supervisors then inspect these sub-networks by fetching transactional data and identify AML violations.

The use of Artificial Intelligence and Machine Learning increases the efficiency and effectiveness of identifying violations. They have the capability to identify patterns that humans cannot. Identifying potential AML violations by manual methods take about two years to complete, while the automated system takes only about a few minutes. The application is currently under development and is expected to be operational by the end of 2018.

Source: Bank for International Settlements

SupTech applications can be employed for micro prudential supervision activities that cover credit risk evaluation and liquidity risk detection. Loan default forecasting can be done using machine learning algorithms on data blended from balance sheets, central credit register and other firm-specific data. Neural networks are also being experimented upon to develop encoders that analyse anomalous liquidity flows during simulated bank runs. When these technologies reach maturity, they can effectively be used for risk management.

Fraud Identification – Securities and Exchange Commission (SEC)

The Securities and Exchange Commission (SEC) makes use of unsupervised learning and topic modelling in its fraud identification methods. Initially, unsupervised learning detects the irregularities in data such as regulatory filings. Then, topic modelling is used to uncover the underlying themes embedded in the data. This technology is used to find commonality and outlier behavior among market participants. A large amount of structured and unstructured data from filings are fed into a Big data computing environment. Unsupervised learning algorithms that include topic modelling and tonality analysis are used to identify and report outlier behavior. Topic modelling lets the data define the themes of each filing. Tonality analysis gauges the negativity of a filing by counting the appearance of certain financial terms that have negative connotations. Back-testing analysis of the results show that these methods are five times better than random at identifying language in investment adviser regulatory filings that could merit a referral to enforcement. This technique is useful to guide regulators to high-risk areas and help them in prioritizing investigations. It enables deployment of the limited resources in critical areas that are most susceptible to fraudulent activity.

Source: SEC Speech 2017 by Scott W. Bauguess, Bank for International Settlements

In summary, SupTech is hailed as a game-changer in efficient reporting and forward monitoring of risk. It holds the potential of turning risk and compliance monitoring from a reactive or backward-looking tool into a predictive process. While RegTech refers to applications of innovative technologies that support compliance with regulatory and reporting requirements by licensed or regulated financial institutions, SupTech refers to technologies used by supervisory agencies themselves. As regulatory data can now be digitized, it allows for the usage of algorithms to monitor, evaluate and synthesize regulatory information and enable better oversight, reporting and compliance from the regulator's side.



Section 9

Conclusions

FinTech being an amalgamation of cutting-edge technology with financial services, demands for a change in approach from regulators. There is a pressing need for the adoption of innovative methods and tools so that the risks posed by emerging FinTech services can be effectively identified and mitigated. Regulatory Sandboxes and Accelerator programs are some of the notable tools adopted by several markets worldwide, which have effected a successful collaboration between FinTech firms and regulators.

However, a regulator cannot afford to rely on a one-size-fits-all approach due to the varying nature of technological developments in FinTech and the unique attributes associated with each of the markets across the globe. Active monitoring and gauging of risks by a dedicated regulatory entity is highly recommended in such cases. The challenge for regulators and policy makers would be to ensure that new financial technologies is allowed to thrive and prosper in a way that maximizes the economic opportunities, while minimizing the risk and contributes to a robust and sustainable economic growth.

With respect to creating a cohesive and functional roadmap for FinTech in Kuwait, it would be essential to coordinate between various regulatory touchpoints and other relevant stakeholders to undertake a scoping exercise to facilitate a general understanding of the key FinTech innovations and regulatory developments. Also essential will be creation of an organizational structure for an international FinTech hub for solidifying the competitiveness of Kuwait's financial services ecosystem.

A strategic blueprint for managing the overall branding of Kuwait as a FinTech hub through FinTech events and initiatives can only succeed if there are robust measures for protecting the hub's ecosystem against various market or consumer related risks linked to the use of Kuwaiti associated FinTech products or services. For that, it is crucial to commit to an exercise of studying cross country practices across international hubs and analyzing models of successful regulatory measures to disruptions.

Developing guidelines for FinTech related courses in higher and technical education spheres would serve the purpose of developing a home-grown talent base. Also, Research & Development (R&D) efforts would accelerate in parallel. Developing a set of industry guidelines or standards that will enable Kuwaiti FinTech companies to more easily and effectively partner with existing incumbents will support smoother expansion of the sector.

Crucially, regulators have a critical leadership function to play in helping in the articulation of a vision for FinTech, and collaborating with interested industry and academia partners to catalyze the implementation of the vision. Concomitantly, in addition to exploring how to strengthen Kuwait's role as an international FinTech hub, it is vital to study how to create best-in-class industry standards, practices, regulations, etc., which will strengthen the ability of Kuwaiti regulators and firms to be seen as world-leading. In fact, Kuwaiti standards may influence global practices too.

FinTech presents multiple challenges as well as significant opportunities. However, the biggest risk is allowing the phenomenon to pass by without taking early initiatives. In such a scenario, not only does Kuwait risk losing the untapped economic potential of FinTech, but can subject the entire Kuwaiti financial services to competitive disadvantage due to not being at the forefront of trending financial technologies.



Section 10

Recommendations

The study uncovers that it is futile to try developing an all-encompassing definition for FinTech. It is best understood as financial services enhanced by new technologies. A lot of demand for FinTech services is actually coming from more consumers quickly becoming digital. In other words, it is a type of bottom-up approach as consumers want to manage their financial needs and money in a more personalized and proactive manner.

Though FinTech firms seek a level playing field, policymakers and regulators will have to assess systems and protocols around consumer protection, data privacy, cyber security, liability responsibility, etc. This is especially because the emergence of FinTech as a prominent trend is driven by convergence of multiple technologies like AI, smart phones, Big Data, APIs, Blockchain, cloud computing, etc.

On a larger business level, both banks and FinTech's have to take note that giant technology companies (the likes of Google, Amazon, etc.) are fervently encircling opportunities in financial services like payments. It could be possible that for both banks and FinTech companies, these technology behemoths might be the common business adversary. Meanwhile, at a policy level, regulatory Sandboxes are appropriate vehicles to explore collaboration, experimentation and risk assessment on emerging KYC frameworks, novel modes of cross-border inter-bank payments, open API architectures, etc.

FinTech can be construed as built on three pillars—Operational; Data and the Mindset underpinning its deployment and use. This means that new financial services will not always fall completely under the existing Kuwaiti regulatory frameworks. This is evident in areas like crowd or peer-to-peer activities for SMEs, etc. Taking a broader GCC perspective, a lack of a unified GCC framework also hampers the ability of FinTech service providers to scale-up while faced with conflicting approaches to domestic supervision and regulations.

Through this study, recommendations have been arrived at for three main stakeholder groups within the FinTech sphere, which are Regulators, the Banks and FinTech companies (particularly startups). Aligned strategic initiatives can help combine technology, clients and regulatory compliance around needed innovation and novel business models. This involves steps like Kuwaiti banks interacting with FinTech start-ups and learning insights from them about their arsenal of technologies, emergent business models, evolving methodologies, etc. An open innovation ecosystem can provide a platform for start-ups and banks to jointly develop FinTech tests and trials, while maintaining required regulatory compliance levels, during use of banks' data in authorized formats.

