International Journal of Multidisciplinary and Current Educational Research (IJMCER)
ISSN: 2581-7027 ||Volume|| 3 ||Issue|| 3 ||Pages 191-205 ||2021||

Fintech Revolution, Perceived Risks and Fintech Adoption: Evidence from Financial Industry of Pakistan

Asima Saleem

ABSTRACT: Financial technology has seen a significant growth for providing financial services. The emerging risks is an important hurdle for Fintech adoption. This study identified the risks emerging from the use of financial technology in providing financial services. The evidence confirms that Fintech revolution leads to the emergence of risks: Strategic risk, operational risk, Cyber risk and regulatory uncertainty. This study investigated the relationship between ongoing Fintech revolution and Fintech adoption intention, which has been negatively influenced because of emerging risks. The fear of associated risks hesitate the people from adoption. Auditors in the Fintech companies can significantly reduce these risks through effective protecting strategies. The study investigated the moderating role of auditors for management of Fintech risks by applying risk management process. Multi-method quantitative study is used. Data collected through questionnaires from 200 respondents from different Fintech companies in Pakistan. For testing hypothesis, statistical analysis conducted through Stata version 14.0. The study shows that all perceived risks increases with the increase in Fintech revolution. The results proved that relationship between Fintech revolution and Fintech adoption intention was negatively influenced by perceived risk. The study also proved that auditor's management of risks moderates the relationship between Fintech revolution and emerging risks.

KEYWORDS: Financial Technology, Perceived risks, Technology Acceptance Model, Financial Auditors

I. INTRODUCTION

Digital technology has revolutionized the existing world and has significantly impacted the mode of operations performed traditionally. The use of technology in providing financial services by financial institutions has seen a significant growth. (Rizvi, 2018) documented that innovative financial technology resulted in advanced financial operations with transformed processes, models and financial transactions that significantly increased the efficiency of financial services provided by financial institutions. Fintech has played a significant role in reshaping the services offered by financial institutions on a globalized scale. Lee and Shin in 2018 reported 67% growth in Fintech investments with in first four months from 2015 to 2016 at global level, with Europe 5.3 billion USD and highest growth rate in Asia- pacific region. (Yong Jae Shin and Yongrok Choi, 2019) in their study proved Fintech as not only a source of innovation but a considerable platform for upgrading of traditional systems in Korea which sustains the economic growth. The results of a global report indicated the highest percentage of payments in Fintech sector i-e 84%. The use of financial technology plays not only the complementary role for conventional financial operations but also create uniqueness in financial services. They proved the feasibility of Fintech sector as an emerging platform for sustainable growth of Korean economy. The KPMG annual report (2019) documented that financial technology has obtained six times more growth in US global market over a period of six years ranging from 18.9 billion (2013) to 111.8 billion (2019). Fintech is highly recognized business sector in the world with unique business processes and models. Gregorio in 2017 highlighted that Fintech has improved access to services that are cost effective, affordable priced, symmetrical information and less intermediary.

Pakistan is a developing country and consider technology advancement a considerable part of their growth and development. (Rizvi, 2018) Pakistan has the capability to be a considerable region for Fintech growth with respect to up to mark teens population, increased penetration of smart phones and internet, customer greater liking for e-commerce, digital transactions and innovation absorption capacity of financial systems in financial sector. But technology adoption involves serious hesitation by the people because of the perceived fear of underlying consequences as well as the risks associated with the use of innovative technology. Despite the presence of opportunities linked with financial technology, one could underestimate the perceived risks obtained from a number of possible Fintech solutions. Such exposures could make the digitalized business operations risky as there has been absence of many concerted foreign regulations for use of financial technology (Treleaven, 2015). The adoption of financial technology in a country is interfered with emerging risks including: cyber security and intellectual power, fear of seeking talented and strong customer base and regulatory uncertainty (Shahid et al., 2016).

