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Article

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Article

FinTech: Ecosystem, Opportunities and Challenges in Saudi Arabia

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Abstract: FinTech is a disruptive international phenomenon that is expected to shape the future of the financial sector. This study describes the features and characteristics of the current Saudi Arabian FinTech landscape and ecosystem. Examples of innovative financial startups in Saudi Arabia, including online banking, transfer and payment services, crowdfunding platforms, peer-to-peer lending, and blockchain initiatives, are discussed. Several changes have occurred within the ecosystem in the last five years; for example, Saudi banks are taking a more cautious approach. However, FinTech initiatives are also being internally developed, encouraging technology companies and startups to focus their efforts on innovations aimed at improving current processes rather than novelty. The government directs its effort mainly toward initiatives related to regulations and laws. Customers are interested in new products that are convenient and easy to use. We compare the Saudi FinTech ecosystem to the United Arab Emirates' FinTech ecosystem and conclude with recommendations for the different stakeholders.



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Keywords: FinTech; infrastructure; ecosystem; Saudi Arabia

1. Introduction

Worldwide, FinTech attracted huge investments in 2018: 2196 deals with a total value of USD 111.8B according to [KPMG \(2019\)](#), double the value of the previous year. Furthermore, the total transaction value in the digital payments sector amounted to USD 4.14B in 2019, as stated by [Statista \(2019\)](#). According to the annual FinTech 100 report published by [Pollari and Ruddenklau \(2018\)](#), the U.S. and China are leading in FinTech startups and companies. Moreover, the same report showed that there are no Saudi Arabian companies in the top 100.

First, it is crucial to define FinTech, but this is not a straightforward task, as many definitions are widely used. The World Economic Forum, for example, defines FinTech as “new entrants that promised to rapidly reshape how financial products were structured, provisioned and consumed” ([McWaters and Bruno 2017](#)). Another more comprehensive definition is “organizations combining innovative business models and technology to enable, enhance and disrupt financial services”, emphasizing that FinTech not only incorporates early-stage startups and new entrants, but also scale-ups, maturing firms, and even non-financial services firms, as reported by [EY \(2017\)](#).

Saudi Arabia Vision 2030 is a government plan to reduce the dependence on oil and diversify the economy; it will also assist in the development of public service sectors, such as health, education, infrastructure, recreation, and tourism. One of the goals includes reinforcing economic and investment activities. One of the vision 2030 themes is a thriving economy that includes investing for the future. Under this theme, the Financial Sector Development Program (FSDP) is motivating new emerging players, such as FinTech startups, to stimulate innovation and competition by 2030 in accordance with Vision 2030.

Moreover, the document shows that one of the metrics is the existence of three FinTech players by 2020. Another metric is the satisfaction index of FinTech with the KSA FinTech ecosystem. Moreover, some of the game changers in developing FinTech-focused funds/accelerators/incubators are the provisioning of venture capital (VC)/equity funding and the stimulation of an entrepreneurial environment (FSDP 2020).

Another initiative, the Saudi Vision 2030 is the creation of the National Digital Transformation Unit (NDU), which is governed by a high-level committee that includes six ministers and other important authorities (NDU 2020). The vision for this unit is “a world-leading digital community and digital government with a sustainable digital economy built on innovation and efficient digital capabilities”. Moreover, it focuses on the transformation into “a digital society based on the creation of digital platforms to enrich interaction and effective community participation, thus contributing to improving the experience of citizens, residents, tourists and investors in the Kingdom” (NDU 2020). It is also worth mentioning that Saudi Arabia is internationally considered to have a successful E-Government program; it ranked very high on the Online Service Index (OSI) and high on the E-Participation Index (EPI) in the UN E-Government surveys, which shows that the infrastructure is suitable for FinTech ecosystems (UN 2018).

The remainder of this article is structured as follows: First, we present the literature review that includes some historical background on FinTech. Then, we discuss the FinTech ecosystem at the international and Saudi Arabian levels, including all of the stakeholders, such as FinTech startups, technology developers, financial customers, traditional financial institutions, and government institutions. Then we compare Saudi Arabian FinTech to the model country, the United Arab Emirates. Finally, we identify and discuss the opportunities in the FinTech industry and the challenges that it faces in Saudi Arabia in the areas of investment management, customer management, regulation, technology integration, security and privacy, and risk management.