Exhibit 10.1: Indicative Recommendations for Regulators

Recommendation	Suggested Action
Articulate and raise awareness with a clear definition of what FinTech services exactly mean in the Kuwaiti context.	A strategic policy document can be created and released to all stakeholders, including banks and FinTech companies. A sub domain webpage can be created to populate all relevant data and research on FinTech as it applies to Kuwait. Ensuring the right mix of skillsets is crucial.
Continuously look for policies that will leverage FinTech as a tool of financial inclusion.	A research page can be dedicated to the website that will update policy developments across the world with respect to FinTech as it applies to financial inclusion.
Assure user trust while improving accessibility and utility of FinTech for multiple stakeholders.	A risk monitoring study can be initiated, along with setting up of a risk tracking and reporting hub.
Adopt a cautious approach when assessing industry competition issues, in the context of the blurred boundaries of digital markets.	

Source: Marmore

Exhibit 10.2: Indicative Recommendations for Banks

Recommendation	Suggested Action
Cooperating with FinTech start-ups providing successful substitutes for traditional financial services may provide long-term competitive edge.	New business models need to be explored. FinTechs should be explored to drive greater Personalization. Simple-to-follow user interfaces designed along with FinTechs.
Creating a new channel through FinTechs might potentially attract clients that traditional banking services do not usually cover deeply (like SMEs).	
Acquiring FinTech companies to obtain access to new technologies.	
Design thinking approach can be imbibed from nimble FinTech startups.	

Source: Marmore

Exhibit 10.3: Indicative Recommendations for FinTech Companies

Recommendation	Suggested Action
Collaborate with banks.	FinTech companies to be active participants of sandbox initiatives of the Central Bank.
Expand upon the narrative of how their services can support financial inclusion.	
Support other FinTechs in building and sharing basic infrastructure too.	
Investments in tools like AI will underpin expansion in capabilities.	Partnering banks and other government agencies can be tapped for investments.
Targeted outreach will be needed in dealing with angel and private equity investors, national and international accelerator or incubator schemes.	Workshops and training programs will help. It can be made available online for facilitating mobile learning.

Source: Marmore

For Kuwait, ensuring the right mix of skill sets is crucial to the initial success in terms of becoming a FinTech hub. Access to essential coding and advanced software skills is mandatory. This will have implications in terms of standing up an effective international skills attraction system, apart from training domestic cadre for the purpose. An action plan to regulating customer adoption and encouraging forward competition will also be essential.

Fintech Case Studies



1. Ajar Online

It can be attested too that rental payments in the GCC region can be a strenuous task for both landlord and tenants, whether it is having to chase down the landlords and paying by cash or cheque, or having to go through the torturous ques at the bank to cash in a cheque. It is a stressful ordeal for both parties. In 2015, Shaheen AlKhudari and three entrepreneurs established a cloud based service for the real estate market to attempt to remedy the solution.

Shaheen AlKhudari, founder and CEO of Ajar online did not envision himself becoming an entrepreneur, after being a regular employee at several firms for 10 years Shaheen decided to find a problem and solve it. Marrying into an apartment in 2014, Shaheen AlKhudari came face-to-face with the grueling task of keeping up with rent payments in Kuwait when he decided to find a solution, Ajar Online. His background in Information Systems as an IT manager at AlKhudari’s previous firm played a hand in easing the digital aspect of the task at hand. After researching the rental problem in Kuwait, Shaheen went on to figure out ways to monetize the service to be provided. Ajar online currently offers benefits;

Landlords	Tenants
On-time rent payment	No trips to the bank
Automatic rent notification	Automatic reminders
Automatic confirmation of payment	Pay at any location
Less administrative work	Online receipts
Live rent collection status and reports	

In simple terms, Shaheen AlKhudari came up with a solution to the hassle of rent payments in Kuwait for both landlords and tenants by offering a hassle-free way to digitize rent payments and collections. However it is simple enough to come up with a solution, it is a more uphill task to sell it. Shaheed took it upon himself to educate his customers, both landlords and tenants in the benefits of digitization, security and the use of the service, in addition to offering free trials to both parties. Fully launched in January 2016, Ajar Online platform mainly serves the Kuwaiti market with operations soon to be underway in the UAE and Saudi Arabia during 2018.

2. Bayzat

Payment solutions, transactions, and trading are usually what come straight to mind when financial technologies are brought into the conversation. Talal Bayaa, founder of Bayzat has taken a different direction when it comes to FinTech, Bayaa has detoured and dug a problem and potential solution that would save money rather than generate it. Lowering costs generally means more income falls under ‘generated’ rather than a loss, this is what Talal Bayaa has tapped into and aims to provide to Bayzat’s customers.

Initially Talal Bayaa and co-founder Brian Habibi set out to simply provide UAE residents find health insurance, then stumbling upon a much greater need and an opportunity to satisfy not just UAE residents but the SME ecosystem as a whole rather than focus on just individuals. Their pool suddenly grew much larger and the potential to grow substantially increased. Insurance firms during 2013 were starting to spend more and more on efficient technology.

Upon discovering the opportunity at hand, Bayzat took the opportunity to expand into HR administration solutions, which complements Bayzat’s initial purpose of health insurance. According to Bayzat HR departments in the UAE spend 70% of their time conducting administration work and answering questions about company benefits. The Bayzat team has identified this and aimed to provide through their service;

Employee Records	Health Insurance	Time Off
Managing employee records, with hands free data entry and easy access to employee information.	Easily access health insurance policy. Be able to add or remove members and explore personal network and health benifits easily	Tracking time off made easier and quicker, approvign requests and quicker, approvign requests and viewing of balance days on an efficient system and other types of leaves

Talal Bayaa saw the opportunity to cater to consumers who are in need of efficiency, with a heavy workload on a small team, therefore Bayzat have identified SMEs, employees, employers and entity alike, to target. Bayzat recognized that SMEs can suffer the most from having to derail focus from their product or service to having to worry about HR administration or market research.

Oxford Strategic Consulting discovered that effective HR potentially can add US\$ 14bn per year to the GCC’s GDP. While ‘Sage’, an HR software provider, argue that the correct automation tools can halve time spent on HR administration therefore saving up 40% in total costs over the year. In the GCC many tasks such as tracking employee data and benefits are done manually and are still paper-dependant, specifically government institutions. This therefore outlines the potential scale of benefit that is presented to Bayzat to cater too and expand upon with their service. Today Bayzat has continued its strides servicing 12,000 employees in the UAE and further plans for expansion into different countries, firstly Saudi Arabia, with increased investments into Bayzat, the number can potentially reach more than triple the current amount.

3. BitOasis

Launched in the last quarter of 2014 in Dubai, BitOasis set out to offer a digital wallet service based on Blockchain currency Bitcoin, later acquiring seed funding from Wamda Capital and others in 2015. Today BitOasis caters to the Middle East, North Africa, and Asia. Offering additional services to users in the UAE, Kuwait, Bahrain, Qatar and Saudi Arabia, allowing them to use an exchange service by wiring money to a BitOasis bank account to be changed to Bitcoins for a 1% fee.

Ola Doudin, who used to live in Amman, having quit her job in London's financial sector during the aftermath of the 2008 global financial crash, bought her first Bitcoin three years ago.

Having moved back to Amman in Jordan and working on entrepreneurship initiatives with Aramex founder Fadi Ghandour, Ola picked up a copy of Business insider. Business insider had covered the topic of Bitcoin in 2013, where Ola Doudin saw that Bitcoin, in her own words is "transformative". After months of research on digital currency in scientific journals and connecting with enthusiasts on platforms such as Twitter, Ola found that Bitcoin was hard to come by in Jordan and generally in the region at the time. This prompted joining several Bitcoin meetups in Amman and Dubai, where she met Daniel Robenek, a Czech software engineer. Their partnership birthed a safe platform allowing users to purchase Bitcoin in the Middle East, through BitOasis.

