Major: FIN

S.No. (F7)

"Fintech in COVID-19 and beyond: What factors are boosting Fintech use in Pakistan?"

By:

Amna Naseer **01-321212-006**

MBA (1.5)

Supervisor:

Rabia Umer

Department of Business Studies

Bahria University Islamabad

Fall-2022

FINAL PROJECT/THESIS APPROVAL SHEET

Viva-Voce Examination

Viva Date 06 /02 /2023

Topic of Research: (Fintech in COVID-19 and beyond: what factors are boosting Fintech use in Pakistan.)

Names of Student(s): Enroll #

- AMNA NASEER 01-321212-006

Class: MBA (1.5)

Approved by:

(Rabia Umer)
Supervisor

( )

Internal Examiner

( )

External Examiner

Dr.Syed Haider Ali Shah
Research Coordinator

Dr.Khalil Ullah Mohammad

Head of Department
Business Studies

ABSTRACT

The purpose of the current study is to investigate the impact of factors affecting user perception and intention towards the adoption of Fintech in Pakistan in COVID-19 and beyond. Undoubtedly an increase was observed in the use of Fintech services during COVID-19. However, to keep the users hooked with the services and lead them towards the adoption, firms need to identify key factors important to users that enhance their intention to use the service and in maintenance of existing users in long term. A qualitative approach was adopted, and a self-administered questionnaire was designed and distributed to collect data. A data of 257 responded was collected from the user of Fintech in Pakistan and smart-PLS 4 was used for analysis. The findings revealed that Covid-19 lockdown , data security and privacy, trust and quality of staff service are the factors enhancing user intention to adopt Fintech and perceived usefulness partially mediated this relationship. Thus, users how have found Fintech services useful during COVID-19 have moved towards adoption of the service. The research is useful for the government to achieve one of their sustainable development goals and for firms who want to develop their capability and competitive advantage.

Key words:

Fintech, Perceived usefulness, COVID-19 lockdown

ACKNOWLEDGEMENT

All praises and thanks to Allah Almighty, the most merciful, the most beneficent. I express my deep gratitude to Allah (S.W.T) for all the blessings He has bestowed upon me, including the opportunity to be a part of this wonderful world and for granting me knowledge and wisdom. I am deeply thankful to Madam Rabia Umer, my supervisor, for her dedication, guidance, constructive criticism, and support throughout the research. Without her guidance this work would not have been possible. I also extend my appreciation to my beloved parents, family, and friends for their unwavering support, prayers, and encouragement, particularly during difficult times.

DEDICATION

I dedicate this work to Allah Almighty without whom I would have been unable to complete this degree. I would also like to dedicate this work to my parents who have worked day and night to provide us better education and I wouldn't be here if it wasn't for them, my friends who have supported me through thick and thin, my teachers who have been really helpful and been there every time I needed them and provided with knowledge that I wouldn't have been able to get without their hard work.

Table Of Contents

List of Tables

List of Figures

CHAPTER NO. 01

1. INTRODUCTION

1.1 Background of study

In modern-day economies wide range of functions are performed by financial service industry to facilitate financial economic activities. Assessment of financial service is considered crucial to build socioeconomic resilience during crisis (Adaba et al., 2019; Karusala et al., 2019). Innovation and advancements in information and communication (ICT) industry has become a landmark in revolutionizing the financial industry. Wide use of mobile technologies and digital expansion has transformed the user expectations thus demanding a change in financial paradigm specifically in term of service delivery. Financial digitalization has shown rapid growth in recent year due to ICT advancements. Economies all over the globe are using financial services compelling financial service industry to come up with such range of product and services that are efficient and innovative which leads towards the increased use of Innovative financial technologies (Rizvi, 2018).

Financial technology (Fintech) refers to a segment of industries that consist of technology cantered companies with aim to change the traditional way of financial services by providing innovative products and services with the help of information technology applications. Generally, fintech includes checking of bank balances, execution of account transaction and making payments (Tiwari and Kartika, 2019). Financial technologies provide many benefits to its consumers as well as to financial industry. Mainly it makes transactions less expensive, transparent, and secure (M. A. Chen et al., 2019; Puschmann, 2017b). Fintech minimalizes the distance between consumers and financial institution and become a contributing factor for increased financial inclusion (Demirguc-Kunt et al., 2018). Its user friendliness and service quality provide high end financial solutions(Le, 2021a; Saksonova & Kuzmina-Merlino, 2017).

Following the change multiple industrial areas like e commerce, securities and insurance are implementing fintech (HurYeon & Lim se hun, 2017). Fintech has emerged because of forth

industrial revolution also known as industry 4.0 that instigated a shift in financial system. Mainly fintech companies work in the areas of payments transfer, cryptocurrency, trading of stocks, making loan requests, mobile services among others. Fintech facilitate trading, electronic services and businesses that are being offered to retail consumers(Lim et al., 2019). Recent rise in mobile payment industry due to innovative fintech payment service like Samsung pay and Apple pay provides clear evidence that is the most important and fastest developing industry from consumer perspective (Al-Qudah et al., 2022). Efficacy of financial institutions gets globally effected by evolution in financial technology that yield new and improved fintech processes, business models and applications.

Technological firms and financial institutions are drastically increasing their investment in fintech technologies thus attracting a global investment of 40 billion in 2019 (KPMG, 2019). Globally From 2015 to 2016 fintech investments have reportedly grown by 67% (I. Lee & Shin, 2018) in which Asian pacific region has the highest growth rate. Fintech not only a source of innovation but it is also a platform for the upgradation of traditional systems that results in sustainable economic growth (Y. J. Shin & Choi, 2019). Global report on fintech indicated the highest percentage of payment rounding up to 84%. Financial technology not only play a complementary role for traditional financial operations but also give a factor of uniqueness to the service. According to the 2020 report of KPMG global market has seen six percent more growth in financial technology over a course of six years increasing from 18 billion to 111.8 billion. According to one of the reports of Forbes utilization of consumer finance apps has grown to 71% in 2019 (Salz, 2020).

However, fintech still has to overcome many challenges in its maturity process, it requires long-term effort and time for it to be successful and being publicly acknowledged specially in case of retail financial services. In developing countries these challenges are even more sever and it take even longer period to strike a balance between risk and benefits associated with fintech innovation. Therefore, people belonging to socioeconomic class with lesser resources are not properly informed about the financial product and are less likely to seek financial information. It is also seen to unbanked the population in developing countries mobile services plays an important role in providing financial services. However, very few studies had been conducted to explore the adoption intention of fintech specially in developing countries and even lesser research would been found on fintech adoption during crisis or shocks.

An unanticipated pattern can be found in technological adoption due to various shocks that enables long term societal and economic changes. Similarly, Covid 19 pandemic started out as a shock to public health and healthcare systems which later turn into a global economic shock. Catastrophic effects of COVID along with its rapid transmission forced people to change their behaviours (e.g social distance) and forced government to impose a country wide lockdown as a measure to control the virus spread. where all these restriction on one hand become a major cause of downfall for many economics and business sector on the other hand it acted as a golden opportunity for entities providing communication, goods and services over the internet that resulted in increased use and adoption of such services. Undoubtedly adoption of digital means of finance during COVID had positively helped many firms and households in mitigating some of the health risks and socioeconomic effects of pandemic. This massive and accelerated trend towards the adoption of fintech is likely to exert important consequence on market equilibrium as newer tech-based players are entering into the market giving tough time to traditional incumbents.

In this research, we documented the impact of COVID 19 on fintech adoption specifically in Pakistan where people are generally reluctant towards new technologies. In addition, few other factors are also included that might facilitate or hinder the adoption of fintech. An Individual intention to Adopt and accept fintech differs from person to person, from group to group, from one social perspective to another, and from on cultural backdrop to another. Pakistan a developing country also consider technological advancement important for its growth and development (Rizvi,2018). In Pakistan the number of internet users rose from 22% (44.6 million) to 36.5% (82.90 million) of the population between 2018 and 2022 (SIMON KEMP, 2022) , which provides an opportunity to Pakistani financial institutions to reach out to wider customers base and offer their online services.

According to one of the reports from United States Agency for International Development (USAID) on regulatory framework for finches in Pakistan 2020 indicates that even though most of the financial services are dominated by banks in Pakistan their seems to be a very little use of accounts and noncash payments. Thus, providing a huge window for fintech entities to provide fintech related innovations in business models and services that are not taped by traditional banking systems. All these new entrants and technologies inevitably drive a countries financial and technological network thus increasing competition, choice, and overall efficiency of financial services along with improvement in financial inclusion in case of emerging economies.

Unfortunately, the report finds out in Pakistan people usually hesitate to adopt new technologies mainly because of underling risk including cyber security, regulatory and operational risk associated with their use. In addition to all this Pakistani culture is also typecast as the one where majority of population prefer traditional / physical mode of conducting financial transaction Thus, creating a challenging situation for fintech companies. Therefore, without knowing the influential factors FinTech service providers will going to continue to struggle and keep on waiting their time, money, effort, and resources. Furthermore, there is a need to make people aware of fintech services and other application and they need to feel safe and secure while using the technology as it is completely novel to them. Therefore, further studies are needed aiming at understanding the underline factors affecting the use and adoption of fintech by users in Pakistan. Although we could find a lot of research on m-payment and e-payment as a form of fintech services as a result of technological advancement in payment methods in developing countries but there is not much literature found on general adoption of these technologies in developing countries and in Pakistan in particular during and post COVID 19. Thus, this research will present an effort on filling the gap mentioned above by determining the crucial factors that affect the use and acceptance of FinTech in Asian context, specifically in Pakistan.

1.2 Fintech in Pakistan

Availability, accessibility and usage of financial products and services to the underprivileged people is knows as financial inclusion (Kunt, 2017). Everything ranging from access to a bank account, insurance, saving and credit facility to the less fortunate group of the society in a transparent and fair manner at affordable cost by the financial institution are all included in financial inclusion (Raza, 2015). Digital financial inclusion can also be described as accessibility and usage of financial services being offered to public by using information and communication technologies in a manner that is suitable for the end user (Prasad, 2019).

Financial inclusion is very important for financial development as it elevate poverty and inequality and leads towards sustainable economic development (Kunt, 2017). Pakistan is the six most populated country in the world that is transiting from cash-based economy to digital one. Pakistan lies in the range of countries of lower middle income where literacy rate and financial inclusion is very low (GOP, 2019). A major portion of Pakistani population lacks access to financial services

(Kunt D et al, 2012). Financial inclusion ration of Pakistan is 21% compared to lower middle-income countries that have an average of 33%. Mainly because of the high cost of banking services and products hinder the spread of financial services to the underprivileged part of society. For many years lack of access to basic financial service was a major issue.

However, now a days technology based financial service are acting as a bridge to overcome the issues of affordability and accessibility. Currently government of Pakistan is also taking active step to improve financial infrastructure with the implementation such strategies and policies that facilitate FinTech. As a result of all these efforts currently Pakistan has more than 160 million biometric verified mobile connections along with 58 million mobile wallet accounts among which 53% are inactive. To increase the financial inclusion, Pakistan in 2015 introduces its National financial inclusion strategy with the target to open 65 million digital accounts by 2023.

According to one estimate there are approximately 40 prominent fintech companies in the country that are grouped in seven categories based on their product and services. These categories are payment, service providers, payment independent software vendors, merchant aggregators, digital credit/saving, wallet service, insurance tech, identity service. Some of the widely used fintech services in pakistan are JazzCash, EasyPaisa, Haball Private Limited(B2B), RAAST(contextual payment), KuicPay, PayPro, TCS, Pakistan post, Monet (e-payment), AutoSoft Dynamics(consultancy), KarloCompare (personalized payment Aap), Batwa (Mobile wallet), Finja (free payment web Application), Careem pay and wallet, Alfalah (internet banking), Askari Bank (Paymax), HBL(Konnect), MCB, Meezan, Standard Charter (Mobile Banking), Tez Fin, UBL Omni, Upaisa and Red Buffer, One Load, Payload (Wallet). Thus, the future of fintech holds great potential in Pakistan.

Government intervention and with the introduction of RAAST program a considerable market opportunity have been created for fintech to benefit from. A significant shift has been observed in the adoption of digital financial technologies on user side because of Covid-19. An exponential increase of 102 percent was seen on the use of mobile banking and a 42 percent increase was observed on the use of internet banking. All this shows a dramatic shift in consumer preferences thus opening several opportunities for fintech to capture (Termezy & Razi, 2021).

1.3 Fintech and Covid-19 in Pakistan

Historically the world had encountered several major pandemics outbreaks that has drastically change the global economies. Some of them include SARS (Sever Acute Respiratory syndrome) (Chen et al., 2009), EVD (Ebola virus disease) (Ichev & Marinč, 2018). Similarly in 2019 world came across another deadly corona virus that caused havoc throughout the world. Due to the virus massive spread and related deaths, the COVID-19 (coronavirus) was declared as a global emergency by the world health organization (WHO) in February 2020 which later declared as a pandemic in March 2020. This virus where on one hand engulfed millions of precious lives on the other hand it impacted economics in the worst possible way and Pakistan was no exception. The coronavirus had infected 1.57 million individuals and was responsible for 30 thousand plus deaths in Pakistan as of October 2022.