2. Literature Review

The global financial markets were severely affected by the start of the Internet revolution in the 1990s. Most importantly, as a result of the Internet’s emergence, financial transaction costs have significantly dropped. The electronic financial service, involved in all types of financial services we use today, including retail banking, insurance, security, and trading, has allowed individuals and legal entities to access information about financial products and services and to execute transactions without physical contact with financial institutes. Furthermore, during this time, new business models in the digital finance industry emerged; these included internet and mobile banking, affordable online brokerage services, and mobile payments. Most of these changes have led to reductions in the number of bank branches and offices (Soloviev 2018).

In the middle of the 1990s banking notably changed as a result of the introduction of internet banking and with the widespread access to Internet at home. Liao et al. (1999) discussed the adoption of virtual banking, which they defined as ATMs, phone banking, home banking, and internet banking. They found that only 10% of the respondents in their study used home banking (internet banking from home) in Hong Kong during this period. However, their study showed that 97% of the respondents used ATMs, and, interestingly, 63% of them expressed that they intended to use internet banking in the future.

Furthermore, a study conducted by Daniel (1999) showed that only 25% of respondents offered fully online banking services, and 50% of them offered a trial, or their service was under development. The previous two studies show how technology moved users from traditional banking to online banking in a short time. Furthermore, the study conducted by Sathye (1999) quantified the factors affecting the adoption of internet banking by Australian consumers. The main reasons for the slow adoption of internet banking were observed to be the lack of awareness and security concerns. Another development that shaped the development of financial technology was the appearance of smartphones around 2005. According to Shaikh (2013 cited in Shaikh and Karjaluoto 2015), “The expanded uses of

smartphones has increased demand for m-banking services, prompting many more banks, microfinance institutions, software houses, and service providers to offer this innovative service together with new sets of products and applications designed to extend their client reach (including to unbanked populations), improve customer retention, enhance operational efficiency, increase market share, and provide new employment opportunities”.

As discussed in the previous paragraph, the first appearance of FinTech was the introduction of internet banking. Another example of digital financial services was the introduction of the online trading of securities, which occurred at a later stage. [Weber \(2006\)](#) stated that using information technology is transforming financial trading, lowering costs, and increasing market transparency. As a result, it will reduce transaction costs and provide traders with access to markets.

The following trends are a reaction to significant contributions of social media and social networks. The first essential phenomenon that contributed to the emergence of FinTech innovations was the sharing economy, which is disturbing traditional business. [Schor et al. \(2016\)](#) categorized sharing economy activities into four types, namely, “recirculation of goods”, “increased utilization of durable assets”, “exchange of services”, and “sharing of productive assets”. For example, Uber does not own any cars, and Airbnb does not own houses, apartments, or hotels. The same pattern can be observed for Facebook, Alibaba, Amazon, and many more. However, typical traditional banks own tangible assets, which include bank capital, real estate, machinery, equipment, and office supplies; and intangible assets, including goodwill, licenses, patents, and technologies. The other phenomena are disturbances caused by the new economy that Collins defines as the postindustrial world economy based on Internet trading and advanced technology startups; startup growth and startup valuation are enormous. The third trend is the ease of access to information technology, especially Internet and mobile devices.

Although it is challenging to state when FinTech started, it gained the attention of scholars in the aftermath of the 2008 financial crisis. This was not the only reason, however, as this occurred during the same time as the development of new technologies, such as artificial intelligence and blockchain. The integration of these technologies with social media networks resulted in FinTech becoming a hot topic. FinTech startups were observed to solve many problems, either offering new services and products or providing customers with traditional services who did not have access to or could not work with banks and financial intuitions. Furthermore, some FinTech companies leveraged new technologies to offer new services that use new data and super analysis.

Currently, the debate on FinTech includes various themes. (1) The notion that FinTech startups represent the future of financial institutions and that they will replace traditional banks is a misconception, at least in the short term. (2) Banks will be enablers of FinTech, and they will work as platforms or ecosystems for them ([Dapp et al. 2015](#); [Panetta 2018](#)). (3) FinTech startups will bring competition, and they will replace small banks, but they cannot compete with banks because their services are unbundled ([Navaretti et al. 2018](#)). (4) Traditional banks will use FinTech to improve their services and products ([Wonglimpiyarat 2017](#)).

