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Is Pakistan Ready to Embrace Fintech Innovation?

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Abstract

Pakistan is an emerging market for fintech, with increasing facilitation for digital payments, widespread internet and smartphone penetration, consumer preferences for social media and booming online commerce. Also, the State Bank of Pakistan provides sound regulations, which act as a platform for fintech growth. While regulations are necessary, they might also become a threat for an industry still in its infancy. This paper aims to provide a qualitative assessment of economic, demographic and technological factors that are conducive for the penetration and growth of fintech in Pakistan. A second, but no less important, objective of this paper is to look at the regulatory framework governing fintech and its contribution in making the segment an active or dormant player in the financial services industry.

Keywords: Fintech, disruption, innovation, financial services, emerging market, Pakistan.

JEL classification: G20, K20, O16.

1 Introduction

Fintech is a segment of industries consisting of technology-focused companies with innovative products and services, traditionally provided by the financial services industry. These companies work in the areas of stocks trading, peer-to-peer lending, cryptocurrencies, transfer payments and equity crowdfunding, among others. Globally, fintech innovation has aided financial advancement, resulting in new business models, processes, applications, products, or services, changing the face of global payments with a substantial effect on financial institutions and the efficiency of financial services. According to some estimates, by the end of 2017, the size of the global fintech market had already reached 3.6 trillion USD and is expected to reach as high as 8.3 trillion USD by 2022. Fintech influence on

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financial services is growing, as 82% of incumbents expect to increase fintech partnerships in the next three to five years, and the annual ROI on fintech related projects is expected to be around 20% (Rickert et al. 2017).

The fintech market is continuously evolving and expanding with an increasing diversity of funding sources, scope of business and geographic spread. These innovations are intense in nature; hence they hold a considerable potential to alter and restructure existing financial services. Most fintechs combine financial services with additional activities associated with e-commerce, sharing-economy businesses and big data analytics to provide new added-value (Nakaso 2016). Apart from the technology-led platform for the users of financial services, fintech innovations also provide a wide array of choices for users, ranging from efficient and secure payments to better accessibility of financial services, resulting in improved financial inclusion and an ideal experience in terms of cost and efficiency.

For consumers, fintechs offer personalized and interactive services by allowing them to conduct transactions over their mobile device, boosting customer experience. Among the notable services that allow consumers to make online payments are *PayPal* that supports purchases made through *eBay*, and *Amazon pay* for purchases made through *Amazon.com.* In China, *Alipay* works with *Taobao*, the Chinese equivalent of *eBay*. Among other recent advancements in developed and BRIC markets, companies like *Venmo, Google Wallet, WeChat, Facebook Messenger* and *Snapchat* have set up Person-to-Person (P2P) internet-based solutions that enable people to send money to each other using a mobile device. This seems to be more convenient than physically transferring cash or making online bank transfers (Mccaffrey & Schiff, 2017).

Fintechs also complement the conventional role of financial institutions by assisting incumbents in providing products and services efficiently and increasing the spread of the industry. Fintechs, by developing easier and innovative financial products and solutions at lower costs have enabled the provision of these to the poorer segment of society, who heretofore have been financially excluded (KPMG, UK, 2017). For businesses, some fintechs operate to detect fraud (e.g., Ravelin), manage risks and deal with compliance issues (e.g., Covi Analytics).

Among its other significant impacts on the traditional banking sector (payment systems, lending and financial advice) and capital markets, fintechs have provided improved access to services, a reduction in prices, costs of intermediation and information asymmetries, and have improved efficiency (Gregorio, 2017). In terms of transaction payments, banks still dominate the market, but payments made through non-bank sources such as Apple, Google, PayPal and other mobile payment options are gaining popularity, disrupting traditional modes of payment. Digital currencies, such as *Bitcoin* or *Ethereum*, use advanced encryption methods to control the generation of currency units through blockchain technology. This technology comprises a digital database for the verification of transactions, with a system of decentralized blocks of records. This allows peer-to-peer transfer of value to take place without the need for an intermediary to confirm the transaction, as computers validate every transaction. Blockchain technology has the potential to be disruptive, as it paves the way for various cost-saving innovations and permits a currency without the support of a government or intermediary - the function traditionally performed by banks.

The upsurge of pioneering fintech solutions is posing an ever-growing risk to the existing players in the traditional banking business models. Many fear losing business to innovators, beginning with payments, fund transfer and personal finance sectors. This disruptive shift in technology and business model innovations has also raised regulatory concerns globally, as strong regulations exist for mainstream financial institutions only and may not be adequate to deal with the complexities of fintechs (disruptors). Therefore, most fintech companies face regulatory uncertainty in terms of the laws with which they will need to comply, or possible over-regulation as an intimidation to their growth.

Fintech has reshaped the financial sector on a global scale, and its transformative potential is also seen in developing economies. Pakistan, being the world's sixth most populated country, is a cash-based economy with 85 percent of its population being financially excluded. The high banking infrastructure costs act as a barrier to the diffusion of financial services beyond a small fraction of the population. At present, only a few fintechs operate in the country, and those are primarily in the developed cities of Lahore, Karachi and Islamabad. This sluggish growth and the shortage of fintechs in Pakistan is a consequence of investment in this sector only at the local level, and therefore inadequate. The fintech ecosystem in the country is hobbled by threats to data security and intellectual property, trouble attracting the right talent and customer base, and uncertainty in future regulation, which discourages entrepreneurs from venturing into the fintech environment (Shahid et al. 2016).

However, Pakistan possesses the potential to be an attractive market for fintech growth, owing to the increasing youth population, disruptive internet and smartphone penetration, consumer preference for mobile phones and social media, booming online commerce facilitating digital payments and an overall financial system having absorption capacity for innovation. The regulatory framework for financial services is fairly strong in Pakistan, with laws such as Payment System Operators (PSOs), Payment Service Providers (PSPs) and Branchless Banking regulations issued by the State Bank of Pakistan (SBP). All of these could act as platforms for carefully controlled and regulated *fintech-led* growth. Nonetheless, stringent regulations should not be viewed only as a support, as it might also become a threat for the emerging fintech industry, which is still in its infancy stage.

This paper primarily provides a qualitative assessment of economic, demographic and technological factors that could be conducive for the penetration and growth of fintech in Pakistan. The secondary, but equally important, contribution of this paper is the analysis of the regulatory framework governing fintech in Pakistan and the contribution of these regulations in making the segment an active or dormant player in the financial services industry.