In Pakistan as all over the world, for the containment of the virus government imposed strict preventive measures such as social distancing and full to smart lock down to save lives. All these measures had consequences on households and economy as most of the public and private business were closed and are being cautiously open in stages. According to one of the research Pakistan economies shrunk to negative 0.47% in 2019-20 which was already low at 1.9 % in the prior year. Due to timely intervention from the government, Pakistan was able to minimize the negative impact of COVID by many folds that later resulted into an increased GDP of 2.08 percent in 2020 and later surpassed the targeted GDP of 2021. Even though Pakistan with strict measures was able to curb the spread of the COVID-19 virus but the impact of these measures on public were quite significant. Amid all the restrictions many of the business shifted to digital modes to continue their operation. Business and public were left with no choice but to use digital means to fulfil their daily need. All these circumstances have forced people and business to use some sort of digital mode of financial service. Thus, to understand weather in crisis or forced situation people change their perception and intention towards digital financial technology research is needed that will focus on examining the factor that affects Pakistani citizens intention to use fintech service platforms. Therefore, this research study contributing factors that facilitate fintech adoption in citizens of Pakistan during the time of crisis like Covid.

1.4 Research Gap

Fintech recently become a trendy topic for researchers all over the world due to COVID-19. A significant increase in Fintech adoption was observed in COVID-19 as it emerges as a life saver

for many users (Fu & Mishra, 2022). Pandemic where on one hand has changed the world on the other hand has changed user perception and behaviour towards Fintech (Le, 2021). However, further research is needed to generalize these findings as different countries have different cultural, social, and economic paradigms that gravely affect user behaviour towards Fintech adoption (Le, 2021). A developing country like Pakistan has yet to overcome many difficulties to increase its financial inclusion and move towards a digital economy (Noreen et al., 2022). Previously researchers have performed their research for studying various aspect of Fintech Adoption (Rizvi et al., 2018). However, limited research work has been performed in Pakistan to investigate about the factors that influenced Pakistani users to acknowledged Fintech as useful during COVID-19 and boosted their intention to adopt Fintech even after the COVID-19 end. Therefore, this study presents an effort to fill the gap mentioned above and determine the critical factors that affect user perceived usefulness toward Fintech services and whether that boost Pakistani user intention towards the adoption of Fintech.

1.5 Problem statement

Fintech increases the self-efficacy of both financial organizations and consumers in reducing time wasted on traveling and paperwork (Ashta and Biot-Paquerot, 2018; Das, 2019). Normally people prefer to go out shopping and use financial services face to face. However, Pandemic have changed the circumstances. Covid-19 restriction has created problems for public and businesses in meeting their financial needs. Due to lockdown, all transactions need to be transferred online thus making fintech services need of the hour. In Pakistan fintech adoption rate is low as compared to other countries. One of the sustainable development goals (SDGs) set by government of Pakistan is to increase financial inclusion in the country. Apart from the SDGs Fintech firms in Pakistan are also becoming competitive in maintaining existing customers and attracting new ones. Thus, creating a need to conducted research for fintech firm and government that provide a deeper understanding of factors that affect consumer adopt of fintech services in Pakistan.

1.6 Research objectives

The objectives of this research are as follow.

- To examine the effect of Covid-19 lockdown, trust, data security and privacy, QAS on perceived usefulness toward Fintech among the users of Pakistan.
- To examine the effect of perceived usefulness towards fintech on intention to adopt fintech among the users of Pakistan.
- To examine the mediating effect of perceived usefulness towards fintech on the relationship between Covid-19 lockdown, trust, data security and privacy, QAS (predictors) and intention to adopt Fintech (outcome) among the users in Pakistan.

1.7 Research Questions

- Can COVID 19 lockdown, trust, data security & privacy and quality administrative services effect the perceived usefulness towards fintech in user of Pakistan?
- How perceived usefulness towards fintech effects user intention towards fintech adoption in Pakistan?
- Does perceived usefulness towards fintech mediate the relationship between Covid-19 lockdown, trust, data security and privacy, QAS and intention to adopt Fintech among the user in Pakistan.

1.8 Research contribution

Numerous studies have been conducted on fintech adoption, benefits, risks, challenges and found varying findings in different economies. However, the recent pandemic has significantly changed the situation. Limited research is available about COVID-19 effect on fintech services specifically in terms of developing countries. Therefore, this research will contribute to the existing literature by examining the effect of COVID-19 lockdown, trust, QAS, data security and privacy on perceive usefulness towards fintech along with effect of perceive usefulness towards fintech on intention to adopt fintech services in Pakistan.

Up till now mostly COVID-19 related studies were conducted in developed countries who are quite different from developing countries in terms of their demography, culture, quality of life, technological advancements, economy. Therefore, the finding of this study will be different from the previous studies as it is being conducted in Pakistan which is a developing country.

1.9 Significance of the study

Fintech enables businesses and customer to efficiently perform their online transactions in a cost-effective manner. The findings of this study will help the fintech companies of Pakistan to understand the factors that affect fintech adoption intention thus providing them with the insight to improve their service and enhance their customer satisfaction. This study can also be of interest to scholars who may wish to use the findings as a basis for further research on the subject.

CHAPTER NO. 02

2. LITERATURE REVIEW

2.1 Introduction

This chapter will summaries all the previous studies conducted on financial technology (fintech) specifically in terms of the factors that are influential towards the fintech adoption. It starts with the theoretical background which explain the theories being used to explain technology adoption. Further in empirical literature factors including covid-19 lockdowns, trust, data security and quality administrative services have been discussed as a contributing factor towards fintech perceived usefulness that further extends towards fintech adoption intention.

2.2 Fintech

Amalgamation of finance and technology resulted in the emergence of FinTech which uses innovative technological advancement like mobile and internet of things to increase the efficacy and productivity of finance related services without the intervention of a financial company (Chuang et al., 2016; Kim et al., 2016a) Fintech is described as an innovative and troublesome financial service where the use of information technology is a very important factor in non-financial companies (H.-S. Ryu, 2018). With globalization and digitalization information technology is revolutionizing traditional means by replacing them with new ones. Financial sectors are transforming their business processes with the adopting and incorporation of technological advancement. From previous research it is evident that the efficiency and scope of financial services can be improved with the application of technology.

Categorization of Fintech services are also increasing day by day such as crowdfunding, lending, peer to peer, mobile payment, and others. Apart from these there are many other types of fintech categories that are emerging throughout the world mainly including artificial intelligence (AI), blockchain, robot advisors, information, and feeder websites among others. Fintech has increased the financial inclusion by providing cost effective financial services to users and proven helpful in contracting the distance between the consumer and financial institution (Demirgüç-Kunt et al., 2020). Technological innovations are used by fintech to improve financial services (Schueffel,

2016), by using different application programs and artificial intelligence, blockchain for the delivery of financial services. Product and service Innovation provided by fintech is not limited to a certain business model in the financial industry. All the traditional financial services, mainly including financial transaction, insurance and investment provided by traditional financial institutions can be covered with the use of fintech (Arner et al., n.d.; Gimpel et al., 2018). According to one of the estimates the size of global fintech market that stand at $110.57 billion in 2020 will be increased by 2030 and reached at $698.48 billion.

Undoubtedly currently fintech is being applied all over the world but unfortunately different countries have shown different rate for fintech adoption, and an ambiguity was observed in FinTech adoption pattern (Frost, 2020). China, United Kingdom, Finland, India, and Korea are among those countries where fintech is widely being used (Kim et al., 2016a). Adoption on fintech in Pakistan remain slow as compared to other countries therefore arising the need for exploratory study that decipher the underlying factors influencing the adoption intention.

2.3 Theoretical background

The study drives its theoretical framework from technology adoption model (TAM) which is widely used in previous studies for investigating how and why different technologies are accepted by consumers. An extensive literature can be found on various determinants of information technology (IT) utilization and adoption (Skare & Soriano, 2021; Toufaily et al., 2021). The very first theory that attempts to explain the decisions about adoption or rejection of certain technologies was grounded in the field of psychology. The theory of reason action (TRA) by Ajzen and Fishbein (1980) suggested that people faith pertaining to the adoption consequences govern their adoption attention towards a certain behaviour or towards the adoption of a certain technology. Therefore, to understand the adoption of certain ideas, behaviours, and technological advancement the theory of reason action (TRA) is Widley being used by researchers. To further extend Ajzen and Fishbein (1980) theory of reasoned action technology acceptance model (TAM) was developed.

Based on the TRA along with some modification technology acceptance model (TAM) was developed by Davis et al. (1989a) which tries to explain while performing a task why certain technologies are being preferred by the end users. By using technology acceptance model Davis

et al. (1989a) discussed about the effects caused by external variables on an individual attitude and internal believes. TAM divides the factors influencing an individual behavioural attitude in to perceives usefulness and perceived ease of use that significantly impact on the adoption of any new technology. These two theories are very useful in determining the usefulness of technologies. According to Chuang et al (2016) TAM explain the relationship between behavioural intention by predicting the user acceptance towards information technology. It is believed that if a technology is considered to be useful and has the ability to enhance a person's performance then that technology, behaviour or service is more likely to be adopted by the people. In TAM perceived ease of use and perceived usefulness are reliable variables whose reliability and validity have been confirmed from numerous previous studies (Wallace & Sheetz, 2014). As technology acceptance model does a great job of explaining why there is a difference in consumer willingness towards the adoption of information technology along with its flexibility for improvement and customization according to the problem under examination, had made it one of the commonly used model in the field of information technology (Z. Hu et al., 2019a).

2.4 Empirical background

2.4.1 COVID-19 Lockdown

Fintech is referred as technological advancement of products and services in financial industry where companies keep on struggling in effort to make their digital financial services accessible, affordable, and useful (Puschmann, 2017). By applying technology adoption model and theory of reason action the study explains the behaviour of individuals towards fintech and how beneficial these services were in term of their usefulness during lockdown. The resent covid-19 pandemic had serious long term economic and financial implication. A strategic and policy shift was observed in the financial industry all over the globe due to this pandemic. Millions of people around the globe were affected by Covid-19, to cope with its catastrophic effects different preventive measures, and standard operating procedures (SOPs) were adopted to combat with the rapidly spreading virous. Among different preventive measures one was lockdowns. Almost each country government around the globe had closed their boarders and imposed countywide lockdowns to slowdown the virus spared causing business to shut down and forcing people to stay

at home that results into sizable contractions in factory output production with imminent consequence on economic activities. Amid all these restrictions people were unable to go and physically shop from the markets but for their survival people still have to buy products for their daily needs and had to use services for work related purposes, important requirements and for entertainment purposes (Wójcik & Ioannou, 2020). Thus, causing significant lifestyle alteration in people these changes mainly include an individual attitude towards work, bank transaction, methods of payment, and shopping habits among others (Khatun et al., 2021).

Covid- 19 pandemic where on one hand severely affected public health and economies on the other hand had opened numerous growth opportunities for the field of information and communication technologies including FinTech where new and innovative financial trends and technologies will be a game changer and have the potential to grow due to pandemic (Das, 2019). Before 2019 the adoption rate to fintech related services was not that prevalent but during and after Covid-19 fintech adoption rate goes up to nearly 75% throughout the world, an increase of nearly 32% had been seen in the downloading rate of fintech related application due to Covid-19 and related lockdowns. Pandemic has caused many individuals to realize how important and useful these fintech services are for them as they were left as the only means through which people can pay for their daily needs (Fu & Mishra, 2020). Thus, enabling consumers to embrace digital finance services during and after pandemic to keep up with their daily needs by purchasing different product and services (Fu & Mishra, 2020).

China has observed rapid development of e commerce models because of covid-19 outbreak. Instore shopping was replaced by online platforms and most of the store turn to online sale due to the covid-19 related restriction causing the mobile payment business to grow in the first quarter of year 2020 by 14.29 percent in China (Government of China, 2020). Covid -19 pandemic has also facilitated the development of mobile and digital payments in India. Europe has also observed an accelerated growth in the development of FinTech companies and digital financial services. Netherland has also seen a shift in online payment from offline payment due to covid19 outbreak. In short all over the world significant shifts were observed in the financial industry. Thus, for fintech industry, pandemic is considered to be an important factor that influence a user perception about the usefulness of technology. Perceived usefulness can be explained as consumer acceptance about a certain technological advancement as effective and useful and their belief that with the

adoption of such technologies their life will become easily which will ultimately result in better performance (Moon & Kim, 2001; Venkatesh & FD Davis, 2000).

The two-year prolonged period of Pandemic has helped user in realizing the importance and usefulness of fintech platforms in managing a normal life thus effecting their intention to adopt. Globally lockdown has induced familiarization towards the usefulness and convenience of fintech that will likely further effect the adoption in the post Covid-19 era. Considering all the above discussion and evidence from the previous research this study takes Covid lockdown as an import factor that effect user perception about FinTech usefulness and their intention to adopt. Therefore, the following hypothesis is formulated.

H_1: Covid-19 lockdown has a significant positive relationship with intention to adopt Fintech, and perceived usefulness mediates this relationship.

2.4.2 Trust

The concept of trust had been studied by the scholars in multiple disciplines like psychology, sociology, business and management and other fields (Lee et al. 2001). Whenever there is an interaction between two parties trust is necessary specially if one of them faces risk (McKnight & Chervany, 2001). Therefore, Trust is considered very important for Individuals for the making of beneficiary relationships. It makes it possible to accept fiduciary relationships in quest of achieving common goals. For many decades trust has been researched but it become a more important phenomenon with the evolution of information and communication technologies. Simply putting in term of business we can say that trust is sort of faith in the products, services, and repute of a business or organization (Lewis & Weigert, 1985).