Challenges faced by Fintech: (Rizvi, 2018) documented the PwC report of Global Fintech (2017), highlighted the hurdles faced by Financial institutions and global incumbents adopted Fintech. The figure 1 below shows the major challenges faced by Fintech are Cultural and management differences (55%), regulatory uncertainty (48%), differences in business models (40%), operational problems (36%) and IT compatibility (34%). Among other incumbents IT security is the major challenge (58%) and regulatory uncertainty (54%). The growth and efficiency obtained in financial transactions through Fintech in developed economies triggered us to highlight the risk factors which hesitate the people from developing economies for its adoption. (Rizvi, 2018) highlighted that Pakistan is on the 6th rank with respect to population and consider cash based transactions with about 85% of people still poses financial exclusion. People in Pakistan has positive and attractive potential for adoption of financial technology but the perception about risk factors including: Strategic risk, cyber security risk, operational risk and regulatory uncertainty play a discouraging role. The report of "The State of Financial and Digital Inclusion Project" in 2017 highlighted that Pakistan occupied 16th position among 26 nations for Fintech inclusion, indicated a threatening situation.

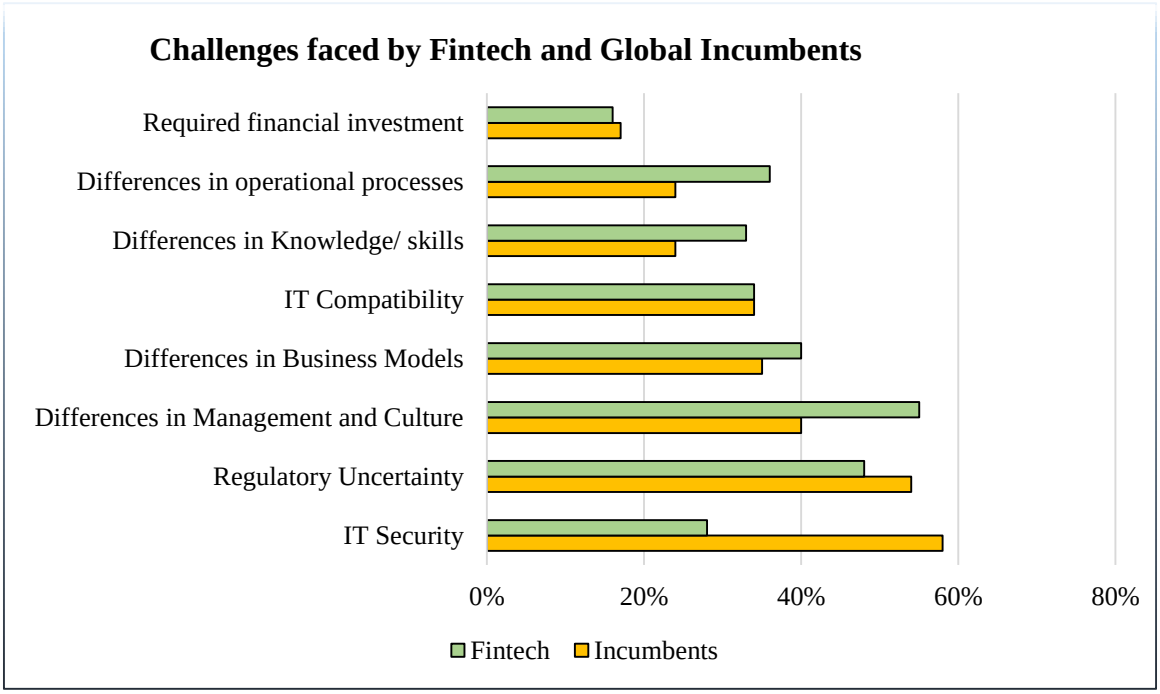


Figure 1: Challenges faced by Fintech and Global Incumbents

Source: PwC Global Financial Report, 2017 and (Rizvi, 2018)