Today, worldwide and locally, many banks and financial institutions are paying attention to FinTech, and some show considerable interest in FinTech, and the competition, strategy, regulations, and cooperation with FinTech startups. Generally speaking, banks are positioning themselves as financial service providers and payment and trading platforms. They are also trying to become marketplaces for financial services.

3. Methodology

The nature of this study made choosing the proper methodology challenging. A lack of data and reaching the stakeholders were problems. For these reasons, we chose the case study method suggested by [Welch et al. \(2011\)](#). According to these authors, case studies should address the “confrontation of theory with the empirical world”. Theorizing from case studies can be accomplished via four approaches: inductive theory construction,

natural experimentation, interpretive sense making, and contextualized explanation. Inductive theory construction compares variables to constructs in order to determine their relationships. This is the most frequently used strategy, but it is regarded as a weak kind of causality. Natural experimentation is characterized by a high degree of internal validity as a result of its rigorous implementation. Interpretive sense making prioritizes specific comprehension above generalizable explanations. By emphasizing both objectives, contextualized explanation overcomes the trade-off inherent in the other three strategies. Although this strategy is believed to be more beneficial than the others, a variety of methods are encouraged.

A case study exploring the creation of the FinTech ecosystem in Saudi Arabia was chosen. Understanding the phenomena requires an examination of the role of each stakeholder in the ecosystem. In Saudi Arabia, the ecosystem is incomplete, with each player not being completely available, making it difficult to reflect each actor's contribution and its relationships with others. The UAE as a case study serves as a reference model for incomplete ecosystems to learn from. This falls under the category of the most widely used methods of inductive theory construction. Despite being a weak form of causation, the primary objective of using the UAE case in this study was not to explain any causative linkages but to use it as an approximation for how the Saudi Arabian FinTech ecosystem will grow. The case study technique employed in this study enabled the aim of "confronting theory with the actual reality" to be accomplished. We chose the UAE because it is the highest ranked country in the global FinTech Index Ecosystem Ranking of countries constructed by MAMBU (2021). This index ranks cities and countries, and the UAE ranked 28th in 2021; Saudi Arabia ranked 65 in the same year.

The main goal of this study was to determine what forms the Saudi FinTech Ecosystem. In addition, the investigation was carried out by responding to three sub-questions:

- Research question 1: Who are the primary agents of a FinTech ecosystem?
- Research question 2: What is the function of each agent?
- Research question 3: How do these agents communicate with one another?

4. The Saudi FinTech Ecosystem

It is vital to differentiate between the global and local FinTech ecosystems, although they intersect in many areas. To fully grasp the opportunities and challenges in FinTech innovation, we must analyze the ecosystem. We look at the international ecosystem and then link it with the local ecosystem in Saudi Arabia for the analysis. A stable symbiotic FinTech ecosystem is instrumental in the growth of the FinTech industry (?). Furthermore, Diemers et al. (2015) suggested that the FinTech ecosystem consists of entrepreneurs, governments, and financial institutions. Moreover, Lee and Shin (2018) have identified five categories of the FinTech ecosystem, and they are as follows:

- FinTech start ups;
- Technology developers;
- Governments;
- Financial customers;
- Traditional financial institutions.

These categories of FinTech ecosystem collaboration are the fuel for innovation, add value to the economy, and increase competition in the financial industry. Ultimately, this will benefit consumers in the financial industry. The following is a detailed explanation of the five different categories and their roles in the Saudi FinTech Ecosystem.

4.1. FinTech Startups

At the heart of the FinTech ecosystem are FinTech startups; these companies are entrepreneurial. They are innovative in specific areas, such as payments, international transfer, lending, crowdfunding, capital market, and insurance, operating with lower costs than their traditional counterparts. They also target niche markets and provide personalized services that traditional financial firms struggle to offer. According to Basole and Patel

(2018), one of the key characteristics of FinTech, which is causing a massive disruption of the entire financial sector, is that the services typically offered by traditional financial institutions are being quickly unbundled by an increasing set of startups, leading to new models of collaboration and a significant shift in power. As Haddad and Hornuf (2019) explained, FinTech startups are categorized as asset management, exchange service, financing, insurance, loyalty program, payment, regulatory technology, and risk management startups, among others. They also summarized the drivers of FinTech startups as follows:

1. The more developed the economy and traditional capital market, the higher the demand for FinTech startups.
2. The extent to which the latest technology is available in an economy, allowing FinTech startups to build their business models on the basis of these technologies.
3. The soundness of traditional financial institutions—it is assumed that FinTech startups occur more commonly in countries with fragile financial systems.
4. The roles of the credit and labor markets and business regulations in FinTech startup formations—it is assumed that FinTech is more common in markets with more regulations and in larger labor markets.