While exploring the literature on the issues of technological adoption it is found that researchers had mainly focused their research on trust, and it is often seen that trust is also commonly used as a basis to attract users towards a new technology apart from perceived usefulness. Trust and confidence of consumer regarding the security of their transaction remain a vital component to why institutions were entrusted by the consumer for their finances(Wentzel et al., 2013). Organization providing online financial transaction services are views as trusted facilitator by the users but if this trust is breached it will cause user to avoid transacting with such organization

(Hoffman et al., 1999). Similarly in terms of FinTech trust also play a very important role as most of the fintech related application services involve high dimensional data of users. Therefore, it is very significant to research how trust affects attitudes and behaviour of users and their willingness to adopt new technologies. Thus, this research has taken trust as a second determining factor that affects a user view about the perceived usefulness of a technology and his/her intention towards the adoption of such technology. According to Hansen et al., (2018b); Siau & Shen, (2003); Vance et al., (2008) in digital financial services trust is defined in term of transparency, availability, security, and confidentiality. Thus, whenever it comes towards the adoption of fintech services trust paly a very vital role in its adoption (Gefen, 2000; Joubert & Belle, 2013; Malaquias & Hwang, 2016) and boost the attitude of the customer towards the use of mobile based application (Mahatanankoon et al., 2005). Therefore, trust is very important in understanding and recognizing the perceived usefulness of fintech related services, when user has trust that his personal and financial information will be protected, his privacy will not be compromised, and he will be provided with quality services he will automatically recognize the perceived usefulness of the technology.

Multiple elements are condensed to be influential when we talk about trust in digital financial technologies adoption for example availability, integrity, confidentiality, stable connectivity (Zhang et al., 2003). Numerous studies had been conducted to understand the importance of consumer trust on fintech services because of this trust is considered to be one of the most widely research belief of TAM when it comes to the use of different technological tools related to fintech services (Chuang et al., 2016; Vance et al., 2008). Fintech companies that are successful in providing their clients an incredibly long-lasting sense of security about user data will be able to enjoy huge opportunities in terms of their growth and revenue. Therefore, due to relatively higher risk of security and switching cost it is vital for the fintech companies to build trust in order to facilitate FinTech adoption (Singh & Srivastava, 2018). When consumers were entertained with quality services their trust on the quality of the system will automatically increase specially when we talk about fintech related services, as these services are conducted without any human connection therefore consumers are more concerned about their quality and security (N. Singh & Sinha, 2020). Thus, when we talk about adoption of fintech related services the very first point comes to the mind of customers is the level of trust they have on the use of fintech services. Considering all the above discussion and evidence from the previous research this study take trust

as an import factor that effect user perception and adoption intention towards FinTech. Therefore, the following hypothesis is formulated.

H_2: Trust has a significant positive relationship with intention to adopt Fintech, and perceived usefulness mediates this relationship.

2.4.3 Data security and privacy

In the rapidly innovative world of financial technology privacy protection is an important aspect from a user perspective. A large portion of technology adoption literature consider data security and privacy as one of the main contributors hindering the adoption of new technologies. According to the International Organization for Standardization through its standard ISO 27002 data security is described as availability, confidentiality, and integrity of data. Data security can be defined as the insurance of both the data and the related assets like the security of equipment being used for data collection, storage, and transmission (Whitman and Mattord., 2009). Whereas privacy can be defined as an assurance that a user information will remain confidential and protected while using fintech services (Goodwin,.1991). When it comes to the adoption of digital financial services security of data and information privacy is one of the key elements to be in consideration by users (Chuang et al., 2016). With growing advancement in the field of technology everybody is reaping their benefits and making their life easier from just a click of a button. All these technological advancements where on one hand have increased their user efficiency, on the other hand they have also increased the risk of malware attacks and data theft when users simply download and install different application on their smartphone. This ultimately give rise to the user concerns that if they use such technologies their personal and financial information would no longer be in safe hands and it could be leaked or stolen anytime and to anybody(Noor et al., 2019).

From past few years we have seen many such cases where user have to suffer from data theft which ultimately resulted in loss of large amount of user money either due to the leakage of personal information or due to the lack of protective measures on the end of financial systems (Byrnes, 2020; Yang et al., 2021). Despite all these negative aspects which is the root cause for users growing anxiety towards the adoption of such technologies the rate of worldwide mobile application downloads has seen a continuous growing trend(Statista, 2019). Still when it comes

to the use and adoption of digital financial services Data security and privacy is considered an important aspect by the consumer in building their believes and selection of digital payment services (Barth et al., 2019). In order to overcome user apprehension towards the use of fintech it is required that all fintech related service providers should be more open about their data collection and protection measures.

Now a days protection of user information is indirectly associated with the reputation of the services and to gain sustainable competitive advantage over rivels it is necessarily very important for fintech service providers to limit their user apprehension about security by making it as one of their priorities. So, when the users realize the presence of high level of data security and protection, improved control mechanism, easy to use procedures along with stable fintech services, all these measures automatically increase the user perceive usefulness towards fintech services which further results in higher customer satisfaction. Therefore, if a customer feels confident that his information will remain secured his desire to keep on using the service will increase (Z. Hu et al., 2019b; Stewart & Jürjens, 2018a). Thus, fintech service provides who ensures greater data security and introduce high quality privacy systems will be one of the greatest reasons to capture user trust and major cause for the retention of the customer for a longer period. Considering all the above discussion and evidence from the previous research this study takes data security and privacy as an important factor that effect user perception about FinTech usefulness and intention towards Fintech. Therefore, the study formulates the following hypothesis.

H_3: Data security and privacy has a significant positive relationship with intention to adopt Fintech, and perceived usefulness mediates this relationship.

2.4.4 Quality administrative services

When we talk about quality administrative services (QAS) it mainly refers to the quality of services connected to execution of contract, management of subcontract, digital transactions, problem resolution and many other related services which are provided to the end user. Specifically in the field of fintech all the transaction are executed through digital platforms eliminating the human factor which is one of the main components of quality administrative services as these services are mainly revolved around human connection. Therefore, previously held studies aiming on finding

out factors that contributes towards the credibility of any bank or brand have found QAS as one of the main factors that contributes towards the credibility of that bank or brand image (Chuang et al., 2016). Whenever a user encounters any issue in their online transactions either in the form of a fraud, identity theft, wrong entry, incorrect amount and so on, the first thing the user must do is immediately stop that transaction as soon as possible for that QAS is going to be the first way through which customer will connect to the service provider. Therefore, if the customer goes through any unnecessary steps or faces any kind of difficulty in this service, he will become disappointed and either show reluctance towards the use of service or simply look for other alternatives(Z. Hu et al., 2019b; Razzaque et al., 2020).

When it comes to the use of electronic administrative services, we must examine both factors related to human services and artificial intelligences. When companies efficiently use human and technological factors to deal with the queries of their customers by using text, digital chat rooms, speech to text or text to speech software's to resolve customer issues or give response to their questions quickly and efficiently. All these software's enable companies to keep in touch with their users around the clock (Belanche et al., 2019). Thus, in recent times if a company wants to be successful in a sustainable manner, then it is very crucial that they entertain their customers with quality administrative services which can be done with the introduction of electronic administrative services via chatbots or through different call-to-action application or webpages or with the help of digital chat services (Jang et al., 2021). Simply by using online administrative services a company cannot achieve sustainable success for that they need to train their staff of online customer service in a continuous manner to provide superior service quality such as knowledge advancement and on the spot problem resolution (Chuang et al., 2016). All of this will lead customer to perceive fintech as a useful service thus creating new and increased opportunities for the use of fintech in future (Kim et al., 2016b). Hence quality administrative services are useful in increasing customer perceived usefulness of fintech related services. Considering all the above discussion and evidence from the previous research this study takes qualitative administrative service as an important factor that effect user intention and perception about FinTech adoption and usefulness. Therefore, the study formulated the following hypothesis.

H_4: QAS has a significant positive relationship with intention to adopt Fintech, and perceived usefulness mediates this relationship.

2.4.5 Fintech adoption intention

Technology acceptance model (TAM) describes perceived usefulness (PU) as a user confidence level for using a specific system that will increase his or her performance in a task or job. Simply putting PU is a user perception about the performance that he or she experience about the outcome (Chuang et al., 2016; Wonglimpiyarat, 2017). In the world of technology one of the important factors that drives user to adopt a new technology providing that the job is now being completed with more efficiency resulting in higher performance is perceived usefulness(Chuang et al., 2016; Wonglimpiyarat, 2017)**.** In terms of digital financial technology perceives usefulness can be defined as one's belief in the degree of helpfulness he or she will get by using fintech related services (F. D. Davis, 1989). In this research several attributed were selected from the scale which was developed by Davis (1989) to measure the perceived usefulness of fintech.

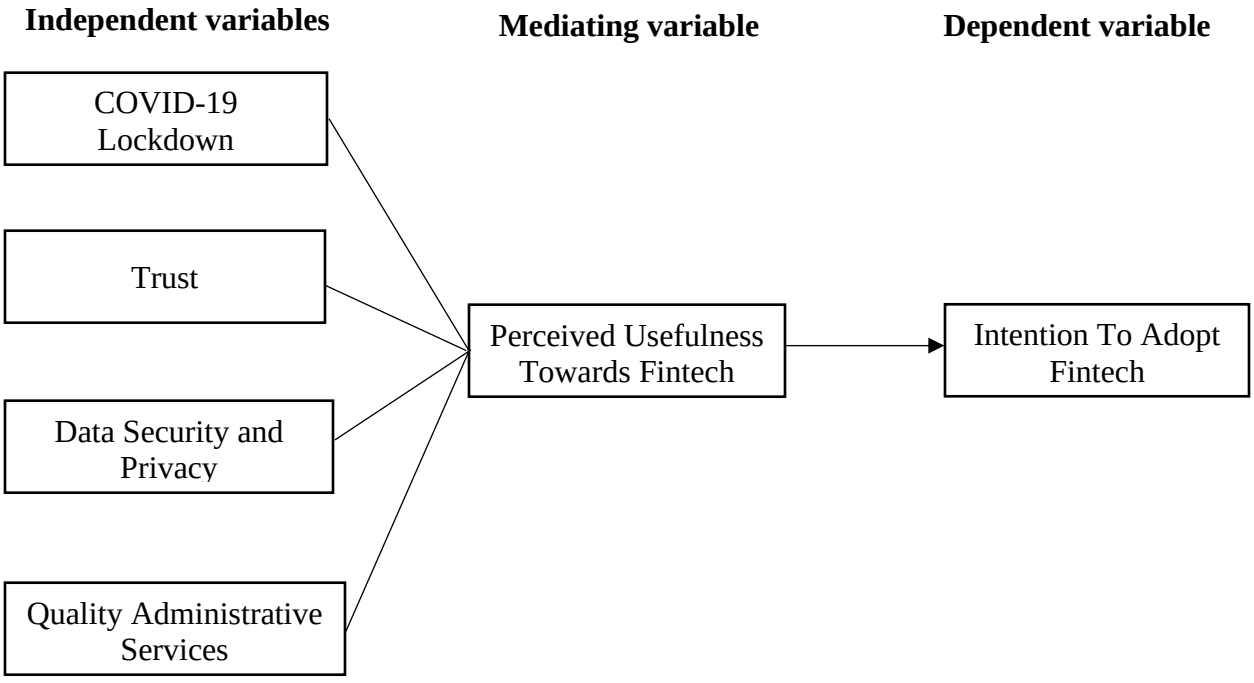
Technological advancements are proven to be game change in every filed either we talk about medicine, education, telecommunication or any other filed no matter where you look you will see people benefiting from them same is the case with fintech services, with latest advancement in this filed user were able to increase their task completion rate, able to reduce their travel time and were also able to reduce excessive paper work which are associated with traditional financial system (Chuang et al., 2016; J. Lee et al., 2019). From decades of research scholars have realized that individuals keep on frequently involved in the process of evaluating the consequences of their behaviour and actively participate in the process of making choices based on the desirability of perceived usefulness (Chuang et al., 2016; Moslehpour et al., 2018).

Based on the analysis of the past research it is observed that a user intention towards the adoption of fintech has strongly influenced by perceived usefulness that enables consumer to avoid making unnecessary mistake while performing a specific job with the help of fintech. Furthermore, perceived usefulness will also affect consumer intention to use fintech as consumer will evaluate their level of satisfaction being received after using a financial service via means of technological platforms (Chuang et al., 2016; Moslehpour et al., 2018; Wonglimpiyarat, 2017)**.** Recently covid-19 pandemic where on one hand have generated many problems for governments, industries, and customers but on the other hand have proven to be helpful for many businesses specially for the ones who use digital platform or transit to online platforms. Therefore, many users during covid-19 have recognized the usefulness of online financial services when it comes to paying for their

daily necessities (Billore & Billore, 2020). Some of the factors that contributes towards the usefulness includes serviceability, the potential to safeguard information and customer satisfaction with the quality of services. For fintech related business covid-19 is considered as a blessing because they don't have to bear any marketing expenditures to promote their service, users automatically grab this opportunity and started using fintech services due to repeated lockdowns and many other related restrictions which limits the user accessibility. As users can continuously and effectively use fintech services for their financial transactions with safety, quality, and ease (Hansen et al., 2018a; Jiwasiddi et al., 2019). All of this make it very clear to the users about the usefulness of fintech. Thus, increasing the chance at user end to keep on using the service even after Covid-19 as they perceived such services to be useful (Revathy & Balaji, 2020). Considering all the above discussion and evidence from the previous research this study takes perceived usefulness as an important factor that effect user intention to adopt FinTech. Therefore, the study has formulated the following hypothesis.