Customers in locations such as Egypt or Morocco, Bitcoin is used to pay for gaming, virtual private networks and cloud services on an everyday basis. Transactions of such nature can be expensive when done conventionally through bank transfers and credit cards, sometimes users in Egypt and Morocco will not be able to pay in any possible way due to location restrictions associated to credit cards and their location. Expatriates in the gulf can similarly use Bitcoin to pay bills or top-up phone credit for families in their domicile, whereas the wealthier demographic of GCC nationals can use Bitcoin in diversifying their investment portfolio.

Fast-forwarding to the present day, BitOasis is working with regulators in Dubai to provide their business and operations regulation with plans of further expansions in 2018.

4. Finerd

Following the development of FinTech model in the US and acted as an advisor for a similar venture in Europe, Finerd creator de Lecea had been keenly keeping a close eye on FinTech for a while. Moving to Dubai, de Lecea discovered the investment needs of GCC residents and came to the conclusion that a new method of saving and investing can bring substantial benefits for the GCC market.

After coming into contact with an old colleague who has extensive entrepreneurial experience and contacts in the GCC, de Lecea and Fotilas came together to establish Finerd. Using the most advanced technology, extensive academic research and transparent management style, the service caters to customers offering intelligent investment solutions to individuals and businesses alike.

Simply put Finerd offers an automated investment management solutions platform, with the aim of reducing costs of key processes by automating them. Removing layers of intermediaries, eliminating conflicts of interests while investing in a selection of passive, low-cost, tax conscious instruments. Both de Lecea and Fotilas' backgrounds indicate that their partnership is a natural marriage of both their expertise with de Lecea combining academic background with years of professional experience in financial services. On the other hand, Fotilas boasts extensive investment banking experience and entrepreneurship with several ventures that have turned out successful. Fotilas, already a partner at Gulf investor circle group (GIC), once coming across Finerd he deemed it to be worthy and exciting.

Finerd's automated investment solutions presents the advantage of security as money is held at offshore jurisdiction with one of the biggest brokers/custodians in the world. Finerd's automated service also provides sophistication of a highly diversified investment portfolio designed and managed with proven strategies. Finerd customers enjoy transparency with clear descriptions of cost and prices involved with no hidden fees. Finerd offers customers personalization through client's personal goals, risk tolerance and investment horizon, added with convenience of being able to track and manage portfolios throughout the 24 hour day. De Lecea adds "One of the characteristics of the product is that we offer sophisticated investment solutions without the need of having one million dollars.", in simpler terms Finerd allows customers to invest without having a minimum amount of investment required. The investment portfolio includes stocks, bonds, and real estate in North America, Europe, Asia, Latin America, GCC and emerging markets, according to the client's personal needs set.

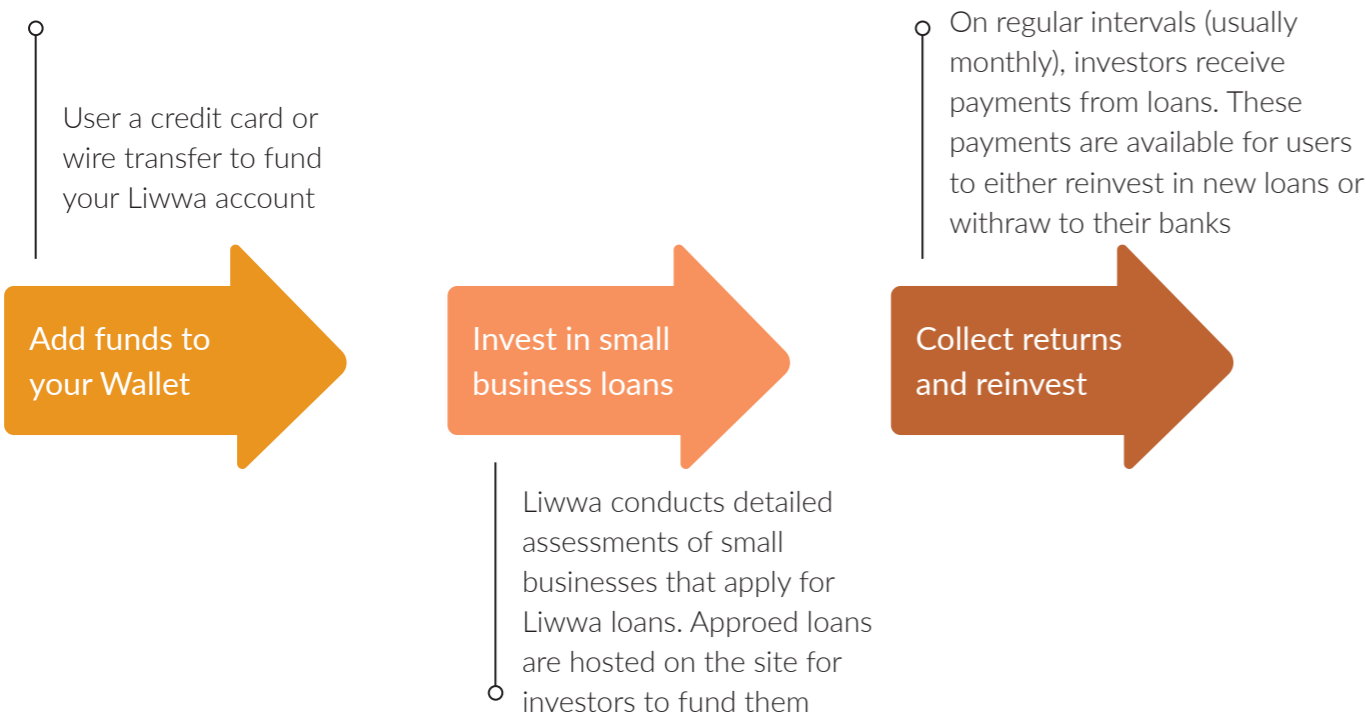
De Lecea added "our future plans are to expand internationally across the GCC and MENA. Interestingly enough we have already been approached by investors and entrepreneurs who wish to take Finerd to Hong Kong and China. With the service being a success in Dubai, Finerd is looking to expand not only in the GCC but aspires to offer its service world-wide, additionally expand into Islamic finance eliminate any exclusions from the market of Islamic investors.

5. Liwwa

Disregarding the GCC, the MENA region's SMEs have found it hard to come by when attempting to secure finance for their businesses, therefore reducing their capability to contribute to economic growth and job creation in the region. In 2012, Ahmad Moor took it upon himself to establish a platform for peer-to-peer (P2P) lending called Liwwa specifically targeting SMEs.