Globally, FinTech startups are on the rise; in 2020 the number of FinTech startups rose to 20,000, from 10,000 in 2018, as stated by Statista (2020). Of these 20,000 startups, around 37% are in Europe, the Middle East, and Africa. We could not determine the exact number of FinTech startups in Saudi Arabia; the only statistic we could use is the number of permissions issued by regulators, which was around 35 startups. This is considered to be satisfactory, taking into consideration when sandbox was first developed. For us to differentiate between FinTech startups in Saudi Arabia, we should clarify that the distinction between them we consider is the regulator of the service they provide; this is further discussed in the section on the government. Although many operating FinTech startups are from other countries, we only listed those who received a permit either from the Capital Market Authority (CMA) or the Saudi Arabian Monetary Authority (SAMA). As Figure 1 shows, there is a total of 31 startups. Among these, 22 companies are permitted by the SAMA and 11 by the CMA. As the figure also shows, 36% of the FinTech startups are working in the field of payments, and 11% are involved in crowdfunding (including capital and loans). Currently, the size of the FinTech sector in Saudi Arabia is not precise. It is worth mentioning that some FinTech startups were established very early and before these efforts, and due to the absence of regulations, several startups founded by Saudis were initially established in other countries, such as the case of PayTabs (Bahrain).

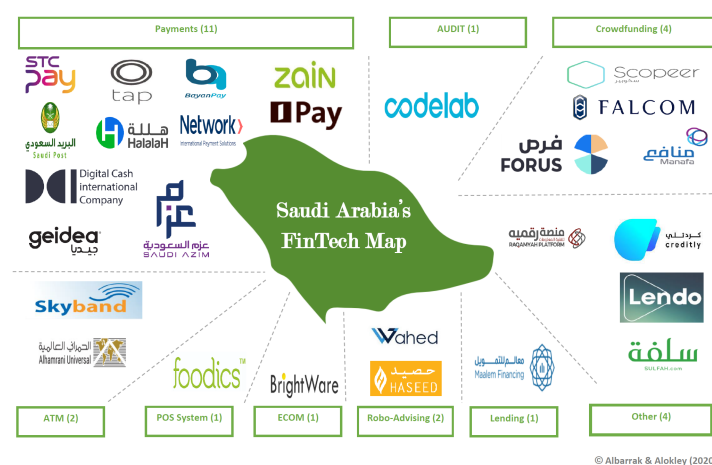


Figure 1. FinTech startups in Saudi Arabia by service.

To our knowledge, many players exist on the market, but they are not easily found, and it is expected that this market will expand massively in the future based on the Saudi Vision 2030. Furthermore, several competitors exist. Some of them are traditional

institution-backed startups, such as STC Pay (backed by a Saudi Telecom Company) and Alinma Pay (backed by Alinma Bank), and the remainder are FinTech startups. As there are several categories of competition, we note that they are particularly concentrated in some categories, especially in payment solutions. Recently, \$200 million was provided by Western Union for STC Pay (a Saudi-based mobile wallet owned by Saudi Telecom (stc)) for a 15% stake. This will make the market evaluation of STC Pay reach \$1.33 billion, marking the birth of the first unicorn in Saudi Arabia. On the other hand, although several unicorns were established in the UAE, none of them are FinTechs.

As Table 1 shows, although the UAE is ranked highly as a FinTech ecosystem, we note that Saudi Arabia was growing faster in the years of 2018–2020 by 113%. Several FinTech startups are also in the pipeline for the year 2021, so their number is expected to rise massively.

Table 1. Growth in numbers of startups in Saudi Arabia and UAE (source: Crunchbase).