H_5. Perceived Usefulness towards Fintech has a significant positive relationship with intention to adopt Fintech.

2.5 Theoretical framework



CHAPTER NO. 03

3. METHODOLOGY

3.1 Introduction

This chapter will summarise the research methodology employed by this study for the collection and analysis of the data. It starts with explaining the research approach used in the study then the sampling technique used and the rationale behind it. Further data collection method its rationale and measures used for questionnaire are explained. Lastly data analysis tools used, and its rationale is discussed.

3.2 Research approach

Broadly there are three types of research approaches qualitative, quantitative, and mixed approach. Among these approaches the current study is using quantitative approach to measure the effect of independent variables such as covid-19 lockdown, trust, QAS, data security on dependent variable intention to adopt fintech and to check weather perceived usefulness mediates the relationship between the dependent and independent variables in Pakistan. However, when it comes to the strategy the study is causal as it examines the effect of independent variables on dependent variable.

3.3 Sample selection

As this study requires the collection of empirical data regarding FinTech adoption. The population of the study is Pakistani users of FinTech services. Due to unavailability of list of consumers using fintech services convenience sampling was used to conduct the survey. As this approach of sampling is considered and frequently used by social science studies because of its accessibility, quick response, and closed proximity (Jager et al., 2017). As per Roscoe (1975) there are some rules of thumb that needs to be followed when it comes to sample selection one of them is that the size of the sample should be many times the number of variables being used in the study most preferably by 10 to 15 times. Table G*Power* was utilized to compute minimum sample size of

the study according to the recommendation of Hair et al. (2014). As the current study has four independent variables, one mediating variable and one dependent variable so the recommended minimum sample size came out to be 138. Thus, this study has collected the data from 257 participants who had used and currently using Fintech service.

3.4 Data collection technique

As the study focuses on determining factors that influence Pakistani user intention to adopt fintech. Regarding this, collection of primary data is best for gaining information pertaining to Pakistani consumers intention to adopt FinTech. Therefore, this study uses a survey method for the collection of primary data. A questionnaire is developed by adapting the scale already used in previous studies to measure the relationship between dependent and independent variable. A self-administered questionnaire is used to collect data from Fintech users in Pakistan. Online platforms like google forms was used to administered and collect data through questionnaire. To ensure quality of data collection participant were asked a screening question whether they use any form of Fintech service. If the reponed with "Yes" then they move to the next section. Therefore, the data was collected only from those individuals who used or still using any form of FinTech service in Pakistan.

3.5 Measures

This study uses the items from previous studies on fintech. The items are measured on a five-point Likert scale (1= Strongly Disagree to 5= Strongly Agree). Four items were adapted and modified from Baker et al. (2020) scale to access the effectiveness of Covid-19 lockdowns. Three scale items were adapted and modified from Stewart and Jurjens (2018) to measure the effect of Trust. Four items were adapted and modified from Stewart and Jurjens (2018) scale to assess the impact of data security and privacy. Three items were adapted and modified from Russell-Bennett et al. (2017) scale to measure the effect of Quality administrative services. Perceived usefulness towards fintech is measured by adapting and modifying three items from the scale of Davis et al. (1989). Lastly, Intention to adopt fintech was assessed by adapting and modifying three items from the scale of Chuang et al. (2016).

3.6 Data analysis

The study used partial least square structural equation modelling PLS-SEM for the examination of causal relationship between the variables. PLS-SEM is one of the most widely used multivariant analysis techniques whenever there is a need to examine causal predictive links (J. F. Hair et al., 2012; Khan et al., 2019; Richter et al., 2015; Ringle et al., 2012). Whenever there is need to find out relation or influence between constructs or the emphasis is on the development of the theory in a predictive research model, generally PLS-SEM is recommended due to its exploratory nature (Fornell & Bookstein, 1982). A two-stage analytical process is being used for data analysis as proposed by (Gefen et al., 2000). At the first stage assessment of measurement model is conducted through discriminant testing, convergent validity testing, internal consistency, and reliability testing. This helps to determine how each item is related to its latent variable. In the second stage a structural model evaluation is conducted which helps us to understand the relationship between latent variables and helps in hypothesis testing. Version 4.00 of PLS-SEM is used for the analysis of model measurement and structural models.

CHAPTER NO. 04

4. ANALYSIS & RESULTS

4.1 Introduction

This chapter will explain in detail all the results obtained from the analysis of the data collected for this research. There were 257 participants in this study and all of them were Pakistani citizen who used or still using any fintech service available in the country. This section begins with the demographic profile of the respondents along with the measurement and structural model analysis which was conducted using PLS-SEM. The reliability and validity of the construct is established by the measurement model whereas the structural model ascertain the significance of hypothesized relationships. Different hypotheses were proposed to evaluate the relationship of predictors with the dependent variable.

4.2 Demographic Data

A total of 269 participants responded to the questionnaire out of which 12 responses were eliminated as they were not complete. Therefore, data from 257 respondents were used to test the proposed model. The demographic feature of the respondents is reported in Table 1.

The first demographic element is gender which separates male and female from population test. It is clear from the table that the number of male respondents is on the higher side as compared to the female respondents. The data include more men than women as there were 29.96% were female and 70.04% were male.

The next element was age. The respondents were divided in to three age groups. The first group contains respondents below 35 years, second group contains respondents between age of 36 and 55 years and the third group contain respondents over the age of 55 years. Out of 257 respondents 45.53% were below the age of 35 years, 37.35% were 36 to 55 years old, 17.12% were over the age of 55 years. After age the next demographic element used in the study was education. In terms of education 47.86% respondent were undergraduates, 47.08% were postgraduate and 5.06% were FSC. Another element used in the study was Occupation. In the study majority of the respondents

were Government servant (40.86%), professionals (35.80%), students (10.12%), service industry proprietor (7%) and housewife (5.45%).

After occupation the next element used in the study was usage of FinTech. The frequency of fintech usage was divided in four subcategories. Respondents were asked to choose the amount of Fintech usage appropriately. Amony the respondents 47.86% are the ones who using Fintech service frequently, 31.13% respondents were using the service quite Often, 17.12% were the respondents that uses the service sometimes and 3.89% respondents used it rarely. Lastly computer skills of the responded where asses as it is one of the important skills required to use any technology. Among the respondents 10.12% are the ones having basic skills, 22.96% have intermediate, 46.30% have advance and 20.62% have expert skills.

Table 1. Descriptive statistics

Demographics		**N = 257**	**%**
Gender	Male	180	70.04
	Female	77	29.96
Age	<35	117	45.53
	36-55	96	37.35
	Over 55	44	17.12
Education	Matriculation	0	0.00
	FSC	13	5.06
	Undergraduate	123	47.86
	Postgraduate	121	47.08
Occupation	Student	26	10.12
	Government servant	105	40.86
	Housewife	14	5.45
	Service industry proprietors	18	7.00
	Professionals	92	35.80
	Other	2	0.78
Usage frequency	Frequently	123	47.86
	Often	80	31.13
	Sometimes	44	17.12
	Rarely	10	3.89
Computer skill	Basic	26	10.12
	Intermediate	59	22.96
	Advanced	119	46.30
	Expert	53	20.62

4.3 Measurement model

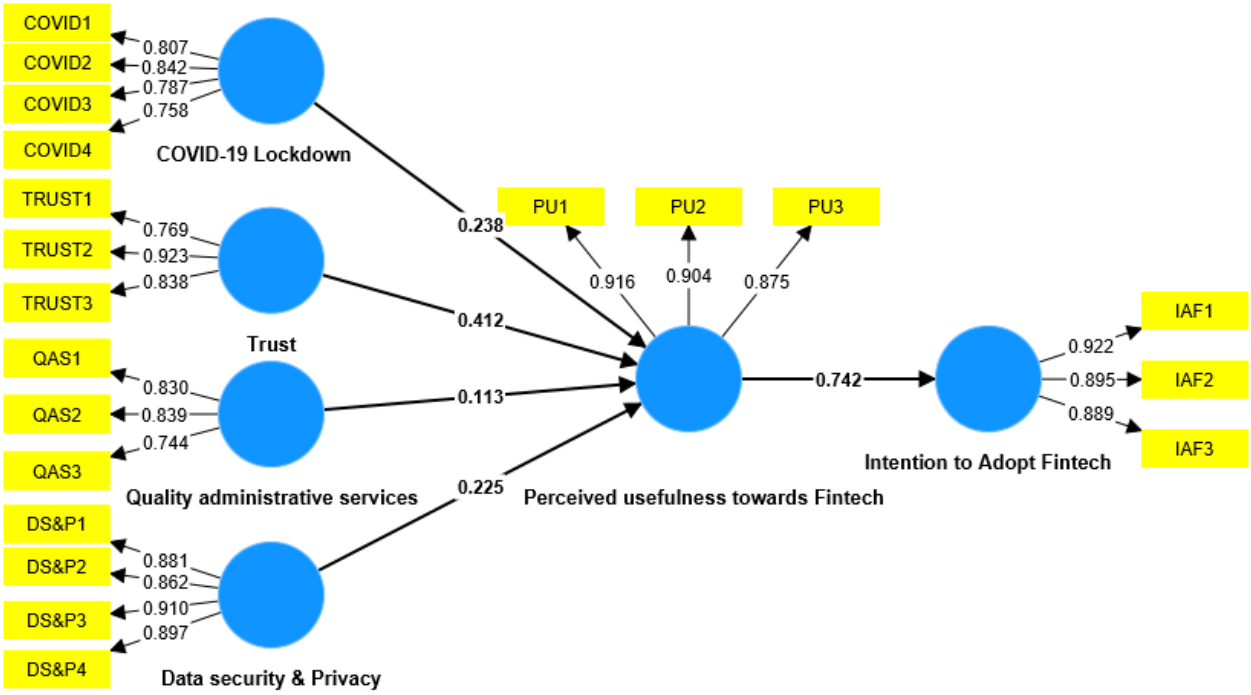


Figure 2. PLS algorithm analysis of the measurement model

Smart PLS 4_windows-x64 is used to assess the measurement and structural model. Smart PLS 4 is a statistical software which is used to estimate the structural model parameters and measure psychometric properties of measurement model. The validity and reliability of measurement model is estimated by assessing: (1) factor loadings, (2) Indicator Multicollinearity (3) convergent validity, and (4) discriminant validity.

4.3.1 Factor Loadings

The extent to which in a corelation matrix each of the items corelate with the given principal component is referred to as factor loading. The range of the factor loadings is from -1.0 to +1.0 where a higher absolute represents a higher corelation between items aand its underlying factor (Pett et al., 2003) .In the current study none of the item's loading are less than the proposed

recommended value of 0.50 (J. F. Hair et al., 2017). Therefore, none of the items were dropped from the model. Factor loading are presented in Table 2.

Table 2. Measurement model results from factor analysis

Constructs and variables	Standardized factor loadings	Cronbach alpha	CR
COVID-19 Lockdown			
I needed DFS for online purchases during COVID-19 lock down.	0.807	**0.811**	0.876
I used DFS to purchase online during COVID-19 lock down.	0.842		
I used original products website to buy things I need due to COVID lock down.	0.787		
I needed DFS while using online purchasing platforms during COVID lock down.	0.758		
Trust			
I believe DFS are trustworthy.	0.769	**0.797**	0.882
I believe DFS providers keeps my personal information safe.	0.923		
I believe the DFS I use is reputable	0.838		
Quality Administrative Services			
I feel my transactions are safe whenever I use the service	0.830	**0.734**	0.847
The service provider has been helpful in answering my questions.	0.839		
In general, the service provided has supported the use of DFS.	0.744		
Data Security and Privacy			
I trust in the technology of DFS I am using.	0.881	**0.910**	0.937
I trust in the ability of my DFS provider to protect my privacy.	0.862		
I am not worried about the security of the DFS I use.	0.910		
I feel confident using DFS for various activities.	0.897		
Perceive Usefulness towards Fintech			
Online purchase has become quicker with the use of DFS.	0.916	**0.880**	0.926
With the use of DFS, I can manage my online sale/purchase activity effectively.	0.904		
I believe overall the use of DFS is very helpful.	0.875		
Intention to Adopt Fintech			
I will use/continue to use DFS to fulfill my needs in future.	0.922	**0.886**	0.929
Following the shift, I predict I will continue using digital financial platform in the future.	0.895		
I recommend the use of digital financial platform to my friends, family and/ or other contacts.	0.889		

Note: AVE: Average variance extracted; DFS: Digital Financial Services.

4.3.2 Indicator Multicollinearity

To assess the multicollinearity in the indicators (VIF) Variance Inflation Factor statistics is utilized (Fornell & Larcker, 1981). If the values of VIF is below 5 then no issue of multicollinearity will rise in the model (Hair et al., 2016). VIF values of the indicators used in the current study is presented in Table 3. The VIF values presented in the Table 3 reveals that VIF values for each of the indicators is below the recommended threshold.