Ahmad Moor, a former journalist, experienced first-hand in 2011 the effects of the Arab Spring. The Arab Spring manifested a lack of opportunities for the young leading to a wave of discontent by lifting a barrier for job creation in the region by the lack of financing available for emerging enterprises. "The revolutions in this part of the world were an expression of how badly people needed capital, with that in mind I wanted to start something that could deliver opportunities", explain Ahmad Moor as his motive for establishing Liwwa. Studying Public policy at Harvard University later in 2011, Ahmad met his co-founder Samer Atiani who like Ahmad, originally comes from Palestine. Together they established Liwwa, an SME crowdfunding platform-based financing

How does it work? (Liwwa, 2018)



6. Madfoocatcom

Residing in Saudi Arabia Nasser Saleh – Found and CEO of Madfoocat, was accustomed to making online payments where, similar to Kuwait’s KNET, Saudi Arabia has its own payment system called Sadad. After moving back to Amman, Jordan where the population primarily make their payments in person, Nasser Saleh created MadfoocatCom in 2011. Nasser assumed that the he could establish a platform similar to Sadad in his native Jordan to instantly take off as no payment system was present, however later found out that he had miscalculated the demand expected of a payment system like MadfoocatCom from local banks and billers.

On the verge of running out of finances, as a last resort Nasser reached out to the Central bank of Jordan (CBJ) in 2013 in hope of getting a response when it most likely was impossible he would get any attention. He sent a fax to the governor of the Central bank, in which to his own surprise he got a phone call from Maha Bahou an executive director at the CBJ. It turns out Maha Bahou, who oversaw payments, was discovering the implementation of a payment system in the country and was interested to hear his ideas. Bahou insisted Nasser bit on the government’s new bill payment platform. To increase chances, he set up a meeting with Paul Edwards who heads a Cairo-headquartered firm that operates the switches of ATMS in Jordan. Nasser sought to strike a profitable partnership and agreed to split revenues 50-50. Luckily enough, their offer was said to be the best technical offer were awarded the tender.

Fast-forward to the present day, MadfoocatCom operates the bank’s online payments as eFawateercom with more than 100 billers, including entities and telecoms and receive payments electronically through 23 of 25 banks in Jordan. MadfoocatCom today showcases a glimpse of how the government and startup’s relationships are changing in the Middle East and are seen as a pioneer in that regard.

7. Ondeck

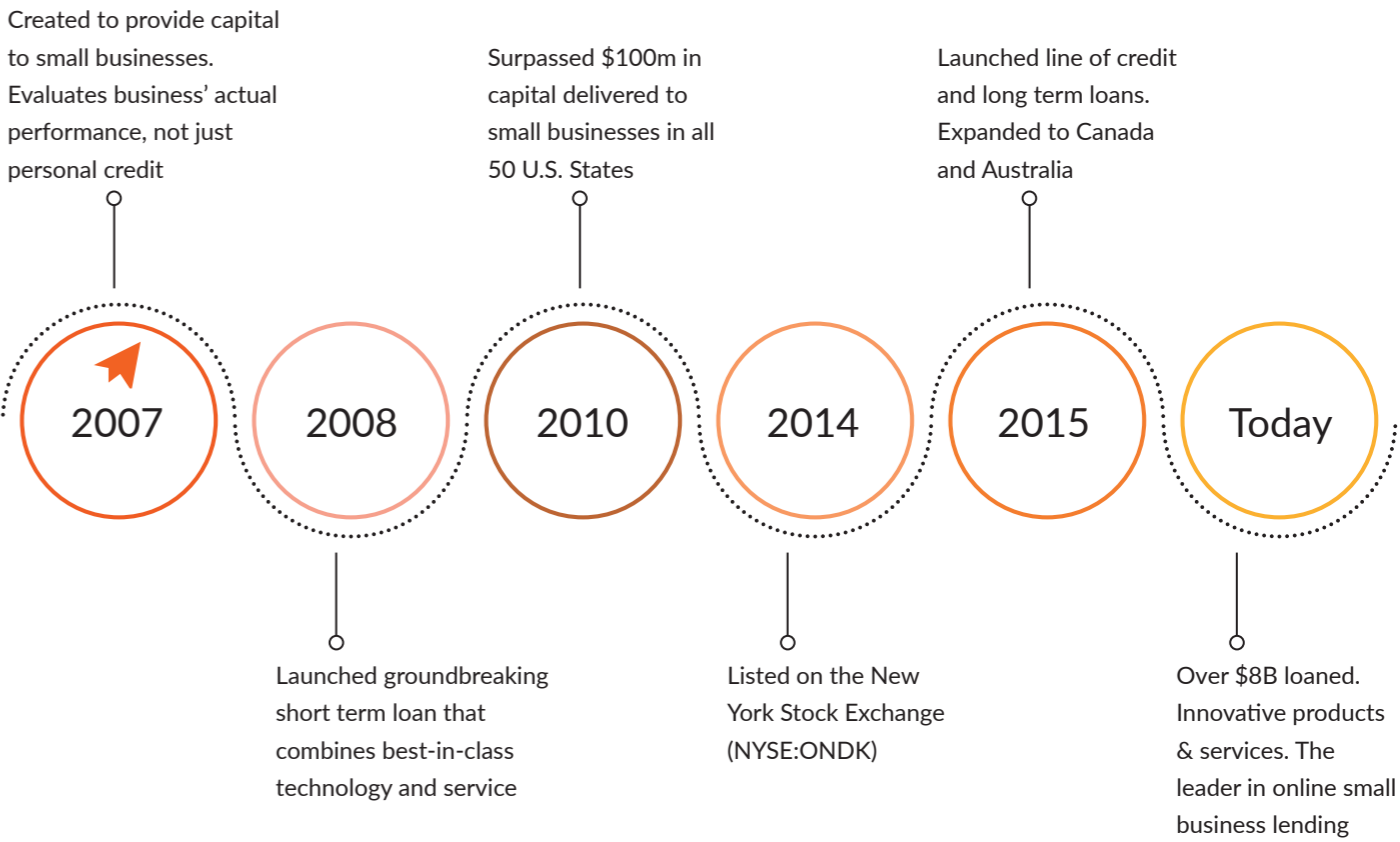
Local banks in Kuwait and UAE do not have considerable risk appetite to finance SMEs in the region, hindering the development and growth of SMEs, including FinTechs. Therefore it is interesting to explore how FinTechs have evolved when faced with the same problem when heading West in Europe and the USA.

Many new FinTechs have facilitated ways in developing without considerable regulatory capital, due to the fact that they suffer no transformation risk. This brings attention to crowdfunding platforms that can arrange online direct lending to SMEs, leaving the individual investor with all the risk.

FinTechs have turned the corner, entering themselves into the SME financing space with ample success in recent years, of which includes Onedek as one of the largest alternative lenders. Launched in 2007 as a non-bank online platform for small business lending, it also offers proprietary technology and credit models when assessing financial strength and risk profiles of SMEs. Onedek allows customers to apply within just minutes, offering almost instant credit decisions and funds within 24 hours.

Originally funded by VC funds, Onedek has diversified funding by providing sophisticated investors. In other words, Onedek offers SMEs loans that are funded by sophisticated investors that carry the risk. This propelled Onedek in 2016 accumulating USD 7billion from originated financing and is now operating in the US, Canada and Australia.

Big players such as JP Morgan Chase have taken notice prompting them to enter into a partnership with Onedek to provide origination and loan service technology enabling JP Morgan Chase to offer digital and streamlined lending processes to its SME customers.



8. OneGram

Satoshi Nakamoto introduced Bitcoin as a digital analog to gold around eight years ago, limited in supply but secured by modern cryptography developed for the modern age of internet. With this, many versions of cryptocurrency were created, but to little success. A somewhat niche market regardless of significant developments and innovations in the market. With fear of diverting from the traditional money currencies that have been in places for hundreds of years, concerns of legitimacy of currency, threat of theft and so forth has discouraged many mainstream use.