Country Name	2018	2019	2020	Growth
Saudi Arabia	10	20	60	147%
United Arab Emirates	81	90	122	34%

4.2. Technology Developers

Technology developers offer digital tools for social media, big data analytics, cloud computing, artificial intelligence, smartphones, and mobile services. Technology developers are creating a favorable environment for FinTech startups to launch innovative services quickly. Big data analytics can be used to provide customers with unique, personalized services, and cloud computing can be used by financially limited FinTech startups to launch web-based applications at a fraction of the expense of building in-house infrastructure. Algorithmic trading strategies can be used as a basis for robo-advisor wealth management services at considerably lower fees than those of traditional wealth management services. Social media facilitates community growth in crowdfunding and personal lending services. Mobile network providers also provide FinTech businesses with low-cost infrastructure for the creation of services, such as mobile payment and mobile banking. In turn, these technology entrepreneurs create revenue for the FinTech industry. Although they have a key role in the FinTech ecosystem, we note that although there is a huge demand for developers, there is a shortage of supply. As far as the authors know, there is no education institute locally that offers programs in FinTech in either country. This is a gap that should be filled in order for both ecosystems to be successful.

4.3. Financial Customers

FinTech startups are very unique when considering the types of customers they target. While other traditional financial institutions have many types of customers, FinTech is specialized to some extent to end-user (individual) customers. These customers are the main source of revenue for FinTech companies. Furthermore, globally, a study conducted by [Gulamhuseinwala et al. \(2015\)](#) showed that early FinTech adopters tend to be young and high-income users. The Global FinTech Adoption Index 2019 (GFAI) showed that the global consumer adoption in 2019 reached 64% [[EY \(2019\)](#)]. The study conducted by [Jünger and Mietzner \(2020\)](#) showed that 31% of households in Germany could imagine shifting to FinTech from traditional financial institutions. On the other hand, locally, in Saudi Arabia, we have very unique characteristics in terms of both financial customers and customers in general. The characteristics of customers in Saudi Arabia are as follows:

1. The GDP per capita is USD 23,139, and Saudi Arabia is considered to be a high-income country according to a World Bank report [[World Bank \(2020\)](#)].
2. The population of Saudi Arabia in 2018 was 34.2 million according to General Authority for Statistics (GAS), and 25% are between 15 and 30 years of age. [[GAS \(2019\)](#)].

3. The level of education is very high in Saudi Arabia, and the literacy rate is 95%, as reported by [WB \(2016\)](#).
4. Saudi Arabia boasts a high mobile penetration rate of 89.5%, as a recent report published by [GAS \(2020\)](#) shows.
5. There is a high level of acceptance of technological changes in Saudi Arabia, as 90% of Saudis are active Internet users—30.26 million as of 2019 [[GAS \(2020\)](#) and [GMI \(2019\)](#)].
6. In terms of social media platforms, 67% of Saudis are active on at least one [GMI \(2019\)](#).
7. Consumers in Saudi Arabia are heavy users of digital banking channels: 80% to 90% of respondents in a study by [McKinsey \(2016\)](#) reported that they use digital banking channels. Specifically, 85% of the respondents used online banking and 81% used mobile banking.
8. Saudi Arabians are open to compelling digital-only offers, as in the same study conducted by [McKinsey \(2016\)](#), 52% of respondents were willing to open an account with a digital bank.

As Table 2 shows, the FinTech customers in the two countries are similar in their levels of education. However, the number of users and the population make the Saudi market more attractive. The median age in Saudi Arabia is also another special characteristic that could be crucial in the development of the FinTech ecosystem.

Table 2. A comparison of financial customers between Saudi Arabia and the United Arab Emirates (source: World Bank).

	Saudi Arabia	United Arab Emirates
Pupulation (2020)	34,813,871	9,890,402
GDP per Capita	20110 USD (2020)	43103 USD (2019)
Litteracy	93.2% (2015)	95.3% (2017)
Mobile Penetration (2020)	87.50%	99%
Median Age	30.8	38.4
Users of Social Media	27,048,861 77.7%	8,913,217 90.1%

All of these factors show that financial customers are ready to use and adopt FinTech products.