Table 3. Multicollinearity Statistics (VIF) for indicators

	VIF
COVID1	1.724
COVID2	2.098
COVID3	1.8
COVID4	1.425
DS&P1	2.941
DS&P2	2.545
DS&P3	3.364
DS&P4	3.37
QAS1	1.417
QAS2	1.508
QAS3	1.441
TRUST1	1.476
TRUST2	2.801
TRUST3	2.247
PU1	2.808
PU2	2.694
PU3	2.11
IAF1	2.969
IAF2	2.485
IAF3	2.351

4.3.2.1 Reliability Analysis

According to Edward G Carmines (1979) the extent to which a measuring instrument is table and consistent is defined as reliability. Repeatability is the essence of reliability. Same results will be

obtained if the instrument is administered again and again. Composite reliability (CR) and Cronbach Alpha are the two most commonly used methods to established reliability. When the composite reliability (CR) and Cronbach Alpha of each construct exceeds the threshold value of 0.7 then it is said that the measurement model has a satisfactory reliability statistic. Table 2 present the results of Composite reliability (CR) and Cronbach Alpha. It shows a range of Cronbach Alpha from 0.744 to 0.923 and a composite reliability range from 0.882 to 0.937. The results obtained from both indicators of reliability shows that all the indicator used in the study poses satisfactory reliability as they are over the required threshold of .70 (Hair et al., 2011). Hence construct reliability is established.

4.3.3 Construct validity

By using PLS-SEM construct validity is established when there is convergent validity and discriminant validity.

4.3.3.1 Convergent validity

According to Bagozzi et al, (1991) convergent validity can be defined as the degree to which multiple attempts for the measurement of the same concept are in agreement. The idea behind is that for a measure to be said as the valid measure of a concept then there should be a higher corelation between two are more measures that are used for the same thing. In order to establish convergent validity according to Fornell and Larcker (1981) all the average variance extracted values should be greater or equal to the recommended value of 0.50 only then items will converge to measure the underlying construct. Results of convergent validity in the current study shows that all the constructs are valid as their AVE statistics that are ranging from 0.638 to 0.814. are meeting the threshold. Hence convergent validity is not an issue. Table 4 shows AVE values of all the constructs.

4.3.4 Discriminant validity

Discriminant validity refers to the degree to which different measure of concepts are distinct. The idea is that if two or more concepts are unique, then their valid measures should not corelate too highly (Bagozzi et al., 1991).

4.3.4.1 Fornell and Larcker Criterion

According to the criteria set by Fornell and Larcker (1981) when the average variance extracted (AVE) square roots of a construct is greater than its corelation with all other construct then it is said that the discriminant validity is established. Table 4 presents the square root of AVE with all the constructs. In the study for a construct, it is found that the square root of AVE was greater than its corelation with other constructs. Therefore, provides a strong supporting ground for the establishment of discriminant validity.

Table 4. Construct Reliability and Validity (Forner and Larcker Criterion)

	AVE	COVID	DS&P	IAF	PU	QAS	TRUST
COVID	0.638	0.799					
DS&P	0.788	0.369	0.888				
IAF	0.814	0.470	0.487	0.902			
PU	0.807	0.540	0.517	0.742	0.898		
QAS	0.649	0.487	0.457	0.539	0.463	0.805	
TRUST	0.715	0.398	0.37	0.443	0.626	0.319	0.846

Note: AVE: Average Variance Extracted; CI: COVID-19 lockdown; DS&P: Data security and privacy; IAF: Intention to adopt Fintech; PU: Perceived usefulness toward Fintech; QAS: Quality Administrative Services; TR: trust.

4.3.4.2 Heterotrait - Monotrait ratio (HTMT)

Proposed by Henseler, Ringle and Sarstedt (2015) HTMT is a corelation measure based on the estimation of corelation between the constructs. It is one of another way for the establishment of discriminant validity. According to Klin (2011) a threshold of 0.85 or less is recommended. The current study shows results of HTMT ratio range from 0.400 to 0.839 that are less than the recommend threshold proposed by Klin (2011). Thus, providing support for the establishment of discriminant validity. The HTMT results are shown in Table 5.

Table 5. Discriminant Validity - HTMT

	COVID	DS&P	IAF	PU	QAS	TRUST
COVID						
DS&P	0.418					
IAF	0.556	0.538				
PU	0.635	0.575	0.839			
QAS	0.631	0.553	0.664	0.556		
TRUST	0.493	0.433	0.529	0.747	0.400	

4.4 Structural Model

After the evaluation of measurement model the next step in structural equation modelling is the assessment of hypothesized relationship to prove the proposed hypothesis.

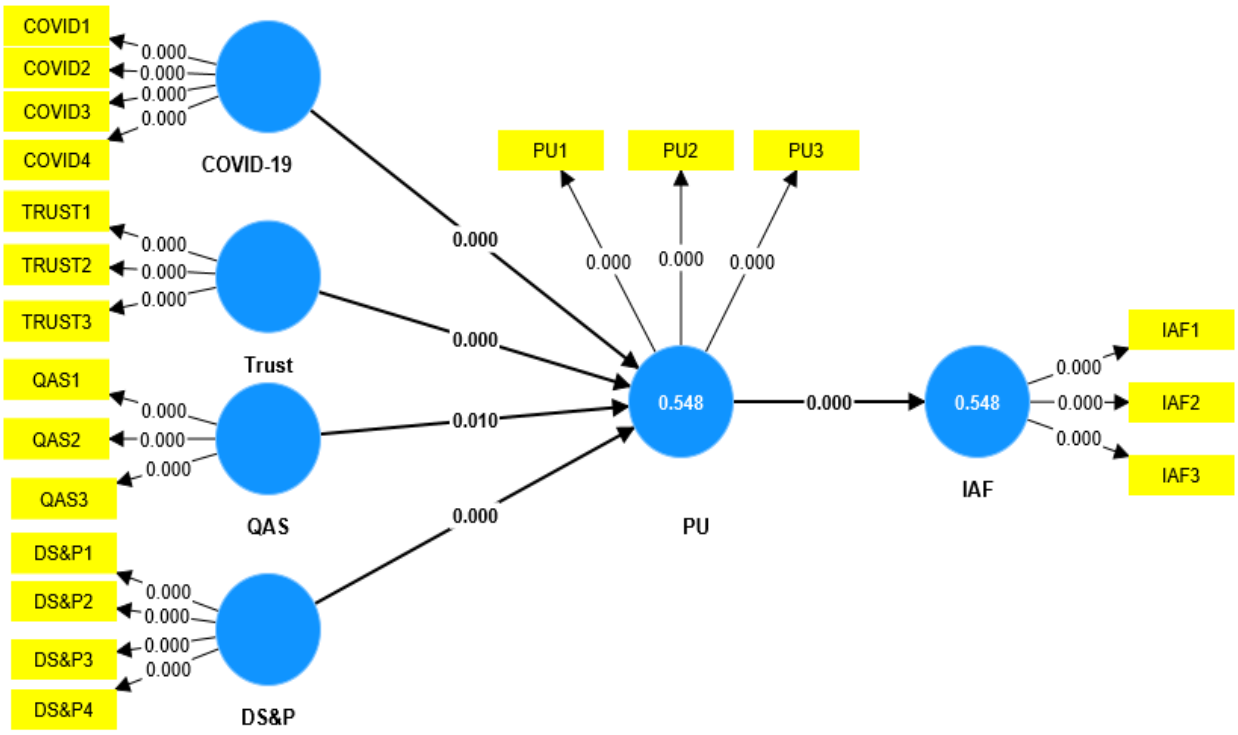


Figure 3. Assessment of the structural model.

4.4.1 Goodness of Fit (Model's predictive capabilities)

The coefficient of determination (R2), Effect size (F2), Standardized Root Mean Square Residual (SRMR) are used in the current study to assess the goodness of fit. The result of the analysis (see Table 6) shows that Covid-19 lockdown, trust quality administrative services and data security and privacy have high squared multiple correlation (SMC; R^2). Nearly more than half of the variation (SMC = 0.548) in perceives usefulness is explained by the direct impact of Covid-19 lockdown, trust quality administrative services and data security and privacy. For intention to adopt Fintech (SMC = 0.54) show a proportion of variance in IAF which is explained by the direct impact of perceived usefulness towards fintech. Furthermore, in the present study Fintech adoption intention is assessed through several predictor variables. F^2 statistics were used to identify the effect size of all the predictor variables as recommended by Haie et al (2013) on IAF. F^2 statistics specifies that whether the removal of an independent variable has a substantial impact on the dependent variable (J. F. Hair et al., 2013). In the context of present study, the analysis of F2 statistics results shows that the removal of perceived usefulness (PU), data security and privacy (DS&P), and Trust will have a significant impact on Fintech adoption intention (IAF), The F^2 statistics are presented in Table 6. Lastly standardize root mean square residual (SMSR) statistics were used to assess goodness of fit. According to Hu and Bentler (1999) a value of SMSR less than 0.01 or 0.08 is considered to be a good fit. The SMSR value in the present study is 0.09 which is in compliance with the recommended values.

Table 6. Effect size for independent variables

	Coefficient	STDEV	T statistics	P values
COVID -> IAF	0.001	0.008	0.104	0.917
COVID -> PU	0.088	0.056	1.569	0.117
DS&P -> IAF	0.084	0.043	1.970	0.049
DS&P -> PU	0.085	0.043	1.975	0.048
QAS -> IAF	0.016	0.015	1.130	0.259
QAS -> PU	0.019	0.016	1.205	0.228
Trust -> IAF	0.434	0.126	3.446	0.001
Trust -> PU	0.297	0.093	3.188	0.001
PU -> IAF	1.223	0.217	5.646	0.000

4.4.2 Hypothesis testing

To test the proposed hypothesis and the structural model path coefficients (β) between latent variables are assessed. According to Hair et al., (2011); Wetzels et al., (2009)there should be a path coefficient value of at least 0.1 in order to account for a certain impact within the model. The path coefficients of the present study are presented in Table 7, all the proposed hypotheses are supported.

H_1: Covid-19 lockdown has a significant positive relationship with intention to adopt Fintech, and perceived usefulness mediates this relationship**.**

H_1 evaluates whether Covid-19 Lockdown has a significant positive impact on intention to adopt Fintech (IAF) and does perceived usefulness (PU) toward Fintech mediate this relationship. In the study the results revealed that Covid-19 Lockdown has a positive significant ($p < 0.05$) impact on the PU ($\beta = 0.238$, $t = 3.727$, $p = 0.000$) and IAF ($\beta = 0.177$, $t = 3.585$, $p = 0.000$). Hence H_1 is supported.

H_2 evaluates whether Trust has a significant positive impact on intention to adopt Fintech (IAF) and does perceived usefulness (PU) toward Fintech mediate this relationship.

In the study the results revealed that Trust has a positive significant ($p < 0.05$) impact on the PU ($\beta = 0.412$, $t = 7.181$, $p = 0.000$) and IAF ($\beta = 7.181$, $t = 7.683$, $p = 0.000$). Hence H_2 is supported.

H_3: Data security and privacy has a positive effect on perceived usefulness towards fintech, and perceived usefulness mediates this relationship.

H_3 evaluates whether data security and privacy have a significant positive impact on intention to adopt Fintech (IAF) and does perceived usefulness (PU) toward Fintech mediate this relationship. In the study the results revealed that data security and privacy have a positive significant ($p < 0.05$) impact on the PU ($\beta = 0.225$, $t = 4.295$, $p = 0.000$) and IAF ($\beta = 0.167$, $t = 4.216$, $p = 0.000$). Hence H_3 is supported.

H_4: QAS has a significant positive relationship with intention to adopt Fintech, and perceived usefulness mediates this relationship**.**

H4 evaluates whether Quality administrative services (QAS Trust has a significant positive impact on intention to adopt Fintech (IAF) and does perceived usefulness (PU) toward Fintech mediate

this relationship. In the study the results revealed that Quality administrative services has a positive significant ($p < 0.05$) impact on the PU ($\beta = 0.113$, $t = 2.579$, $p = 0.010$) and IAF ($\beta = 0.083$, $t = 2.525$, $p = 0.012$). Hence H4 is supported. Hence H4 was supported.

H_5. Perceived Usefulness towards Fintech has a significant positive relationship with intention to adopt Fintech**.**

H_5 evaluates whether Perceived usefulness (PU) has a significant positive impact on the Intention to adopt Fintech (IAF). In the study the results revealed that perceived usefulness has a positive significant ($p < 0.05$) impact on the IAF ($\beta = 0.742$, $t = 26.414$, $p = 0.000$). Hence H_5 was supported.

Table 7 Analysis of competing structural models.

	Path	Coefficient	T statistics	P values	Results
H1	COVID -> IAF	0.177	3.585	0.000	Accepted
	COVID -> PU	0.238	3.727	0.000	
H2	Trust -> IAF	0.305	7.683	0.000	Accepted
	Trust -> PU	0.412	7.181	0.000	
H3	DS&P-> IAF	0.167	4.216	0.000	Accepted
	DS&P -> PU	0.225	4.295	0.000	
H4	QAS -> IAF	0.083	2.525	0.012	Accepted
	QAS-> PU	0.113	2.579	0.010	
H5	PU -> IAF	0.742	26.414	0.000	Accepted
	R^2				
	Intention to Adopt Fintech 0.548 (54.8%)				
	Perceived usefulness towards Fintech 0.54 (54%)				

4.4.3 Mediation Analysis

To check whether perceived usefulness (PU) mediated the relationship between Covid-19 Lockdown, Data security and privacy, QAS, Trust and Intention to adopt Fintech. The results (see Table 8) revealed that the total effect of Covid, DS&P, QAS, Trust on IAF is significant (βcovid = 0.177, pcovid = 0.000; βDS&P= 0.167, pDS&P = 0.000; βQAS = 0.083, pQAS= 0.012; βTrust= 0.305, pTrust = 0.000). With the inclusion of mediating variable (PU), the impact of Covid, DS&P, QAS, Trust on IAF remain significant as their direct effect (βcovid = 0.238, pcovid = 0.000; βDS&P= 0.225, pDS&P = 0.000; βQAS = 0.113, pQAS= 0.010; βTrust= 0.053, pTrust = 0.000)

and specific indirect effect ((βcovid = 0.177, pcovid = 0.000; βDS&P= 0.167, pDS&P = 0.000; βQAS = 0.083, pQAS= 0.012; βTrust= 0.305, pTrust = 0.000) are all significant($p < 0.05$). this shows that the relationship between dependent variable and independent variable is partially mediated by mediating variable.