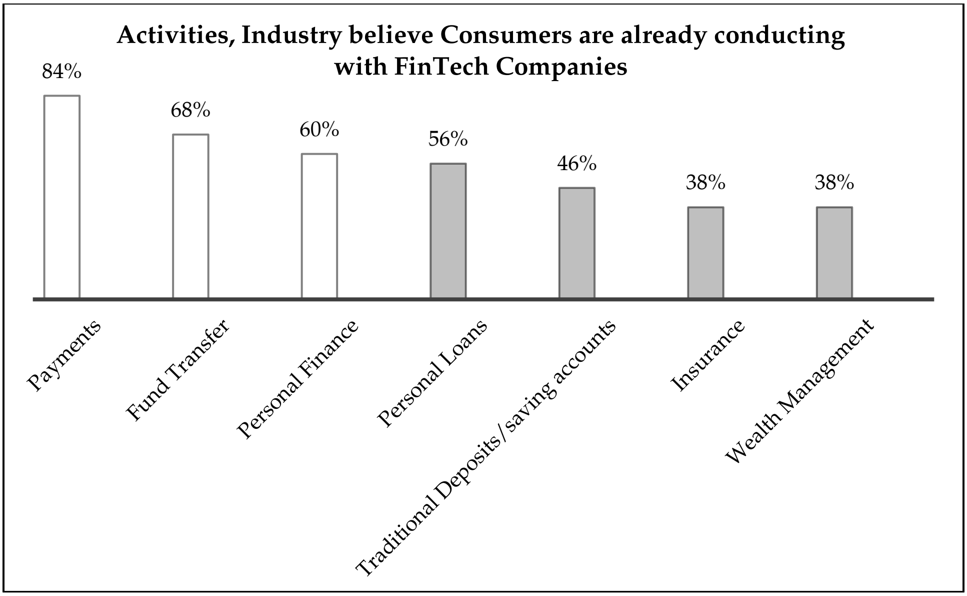
The paper is organized as follows: section 2 provides an overview of the global fintech industry and its various categorizations, drivers, impacts, opportunities and challenges for growth; section 3 presents the current state of the fintech industry in Pakistan; section 4 provides a qualitative assessment of the opportunities and challenges faced by fintechs in Pakistan; section 5 discusses the regulators and regulations governing fintech in Pakistan and stresses the need to create a balance between rectifying inaccuracies of fintechs with the flexibility to revolutionize in order to develop a favorable environment for fintechs in Pakistan; and section 6 concludes with forward-looking policy recommendations, for the industry players and regulators based on the learning of global best practices that several countries have adopted to deal with this digital revolution.

2 Understanding Fintech

Fintech is a global advancement of financial services driven by technology and shifts in customer expectations. Fintech firms employ technology to deliver the best financial solutions to clients with an aim to digitize the financial segment, resulting in cost reductions and new ways of working to gain transparency in the market (Gregorio, 2017).

Primarily operating in areas of banking, insurance and asset management (KPMG UK 2017), fintechs have been classified into various domains. Gregorio (2017) identifies five broad areas where fintech firms are operational. These include 1) finance and investment (venture capital and crowdfunding), 2) internal finance operations and risk management, 3) payments and infrastructure (electronic payments and Over-the-Counter derivate trading), 4) data monetization and security, and 5) customer interface.

Figure 1: Business Domains where Fintechs are Active



Source: Adapted from PWC Global Fintech Report, 2017.

Fintechs spread into many domains of financial services, ranging from products to markets to services. Figure 1 shows that payments, fund transfers, and personal finance are the most active sectors in which fintechs operate. In other domains, such as insurance and wealth management, consumers are less active.

Fintechs, based on the stages of their life cycle, can be classified into start-ups, unicorns and GAFAs. These can be defined as follows:

a) A **Start-up** is a firm whose aim is to initiate a business activity associated with technology, the internet or innovation. Such young firms have an inventive business plan and are growing in the market. Their human organization develops products and services in diverse ways by applying innovation, with the aim of decreasing costs. The focus of their design and commercialization is customer oriented and the internet platform is used to move it forward (Prashantham & Yip, 2017). These firms provide services using social networks and conduct activities previously managed by banks (Romānova & Kudinska, 2016).

b) **Unicorns** are companies having a theoretical value of more than US$1 million. Their market value is largely based on the percentage of speculation linked with their expectation of profitability and future growth. The business model focuses on acquiring a large customer base. It is expected that in the future they will have to be regulated to control their actions.

c) **GAFAs** (Google, Amazon, Facebook and Apple**)** are the revolutionary firms of the stage ".com" and are presently working as digital monopolies, well known as GAFAnomics (MEDICI Team, 2016).

2.1. Drivers of Fintech Growth

Fintech growth has been driven by a number of factors, including technological evolutions, innovation spirals, changing consumer demands and fluctuations in the macroeconomic and financial background.

Technology is the center of the changing payments setting, with better solutions and capabilities swaying consumer behavior and expectations also driving considerable industry transformation (Broom, 2015). The technological and payment system developments, such as cloud-based solutions and application programming interfaces (APIs), are being adopted by businesses, especially startups, to build and adapt their operations more efficiently. New cloud and API technology has aided the start-up sector to disrupt recognized players and quicken change.

The prevalence of mobile devices has driven the move towards adopting mobile financial services, such as mobile banking and payments. Smartphone technology itself has given a boost to fintech innovations such as mobile payment technologies, online brokerage and banking products that are needed to match the progressively mobile lifestyle that smartphones have facilitated.

The growth in e-commerce, mainly due to demand by consumers, has facilitated further transformation in digital payment experiences, with a shift towards a post-cash economy. Those tech-savvy consumers engaged in online shopping and banking value ease-of-use, convenience and speed, which has pushed businesses to incorporate financial technology into their setup.

Also contributing to fintech growth are millennials, known as Generation Y, who value innovation and are more likely to use new financial services and products. Along with innovation, their social media openness and adaptability towards the latest automated gadgets makes them keen to demand fintech products that fit their busy way of life and mindset. The demand for personalized and easy-to-use products and services by consumers is an opportunity for fintechs to respond by developing products well-suited to their needs (Lei, 2014).

Further, in this era, digital or cashless payments are seen as an alternative to cash and plastic money since they are more convenient and secure in the daily lives of individuals in terms of their consumption (Japan-METI, 2017). Digital technology has begun to dominate so that the physical act of paying is rarely seen. Instead, the automation of payment has converted money from a physical form of exchange into another form of data (OECD, 2002); thus acting as a key driver of fintech growth.

Globalization and other changes in market trends have also contributed to the rapid development of this sector. The world has become globalized as developing markets have the capacity to surpass their more advanced equivalents, and the transferal of new information is both rapid and worldwide. Currently, penetration of innovations is possible at a much faster rate than ever before. The remarkable growth of smartphone and mobile usage is now placing digital services in the hands of consumers who earlier could not be reached, providing a richer, more valuable experience around the globe.

From an unorthodox perspective, it can be claimed that the global financial crisis in the United States in 2008, which later spread to Europe and Asia, has also played a revolutionary role in increasing the prominence of fintech. During the financial crisis, banks were not willing to borrow money. This dysfunctionality of the credit market had negative effects on the economy in terms of consumption and investment. The increased number of layoffs and uncertainty about the future caused consumption to plummet, further negatively affecting employment. These factors signaled firms to cut their prices and costs in order to keep up sales. As a consequence, fintech companies came into play as one of their objectives was to reduce costs and reach out to many customers over the internet (Gregorio, 2017).

Since the onset of the Global Financial Crisis, the banking industry has witnessed changes in growth, digitization and the regulatory environment. The increasing pressure of competition is fierce. The regulators who were once opposed to non-bank entrants have now become open to the idea of allowing them, acting as threats to banks. The cutthroat competition between banks creates a need for collaboration with fintechs to provide new products in order to meet the growing demand of consumers and digitizing processes.