Onegram was created with the aims to solve the issues mentioned previously by instilling a business ecosystem to solve the entry and exit issues that are related to cryptocurrencies. Done by backing each coin/token with one gram of gold at launch In order to address the risk involved while using block chain technology to solve outstanding problems by establishing a unique version of cryptocurrency that differentiate it from the rest.

Managing 1% of global GDP, the Islamic financial sector is growing at nearly 20% per year. The first “Sharia-compliant” cryptocurrency, Onegram keeps gold in a digital format that is both secure and digitally transferable, “Opening the doors for cryptocurrency trading to the Islamic world”.

Ibrahim Mohammed created Onegram in 2007 by partnering with GoldGuard in order to provide the opportunity to investors who are interested in financial markets and security of commodity backed investments to be able to tap into and benefit from technological advances in block chain.

Despite Muslims making up 25% of the global population, Onegram will be the first cryptocurrency that puts Islamic markets into consideration. Every transaction of Onegram entails a small transaction fee, which is then reinvested in more gold in return increasing the amount of gold backing each “Onegram” therefore increasing in real value over time.

June 1st 2018 marks the day Onegram has been launched, along with its own digital wallet with aims to expand into new payment gateways such as Yallapay by August of 2018 and launch of OneGram ATM's starting in Dubai projected for September of 2018.

9. Paytabs

A complete online payment processing system with integral fraud protection, Paytabs ensures that SMEs are paid swiftly, safely and cost-effectively. It was founded in 2014 by Abdulaziz Al Jouf with capital from Saudi Aramco Entrepreneurship Center, now its Paytabs founder has been cited twice by Forbes Middle East as a top-100 entrepreneur.

In January 2014, Abdulaziz Al Jouf noticed that traditional banks in the region displayed considerable resistance towards financial technologies that could improve their services. After being based in Khobar, Saudi Arabia for a full year, Paytabs have moved their operations in May of 2015 to Bahrain where it enjoys 30% lower operational costs than countries such as Kuwait, UAE and Oman. This was done in order to further grow the business while

lowering costs in a geographical location that remains advantageous in providing their services to their main market at the time being Saudi Arabia. Bahrain being in close proximity to Khobar, Saudi Arabia helped maintain its operations close to their target market while also lowering operational costs for Paytabs benefit. A year later, Paytabs showed significant movements in a short space of time to break the barrier of 10,000 customers, which lead Paytabs to recognize the potential for the growth of the business even further, making them take action towards negotiating licenses for five different countries in the same year, aiming to go international starting with Asia. Currently with approximately 100 employees Paytabs has shown ample potential for growth beyond the borders of the GCC region, prompting an investment round of \$20 million in order to fund Paytabs expansion towards more than 20 markets, making it the region's largest FinTech startup since August of 2017.

10. Yallacompare

Formerly known as ‘Compareit4me’ Yallacompare allows consumers to shop around for bank loans, credit cards, insurance policies from many competing financial institutions at no cost. ‘Compareit4me’ generating nearly half a million applications for financial products last year from 50 banks and 12 insurance companies, currently operate in 9 countries including Saudi Arabia, Egypt, Kuwait, and Qatar. This has pipped ‘Compareit4me’ to be ranked 8th in Forbes’ Middle East ranking of most promising UAE startups in 2016 epitomizing their success so far. In 2017, ‘Compareit4me’ has chosen to rebrand itself as Yallacompare in attempt to target both English and Arabic speakers which constitute the majority of their consumer base.

Authority does not play well with many people, and certainly not for founder and CEO of now Yallacompare, John Richards. At the tender age of 17, John knew he wanted to be at the top of the imaginary food chain “The first month of my new job, I knew I should be running that company, I always said I’d rather run a food truck than work for other people”. In August 2011, John Richards did just what he said he would, and founded ‘Compareit4me’. John saw the gap, and filled it by establishing a new platform for the UAE and GCC as a whole. After ‘Compareit4me’ was a hit, they branched out into insurance comparison services. According to John branching out into insurance comparison had shifted goals and presented a challenge “we had no knowledge of the insurance market and had to build it from the ground up, unlike in the UK the UAE had no white label products that could be taken and modified”. However the idea plummeted into success, made easier by the need for buying car insurance to be made quick, easy, and cheap. According to John Richards, Yallacompare saves their users AED400 to AED600 on average per policy. With Yallacompare at the forefront of its field, John Richards is looking to improve even further using the efficiency advantages of technologies to put to use in their locations outside of the UAE. Operations in Saud Arabia are taking further advancements to make sure all local insurers are connected by APIs, where John went on to say “This will allow them to change pricings on the go, that means quotes and issued policies will come via the API, an end-to-end technology without human intervention”. With threat of similar companies emerging in the UAE and GCC, John is adamant that Yallacompare's solid start and their current foundations will cement them as the big player, especially in the UAE where Yallacompare excel

at offering more than 70% of online insurance being sold inside the UAE with anticipation of that percentage growing. Yallacompares success is epitomized in their revenue even before rebranding where turnover rocketed up to \$4.5million in 2016 and raising a total of \$5.7million from investors up to 2016. It is evident that ‘Compareit4me’, not Yallacompares will remain at the top.

11. Myfatoorah

Myfatoorah, founded in 2015, offers innovative online payment solutions to customers, enabling Kuwaiti businesses to maximize efficiency with respect to online transactions. The payment solution is designed to enable the companies to invoice clients and accept the payment online through a secure gateway. They offer an easy-to-use software which enables the companies to build business and enhance the user experience.

Myfatoorah’s services include creating and sending invoices, providing the option to share the service charge or charge the client with debit and credit service fees. It provides the ‘Quick Invoice’ feature that allows faster billing to frequent customers and ‘Multiple invoices’ which allows easy billing to multiple clients at once. The quick payment link allows generation of a unique URL which could be passed on to the customers or shared in social media. It offers launching of ecommerce sites and integrates with websites and web applications payment gateway. Myfatoorah instalment services offer instalment scheduling services once the payment frequency is set up.

The highlight of Myfatoorah services is that their platform is advanced and it can be integrated to any new or existing website. It enables its users to streamline their processes and improve the experience of their clients.

12. OG Money

OG Money was found in 2004 by Mr.Al-Rashidi as pioneer in the mobile solutions space. Formerly known as Payit, it offers a platform for all your bill payments, top-up, charity, utilities etc. Og money has revolutionized the digital payments sector by providing the users with mobile wallet capabilities, banking, merchant and checkout facilities, virtual stores and turnkey dealer solutions. It allows users to receive remittances, wages, and subsidies and do shopping, provide funds for vouchers and gift cards, pay utility bills and fees.

Og money functions as a platform to connect customers, banks, telecom operators and service providers through the mobile phone.

OG Money partners with Microsoft and has received official authorization and compliance certification from the Central Bank of Bahrain, Kuwait Finance House, Warba Bank in Kuwait, Bank Misr in Egypt, Tadhamon International Islamic Bank in Yemen and many other banks in the region. It is also PCI/DSS compliant and maintains the highest security level within the financial services industry.