Table 8 Mediation Analysis

Total Effect			**Direct effect**		**Specific Indirect effect**		
	β	**p values**	**β**	**p values**		**β**	**p values**
COVID -> IAF	0.177	0.000	0.238	0.000	**COVID -> PU -> IAF**	0.177	0.000
DS&P -> IAF	0.167	0.000	0.225	0.000	**DS&P -> PU -> IAF**	0.167	0.000
QAS -> IAF	0.083	0.012	0.113	0.010	**QAS -> PU -> IAF**	0.083	0.012
Trust -> IAF	0.305	0.000	0.053	0.000	**Trust -> PU -> IAF**	0.305	0.000

CHAPTER NO. 05

5. DISCUSSION & CONCLUSION

5.1 Introduction

This chapter will discuss all the results presented in previous chapter along with their theoretical and practical implication. Lastly will present conclusion of the study along with limitation and future research direction.

5.2 Discussion

Based on TAM theory and Fintech adoption the current study shed light on the use of Fintech services in a post COVID-19 World by incorporating the impact of COVID-19 lockdown factor and the intention to adopt Fintech. Even though previous studies have found privacy and administrative services as important factor that influence perceived usefulness of Fintech but the current study sheds light on whether the positive experience of the users about the use of Fintech services during COVID-19 lockdown have significantly boost the intention to keep on using the Fintech service post COVID-19 lockdown. The study confirms that during COVID-19 lockdown trust, administrative services and security while using Fintech service are the factors affecting the intention to adopt and use fintech. Among all the factors Trust is the most influential factor ($\beta = 0.412$), followed by COVID-19 lockdown ($\beta = 0.238$), Data security and privacy ($\beta = 0.225$) and quality of the administrative services ($\beta = 0.113$). While using Fintech the cumulative effect of the above four factor could lead the user towards the adoption of Fintech even after the end of the pandemic.

5.2.1 Theoretical implication

This study proves that COVID-19 has significantly impacted the perceived usefulness towards Fintech in terms of repetitive lockdown, convenience, and social distancing. Therefore, it become one of the factors that leads user towards the adoption of Fintech (Chuang et al., 2016; F. D. Davis, 1989; H. S. Ryu, 2018; Saksonova & Kuzmina-Merlino, 2017; Stewart & Jürjens, 2018b). Apart

from COVID-19 the research indicates trust, data security and privacy and quality administrative services are other the factors that are leading users towards the adoption of Fintech. The present research examines the impact of COVID-19 lockdown on the use of Fintech related service as it was a situation where willingly or unwilling people had to shift on online mode therefore in one way or another, they had to use some form of Fintech service. In context of Pakistani culture where people are sceptical about the technologies and their usage COVID-19 related restriction have forced people to used technologies which in normal circumstance they would avoid. Therefore, there is a need to provide an insight to the Fintech firm about the future of the technology in the country. Additionally, the results of the study revealed that data security, privacy, trust, and quality of administrative services have a significant effect on perceives usefulness towards Fintech that support the finding of previous research conducted on the model of TAM (Chuang et al., 2016; Kang, 2018; Stewart and Jürjens, 2018).

Additionally, our study also finds that in the era of high-end technology the need of human contact is vital for facilitation and adoption of technologies along with other factors. An effective and corporative administrative staff is important for the retention of current users. Therefore, the study also adds to the knowledge of quality service and how it can build and encourage the users to keep on using Fintech services (Chuang et al., 2016; Davis et al., 1989b). Thus, in order to boost the adoption of Fintech services more attention should be paid on find ways that can improve the quality of administrative services.

The study through its mediation analysis also examined the extended factors that influences perceived usefulness towards Fintech by enhancing the user intention to adopt the service (Stewart and Jürjens, 2018). The result of the study reveals that perceived usefulness is significantly affected by the four factors used by the study including trust, COVID-19 lockdown, QAS and data security and privacy which in turn effect the user intention to adopt Fintech services post COVID-19. The study incorporates the impact of COVID-19 pandemic specially the lockdown situation as one of the factors on which very limited research is found in Pakistan as a contributing factor that boots user intention to adopt Fintech in Pakistan.

5.2.2 Practical implication

The study clearly leads towards the implication of an established trend in Fintech adoption in Pakistan. Previously users were sceptical about the use of Fintech related technologies as cultural

dimensions of the country along with lack of improper telecommunication infrastructure, regulations, and inadequate country digital readiness were the major factor hindering user intention to adopt new technologies (Arsalan Nazir & Saleem Khan, 2022). In 2019 COVID-19 fit the world putting economies in the situation of complete lockdown as a preventive measure to minimize virus spread. Pakistan was no exception it came into a situation of complete lock down in March 2019 forcing businesses and general public to move towards the online platform in order to keep their business running and fulfilment of basic necessities. At that time people have no choice but to use Fintech platform to cater their financial needs as they were convenient tool for transact from home. Their positive Fintech experience during COVID-19 led them towards the adoption of the service as they found these services useful and supportive during lockdown. As the study predicts the factors that are influential towards the adoption of Fintech post Covid-19 it provides practical implications for the government, firms, Fintech service providers and financial institution by providing an insight on how they can improve their digital infrastructure, user base and retain existing users thus altogether contribution towards the fulfilment of sustainable development goals set by the government of Pakistan by increasing the financial inclusion in the country. Consumer satisfaction play a vital role in keep the user attached to Fintech service. In Pakistan where uncertainty avoidance index is quite high a digital infrastructure posing more risk than benefit will shake user trust on the service causing them to reject such technologies. Therefore, to make Fintech services indispensable in user perception it is very important for the firms to pay more attention towards the security and supportive services they provide to their users. To enhance user trust and minimize user concern about the data security and safety firms need to update their software regularly to ensure data security of user. Apart from this firms also need to pay attention towards the quality of service provided to the user. To improve user experience with the service mangers of the Fintech firms need to arrange training programs for the staff to meet the expectation and requirement of the users. A well trained and skilled staff is crucial in maintaining the user based it also provide firms with a competitive advantage against other competing businesses. Additionally, mangers need to highlight data security and privacy element of their service in their advertisement to make user trust their service and enables them to keep using the service for in a long run. A regular audit of the Fintech service quality and user satisfaction will also help managers in detecting inefficiencies in their service quality and help them take timely corrective measure that ultimately result in increased user satisfaction.

5.3 Conclusion

This study is an effort to examine the impact of COVID-19 along with additional factors on Pakistani user intention to adopt Fintech. The study circulated questionnaires to the users with different age and educational background living in Pakistan who have directly used or still using any form of Fintech service available in the country. The analysis was carried out through smart-PLS where firstly responses were input. PLS-SEM was used to estimate the relationships. First factor analysis was carried out to find out the validity and reliability of the construct then bootstrapping was run to find out the impact of independent variables on dependent variable. The finding reveals that COVID-19 has significantly impacted the perceived usefulness towards Fintech in terms of repetitive lockdown, convenience, and social distancing. Therefore, it become one of the factors that leads user towards the adoption of Fintech (Chuang et al., 2016; F. D. Davis, 1989; H. S. Ryu, 2018; Saksonova & Kuzmina-Merlino, 2017; Stewart & Jürjens, 2018b). Apart from COVID-19 the study also find trust, data security and privacy and quality administrative services as important factors that are contributing towards the adoption of Fintech in the country. Although the current study provides meaningful insight on adoption of Fintech in Pakistan, the study has some limitations that can act as a basis for future research. In the current study the representation of male respondent (70.04%) is more compared to female respondent (29.96%) future studies can use a balance proportion of male and female respondent to have an equal representation of perception. Future study can use a longitudinal approach to investigate user relationship with Fintech Service whether user behaviour change with time along with the underlining factors. Apart from this specific Fintech services can be selected, and comparison can be made between them to find out factors that enables user to keep using that service along with the specific feature of their service that help in creating a competitive advantage (Ryabova, 2015). Additionally future research instead of user perspective can investigate from a firm perspective and find out factors that hinder their ability to serve their user.

Reference

Adaba, G. B., Ayoung, D. A., & Abbott, P. (2019). Exploring the contribution of mobile money to well-being from a capability perspective. *The Electronic Journal of Information Systems in Developing Countries*, *85*(4). https://doi.org/10.1002/isd2.12079

Al-Qudah, A. A., Al-Okaily, M., Alqudah, G., & Ghazlat, A. (2022). Mobile payment adoption in the time of the COVID-19 pandemic. *Electronic Commerce Research*. https://doi.org/10.1007/s10660-022-09577-1

Arner, D. W., Barberis, J., & Buckley, R. P. (n.d.). *The Evolution of FinTech: A New Post-Crisis Paradigm?* http://ssrn.com/abstract=2676553http://ssrn.com/abstract=2676553

Arsalan Nazir, M., & Saleem Khan, R. (2022). The Impact and Factors Affecting Information and Communication Technology Adoption in Small and Medium-Sized Enterprises: A Perspective from Pakistan. *Journal of Organisational Studies and Innovation*, *9*(1), 20–46. https://doi.org/10.51659/josi.21.145

Bagozzi, R. P., Yi, Y., & Phillips, L. W. (1991). Assessing Construct Validity in Organizational Research. *Administrative Science Quarterly*, *36*(3), 421. https://doi.org/10.2307/2393203

Barth, S., de Jong, M. D. T., Junger, M., Hartel, P. H., & Roppelt, J. C. (2019). Putting the privacy paradox to the test: Online privacy and security behaviors among users with technical knowledge, privacy awareness, and financial resources. *Telematics and Informatics*, *41*, 55–69. https://doi.org/10.1016/j.tele.2019.03.003

Belanche, D., Casaló, L. v., & Flavián, C. (2019). Artificial Intelligence in FinTech: understanding robo-advisors adoption among customers. *Industrial Management & Data Systems*, *119*(7), 1411–1430. https://doi.org/10.1108/IMDS-08-2018-0368

Billore, S., & Billore, G. (2020). Consumption switch at haste: insights from Indian low-income customers for adopting Fintech services due to the pandemic. *Transnational Marketing Journal*, *8*(2), 197–218. https://doi.org/10.33182/tmj.v8i2.1064

Byrnes, S. (2020). Can Consumer Data Privacy Coexist With How Businesses Want To Use Data? *Forbes Technology Council*.

Chen, C. D., Chen, C. C., & Huang, B. Y. (2009). The positive and negative impacts of the sars outbreak:a case of the Taiwan industries. *Journal of Developing Areas*, *43*(1), 281–

293. https://EconPapers.repec.org/RePEc:jda:journl:vol.43:year:2009:issue1:pp:281-293

Chen, M. A., Wu, Q., & Yang, B. (2019). How Valuable Is FinTech Innovation? *The Review of Financial Studies*, *32*(5), 2062–2106. https://doi.org/10.1093/rfs/hhy130

Chuang, L.-M., Liu, C.-C., & Kao, H.-K. (2016). International Journal of Management and Administrative Sciences (IJMAS) The Adoption of Fintech Service: TAM perspective. In *International Journal of Management and Administrative Sciences (IJMAS* (Vol. 3, Issue 07). www.ijmas.orgwww.ijmas.org

Das, S. R. (2019). The future of fintech. *Financial Management*, *48*(4), 981–1007. https://doi.org/10.1111/fima.12297

Davis, D. F., Bagozzi, P. R., & Warshaw, R. P. (1989). *User Acceptance of Computer Technology: A Comparison of Two Theoretical Models*.

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly: Management Information Systems*, *13*(3), 319–339. https://doi.org/10.2307/249008

Demirguc-Kunt, A., & Klapper, L. (2012). *Measuring Financial Inclusion: The Global Findex Database*. The World Bank. https://doi.org/10.1596/1813-9450-6025

Demirgüç-Kunt, A., Klapper, L., Singer, D., Ansar, S., & Hess, J. (2020). The Global Findex Database 2017: Measuring Financial Inclusion and Opportunities to Expand Access to and Use of Financial Services*. *The World Bank Economic Review*, *34*(Supplement_1), S2–S8. https://doi.org/10.1093/wber/lhz013

Edward G. Carmines, R. A. Z. (1979). *Reliability and Validity Assessment*. SAGE Publications.