Although the previous evidence proved that Fintech had played a significant role in reshaping the future of financial industry but the adoption of financial technology is still doubtful because of user's skepticism regarding associated risks. (Ryu, 2018b) highlighted the Fintech adoption barriers, which are the risk issues that hesitate the people from adoption of financial technology. The adoption barriers include: 1) financial risk (financial loss, extra fee and transaction cost), 2) legal risk (regulatory uncertainty for adoption, 3) security risks (privacy issues and ill-protected security technologies) and 4) operational risks (inadequacy in processing and systematic issues of Fintech companies. Fintech companies are in the challenging phase to mitigate those potential risks and increase the Fintech adoption. Auditors of a firm can play a significant role in mitigation of the risks associated with the adoption of digital technology for financial transactions through development of effective protection strategies that embrace the disruptions in processes with Fintech innovations. (Gomber et.al, 2018) suggested that financial institutions need to control the disruptions in the processes resulted from emergence of financial technology through developing effective protective strategy. (Magrane and Malthus, 2010) highlighted the roles of Audit committee as a moderator including: monitoring of external financial reports, internal controls, risk mitigation and external and internal auditing.

The main objective of the study is to identify the emerging risks which hesitate the fintech adoption intention. This study analyzed the relationship between Fintech revolution and emerging risk factors: Strategic risk, cyber security risk, operational risk and regulatory uncertainty. The study also investigated the moderating role of

auditors for risk reduction through the development of effective protection strategies. The study seek to provide answer of the following critical questions: What are the risks associated with Fintech? How these perceived risks influence the fintech adoption intention? How auditors mitigate the risks through implication of risk management framework. To analyze this, theory of perceived risk, theory of reasoned action are applied for determining how perceived risks impact the adoption of Fintech. This study provides insight for Fintech companies that are in the challenging phase to mitigate those potential risks and can increase the Fintech adoption in Pakistan.

Fintech in Pakistan : (Rizvi, 2018) documented different kinds of Fintech in Pakistan including ABACUS (management consultancy and provide solutions, technical systems and outsourced services), AUTOSOFT Dynamics(Offer consultancy and services regarding bank products), INNOVS (technical systems and provisions of solutions through consultancy services, outsourcing services offered to commercial banks through links with Easypaisa, Fonepay is used for transactions through smart phones), KARLOCOMPARE (Internet Apps for personalized financial transactions, MONET (e-payment transaction processes and systematic operations) and TPS (provision of cards and e-payment solutions and management of operations). The emerging Fintech including BATWA (start up for mobile wallet services), FINJA (no cost systematic payment options, free, frictionless instant payments, development of SimSim web application), ONELOAD, PAYLOAD, RED BUFFER (mobile and e-payment solutions and web based financial services) and STOCKSFM (a network, provide information to investors for managing their financial investments. The other firms consisted of startups, banks and telecommunication that provide digital financial services include: ASKARI BANK LIMITED (offer branchless banking under Paymax), BANK ALFALAH (offers internet banking), CAREEM (Careem Pay and Careem Wallet), CREDITFIX (offer digital loans), HBL(Konnect), Jazz Cash (branchless banking solutions), KEENU (Wallet), MCB BANK, MEEZAN BANK, STANDARD CHARTERED (Mobile banking) ,TELENOR MICRO FINANCE BANK (easy paisa), TEZ FINANCIAL SERVICES (Tez Fin), TPS (Software house and provides solutions regarding digital payments), UBL Bank (UBL OMNI) and Ufone (pay/ Upaisa). These firms facilitate micro lending, digital wallets, payment gateway and online and mobile financial services.