Appendix 2

Incubators and Accelerators in Kuwait

Brilliant Lab (BL)

Brilliant Lab (BL) is a Kuwaiti startup accelerator established in 2011 that invests in knowledge and human capital by supporting the development of new tech enterprises and creating the link between entrepreneurs, private and government bodies and venture capitalist community. BL uses a multidisciplinary approach of providing infrastructure support, expertise and knowledge exchange for tech-startups based in Kuwait. It also facilitates a network that stimulate the exchange of entrepreneurial skills through organizing various events. BL has partnered with Zain, Gatehouse Capital and Mind the Bridge. Their services are as follows:

- BL Startup School that mentors entrepreneurs and engineers
- Brilliant Start that aim to provide a solid investment path for founders
- BL Event and conference that provides platform for budding entrepreneurs to network.

Sirdab Lab

Sirdab Lab founded in 2014 assists aspiring entrepreneurs to develop digital products and tech startups. It supports entrepreneurs by providing training, opportunities of networking and mentorship and access to funding. It aims to make less intimidating by aiding in establishing connections with community members, mentors and potential partners, educating and guiding its members.

Erada Business Incubator

Erada is the first government licensed and accredited business incubator in Kuwait founded in 2017. It combines the internationally accepted methodologies and Kuwait’s local expertise to enable a startup in the incubation and acceleration process. Erada specializes in training the startups to meet the requirements of the National Fund for Small and Medium Enterprises Development.

Regulatory Sandbox Framework for Fintech- Kuwait



The Central Bank of Kuwait (CBK) launched the regulatory sandbox framework in November 2018. The main objectives of the regulatory sandbox framework are to provide a safe environment to test proposed financial products and services, and to encourage financial innovations by temporarily easing participants’ from being part of the regulatory and supervisory requirements.

CBK states the scope of regulatory sandbox as follows: “The Regulatory Sandbox Framework targets both companies and individuals striving to provide innovative FinTech products or services that are based on or relevant to the electronic payment of funds either by using a new technology or an existing technology in an innovative way” .

The regulatory environment is represented in four stages

The maximum duration to complete all stages of the Regulatory Sandbox is one year. The stages are as follows

● **Application Stage:**

The Regulatory Sandbox application form, along with the required documents, as per the guidelines stated on the Regulatory Sandbox page shall be submitted at the CBK's website. The CBK shall review the application to ensure that the proposed product or service is in line with the scope of the Regulatory Sandbox Framework. The applicant will be informed of CBK’s decision.

● **Evaluation Stage:**

In this stage, the application will be evaluated thoroughly from all technical, security and regulatory aspects related to the proposed product or service. The duration of this stage will depend on the level of complexity of these aspects. Once the evaluation process is completed the applicant will be notified of the results, whether to move ahead to the next stage of the Regulatory Sandbox or not.

● **Experimentation Stage:**

At this stage, the CBK, in collaboration with the participant, shall initiate a technical and operational testing of the proposed product or service on an appropriate controlled

environment. Testing will include measuring the level of compliance with CBK's regulations, ensuring adequate security measures are embedded within the proposed product or service, which includes customer confidentiality and privacy standards, as well as measuring the efficiency level of operations. Simulations may be conducted via the CBK's banking systems controlled environment, as an extra measure to ensure the integrity of the proposed product or service. Scope of testing is to be determined on a case-by-case basis. Participants are required to fully commit with the testing process and submit reports required by CBK. At the end of the testing stage, the CBK will determine whether or not the participant moves to the next stage.

● **Accreditation Stage:**

At this stage, the CBK will either grant final or initial approval, or reject the proposed product or service.

First - Final Approval:

The participant will be officially notified by the CBK of the approval, and will have to comply with the following:

- Compliance with all of CBK's relevant regulations, particularly those related to the electronic payment of funds.
- Obtaining all licenses related to the laws enforced in the State of Kuwait.

Second - Initial Approval:

The participant will be notified by the CBK of the initial approval, and will therefore be able to initiate the soft launch of the proposed product or service along with the participation of the volunteer customers. The participant is required to inform the volunteer customers of the potential risks related to the proposed product or service, set adequate risk mitigation measures, and ensure customer data protection measures are set in place.

A precise scope for the participation of the volunteer customers is to be agreed upon between the participant and the volunteer customers on a case-by-case basis.

The participant is able to request an extension for the soft launch duration. The CBK will either approve or reject the request based on its discretion. With the completion of the soft launch, and after providing the CBK with the results, CBK’s subsequent decision will be one of the following:

- Grant the final approval of the proposed product or service, therefore the participant is to comply with section (Final Approval/1, 2) of this document.
- Return the proposed product or service to any of the previous stages of the regulatory Sandbox.
- Reject the proposed product or service.

Third - Rejection:

The participant will be officially notified by the CBK of the rejection.

List of References

ACI Universal Payments and MagnaCarta (2016). 2017 FinTech Disruptors Report. Retrieved from <https://www.aciworldwide.com/-/media/files/collateral/other/aci-magna-carta-fintech-disruptors-report.pdf>

ACOI (2017). Building Blocks for Effective Compliance - Upstream Regulatory Risk & Reporting. Retrieved from <https://www.acoi.ie/download/Presentation-18-Oct-Building-Blocks-for-Effective-Compliance-Workshop-Series-Upstream-Regulatory-Risk-Reporting-.pdf>

Arab Times (2017). NBK at forefront of tech adoption. Retrieved from <https://www.nbk.com/dam/jcr:fa5d5eaf-7f44-4d7d-a8aa.../Arab%20Times.pdf>

Arner D.W., Barberis J., & Buckley R. P., (2017). FINTECH AND REGTECH IN A NUTSHELL, AND THE FUTURE IN A SANDBOX. Retrieved from <https://ssrn.com/abstract=3088303>

Asia Securities Industry & Financial Markets Association (2017). BEST PRACTICES FOR EFFECTIVE DEVELOPMENT OF FINTECH. Retrieved from [https://wpqr4.adb.org/LotusQuickr/asean3abmf/Main.nsf/0/180E8766E9610DDB4825815100430DF3/\\$file/Session%205%20-%20Regulatory%20Framework.pdf](https://wpqr4.adb.org/LotusQuickr/asean3abmf/Main.nsf/0/180E8766E9610DDB4825815100430DF3/$file/Session%205%20-%20Regulatory%20Framework.pdf)

Bain & Company (2015). Retail Banks Wake Up to Digital Lending. Retrieved from <http://www.bain.com/publications/articles/retail-banks-wake-up-to-digital-lending.aspx>

Baker McKenzie (2017). A guide to regulatory Fintech sandboxes across Asia Pacific. Retrieved from https://www.bakermckenzie.com/-/media/files/insight/publications/2018/01/qrg_ap_regulatoryfintech_jan18.pdf?la=en

Bank for International Settlements (2017), The promise of FinTech. Retrieved from <https://www.bis.org/review/r170126b.pdf>

Bank for International Settlements (2017). Sound Practices: Implications of fintech developments for banks and bank supervisors. Retrieved from <https://acpr.banque-france.fr/sites/default/files/medias/documents/d415.pdf>

Bank for International Settlements (2017). Sound Practices: Implications of fintech developments for banks and bank supervisors. Retrieved from <https://www.bis.org/bcbs/publ/d415.pdf>

Bank for International Settlements (2018). Fintech in EMEs: blessing or curse? Retrieved from <https://www.bis.org/speeches/sp180620.pdf>

Bank of England (2016). Enabling the FinTech transformation: Revolution, Restoration, or Reformation? Retrieved from <https://www.bankofengland.co.uk/-/media/boe/files/speech/2016/enabling-the-fintech-transformation-revolution-restoration-or-reformation>