4.4. Traditional Financial Institution

The financial system in Saudi Arabia is considered to be stable. As stated by the SAMA, the Saudi macro financial position remains stable. Saudi Arabia maintains sufficient government reserves and a low debt-to-GDP ratio, which indicate a sustainable fiscal space for further budget financing. Furthermore, Saudi Arabia also maintains a consistently high credit rating, which indicates a sound banking sector. Historically, traditional financial institutions failed to carry out SME lending and financing. The study conducted by [Sheng \(2020\)](#) showed that FinTech facilitates the banking sector's credit supply to SMEs in China.

Traditional financial institutions have played a huge role in the FinTech ecosystem in the wake of understanding how powerful FinTech disruption is and identifying the opportunities it will open up in the market. Today, these institutions are re-designing their business models and also welcome FinTech innovations. Traditional financial institutions are more competitive and also more resourceful in comparison to FinTech startups. The major difference between FinTech startups and traditional financial institutions is that the former attempt to unbundle products, whereas the latter attempt to bundle all products. Today, in Saudi Arabia, many banks are shifting to offering FinTech or cooperate with FinTech startups instead of competing against them. For example, Riyadh Capital started

the Riyadh TAQNIA Fund (RTF), which is a USD 120 million fund in partnership with TAQNIA (The Saudi Technology Development and Investment Company), a company owned by the Public Investment Fund (Riyad Capital 2020). This fund mainly invests in FinTech startups, although there is a lack of information regarding the amount of shares that the fund possesses. Furthermore, one of the first banks to enter the FinTech market was the Gulf International Bank (GIB) with the Meem bank, which was one of the first banks to go digital in 2015 [Meem (2020)]. Furthermore, several banks are outsourcing their point of sale (POS) systems to a new FinTech startup called Geidea. All of these examples show that traditional financial institutions are moving toward further collaboration and integration with FinTech startups in Saudi Arabia. However, specific goals remain to be achieved.

As Table 3 shows, there are vital differences between the two economies when it comes to the traditional institutional response to FinTech. Both countries have announced licenses for digital banks. In Saudi Arabia one exists, which is Meem, as we discussed before; however, this bank operates under a traditional bank license. Recently, two banks were given a license, STC Bank and Saudi Digital Bank. Furthermore, one very substantial positive is that both countries have issued an open banking policy. It is notable that the UAE is more active in investments in FinTech, as the amount of funds invested in FinTech is double the amount invested by Saudi Arabia. The same applies to incubators and accelerators who specialize in FinTech. UAE is more mature in terms of investing in FinTech startups.

Table 3. A comparison of financial institutions in Saudi Arabia and the United Arab Emirates (Source: Crunch Base).

	Saudi Arabia	United Arab Emirates
Number of Digital banks	3	1
Number of Banks adopting FinTech	2	3
Open Banking Policy	Yes (2021)	Yes (2021)
Number of Funds Invested in FinTech	33	92
Number of Fintech Incubators and Accelerators	1	9

4.5. Governments

Since the financial crisis in 2008, traditional financial institutions have been subject to stricter regulations, capital requirements, and reporting requirements from government regulators under Basil III. Governments are vital in the FinTech ecosystem, and this is because of FinTech's need for either new regulations or alterations to existing ones. Overall, there are discrepancies in how governments view FinTech. Some governments are proactive, such as those of the UK and Singapore, whereas various nations are still observing other countries' experiences with caution. The measure of government support of FinTech depends on the economic development plan and the policies of the country in question. The overall norm is that governments either issue new regulations for FinTech or relax some laws. These relaxed regulatory requirements for FinTech startups allow them to provide more customized, inexpensive, and easy-to-access financial services to consumers. According to the IMF (2019) policy paper, the majority of respondents, around 76% of countries, reported that they had made some modifications to their regulatory approaches to facilitate the development of FinTech and supervisory capacity. For example, the EU introduced two regulations in 2018: the General Data Privacy Regulation (GDPR) and the Payments Services Directive 2 (PSD2). Furthermore, Singapore issued regulations on digital lending and equity crowdfunding. To date, several efforts have been made to support FinTech startups in Saudi Arabia. However, there is the issue of several bodies and ministries regulating FinTech. The following describes the related government agencies that deal with the FinTech industry:

1. Saudi Arabian Monetary Authority (SAMA): The SAMA is the central bank of the Kingdom of Saudi Arabia. Its mission is to maintain monetary and financial stability and support balanced and sustainable economic growth. The SAMA does not issue regulations but did create a regulatory sandbox. This sandbox is accessible by both local and international startups. The main categories that the sandbox specializes in are sectors that are under SAMA provisions, such as payment solutions, debt crowdfunding, international transfer, and currency exchange. The SAMA also issued the sandbox framework recently in November 2019. As of the writing of this paper, the SAMA has approved of 22 FinTech companies via the sandbox.
2. Capital Market Authority (CMA): The purpose of the CMA is to regulate and develop the Saudi Arabian Capital Market by issuing required rules and regulations for the implementation of the provisions of Capital Market Law. The CMA launched the FinTech Lab and the Financial Technology Experimental Permit, and they issued clear instructions that were approved and released. The CMA FinTech Lab only permits FinTech that is related to capital markets, such as crowdfunding and robo-advising. To date, eight startups have received approval from the CMA. However, we noted that three of these are still in development stages and are not in operation.
3. FinTech Saudi Arabia (FSA): FSA is an initiative by the SAMA that aims to promote FinTech by education, training, and increasing public awareness. FSA started in April 2018 under the Financial Sector Development Program with the purpose of acting as a facilitator for the development of the financial service technology industry. FSA is making a significant effort to promote FinTech, including the yearly FinTech Tour. This tour in 2019 included 44 events across all cities of the Kingdom. However, several tools that would help FinTech startups are lacking, including financial funding and the licensing of FinTech startups.
4. General Authority for Small and Medium Enterprises (Monshaat): Monshaat was established in 2016 to organize, support, develop, and sponsor the SME sector while following optimal global practices; to increase the productivity of these enterprises; and to increase their contributions to the GDP from 20% to 35% by 2030. There is an apparent collaboration between Monshaat and FSA, which includes linking SMEs with FinTech companies to fulfill the funding cycle. Moonshaat offers many services to SMEs, including indirect funding and easiness of business, thereby facilitating business opportunities, innovation, and entrepreneurship.
5. The Saudi Arabian General Investment Authority (SAGIA): The SAGIA is the regulator responsible for providing investment licenses to international investors; they also offer a one-stop shop that supports international investors in all the governmental procedures required to establish a company in Saudi Arabia.

Table 4 summarizes the key differences between the regulatory environments in the two countries. It is evident that the UAE is more versatile. There are national laws in place, but regulations vary depending on the geographical locations of the startups (Dubai or Abu Dhabi). The introduction of sandboxes in both countries would definitely help to improve and promote innovations in FinTech, as stated by [Goo and Heo \(2020\)](#). However, to date there are no laws or regulations that have been issued to license FinTech startups out of the sandboxes. Based on this discussion, it is evident that efforts are being made by the government to enable FinTech startups and to improve the FinTech ecosystem in Saudi Arabia.

Table 4. A comparison of the regulation environments in Saudi Arabia and the United Arab Emirates.

Saudi Arabia		United Arab Emirates
Regulators (On-Shore)	Capital Market Authority (CMA) Saudi Central Bank (SAMA)	UAE Securities and Commodities Authority (SCA) UAE Central Bank Insurance Authority
Other Regulation	None	Abu Dhabi Global Market : – Corporate activities overseen by ADGM Registration Authority (ADGM RA) – Financial activities overseen by Financial Services Regulatory Authority (FSRA) Dubai International Financial Centre: – DIFC Authority – DIFC Registrar of Companies – the DIFC Financial Services Regulatory Authority (DFSA)
Number of Regulators	2	8
Number of Sand Boxes	2	2
Number of FinTech laws or legislations	0	0

5. Opportunities and Challenges

The Middle East and North Africa (MENA) area is home to 450 million people. Approximately half of the population is under the age of 25 in this overall population. A population with such a young age provides an appealing market of early technology adopters, due to the size of the population. [Zalan and Toufaily \(2017\)](#) argued that following exploratory research with stakeholders from the financial ecosystem in the (MENA). The findings indicate that the FinTech industry is still in its early stages, but has the potential to be disruptive in certain product and consumer categories in the near future. [Banerjee \(2020\)](#) stated that the financial technology (FinTech) industry in the Gulf and MENA area is experiencing a transformation. Taking into consideration the rapid expansion in information technology, the respective governments' emphases on the building of smart cities, and the wave of e-commerce, the area is set for considerable growth in the industry. Furthermore, according to [Deloitte \(2020\)](#) Despite the fact that the Middle East receives just 1% of worldwide FinTech funding (USD 45 billion), the area has enormous potential. Moreover, [Wamda \(2017\)](#) stated that the opportunities that exist in the MENA are due to the following:

1. Eighty-six percent of adults do not have a bank account.
2. SME lending stands at half of the global average.
3. The volume of e-commerce is set to quadruple over five years.
4. One out of two bank customers is interested in new digital services.