Fornell, C., & Bookstein, F. L. (1982). Two Structural Equation Models: LISREL and PLS Applied to Consumer Exit-Voice Theory. *Journal of Marketing Research*, *19*(4), 440–452. https://doi.org/10.1177/002224378201900406

Fornell, C., & Larcker, D. F. (1981). Evaluating Structural Equation Models with Unobservable Variables and Measurement Error. *Journal of Marketing Research*, *18*(1), 39. https://doi.org/10.2307/3151312

Fu, J., & Mishra, M. (2020). *Swiss Finance Institute Research Paper Series N°20-38 The Global Impact of COVID-19 on Fintech Adoption *.*

https://ssrn.com/abstract=3588453Electroniccopyavailableat:https://ssrn.com/abstract=3588453Electroniccopyavailableat:https://ssrn.com/abstract=3588453

Fu, J., & Mishra, M. (2022). Fintech in the time of COVID−19: Technological adoption during crises. *Journal of Financial Intermediation*, *50*, 100945. https://doi.org/10.1016/j.jfi.2021.100945

Gefen, D. (2000). *E-commerce: the role of familiarity and trust*. www.elsevier.com/locate/dsw

Gefen, D., Straub, D., & Boudreau, M.-C. (2000). Structural Equation Modeling and Regression: Guidelines for Research Practice. *Communications of the Association for Information Systems*, *4*. https://doi.org/10.17705/1CAIS.00407

Gimpel, H., Rau, D., & Röglinger, M. (2018). Understanding FinTech start-ups – a taxonomy of consumer-oriented service offerings. *Electronic Markets*, *28*(3), 245–264. https://doi.org/10.1007/s12525-017-0275-0

GOP. (2019). *Education Population by Level of Education*. Pakistan Bureau of Statistics.

Hair, J. F., Matthews, L. M., Matthews, R. L., & Sarstedt, M. (2017). PLS-SEM or CB-SEM: updated guidelines on which method to use "PLS-SEM or CB-SEM: updated guidelines on which method to use." In *Organizational Research Methods, MIS Quarterly, and International Journal* (Vol. 1, Issue 2).

Hair, J. F., Ringle, C. M., & Sarstedt, M. (2011). PLS-SEM: Indeed a Silver Bullet. *Journal of Marketing Theory and Practice*, *19*(2), 139–152. https://doi.org/10.2753/MTP1069-6679190202

Hair, J. F., Ringle, C. M., & Sarstedt, M. (2013). Partial Least Squares Structural Equation Modeling: Rigorous Applications, Better Results and Higher Acceptance. In *Long Range Planning* (Vol. 46, Issues 1–2, pp. 1–12). Elsevier Ltd. https://doi.org/10.1016/j.lrp.2013.01.001

Hair, J. F., Sarstedt, M., Pieper, T. M., & Ringle, C. M. (2012). The Use of Partial Least Squares Structural Equation Modeling in Strategic Management Research: A Review of Past Practices and Recommendations for Future Applications. *Long Range Planning*, *45*(5–6), 320–340. https://doi.org/10.1016/j.lrp.2012.09.008

Hair, Jr. , J. F., Sarstedt, M., Matthews, L. M., & Ringle, C. M. (2016). Identifying and treating unobserved heterogeneity with FIMIX-PLS: part I – method. *European Business Review*, *28*(1), 63–76. https://doi.org/10.1108/EBR-09-2015-0094

Hansen, J. M., Saridakis, G., & Benson, V. (2018a). Risk, trust, and the interaction of perceived ease of use and behavioral control in predicting consumers' use of social media for transactions. *Computers in Human Behavior*, *80*, 197–206. https://doi.org/10.1016/j.chb.2017.11.010

Hansen, J. M., Saridakis, G., & Benson, V. (2018b). Risk, trust, and the interaction of perceived ease of use and behavioral control in predicting consumers' use of social media for transactions. *Computers in Human Behavior*, *80*, 197–206. https://doi.org/10.1016/j.chb.2017.11.010

Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the Academy of Marketing Science*, *43*(1), 115–135. https://doi.org/10.1007/s11747-014-0403-8

Hoffman, D. L., Novak, T. P., & Peralta, M. (1999). Building consumer trust online. *Communications of the ACM*, *42*(4), 80–85. https://doi.org/10.1145/299157.299175

Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal*, *6*(1), 1–55. https://doi.org/10.1080/10705519909540118

Hu, Z., Ding, S., Li, S., Chen, L., & Yang, S. (2019a). Adoption Intention of Fintech Services for Bank Users: An Empirical Examination with an Extended Technology Acceptance Model. *Symmetry*, *11*(3), 340. https://doi.org/10.3390/sym11030340

Hu, Z., Ding, S., Li, S., Chen, L., & Yang, S. (2019b). Adoption Intention of Fintech Services for Bank Users: An Empirical Examination with an Extended Technology Acceptance Model. *Symmetry*, *11*(3), 340. https://doi.org/10.3390/sym11030340

HurYeon, & Lim se hun. (2017). An Empirical Study on the Impact of the Perceived Securities and Trust to Diffusion of IoT-Based Smart Banking Services - Focusing on University Students -. *Journal of Insurance and Finance*, *28*(1), 33–62. https://doi.org/10.23842/jif.2017.28.1.002

Icek Ajzen, & Martin Fishbein. (1980). *Understanding attitudes and predicting social behavior*. Englewood Cliffs, N.J. : Prentice-Hall, ©1980.

Ichev, R., & Marinč, M. (2018). Stock prices and geographic proximity of information: Evidence from the Ebola outbreak. *International Review of Financial Analysis*, *56*, 153–166. https://doi.org/10.1016/j.irfa.2017.12.004

Jager, J., Putnick, D. L., & Bornstein, M. H. (2017). II. MORE THAN JUST CONVENIENT: THE SCIENTIFIC MERITS OF HOMOGENEOUS CONVENIENCE SAMPLES. *Monographs of the Society for Research in Child Development*, *82*(2), 13–30. https://doi.org/10.1111/mono.12296

Jang, M., Jung, Y., & Kim, S. (2021). Investigating managers' understanding of chatbots in the Korean financial industry. *Computers in Human Behavior*, *120*, 106747. https://doi.org/10.1016/j.chb.2021.106747

Jiwasiddi, A., Adam, M., & Adhikara, C. (2019). *Attitude toward using Fintech among Millennials*.

Joubert, J., & Belle, J.-P. van. (2013). *The Role of Trust and Risk in Mobile Commerce Adoption within South Africa*.

Karusala, N., Holeman, I., & Anderson, R. (2019). Engaging Identity, Assets, and Constraints in Designing for Resilience. *Proceedings of the ACM on Human-Computer Interaction*, *3*(CSCW), 1–23. https://doi.org/10.1145/3359315

Khan, G. F., Sarstedt, M., Shiau, W.-L., Hair, J. F., Ringle, C. M., & Fritze, M. P. (2019). Methodological research on partial least squares structural equation modeling (PLS-SEM). *Internet Research*, *29*(3), 407–429. https://doi.org/10.1108/IntR-12-2017-0509

Khatun, M. N., Mitra, S., & Sarker, M. N. I. (2021). Mobile banking during COVID-19 pandemic in Bangladesh: A novel mechanism to change and accelerate people's financial access. *Green Finance*, *3*(3), 253–267. https://doi.org/10.3934/GF.2021013

Kim, Y., Choi, J., Park, Y., & Yeon, J. (2016a). The Adoption of Mobile Payment Services for "Fintech." *International Journal of Applied Engineering Research*, *11*, 1058–1061.

Kim, Y., Choi, J., Park, Y., & Yeon, J. (2016b). The Adoption of Mobile Payment Services for "Fintech." *International Journal of Applied Engineering Research*, *11*, 1058–1061.

KPMG. (2019). *Biannual analysis of global fintech investments*. KPMG.

Kunt, A. D.-, K. L. and S. D. (2017). *Financial Inclusion and Inclusive Growth: A Review of Recent Empirical Evidence* .

Le, M. T. H. (2021). Examining factors that boost intention and loyalty to use Fintech post-COVID-19 lockdown as a new normal behavior. *Heliyon*, *7*(8). https://doi.org/10.1016/j.heliyon.2021.e07821

Lee, J., Ryu, M. H., & Lee, D. (2019). A study on the reciprocal relationship between user perception and retailer perception on platform-based mobile payment service. *Journal of Retailing and Consumer Services*, *48*, 7–15. https://doi.org/10.1016/j.jretconser.2019.01.007

Lee, M. K. O., & Turban, E. (2001). A Trust Model for Consumer Internet Shopping. *International Journal of Electronic Commerce*, *6*(1), 75–91. https://doi.org/10.1080/10864415.2001.11044227

Lewis, J. D., & Weigert, A. (1985). *Trust as a Social Reality**. http://sf.oxfordjournals.org/

Lim, S. H., Kim, D. J., Hur, Y., & Park, K. (2019). An Empirical Study of the Impacts of Perceived Security and Knowledge on Continuous Intention to Use Mobile Fintech Payment Services. *International Journal of Human–Computer Interaction*, *35*(10), 886–898. https://doi.org/10.1080/10447318.2018.1507132

Mahatanankoon, P., Wen, H. J., & Lim, B. (2005). Consumer-based m-commerce: Exploring consumer perception of mobile applications. *Computer Standards and Interfaces*, *27*(4), 347–357. https://doi.org/10.1016/j.csi.2004.10.003

Malaquias, F. F., & Hwang, Y. (2016). Trust in mobile banking under conditions of information asymmetry. *Information Development*, *32*(5), 1600–1612. https://doi.org/10.1177/0266666915616164

McKnight, D. H., & Chervany, N. L. (2001). What Trust Means in E-Commerce Customer Relationships: An Interdisciplinary Conceptual Typology. *International Journal of Electronic Commerce*, *6*(2), 35–59. https://doi.org/10.1080/10864415.2001.11044235

Moon, J.-W., & Kim, Y.-G. (2001). *Extending the TAM for a World-Wide-Web context*. http://www.cc.gatech.edu/gvu/user_surveys/papers/

Moslehpour, M., Pham, V., Wong, W.-K., & Bilgiçli, İ. (2018). e-Purchase Intention of Taiwanese Consumers: Sustainable Mediation of Perceived Usefulness and Perceived Ease of Use. *Sustainability*, *10*(1), 234. https://doi.org/10.3390/su10010234

Noor, U., Anwar, Z., Amjad, T., & Choo, K.-K. R. (2019). A machine learning-based FinTech cyber threat attribution framework using high-level indicators of compromise. *Future*

Generation Computer Systems, *96*, 227–242. https://doi.org/10.1016/j.future.2019.02.013

Noreen, M., Mia, M. S., Ghazali, Z., & Ahmed, F. (2022). Role of Government Policies to Fintech Adoption and Financial Inclusion: A Study in Pakistan. *Universal Journal of Accounting and Finance*, *10*(1), 37–46. https://doi.org/10.13189/ujaf.2022.100105

Pett, M., Lackey, N., & Sullivan, J. (2003). *Making Sense of Factor Analysis*. SAGE Publications, Inc. https://doi.org/10.4135/9781412984898

Prasad, M. (2019). Financial Inclusion: Emerging Role of FinTech. *FinTechs and an Evolving Ecosystem*, *1*(5), 85.

Puschmann, T. (2017a). Fintech. *Business and Information Systems Engineering*, *59*(1), 69–76. https://doi.org/10.1007/S12599-017-0464-6/FIGURES/1

Puschmann, T. (2017b). Fintech. *Business & Information Systems Engineering*, *59*(1), 69–76. https://doi.org/10.1007/s12599-017-0464-6

Raza, M. S. , F. M. , & S. N. (2015). Overview of Financial Inclusion in Pakistan. *International Journal of Management Sciences*, *6*(12), 572–581.

Razzaque, A., Cummings, R. T., Karolak, M., & Hamdan, A. (2020). The Propensity to Use FinTech: Input from Bankers in the Kingdom of Bahrain. *Journal of Information & Knowledge Management*, *19*(01), 2040025. https://doi.org/10.1142/S0219649220400250

Revathy, C., & Balaji. (2020). Article ID: IJM_11_06_008 Lockdown Period. *International Journal of Management (IJM)*, *11*(6), 92–104. https://doi.org/10.34218/IJM.11.6.2020.008

Richter, N. F., Cepeda, G., Roldán, J. L., & Ringle, C. M. (2015). European management research using Partial Least Squares Structural Equation Modeling (PLS-SEM). *European Management Journal*, *33*(1), 1–3. https://doi.org/10.1016/j.emj.2014.12.001

Ringle, Sarstedt, & Straub. (2012). Editor's Comments: A Critical Look at the Use of PLS-SEM in "MIS Quarterly." *MIS Quarterly*, *36*(1), iii. https://doi.org/10.2307/41410402

Rizvi, S., Naqvi, B., & Tanveer, F. (2018). Is Pakistan Ready to Embrace Fintech Innovation? *THE LAHORE JOURNAL OF ECONOMICS*, *23*(2), 151–182. https://doi.org/10.35536/lje.2018.v23.i2.a6

Ryabova, A. v, & Рябова, A. B. (2015). *Emerging FinTech market: types and features of new financial technologies*.

Ryu, H. S. (2018). What makes users willing or hesitant to use Fintech?: the moderating effect of user type. *Industrial Management and Data Systems*, *118*(3), 541–569. https://doi.org/10.1108/IMDS-07-2017-0325

Ryu, H.-S. (2018). *Understanding Benefit and Risk Framework of Fintech Adoption: Comparison of Early Adopters and Late Adopters*. http://hdl.handle.net/10125/50374

Saksonova, S., & Kuzmina-Merlino, I. (2017). Fintech as Financial Innovation - The Possibilities and Problems of Implementation. *EUROPEAN RESEARCH STUDIES JOURNAL*, *XX*(Issue 3A), 961–973. https://doi.org/10.35808/ersj/757

Schueffel, P. mname. (2016). Taming the Beast: A Scientific Definition of Fintech. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.3097312

Siau, K., & Shen, Z. (2003). *BUILDING CUSTOMER TRUST IN MOBILE COMMERCE*. *46*(4).