Bank of England (2017). Building the Infrastructure to Realise FinTech's Promise. Retrieved from <https://www.bankofengland.co.uk/-/media/boe/files/speech/2017/building-the-infrastructure-to-realise-fintechs-promise.pdf?la=en&hash=50B79E4EA60F9C66898013DD0586061AE2E9392A>

Bank of England (2017). The Bank of England's FinTech Accelerator: what have we done and what have we learned? Retrieved from <https://www.bankofengland.co.uk/-/media/boe/files/speech/2017/the-boes-fintech-accelerator-what-have-we-done-and-what-have-we-learned.pdf?la=en&hash=F4068A80F87E00D783B96C0157D4B4FE10A9AA52>

Bank of Japan (2016). Innovations in Payments and FinTech: The Central Bank's Perspective. Retrieved from https://www.boj.or.jp/en/announcements/press/koen_2016/data/ko160317a.pdf

Banque de France (2016). Financial Stability in the Digital Era. Retrieved from https://publications.banque-france.fr/sites/default/files/medias/documents/financial-stability-review-20_2016-04.pdf

Brummer, C., & Gorfin, D., (2014). FINTECH: Building a 21st-Century Regulator's Toolkit. Retrieved from <https://assets1b.milkeninstitute.org/assets/Publication/Viewpoint/PDF/3.14-FinTech-Reg-Toolkit-NEW.pdf>

Cambridge Centre for Alternative Finance, University of Cambridge Judge Business School (2018). Guide to Promoting Financial & Regulatory Innovation: Insights from the UK. Retrieved from https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/701847/UK_financial___regulatory_innovation.pdf

Capgemini (2018). World FinTech Report 2018. Retrieved from <https://www.capgemini.com/wp-content/uploads/2018/02/world-fintech-report-wftr-2018.pdf>

Central Agency for Information Technology, Consolidated Kuwait National ICT Indicators Report 2016. Retrieved from <https://www.e.gov.kw/sites/kgoarabic/Forms/FinalConsolidatedEnglishReportSinglePages.pdf>

Central Bank of Bahrain (2017). Conventional Financing-Based Crowdfunding Directives. Retrieved from http://cbb.complinet.com/net_file_store/new_rulebooks/c/o/Conventional_Financing-Based_Crowdfunding_Directives-8_Aug_2017.pdf

Central Bank of Bahrain (2017). Regulatory Sandbox Framework. Retrieved from https://www.cbb.gov.bh/assets/Whitepapers/Regulatory_Sandbox_Framework.pdf

Central Bank of Bahrain (2017). Shari'a-compliant Financing-Based Crowdfunding Directives. Retrieved from http://cbb.complinet.com/net_file_store/new_rulebooks/s/h/Sharia_Compliant_Financing-Based_Crowdfunding_Directives-8_Aug_2017.pdf

Central Bank of Chile (2017). FinTech and the Future of Central Banking: A Latin American Perspective. Retrieved from <https://www.bis.org/review/r170731e.pdf>

Central Bank of Kuwait (2016). Financial Stability Report. Retrieved from <http://www.cbk.gov.kw/en/statistics-and-publication/publications/financial-stability-report.jsp>

Central Bank of The United Arab Emirates (2017). Regulatory Framework for Stored Values and Electronic Payment Systems. Retrieved from <https://www.centralbank.ae/en/pdf/notices/Regulatory-Framework-For-Stored-Values-And-Electronic-Payment-Systems-En.pdf>

CFA Institute Research Foundation (2017). FinTech and RegTech in a Nutshell, and the Future in a Sandbox. Retrieved from <https://www.cfainstitute.org/-/media/documents/article/rf-brief/rfbr-v3-n4-1.ashx>

Clifford Chance (2017). EUROPEAN FINTECH REGULATION - AN OVERVIEW. Retrieved from https://talkingtech.cliffordchance.com/content/micro-cctech/en/fintech/european-regulatory-report/_jcr_content/text/parsystthumb/download/file.res/European%20Fintech%20Regulation%20-%20an%20overview.pdf

Clifford Chance (2017). FinTech in the Middle East. Retrieved from https://www.cliffordchance.com/briefings/2017/11/fintech_in_the_middleeast.html

Clifford Chance (2017). FINTECH IN THE MIDDLE EAST: AN OVERVIEW. Retrieved from <https://onlineservices.cliffordchance.com/online/freeDownload.action?key=OBWlbFgNhLNomwBI%2B33Qzd-FhRQAhp8D%2BxrlGRel2crGqLnALTlyZe09yAaOcJBPfMuA2WiTVt5zp%0D%0A5mt12P8Wnx03DzsaB-GwsIB3EVF8XiHbSpJa3xHNE7tFeHpEbaelf&attachmentsize=2921483>

Committee on the Global Financial System (CGFS) and the Financial Stability Board (FSB) (2017). FinTech credit: Market structure, business models and financial stability implications. Retrieved from <http://www.fsb.org/wp-content/uploads/CGFS-FSB-Report-on-FinTech-Credit.pdf>

Dell Boomi (2017). Open Banking, PSD2 and the New API Economy. Retrieved from <https://boomi.com/wp-content/uploads/Executive-Brief-%E2%80%93-Open-Banking.pdf>

Deloitte (2017). FinTech in India: Ready for breakout. Retrieved from <https://www2.deloitte.com/content/dam/Deloitte/in/Documents/financial-services/in-fs-fintech-india-ready-for-breakout-noexp.pdf>

Deutsche Bank Research (2016). Start-ups inspire markets with digital technologies. Retrieved from https://www.dbresearch.com/PROD/RPS_EN-PROD/PROD000000000441874/Start-ups_inspire_markets_with_digital_technologie.PDF

Deutsche Bundesbank (2016). Financial Stability Review 2016. Retrieved from https://www.bundesbank.de/Redaktion/EN/Downloads/Publications/Financial_Stability_Review/2016_financial_stability_review.pdf?__blob=publicationFile

Dubai Financial Services Authority (2017). The DFSA Rulebook: Conduct of Business Module (VER29/08-17). Retrieved from http://dfsa.complinet.com/net_file_store/new_rulebooks/d/f/DFSA1547_12383_VER290.pdf

European Commission (2018). Horizon 2020 Work Programme 2018-2020. Retrieved from http://competitivite.gouv.fr/documents/commun/Financements/Les_programmes_europeens/H2020%20Programme%20Travail%20TIC%202018%202020.pdf

Europeye srl (2017). Fintech and Banking. Friends or Foes? Retrieved from https://european-economy.eu/wp-content/uploads/2018/01/EE_2.2017-2.pdf

EY (2016). UK FinTech On the cutting edge: An evaluation of the international FinTech sector. Retrieved from <https://www.ey.com/Publication/vwLUAssets/EY-UK-FinTech-On-the-cutting-edge/%24FILE/EY-UK-FinTech-On-the-cutting-edge.pdf>

EY (2017). Open Banking: Adapting to the new banking landscape. Retrieved from <http://beyondeyportugal.pt/wp-content/uploads/2017/10/Open-banking-leaflet.pdf>

EY (2018). As FinTech evolves, can financial services innovation be compliant? : The emergence and impact of regulatory sandboxes - in the UK and across Asia-Pacific. Retrieved from [https://www.ey.com/Publication/vwLUAssets/ey-the-emergence-and-impact-of-regulatory-sandboxes-in-uk-and-across-apac/\\$FILE/ey-the-emergence-and-impact-of-regulatory-sandboxes-in-uk-and-across-apac.pdf](https://www.ey.com/Publication/vwLUAssets/ey-the-emergence-and-impact-of-regulatory-sandboxes-in-uk-and-across-apac/$FILE/ey-the-emergence-and-impact-of-regulatory-sandboxes-in-uk-and-across-apac.pdf)