2.2. *The Impact of Fintech in the World*

Fintechs have had expected impacts on the banking industry and financial markets. The substantial digitalization of processes has reduced transaction costs and increased convenience for end users. Specifically, widespread internet access and mobile phone penetration have distributed the advantages in reduction of the cost of transactions, due to novel communications technologies, to billions of people. Now, fintechs offer products and services to customers that are much more in line with their demands compared to products offered by traditional intermediaries. By reducing the role of intermediaries and improving working efficiencies, fintech firms are better able to offer products and services at diminished costs, increasing returns for consumers (KPMG, UK, 2017). This reduction in transaction costs eventually puts pressure on the conventional financial intermediaries who are competing to develop products that meet the ever-growing needs of consumers (Bergara & Ponce, 2017). A possible consequence of this changing market structure could be the vertical integration of the financial intermediaries and fintech firms. Additionally, falling transaction costs have had implications for financial inclusion of the underserved population and business sector, especially in developing economies (KPMG, UK, 2017). According to Manyika, Lund, Singer, White & Berry, 2016, 45 percent of adults lack access to a financial account at a bank or other financial institution. By providing the underserved population with low cost innovative solutions and small businesses with funding resources and access, fintechs improve financial inclusion. Fintechs also increase the accessibility of information on financial services, such as online/mobile banking services and investment advice (Alexander, 2017). Moreover, business practices improve with digital payments, allowing them to maintain an electronic record of sales and expenses, monitor cash flows that enhances their understanding of business operations, eventually boosting profitability and productivity (Manyika et al., 2016). The development of branchless banking (BB) has reduced the cost of conducting transactions and of setting up bank branches, which contributes to economic growth through networks of output growth, employment creation, productivity, lessened transaction costs, improved functioning markets and financial inclusion, eventually resulting in poverty alleviation (Triki & Faye, 2013).

In conclusion, fintechs have had pronounced effects on economies, ranging from reductions in transaction costs and information asymmetry to improvements in financial inclusion, efficiency and competition, and a wider access to financial services.

3.1. Opportunities and Challenges Faced by Fintechs Globally

The fintech revolution is considered by many to be among the most important global innovations in the financial industry and has been growing rapidly in previous years. Global investment in fintechs have experienced a 67 percent annual increase from the first quarter of 2015 to 2016, reaching $5.3 billion, with Europe and Asia-Pacific experiencing the highest increases (Lee & Shin, 2018).

Fintechs require an encouraging business environment in order to develop. Closely integrated technology hubs and the availability of skilled staff, such as IT developers, banking analysts and management staff, are important elements for the development of a healthy fintech environment. The state of physical infrastructure (road networks), utilities (power, telecommunication, internet) and distance to existing business hubs are also imperative. Government support in the form of implementing regulations to facilitate ease of doing business, setting licensing requirements and providing financial support for the construction of the fintech hubs, creation of seed funds, grants, or subsidies provide opportunities for fintech development (Diemers, Lamaa, Salamat & Steffens, 2015).

The U.S. is a successful market for fintech growth as it is a leading international financial hub, has strong support structures, healthy financers (Barclays, Bank of America, and Wells Fargo), incubators and accelerators, tax credits for research and development, possesses a large financial technology workforce and attracts large investments (Diemers et al., 2015). The Middle East has also witnessed rapid fintech growth, with success primarily due to strong regulatory support, government-driven funding programs (e.g., Hamdan Innovation Incubator, SeedStartup, In5), venture capitalists, and local financial services providing early-stage funding for startups. For China, the growth in its middle-class, together with a progressive educational system and its dynamic participation in global supply chains, has led to a strong tech ecosystem comprising large local tech firms, robust engineering and business skillsets, and active private equity and venture capital investors. India has also experienced advances in infrastructure, specifically the ability to connect a digital identity to bank accounts enabling financial institutions to expand outreach to millions of new customers. These improvements are paving the way for augmented delivery of financial services from both traditional and nontraditional providers. Further, demonetization of currency notes in 2016 has enhanced the shift from paper to electronic payments and driven the technology-based transformation of financial services in the country (IFC, 2017).

Advances in financial technology improve access to services for the financially underserved community or small businesses by improving the speed, cost and ease of use of such services. Fintech businesses offering financial services have an opportunity to improve their product to gain market share and decrease per-customer operating costs (Mnuchin & Phillips, 2018).

Consumer expectations from financial service providers are a major driver of the fintech revolution. Consumers want financial institutions to rapidly respond to their growing needs and have an increased demand for personalized services. Fintechs, in areas of e-commerce and online banking, have an opportunity to capitalize on these consumer needs (Rickert et al., 2017). Digitization increases competition among traditional firms and opens doors for new firms with distinctive business models, such as peer-to-peer lending, digital-only banks and crowdfunding platforms. Though these fintech firms start at a smaller scale, their expertise in technology helps them to disrupt the status quo. Increased digitization in the payment process has also led to significant cost reductions for firms using existing payment processes, for example, substituting paper checks with electronic payments and minimizing inefficiencies in cross-border payments.

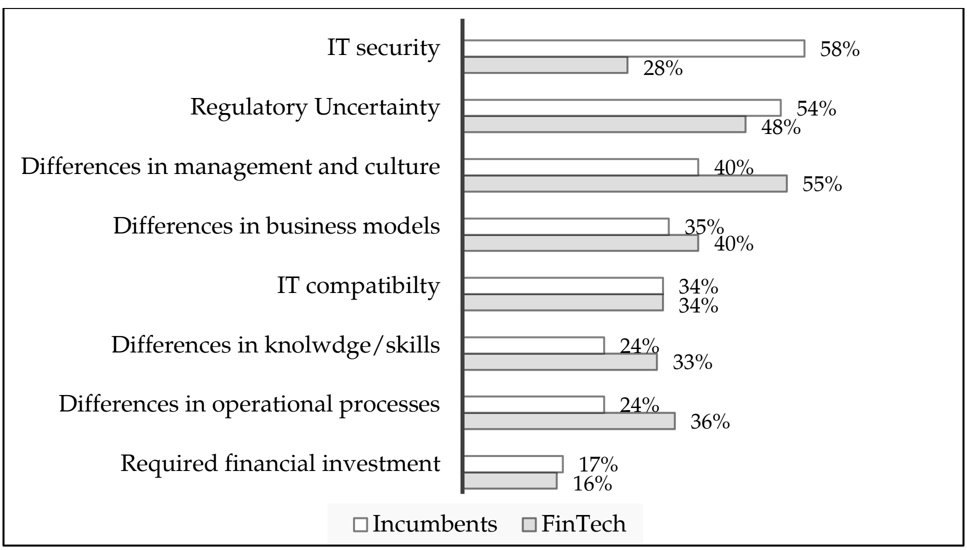
Despite growing impressively, fintechs face a number of complex challenges: regulatory concerns, technology integration, and data privacy and security (Lee & Shin, 2018). Unlike conventional banks and financial institutions, fintechs face regulatory uncertainty, i.e., they are unaware or unsure of the regulations and procedures with which they will need to comply. These could be regulatory challenges for anti-money laundering, capital requirements, data security, and privacy. Each of these could cause registration delays or raise the possibility of being hit with heavy fines.

Since fintechs are built with new technologies, it is a challenge to integrate the fintech applications with the present systems. For the internal development of fintech startups, it is necessary to collaborate or establish joint ventures with banks through incubator programs and corporate ventures. Without a comprehensive integration design, existing banking processes may become unsuitable for use with new technologies, which financial institutions may then not be able to use.

Information security and privacy breach is another major challenge fintechs have encountered worldwide. In online payment applications, such as Google Wallet and MasterCard Pay Pass, critical information stored on mobile devices can become lost or stolen. To counter this, fintech companies must develop, strengthen and maintain suitable measures to protect sensitive consumer data from illegal access. To accomplish this and build consumer trust, they should work closely with regulatory bodies and consumer protection agencies.