SIMON KEMP. (2022, February 16). *DIGITAL 2022: PAKISTAN*. DataReportal – Global Digital Insights.

Singh, N., & Sinha, N. (2020). How perceived trust mediates merchant's intention to use a mobile wallet technology. *Journal of Retailing and Consumer Services*, *52*. https://doi.org/10.1016/j.jretconser.2019.101894

Singh, S., & Srivastava, R. K. (2018). Predicting the intention to use mobile banking in India. *International Journal of Bank Marketing*, *36*(2), 357–378. https://doi.org/10.1108/IJBM-12-2016-0186

Skare, M., & Soriano, R. (2021). How globalization is changing digital technology adoption: An international perspective. *Journal of Innovation & Knowledge*, *6*(4), 222–233. https://doi.org/10.1016/j.jik.2021.04.001

Statista. (2019, November 23). *Number of mobile phone users worldwide from 2015 to 2020*. Statista Research Department, .

Stewart, H., & Jürjens, J. (2018a). Data security and consumer trust in FinTech innovation in Germany. *Information & Computer Security*, *26*(1), 109–128. https://doi.org/10.1108/ICS-06-2017-0039

Stewart, H., & Jürjens, J. (2018b). Data security and consumer trust in FinTech innovation in Germany. *Information & Computer Security*, *26*(1), 109–128. https://doi.org/10.1108/ICS-06-2017-0039

Termezy, M., & Razi, H. (2021). *Fintech Ecosystem of Pakistan Landscape Study*.

Toufaily, E., Zalan, T., & Dhaou, S. ben. (2021). A framework of blockchain technology adoption: An investigation of challenges and expected value. *Information & Management*, *58*(3), 103444. https://doi.org/10.1016/j.im.2021.103444

Venkatesh, & FD Davis. (2000). A theoretical extension of the technology acceptance model: Four longitudinal field studies. *Management Science*.

Vance, A., Elie-Dit-Cosaque, C., & Straub, D. W. (2008). Examining Trust in Information Technology Artifacts: The Effects of System Quality and Culture. *Journal of Management Information Systems*, *24*(4), 73–100. https://doi.org/10.2753/MIS0742-1222240403

Wallace, L. G., & Sheetz, S. D. (2014). The adoption of software measures: A technology acceptance model (TAM) perspective. *Information and Management*, *51*(2), 249–259. https://doi.org/10.1016/j.im.2013.12.003

Wentzel, J. P., Diatha, K. S., & Yadavalli, V. (2013). An application of the extended Technology Acceptance Model in understanding technology-enabled financial service adoption in South Africa. *Development Southern Africa*, *30*(4–05), 659–673. https://doi.org/10.1080/0376835X.2013.830963

Wetzels, Odekerken-Schröder, & van Oppen. (2009). Using PLS Path Modeling for Assessing Hierarchical Construct Models: Guidelines and Empirical Illustration. *MIS Quarterly*, *33*(1), 177. https://doi.org/10.2307/20650284

Wójcik, D., & Ioannou, S. (2020). COVID-19 and Finance: Market Developments So Far and Potential Impacts on the Financial Sector and Centres. *Tijdschrift Voor Economische En Sociale Geografie*, *111*(3), 387–400. https://doi.org/10.1111/tesg.12434

Wonglimpiyarat, J. (2017). FinTech banking industry: a systemic approach. *Foresight*, *19*(6), 590–603. https://doi.org/10.1108/FS-07-2017-0026

Yang, A., Xu, J., Weng, J., Zhou, J., & Wong, D. S. (2021). Lightweight and Privacy-Preserving Delegatable Proofs of Storage with Data Dynamics in Cloud Storage. *IEEE*

Transactions on Cloud Computing, *9*(1), 212–225. https://doi.org/10.1109/TCC.2018.2851256

Zhang, Y., Lee, W., & Huang, Y.-A. (2003). *Mobile Networks and Applications ?*

Bahria University
Islamabad Campus

RC-01

Thesis/ Project Supervisor Allocation Form NO

Please Tick the Relevant Box: ☐ BBA ☑ MBA

1. Student Name: AMNA NASEER Enroll #: 01-321212-006

Course Code: SDW6B Cr. Hrs 03 Degree Duration: 1.5 Cell No. 0335-5846600

Email: amna.naseer232@gmail.com CMS Registration: Yes/No.

(In case of Project, details of other Members)

2. Student Name: _____ Enroll #: _____

Course Code: _____ Cr. Hrs _____ Degree Duration: _____ Cell No. _____

Email: _____ CMS Registration: Yes/No.

3. Student Name: _____ Enroll #: _____

Course Code: _____ Cr. Hrs _____ Degree Duration: _____ Cell No. _____

Email: _____ CMS Registration: Yes/No.

Research Type: ☑ Thesis ☐ Project

Research Area: ☐ Supply Chain Management ☐ Marketing ☐ HRM ☑ Finance

Name of Supervisor: RABIA UMER

1. Student Signature: Amna Naseer Date: 2-10-22

2. Student Signature: _____ 3. Student Signature: _____

_____

Supervisor Signature

Note:

1. **Student fill and send the scanned copy of this form to respective supervisor for the approval. After approval send this form within one week after commencement of classes at research.cell@bahria.edu.pk.**
2. **Students first inquire the supervisor's available slots either from Supervisor or research cell before submission of supervisor allocation form to research cell.**

RC – 02

Please Tick the Relevant Box: BBA ☐ MBA ☑

Major: FINANCE No_____

Library Database Verification Form

Bahria University, Department of Business Studies

With respect to the anti-plagiarism policies proposed by Higher Education Commission, students are required to fill this form for the purpose of ensuring that the Thesis / Project topic chosen by them has not been done before. Topics can be crossed checked with the database available in the library.

Changes in the Thesis / Project topic, however, will require the filling of a new 'Library Verification Form', but after midterm examination no changes in the Topic will be accepted.

Please submit the scanned copy of this form at research.cell@bahria.edu.pk within two weeks of Thesis / Project Registration.

Please fill in the required information:

Enrollment No(s)	01-321212-006
Student Name	AMNA NASEER
Thesis / Project Topic	Fintech in COVID-19 and beyond: what factors are boosting fintech use in Pakistan.

STAFF USE ONLY

Topic Verification

Do you have the proposed topic in your library database repository?

- Yes
- ✓ No

Verifier Name: Saima Ali (c.l) Sign: _____

Date: 06-10-2022

Stamp: BAHRIA UNIVERSITY ★ ISLAMABAD CAMPUS ★ Sig. _____ Library

SUPERVISOR APPROVAL:

Name: RABIA UMER Sign: _____ Date: 6/10/22

Bahria University
Islamabad Campus

RC-04

MBA/BBA

1st Half Semester Progress Report

Name of Student(s)	AMNA NASEER
Enrollment No.	01-321212-006
Thesis/Project Title	Fintech in Covid-19 and beyond: what factors are boosting Fintech use in Pakistan -

Supervisor Student Meeting Record

No.	Date	Place of Meeting	Topic Discussed	Signature of Student
1	24/09/22	G-02	Topic discussion, Area of interest	Amna Naseer
2	1/10/22	G-02	Introduction, literature review	Amna Naseer
3	29/10/22	G-02	Methodology, Research Design	Amna Naseer
4	5/10/22	online	Review of all 3 chapters.	Amna Naseer

Progress Satisfactory [✓] Progress Unsatisfactory [ ]

Remarks: She is doing up to mark work

Signature of Supervisor: _____ Date: 22-11-22

Name:

Note: **Students attach 1st & 2nd half progress report at the end of spiral copy.**

Bahria University
Islamabad Campus

RC-04

MBA/BBA

2nd Half Semester Progress Report & Thesis Approval Statement

Name of Student(s)	AMNA NASEER
Enrollment No.	01-321212-006
Thesis/Project Title	Fintech in Covid-19 and beyond: What factors are boosting fintech use in Pakistan

Supervisor Student Meeting Record

No.	Date	Place of Meeting	Topic Discussed	Signature of Student
5	26/11/22	online	Data analysis - Results	
6	24/12/22	G-02	Result discussion, Conclusion	
7	14/01/23	F-22/1-2	Final review of all chapters	

Progress Satisfactory ☑ Progress Unsatisfactory ☐

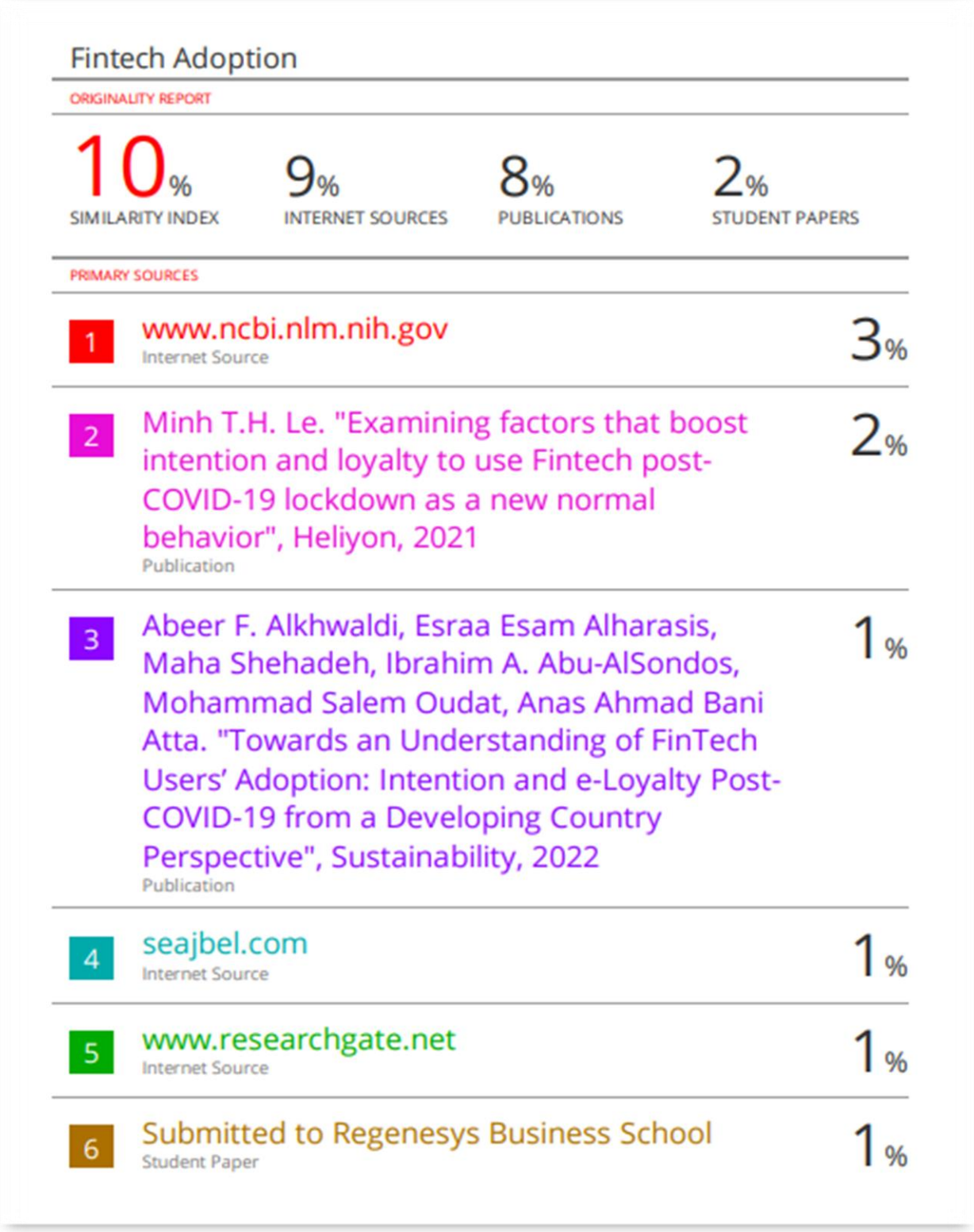
Remarks: She is performing well.

Signature of Supervisor: _____ Date: 14-01-23

Name:

Note: **Students attach 1st & 2nd half progress report at the end of spiral copy.**

Plagiarism Report



Fintech Adoption

ORIGINALITY REPORT

10%	9%	8%	2%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	www.ncbi.nlm.nih.gov Internet Source	3%
2	Minh T.H. Le. "Examining factors that boost intention and loyalty to use Fintech post-COVID-19 lockdown as a new normal behavior", Heliyon, 2021 Publication	2%
3	Abeer F. Alkhwaldi, Esraa Esam Alharasis, Maha Shehadeh, Ibrahim A. Abu-AlSondos, Mohammad Salem Oudat, Anas Ahmad Bani Atta. "Towards an Understanding of FinTech Users' Adoption: Intention and e-Loyalty Post-COVID-19 from a Developing Country Perspective", Sustainability, 2022 Publication	1%
4	seajbel.com Internet Source	1%
5	www.researchgate.net Internet Source	1%
6	Submitted to Regenesys Business School Student Paper	1%

7	Submitted to University of West London Student Paper	1 %
8	iceb.johogo.com Internet Source	1 %

Exclude quotes	Off	Exclude matches	< 1%
Exclude bibliography	Off		