Federal Reserve System (2016). The Opportunities and Challenges of Fintech. Retrieved from <https://www.federalreserve.gov/newsevents/speech/brainard20161202a.pdf>

Financial and Economic Review (2017). The Impact of the Fintech Phenomenon - Radical Change Occurs in the Financial Sector? Retrieved from <http://english.hitelintezetiszemle.hu/letoltes/adam-kerenyi-julia-molnar.pdf>

Financial Services Regulatory Authority (2016). FinTech Regulatory Laboratory Guidance (VER01.31082016). Retrieved from https://www.adgm.com/media/304700/guidance-icos-and-crypto-assets_20180625_v11.pdf

Financial Services Regulatory Authority (2018). Guidance - Regulation of Crypto Asset Activities in ADGM. Retrieved from <https://www.adgm.com/media/304701/guidance-regulation-of-crypto-asset-activities-in-adgm-25th-june-2018-2.pdf>

Financial Services Regulatory Authority (2018). Regulation of Initial Coin/Token Offerings and Crypto Assets under the Financial Services and Markets Regulations (VER02.24062018). Retrieved from https://www.adgm.com/media/304700/guidance-icos-and-crypto-assets_20180625_v11.pdf

Financial Stability Board (2017). Financial Stability Implications from FinTech: Supervisory and Regulatory Issues that Merit Authorities' Attention. Retrieved from <http://www.fsb.org/wp-content/uploads/R270617.pdf>

FinTech Consortium, Economic Development Board Bahrain & Bahrain FinTech Bay (2018). Bahrain FinTech Ecosystem Report 2018. Retrieved from <https://www.bahrainfintechbay.com/fintech-ecosystem-report>

Gulf Bank (2016), Gulf Bank Announces the Middle East's First 'Blinking to Bank' Biometric Mobile Banking App. Retrieved from <https://www.e-gulfbank.com/eng/aboutUs/newsroom/articles/201605251258GulfBankAnnouncetheMiddleEastsFirstBlinkingtoBankBiometricMobileBankingApp.jsp>

Holotiuk, F, Klus M. F, Lohwasser T. S, Moormann J (2018). Motives to Form Alliances for Digital Innovation: The Case of Banks and Fintechs. University of Maribor Press.

International Finance Corporation (2017). Digital Financial Services: Challenges and Opportunities for Emerging Market Banks. Retrieved from <https://www.ifc.org/wps/wcm/connect/4e45d83f-e049-41d3-8378-2e388ffc1594/EMCompass+Note+42+DFS+Challenges+updated.pdf?MOD=AJPERES>

KPMG (2017). Forging the future: Embracing fintech to evolve and grow. Retrieved from <https://home.kpmg.com/xx/en/home/insights/2017/10/forging-the-future-with-fintech-fs.html>

Kuwait News Agency's IT department, Survey conducted in 2016. Retrieved from <http://news.kuwaittimes.net/website/social-media-kuwait-double-edged-sword-72-kuwaitis-use-social-media-5-hours-day/>

McKinsey&Company, World Federation of Exchanges (2018). FinTech Decoded. Retrieved from <https://www.mckinsey.com/~media/McKinsey/Industries/Financial%20Services/Our%20Insights/Fintech%20decoded%20The%20capital%20markets%20infrastructure%20opportunity/Fintech-decoded-Capturing-the-opportunity-in-capital-markets-infrastructure-final-web-version.ashx>

Milken Institute (2017). FinTech: Considerations on How to Enable a 21st Century Financial Services Ecosystem. Retrieved from <https://assets1c.milkeninstitute.org/assets/Publication/Viewpoint/PDF/WP-080317-Considerations-on-How-to-Enable-a-21st-Century-Financial-Services-Ecosystem.pdf>

Monetary Authority of Singapore (2017). Monetary Authority of Singapore and the Danish Financial Supervisory Authority Signs FinTech Agreement. Retrieved from https://www.gov.sg/~sgpcmedia/media_releases/mas/press_release/P-20170629-1/attachment/Joint%20media%20release%20-%20Monetary%20Authority%20of%20Singapore%20and%20the%20Danish%20Financial%20Supervisory%20Authority%20Signs%20FinTech%20Agreement.pdf

Monetary Authority of Singapore (2017). Singapore FinTech Journey 2.0 - Remarks by Mr Ravi Menon, Managing Director, Monetary Authority of Singapore. Retrieved from <http://www.mas.gov.sg/News-and-Publications/Speeches-and-Monetary-Policy-Statements/Speeches/2017/Singapore-FinTech-Journey-2.aspx>

NASDAQ (2018). FinTech Trends 2018: How Technology is Rewriting the Capital Markets. Retrieved from http://images.nasdaqtech.nasdaq.com/Web/NasdaqMarketTech/%7Bb3d0079d-5338-4b2e-84b8-7d094b014502%7D_0387-Q18_FinTech_Trend_Report_2018_3.pdf

National Economic Council (2017). A Framework for FinTech. Retrieved from https://obamawhitehouse.archives.gov/sites/obamawhitehouse.archives.gov/files/documents/A%20Framework%20for%20FinTech%20_FINAL.pdf

Navaretti, G B, G Calzolari and A F Pozzolo (2017). FinTech and Banks. Friends or Foes?. European Economy 2017(2).

Nesta & Cambridge Centre for Alternative Finance, Understanding Alternative Finance: The UK Alternative Finance Industry Report 2014. Retrieved from <https://www.jbs.cam.ac.uk/faculty-research/centres/alternative-finance/publications/understanding-alternative-finance/>

Oliver Wyman (2017). FINTECH IN CHINA: HITTING THE MOVING TARGET. Retrieved from https://www.oliverwyman.com/content/dam/oliver-wyman/v2/publications/2017/aug/Fintech_In_China_Hitting_The_Moving_Target.pdf

Protiviti (2016). Fintech Compliance Readiness. Retrieved from https://www.protiviti.com/sites/default/files/united_states/insights/pov-fintech-compliance-readiness-protiviti.pdf

Qatar Central Bank, Qatar Financial Markets Authority & Qatar Financial Centre Regulatory Authority (2017). The Second Strategic Plan (2017-2022). Retrieved from <https://www.qcb.gov.qa/English/AboutQCB/Documents/The%20Second%20Strategic%20plan%202017-2022%20english.pdf>

Reserve Bank of India (2017). Report of the Working Group on FinTech and Digital Banking. Retrieved from <https://rbidocs.rbi.org.in/rdocs/PublicationReport/Pdfs/WGFR68AA1890D7334D8F8F72CC2399A27F4A.PDF>

Stone&Chalk, Meetig8 (2018). RegTech in the Bag. Retrieved from https://download.asic.gov.au/media/4652477/regtechinthebag_sydney_13feb.pdf

The Treasury of the Australian Government (2018). A win for Aussie FinTechs looking to London. Retrieved from <https://sjm.ministers.treasury.gov.au/media-release/023-2018/>

UAE Securities and Commodities Authority (2017). SCA Launches A Fintech Project Targeting UAE Markets Jointly with PwC. Retrieved from <https://www.sca.gov.ae/English/News/Pages/Articles/2018/2018-2-13.aspx>