PwC, in their Global Fintech Report 2017, have also identified challenges faced by fintech companies and incumbents globally as shown in the Figure 2 below.

Figure 2: Challenges faced by Fintechs and Incumbents Globally



Source: Adapted from PWC Global Fintech Report, 2017.

Figure 2 shows differences in management and culture (55 percent), regulatory uncertainty (48 percent) and business models (40 percent) are identified as major challenges for fintechs. Information technology security (58 percent) is the biggest challenge for most incumbents, followed by differences in management and culture (54 percent), and regulatory uncertainty (40 percent).

3 Fintech in Pakistan

Pakistan, the world's sixth most populated country, is a cash-based economy. The problem of low access to finance has long plagued the Pakistani economy (World Bank, 2017). Ninety-three percent of the adult population remains unbanked (Rizvi, Naqvi & Tanveer, 2017). Pakistan occupies a low rank in financial inclusion when compared to regional and global standards (Nenova & Ahmad, 2009). High intermediation costs with high interest rate spreads, financial illiteracy, high collateral requirements, and prohibitive lending rates have put finance out of the reach of small and medium enterprises. Such high financial exclusion not only makes individuals and businesses vulnerable to income shocks, but also increases their operating costs and dampens future investments. Technology can be harnessed to enlarge geographical outreach, as well as overcome low literacy levels. Through the new technological solutions of branchless banking and mobile banking, physical access to finance can be improved. Partnerships between banks and informal providers could make their services more geographically reachable, less intricate, and more easily understandable for consumers. Pakistani consumers' general perception regarding the (in)significance of formal finance in their daily lives, difficult banking procedures, low outreach, and unsuitable products provides an opportunity for fintechs to design personalized products (World Bank, 2017). Microfinance Institutions (MFIs) in Pakistan are faced with the need for greater funding in order to grow and integrate with financial markets, though they possess immense potential to expand outreach. The use of technology and partnerships with fintech startups will allow them to expand outreach. Current weaknesses of the financial sector could serve as an opportunity for digital financial services to offer solutions to the problem of outreach.

3.1. Type of Fintechs in Pakistan

The fintech industry already exists in Pakistan. Originally, Automatic Teller Machines (ATMs), debit and credit cards were the main products developed by these firms for commercial banks. The introduction of these services was driven by globalization and the rapid technological advancement that was taking place around the globe. Presently, a new class of fintech has emerged in Pakistan that has revolutionized technology and enabled solutions for delivering financial products and services. The products and applications developed by these fintechs aim to revolutionize payment systems, improve financial inclusion, and increase the overall productivity of the economy. The reduced transaction costs for fintech firms allow them to develop products specific to consumer needs, creating competition for the incumbent financial service providers in the country, who, in order to compete, will need to collaborate with fintech firms. This collaboration can be mutually beneficial for both parties, since fintechs have an entrepreneurial approach and incumbent banks possess a large customer base and a repository of customer data. Banks provide the regulatory cover to firms, which focus on innovation and the development of products to be used by the bank's customer base. A successful example of this is the FINCA Microfinance Bank-Finja partnership. Finja, a fintech startup, is developing a mobile wallet application, while FINCA provides a regulatory cover by maintaining a branchless banking license.

Table 1 provides an overview of the fintechs that currently operate in Pakistan, classified into traditional and emergent fintechs.

As a distinction, traditional fintechs work together with incumbent financial service providers as their technology providers through traditional pricing models. Emergent fintechs, also known as disruptors, collaborate with a bank or financial service firm by means of new engagement models where they provide new technology solutions to facilitate existing needs.

Table 1: Fintechs Currently Present in Pakistan

Traditional Fintechs	Services Offered	Emergent Fintechs	Services Offered
ABACUS	Management Consulting, Technology and Outsourcing Services	**BATWA**	Mobile Wallet
AUTOSOFT	Banking products, Consulting Services	**FINJA**	Zero Cost Payment Systems and Cloud Based Payroll Solutions
INNOV8	Technology and Consulting Solutions	**ONELOAD**	Online Mobile Top-up
KARLOCOMPARE	Web Application for Personal Finance	**PAYLOAD**	Payment Solutions
MONET	E-Payment Processing	**RED BUFFER**	Customized Cloud and Mobile Solutions
TPS	Payment Solutions	**STOCKSFM**	Social Investment Network

Note: Adapted from (Shahid et al., 2016) and improved by the authors.

- *Abacus Consulting,* founded initially as a management consulting firm, has now grown into one of the leading business solutions providers in Pakistan. Their primary focus is on developing finance-related business solutions for business and organizations.
- *AutoSoft Dynamics* is a software development venture that develops financial applications used by domestic and international banks.
- *Inov8* is a digital payment company that is growing rapidly in the region. In collaboration with *Easypaisa*, it links its massive distribution setup to all commercial banks that have implemented Inov8's technology. Another application under the name, Fonepay, has also been launched which allows the use of smartphones for making payments.
- *KarloCompare* is a web and mobile application that allows users to compare and buy easily a range of financial products such as personal/auto loans, credit card and travel insurance, with a few clicks.
- *Monet* is an e-payment provider that focuses on digitizing payments in cash-based economies. It was established with the idea and directive to offer electronic payment processing and flexible services in the Branchless and Alternate Banking Channels sphere. Currently, Monet has its own infrastructure and systems operated at Monet Data

Centre(s) to aid banks, financial institutions, and merchants in furnishing their payment transaction processing requirements.