Based on the previous outlook about MENA FinTech, we proceed to focusing on the opportunities and challenges facing the Saudi FinTech ecosystem:

5.1. Opportunities

1. Financial consumer: Customer adoption is a key factor in the ecosystem. All indicators show that consumers are ready and will switch quickly to FinTech.
2. Spread: Profit margins in the market are high, which is evident in the financial statements of the listed banks in Saudi Arabia. This spread is large enough for several key players to enter the market.
3. Expanding: It is recommended that FinTech startups not think locally but regionally, and that they consider other markets instead of focusing on one country. This prospective will provide opportunity in the future for businesses to grow and develop their customer bases.
4. Infrastructure: it is evident that digital transformation progress within the Kingdom will create many opportunities for FinTech startups and other industries to thrive.
5. Government: As mentioned in the Vision 2030, and as evident in the the sections before, there is a significant effort to support FinTechs.

5.2. Challenges

1. Regulations: The number of FinTech approvals issued by either the SAMA or CMA is still small. Approximately 35 approvals were issued, and some of these companies are not even operating. There are various factors that pose challenges for startups that must be addressed. One such factor that may be of interest is that there are several licenses that these startups need to obtain in order to operate. Another factor is that both the SAMA and CMA have been conservative with their approaches to date. Cohorts entering these sandboxes are limited, and as far as we know, many companies are completing applications with a waiting time of between 3 and 9 months.
2. Concentration: Most FinTech startups are concentrated in P2P lending and payments. This is related to the preferences of sandboxes and laboratories or the cohort system.
3. Foreign FinTech startups: These are not permitted to operate directly and they must either start a subsidiary, start a new FinTech company, license their technology, or appoint an agent.
4. International competition: A central issue is that if local startups are not ready for the introduction of international competition in the market, they will struggle to compete.
5. Human capital: Human capital is limited in FinTech due to the limited educational and training locally offered.

6. Conclusions

As we previously demonstrated, many key players in the system have shown good progress. Specifically, regulations, consumers, and startups are on the right track. However, traditional financial institutions should be more involved and create a support system for the industry. Additionally, technology developers are the weakest link in the ecosystem, and further efforts are needed in regard to their training and education. We believe that universities are missing from the ecosystem, and addressing this issue will help improve the technology developers' capabilities. Despite the various efforts made by different institutions and authorities, several challenges and opportunities exist that must be addressed for the FinTech industry to flourish.

The FinTech industry will have a significant effect on the future financial system in Saudi Arabia. The landscape will appear considerably different from how it does today. The FinTech ecosystem is crucial in the industry's development, especially for FinTech startups and traditional financial institutions. This study shows that FinTech efforts have not yet contributed to a radical transformation of the Saudi financial market. For the market to flourish, integrating the viewpoints of all key ecosystem players is important and will result in the emergence of new creative financial services. The fact that all of the elements of success are present should put pressure on regulators and policymakers to act efficiently in order to support the ecosystem. Furthermore, harmony among the various Saudi agencies is needed. The future FinTech startups should focus on the areas of credit scoring for personal banking and corporate credit rating. These are areas with the potential to grow big in the next five years.

Several limitations were observed during this study, the major one being the limited data available about FinTech startups. Furthermore, any attempt to study FinTech in detail might face challenges with such a small sample size. Future research should be qualitative and focus on the barriers faced by FinTech startups. Further investigating how consumers adopt FinTech in Saudi Arabia would be helpful.

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Abbreviations

The following abbreviations are used in this manuscript:

CMA	Capital Market Authority
SAMA	Saudi Arabian Monetary Authority
FinTech	Financial Technology
SMEs	Small and Medium-sized Enterprises
NDU	National Digital Transformation Unit
RTF	Riyad TAQNIA Fund

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