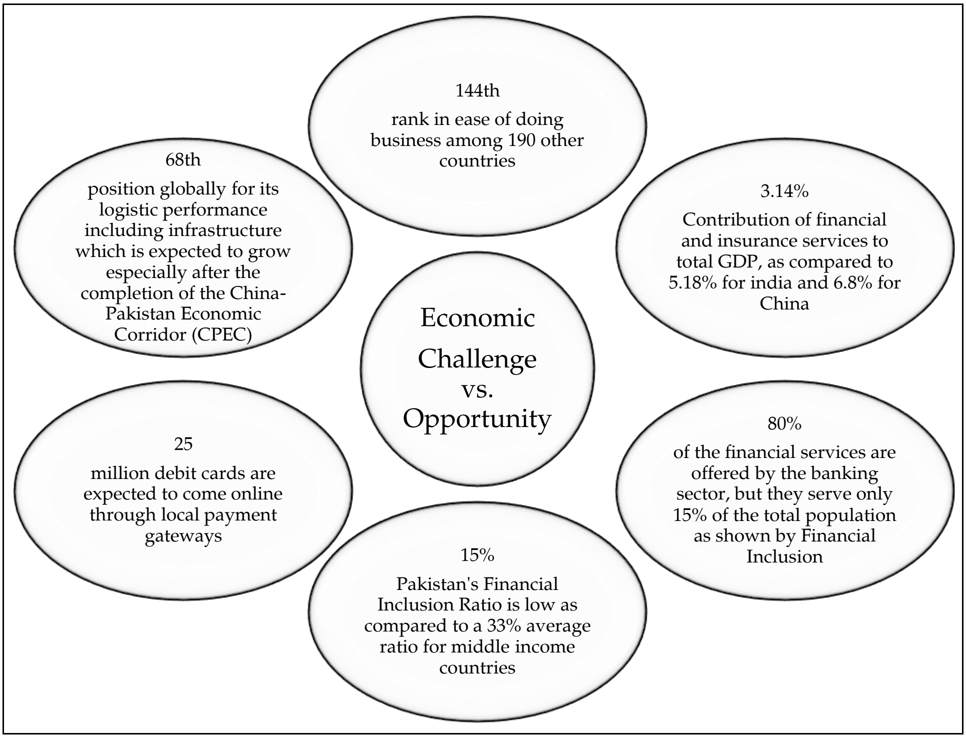
- *TPS* provides cards and payment solutions enabling banks, payment processors, telecoms and other institutions in digitizing payments. They also offer business and technical expertise in pre-paid cards, card management, delivery channel management, and internet and mobile banking.
- *BATWA* is a small startup and provides a mobile wallet to its users for payment purposes.
- *FINJA,* founded by banking and tech industry experts, is a fintech startup serving as a zero cost payment platform and a unified loan and e-commerce marketplace. The SimSim app solution is the first payment solution in Pakistan for free and frictionless payments made instantaneously. This application will be interconnected with the users' current account, allowing them to make payments at a variety of partner retail businesses through their smartphones.
- *OneLoad* is an online platform that allows users to purchase top up credits for their mobile accounts with all mobile companies simply through its efficient mobile application and web portal.
- *Payload* is incubated at *Plan9*, and has developed an easy-to-use technology that permits businesses to receive bitcoin payments while dealing with payments in Pakistani Rupees.
- *Red Buffer* focusses on developing data science services, machine learning/natural language processing (ML/NLP), and cloud and mobile applications.
- *Stocksfm* is a financial communications platform for the financial and investing public. Stocksfm generated the $TICKER tag to allow users to organize and establish "streams" of information around stocks and markets across the web and social media. These streams provide new forms of insight, ideas and information that are used by investors, analysts, media and others as they research stocks and manage their investments across the internet and social media websites. This provides understanding and ideas to investors, media analysts, and others for use in researching and managing their financial investments (Tamoor, 2017).

4 Fintech Growth in Pakistan: Challenges vs Potentials

This section provides a qualitative assessment of economic, demographic and technological factors that could serve either as threats or opportunities for the penetration and growth of fintech in Pakistan.

At present, only a few fintechs operate in Pakistan and those are primarily in the developed cities of Lahore, Islamabad and Karachi. The sluggish growth and shortage of fintechs in Pakistan is a consequence of primarily local, and therefore inadequate, investment in the segment. The current fintech ecosystem in Pakistan could be characterized by holes in various information areas, hindering all ecosystem members and hierarchies. Limited fintech investment raised solely from local investors, a dearth of partnership platforms for fintech incumbents and investors, poor quality of the IT sector (Figure 5), an unwelcoming attitude by incumbent organizations towards partnerships with fintech firms, and difficulties in modifying the behavior of customers are among the key challenges fintech firms have faced (Shahid et al., 2016). The Fintech ecosystem is also subject to several hindrances comprising threats to data security and intellectual property, trouble attracting the right talent and customer base, and an uncertain regulatory environment discouraging entrepreneurs from venturing into the fintech environment. The economic, demographic and technological environment in Pakistan also presents a number of challenges to fintech growth as shown in Figures 3, 4 & 5 below.

Figure 3: Economic Challenges and Opportunities in Pakistan

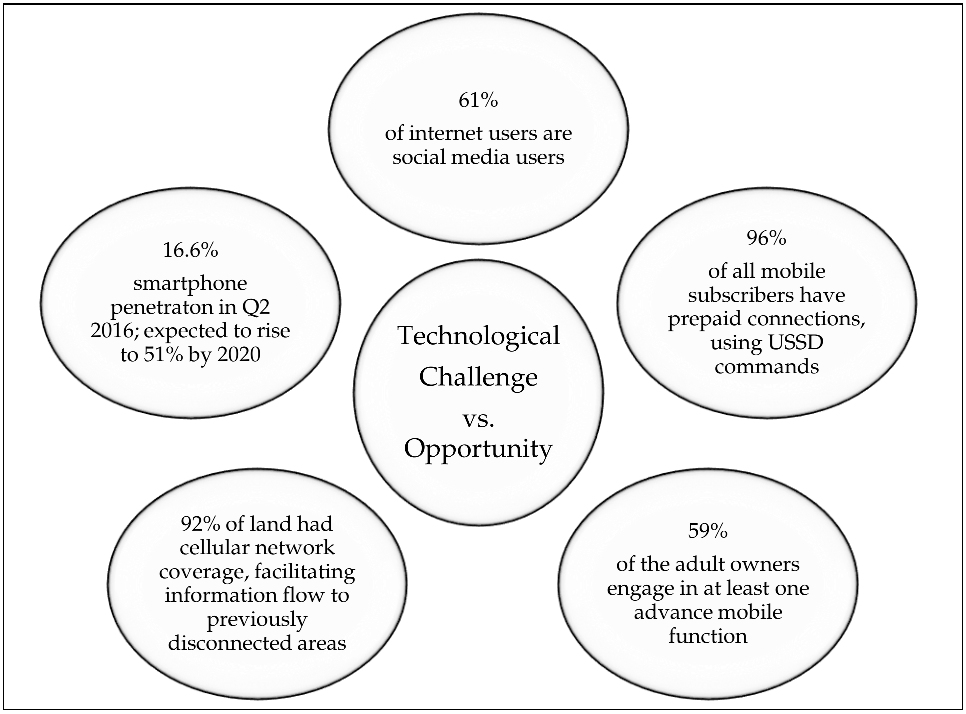


Source: World Bank, State Bank of Pakistan, Karandaz, UNESCO, Pakistan Telecommunication Authority.

Figure 3 presents the economic challenges and opportunities for fintechs in Pakistan. The current state of financial inclusion in the country is disappointing as Pakistan is ranked 16th of 26 nations according to *The State of Financial and Digital Inclusion Project Report 2017*. Figure 3 also shows a financial inclusion ratio of 15 percent, well below the average rate (33 percent) among middle income countries. However, according to the Fintech Survey 2016, in evolving markets where financial inclusion numbers are low, fintechs play a considerable role as they offer a means to digitization. This weakness of the economy can serve as an opportunity for fintechs to grow (Shahid et al., 2016). The provision of financial services is dominated by banks in Pakistan, which could present a challenge for fintech startups to enter the market. But since only a fraction (15 percent) of the population is currently being served by the banking sector, this is an open door for fintechs to exploit and target the remaining population with digital payment solutions, eventually improving financial inclusion and the share of financial services in the country's GDP. The improvements in infrastructure expected with the completion of China Pak Economic

Corridor (CPEC) are also expected to reap substantial benefits for future fintech growth.

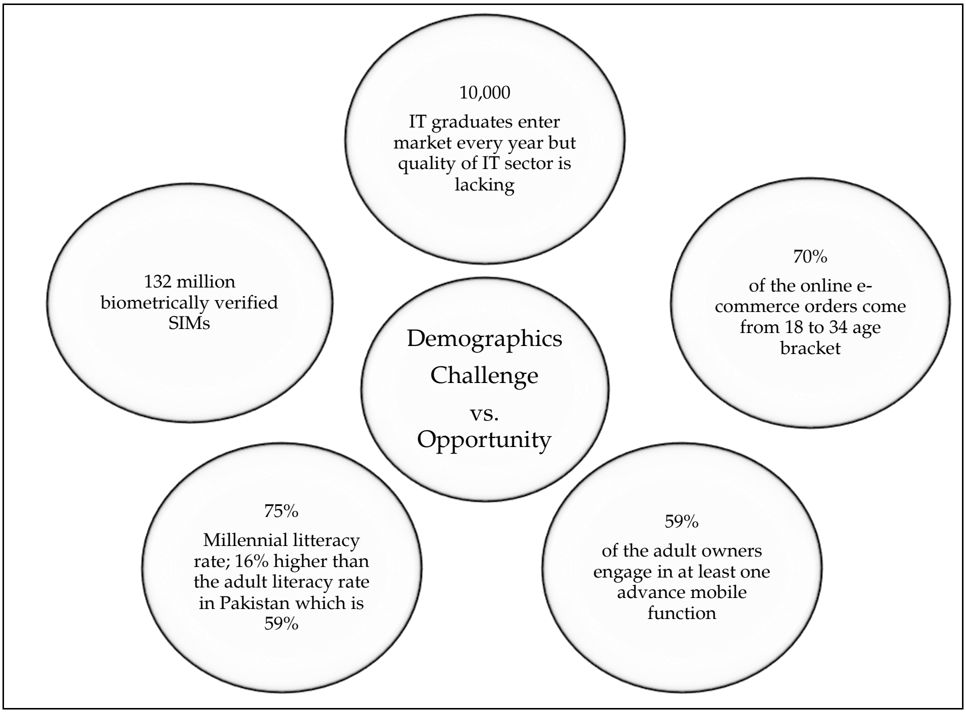
Figure 4: Technological Challenges and Opportunities in Pakistan



Source: World Bank, State Bank of Pakistan, Karandaz, UNESCO, Pakistan Telecommunication Authority.

Technological opportunities and challenges for fintech growth are shown in Figure 4. The still low (16.6 percent), but growing smartphone penetration, internet and social media usage, improving mobile ownership numbers and adult literacy rate of 59 percent presents an opportunity to digitize financial services and provide them through mobile phones. The diffusion and adoption of mobile technology in the Pakistani market – mobile teledensity is 69 percent - has been growing over the years. To further supplement this, the number of mobile internet and mobile internet subscribers is expected to increase from 9 million in 2014 to an estimated 59 million in 2019, making Pakistan the country with the fastest growing mobile internet access rates. In the Global Fintech Survey, mobile data analytics, cyber-security, public cloud infrastructure, biometrics and identity management were considered the most relevant technologies for financial institutions investment by in in order to embrace the disruptive nature of fintechs; it could be safe to say that technological factors in Pakistan are also moving in the right direction.

Figure 5: Demographic Challenges and Opportunities in Pakistan



Source: World Bank, State Bank of Pakistan, Karandaz, UNESCO, Pakistan Telecommunication Authority.

Moreover, current demographics serve as a challenge and opportunity for Fintechs in Pakistan, as presented in Figure 5. Pakistan has the fifth largest youth population, a potential market for the new cohort of financial products and services available over the nexus of Social Media, Mobile, Analytics and Cloud (SMAC). These products are not only appealing, smooth, fast and easy-to-use, but they also match the lifestyle of millennials, who are literate and widely engaged in online e-commerce, demanding fintech products. Secondly, the shift in consumers' preference towards mobile phone usage and social media platforms and away from desktop computers has given rise to digital payments. The verification of 132 million biometrically certified SIMs has paved the way for digital wallets, allowing payments to be made through mobile phones. Many players, including non-bank "banks" and non-profit organizations, are currently working on financial technology to make their applications an actuality in Pakistan. Among non-bank players, one of the biggest examples is that of *Easypaisa*, by Telenor Pakistan, a prominent mobile phone service operator. *Easypaisa* provides financial services such as opening a bank account, withdrawal and deposit of money, funds transfer and bill payments, through more than 70,000 agents in the country. Karandaaz Pakistan, a non-profit organization, is also assisting Fintech startups by providing them grants to advance and encourage financial technology solutions in Pakistan. Access to financial services, payments, e-commerce and interoperability are their main areas of focus.

Together, the assessment of economic, technological and demographic factors reveals that the current fintech ecosystem in Pakistan could be characterized by various challenges hindering all ecosystem members and hierarchies. However, Pakistan still possesses the potential to be an attractive market for fintech companies to grow due to the increasing youth population, disruptive internet and smartphone penetration, consumer preference for mobile phones and social media, booming online commerce facilitating digital payments, and an overall financial system having absorption capacity for innovation.

While fintech innovations are fascinating and can have major positive impacts on any economy like Pakistan's, their darker side should not be ignored. Most fintechs offer financial products which have the ability to generate direct or indirect cash flows. The incentives attached with cash flow generation of fintech products have a strong influence on the product design and usage. Such influences, if compromised, can be used to alter the design or usage of fintech products. This has happened in the past, when derivative instruments that were originally designed for hedging risk became purely speculative instruments due to their inherent leveraged structure. Fintech products are no exception and are prone to such threats, originating both from the innovators and users. One such example is of Bitcoin, which was initially portrayed as a secure alternative digital currency based on blockchain technology. However, as it increased in popularity, its highly secure and complex structure became a vehicle for illegal fund transfers and money laundering. Enormous demand generated by individuals or organizations interested in conducting such covert transactions drove up its price. This price hike, coupled with its online trading, forced ordinary investors to view it as an alternative financial asset. Ironically, no asset with such price volatility as that of Bitcoin can be used as a medium of exchange (i.e., currency), which was the original mandate behind its creation (Chiu, 2016). Nonetheless, regulators are aware of some of these concerns and their approach to fintech regulation can address these concerns.

5 Regulators and Regulations

5.1. Inside the Minds of Regulators

Examining the conduct of financial regulators around the globe, we find that approximately three decades ago, their policies and actions were rather supportive for the entities and products being developed within the financial system. In the 1980s, a number of regulators around the globe either significantly reduced the regulatory constraints that supported competition or at least refrained from adding more.

However, a major shift in the regulatory paradigm occurred in the aftermath of the Global Financial Crisis of 2008, which many people view as a direct consequence of the lax regulatory environment prevalent during the years preceding the crisis. Under this new regulatory paradigm, most financial regulators now hold extremely conservative views towards innovative financial products and are preemptive in formulating policies so to avoid another financial meltdown. Of course, not all regulators hold these same views and there exist the so called 'active' regulators working closely with fintech companies. The ideology of these regulators is to understand and address the key challenges of fintech firms as a priority. This active approach of regulators could surely foster the growth of fintech, but it also raises concerns about conflicts of interest if the users' protection is immolated to protect fintech companies.

Let us restate here, that irrespective of the view taken by the regulators, one cannot disagree with the fact that the regulatory framework of a country has valuable effects on the overall economy and it is important, therefore, for governments to create the appropriate balance between supporting fintechs and protecting the public interest. The problem is that the fintech sector has been developing rapidly and institutions have found it difficult to craft regulation, pertinent to this segment. The rapid growth makes it difficult to design laws for firms of various sizes. Technology, primarily the internet, has boosted the development of new players in the market, for instance, venture capital firms, crowdfunding firms, and virtual currencies such as Bitcoin. Though benefits from such innovations accrue in the form of the creation of new assets and reduced firm costs, it does raise risk and security concerns. Therefore, there is a need for regulators to understand the technology's applicability in order to understand what exactly to regulate (Kalmykova & Ryabova, 2016).

5.2. *Fintech Regulations in Pakistan*

The situation in Pakistan is relatively better than the conservative and pre-emptive view of most regulators around the globe. In fact, the State Bank of Pakistan (SBP) has proven itself to be very progressive in the area of digital finance. The attempts SBP has taken to promote branchless banking and mobile banking (e.g., mobile wallets and over-the-counter transactions) have been documented in detail. One study traces the history and models of mobile banking in Pakistan to assess how the segment evolved and transformed conventional banking structures in the country (Rizvi et al. 2017). Owing to the collective efforts of a number of stakeholders, including the government, regulatory bodies, development agencies, financial institutions, telecom operators and technology companies, developments in the mobile banking sector have been growing.

The State Bank of Pakistan's support for the branchless sector was demonstrated with the issuance of branchless banking regulations and the drafting of a regulatory framework policy in 2008. Under these regulations, many branchless banking models were encouraged to set up. Since 2008, SBP and other government bodies have continued to promote technology in banking, which has created the necessary foundation on which to build a strong digital financial architecture - including fintech - in the country. Additionally, the National Financial Inclusion Strategy (NFIS), developed by SBP in 2015, with the support of the World Bank, provides clearly defined targets and incentives to strengthen the effort towards the utilization and promotion of fintech in the country.

The most important and direct step taken by SBP to promote and facilitate fintechs was the drafting and enacting of laws pertaining to Payment System Operators (PSOs) and Payment Service Providers (PSPs) in 2014[1]. These regulations are applicable to the players interested in becoming licensed operators in Pakistan for payment systems. Interested players can be granted licenses under PSOs and PSPs for the development of an electronic platform with the capability to clear, process route and switch electronic transactions. The entities licensed as a PSO or PSP can also make agreements with banks, financial institutions, merchants, other PSOs and PSPs, or any other company for the provision of services they

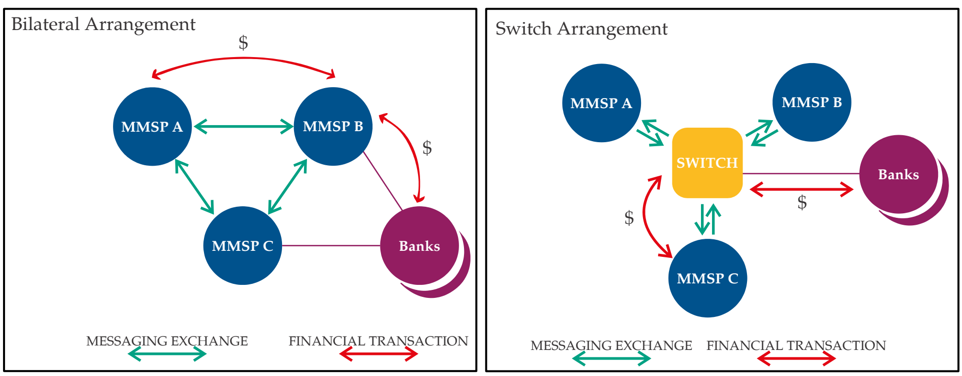
[1] Rules for PSOs and PSPs: http://www.sbp.org.pk/psd/2014/C3-Annex.pdf

intend to provide under the license. So far, only two institutions have been granted the status of PSO/PSP, namely, *One Link*[2] and *NIFT*[3].

In May 2016, the SBP introduced Regulations for Mobile Banking Interoperability[4]. Under these regulations, fintechs are expected to achieve long-awaited Transactional Interoperability that would allow users to transfer funds between mobile accounts from one service provider to another. Account-to-Account Interoperability (A2A Interoperability), the other type of interoperability, has been enjoyed by customers and fintech service providers since 2014.

The most significant feature of the 2016 regulations is the clear guidelines regarding Third Party Service Providers (TPSPs), a new player made mandatory by SBP to execute transactional interoperability. The models requiring involvement of TPSPs can also be referred to as a switch arrangement as opposed to a bilateral arrangement. The differences between the two is explained in Figure 6, below.

Figure 6: Bilateral vs Switch Arrangement



Source: (GSMA 2015).

Under the bilateral arrangement, each Mobile Money Service Provider (MMSP) must establish one-to-one links with all other players (i.e., other MMSPs or banks). Under the switch arrangement, a third party entity, a TPSP in the case of Pakistan, takes the responsibility of creating a hub with which all MMSPs and banks must establish a link.

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2 http://1link.net.pk/
3 https://www.nift.pk/
4 Regulations for Mobile Banking Interoperability 2016: http://www.sbp.org.pk/bprd/2016/C3-Annx-A.pdf

The Regulations for Mobile Banking Interoperability (2016) enabled the Pakistan Telecommunication Authority (PTA) to make a decision to issue the first Third Party Service Provider (TPSP) license in April 2017, which upon realization will set the foundations to achieve full interoperability across the telecom networks and entities providing mobile wallets or BB accounts. On the basis of the information available through PTA, we have compiled some important features of TPSP licensing in the following table.

Table 2: Salient Features of Third Party Service Provider (TPSP) License in Pakistan

License Period	10 Years
Due Diligence by	PTA-SBP Joint Regulatory Committee
License Issuing Authority	PTA
Initial License Fee (ILF)	Rs. 1,000,000/- (Pak Rupees one million)
Non Refundable Processing Fee	Rs. 50,000/-
Performance Bond	Rs. 10 Million in the shape of Bank Guarantees
Paid-up Capital Requirement	Rs. 200 Million (Set by SBP) with the following caveats; **10% as security deposit at the Central Bank** 5% of security deposit in a non-remunerative current account with the SBP Banking Service Corporation. 5% of security deposit in the form of Government securities to be kept under lien at the same department.
Scope of Work	TPSP license authorizes the licensee to establish, maintain and operate for the provision of Financial and Application Service Provider and permits the Channeling, Routing and Switching Transactions for branchless/mobile banking only under Service Level Agreement(s) between Financial Institution (bank), cellular mobile operator(s) and TPSP(s)
Technical Requirement	Capability of switching and routing all interbank Wallet to Wallet and Wallet to Bank account transfers from BB Issuer to BB Acquirer through an authorized PSO which will be responsible for clearing and providing day-end reports for reconciliation.
Jurisdiction	TPSP License shall be granted nationwide for the whole of Pakistan excluding Azad Jammu & Kashmir and Gilgit Baltistan.
License Holder	"None" as of March 2018 at the time of writing this paper. However two applications have been received by PTA and decision to award license is expected by Mid-2018.

Rather than waiting for other commercial players to act first, SBP has proactively developed a mobile application for Asaan Mobile Account (AMA) to facilitate mobile banking interoperability. The app is expected to achieve universal operability by providing a single platform to all bank account holders on different mobile phone networks to conduct financial transactions. According to SBP officials, the app will be simple and available to the users of feature phones as well as users of fully-capable smart phones. An account can be easily opened after verification from NADRA, which is expected to cost the user PRs. 10. With these features, AMA may prove to be an important and innovative fintech product, and can also help to achieve the target of 50 million mobile wallet users set in NFIS 2015. National Financial Inclusion Council (NFIC) approved the AMA scheme in September 2017.

5.3. Future Challenges for State Bank of Pakistan as a Fintech Regulator

Despite the progressive attitude of SBP as a fintech regulator, there are pending issues that require immediate regulatory deliberation. The first issue to address is: Who should actually be the regulator for fintechs in Pakistan? As explained earlier, fintech is on the frontier where finance meets technology, creating questions regarding its main regulator. Should fintechs be treated as financial institutions and be governed by SBP (the current situation, owing to the bank-led model of fintechs prevailing in Pakistan)? Or should the players be treated as mobile technology providers? This is an essential element of fintechs. If they should be treated as a mobile technology, would they consequently be placed under the purview of Pakistan Telecom Authority (PTA)? Is there a need for a new regulator specifically for fintech, considering its unique and evolutionary structure?

Presently, every form of fintech is heavily dependent on digitally-stored data, which is not only susceptible to privacy concerns, but is also exposed to theft and cyber-attacks. In Pakistan, where a large number of intermediaries (e.g., financial institutions, telcos, PSPs, PSOs, TPSPs, NADRA etc.), are mandatory in order to set up viable fintechs, the task of determining exact liability in the case of data breach is itself nontrivial, and the measures that must be taken to ensure data security are a top regulatory priority.

Fintech products or services, being either heavily reliant on mobile technology or based on complex coding technologies (e.g., blockchain, Directed Acyclic Graph (DAG), Tangle, or IOTA), open the doors for unlimited possibilities, but can also create opportunities for fraudsters aiming to extract money from consumers and Fintech companies. The world saw a glimpse of this danger when the popularity of Bitcoin helped a number of fake cryptocurrency providers to sell hoax products to customers and investors.

Another important concern is the potential use of fintech in money laundering and breach of capital controls. The archaic, bureaucratic structure of regulations in Pakistan has proven itself ineffective in dealing with such issues. Incidents like the recent inclusion of Pakistan in the grey list of the Financial Action Task Force (FATF) are enough to expose the weaknesses of regulators in this domain. Now the question is how regulators would deal with the fintech transactions which are far more secured, protected, encrypted, and faster paced compared to conventional financial transactions. This is an area which requires further thought and discussion.

It is also important for regulators in Pakistan to allow healthy competition. Around the globe, fintechs are primarily driven by startups, and Pakistan is no exception. However, it has been observed that the innovative technology developed by these startups is subsequently acquired by existing industry players of variable sizes. The recent partnership between Finja and FINCA Microfinance Bank, which allowed the fintech to receive regulatory approval for its innovative product, a mobile wallet called SimSim, is one such example where a small startup needs to seek the patronage of larger industry players to advance to a higher level.

The SBP has made efforts to promote and outline regulations for the fintech sector as it has a role to play in improving financial inclusion, which is viewed as a key driver of economic growth. However, the proliferation of fintechs is accompanied by threats of cybercrime, money laundering, terror financing, and privacy breach of customer data. SBP and other regulatory bodies have outlined guidelines to protect against the perceived risks associated with fintechs, as public security cannot be compromised.

5.4. Regulator as Competitor

Finally, despite its good deeds and inherent role of guardian, there are incentives for a regulator to become a competitor – a potential threat for much of the fintech sector. The threat arises from the possibility of a Central Bank-Issued Digital Currency (CBDC) or Central Bank-issued Crypto Currency (CBCC). The idea of CBDC creation is feared due to the increasing use of electronic payment systems all over the world and the resulting influx of alternative digital currencies such as Bitcoin. However, there are several reasons why a central bank would not be incentivized to pursue the creation of CBDCs or CBCCs. First, being a regulator, no central bank can actually offer what is considered the primary attraction of digital currencies - anonymity. Digital currencies maintain their popularity so long as they provide anonymity for financial transactions and any action taken by central banks to offer something similar could become a topic of public debate or even lead to litigation. The idea of CBDC creation is far from reality. Another important reason to not pursue this is that any central bank-issued currency, whether physical or digital, is meant for payment purposes and its value should remain stable and on par with the other forms of currencies in the country. If that is the case, then the CBDC would be no different from the already existing currency in bank accounts that exist in digital form. Additionally, although central banks could pitch CBDC as an alternative payment system for retail transactions, the question remains as to what do CBDCs offer that is superior to existing payment systems like Alibaba, Tencent, Facebook, WeChat, and, in Pakistan's case, Finja or Masterpay.

Proponents of CBDC provide a range of possibilities and objectives a central bank can achieve with its issuance, such as a wider spectrum of monetary policy options, direct provision of risk-free assets, general public and consequent safety of financial systems by the reduced systemic importance of commercial banks, and more control over money creation (Dyson & Hodgson, 2016). At the same time, even these proponents are concerned that if a central bank were to issue CBDC and begin to realize these objectives, it could potentially fuel bank runs all over the world (Bech & Garratt, 2017).

6. Conclusion and Policy Recommendations

Fintech growth has been phenomenal worldwide, driven mainly by changing consumer preferences and behaviors, and technological innovations and regulations. Being at the confluence of different technologies, fintechs offer well-personalized and interactive services to consumers by allowing them to conduct transactions over their phone, boosting customer experience. On a broader level, fintechs have the capacity to promote financial inclusion by enabling the provision of new products and services to groups who were previously deprived of access to traditional financial services.

Pakistan, being a developing economy with high banking infrastructure costs acting as a barrier to diffusion of financial services, has a large percentage of the population which remains underbanked. Poor financial inclusion, along with growing mobile phone and internet penetration, changing consumer needs in favor of digitization and online commerce, biometric verification of mobile SIMs and a supportive regulatory environment serve as opportunities for fintechs to step in and provide financial products at low costs. At present, a few traditional and emergent fintechs operate in Pakistan, primarily in areas of banking and insurance. The regulatory framework for financial services is fairly strong and supportive in Pakistan, with laws such as Payment System Operators (PSOs), Payment Service Providers (PSPs) and Branchless banking regulations by the State Bank of Pakistan acting as platforms for Fintech-led growth.

However, fintechs in Pakistan are also faced with a number of challenges such as regulatory uncertainty, limited investment raised solely from local investors, a dearth of partnership platforms for fintech incumbents and investors, an unwelcoming attitude of incumbent organizations towards partnerships with fintech firms, and threats to data privacy and security.

The SBP has made efforts to promote and outline regulations for the fintech sector as it has a role to play in improving financial inclusion, which is viewed as a key driver of economic growth. However, the proliferation of fintechs is accompanied by threats of cybercrime, money laundering, terror financing, and privacy breach of customer data for which SBP and other regulatory bodies have outlined guidelines, so as to be cautious toward these perceived risks, as public security cannot be compromised.

It is important to understand that aside from being providers of mobile payment systems and other financial services, fintech companies create an ecosystem that fosters the collection of a vast amount of data and builds trusted relationships with clients. Financial institutions and banks in Pakistan have realized the importance of these ecosystems and are attempting to innovate within their companies through partnerships with fintech companies. These partnerships will benefit both parties. Incumbent banks will be able to outsource part of their R&D and bring solutions to market quickly, while fintech firms will have access to the large and existing customer base of banks. This is further emphasized by fintech segments that are starting to transition from purely B2C to B2B. We believe that, going forward, adopting effective growth strategies and integrating with fintechs will be essential for innovation. The government should also support the growing fintech sector by formulating regional development plans where they would identify regions on the basis of current capabilities and infrastructure as potential hubs and would offer incentives (such as funding) to boost their growth.

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