II. THEORETICAL BACKGROUND

Fintech Revolution, Perceived risks and Adoption Intention : (Yong Jae Shin and Yongrok Choi, 2019) defined Fintech as technology based financial solutions. Kim et al., 2016 conceptualized Fintech as service industry highly based upon mobile-centered information technology that effectively increases the efficiency of the underlying monetary systems. Loncarski in 2016 defined Fintech as Evolution and utilization of technology with disruption of classical business models used in financial markets as well as bringing about novel and unchartered risk territories. (Gomber et.al, 2017) highlighted the three basic pillars of Fintech revolution. First, Availability of surplus capital utilized for innovative technology in financial sector in globally fertile economic area. Second, the newly developed technical financial services that are different from traditional services and that address the needs of consumers directly, valuably and in a futuristic manner. Third, Fintech involves transformation in business models with automated processing of financial services, working as an intermediary channel for providing financial services with increased customer access and personalization. (Rickert et al., 2017) It has been estimated that till the end of 2017 the global Fintech market size was reached at 3.6 trillion USD which is expected to increase by 2022 at 8.3 trillion USD. Fintech revolution has embraced the world with changes in financial services but there is a need to consider the disruptions associated with digital innovation. These process disruptions increases the risk of financial frauds. (Gomber et.al, 2017) documented the disruption of different processes of financial sectors with the emergence of Fintech. According to PWC Report, the disruptions resulting from financial technology will change the landscape of financial services in year 2020 by including: 1) Complete digitalized financial product and service offerings in the financial industry. 2) Innovative technology applications dominate with increased local services and risk for maintaining cyber security through prevention of financial frauds. 3) Customer intelligence can be a considerable source of profitability which will make the regulators more active with Digital finance innovation. Risks associated with Fintech are increasing day by day around the globe. Fintech revolution now a source of challenge of systematic proportions. (Ryu, 2018a) documented that the Intention to adopt Fintech depends upon behavioral beliefs that influences the attitude of customer regarding Fintech adoption. According to this study, the negative beliefs on Fintech adoption increases perceived risks which negatively influences Fintech adoption intention. He studied different risks and proved that legal risk has significant negative impact on Fintech adoption intention. (Inna Romanova and Marina Kudinska, 2016) Fintech an important part of banking sector to compete both among financial as well as nonfinancial institutions. (Zhongqing Hu et al., 2019) Conducted study on Fintech Adoption intention for Bank Users in China. The study proved negative influence of perceived risk on customer's attitude towards Fintech adoption and customer's trust on Fintech services. (Ooi Chee Keong,

Tang Kin Leong and Chong Jia Bao, 2020) They identified perceived risks: operational risk, security risk, legal risk and financial risk and proved their negative affect on the Fintech adoption intention. The study considered four types of risks as perceived risks including: strategic risk, operational risk, cyber risk and regulatory uncertainty (legal risk).

Strategic risk : (Owen Ryan, 2017) Deloitte defined strategic risk as the risks that endanger the disruption of financial institution's core strategy including changes that endanger the disruption of original strategic terms and conditions of financial institutions. The study documented the foundation pillars of program for management of strategic risk.1) Integrating the management of risk with organization and strategy for considering risks that are effective. 2) Focus on effective tools and methods for identification of upcoming risks. 3) Well aware of the impacts that particular change will bring. The study discussed methods including: Reviewing of strategic risk, procedure for planning strategies, Trend analysis, scenario planning, test the assumed observations, war gaming, understanding of disrupted patterns and management of assets and revenues. (Philippon (2016), Arner, D.W, Barberis. J and Buckley, R.P (2015), Mackenzie (2015), Yong Jae Shin and Yongrok Choi, 2019) Fintech adoption leads to creative destruction by creating new adoptable standards that are highly contradicting to already existing characteristics. Destructive innovation in financial services leads to abolishing of basis for competition.

Operational risk : (Barakat, A., and K. Hussainey, 2013) defined operational risk as possible failures resulted from faulted and poor internal processes, employment and technical systems applied for Fintech. (Hyun-Sun Ryu, 2018a) The study documented that the presence of operational risks is a great hurdle for Fintech adoption by customers. Auditors with relevant competencies, operational expertise can mitigate the risks and encourage people to adopt digital financial services. Basel II Committee defined operational risk as the cost associated with failure resulted from ineffective processes, people and systems used internally or from external environmental events. Basel II Committee highlighted 7 categories of operational risks which were internal fraud, external fraud, poor practices of employment and workplace insecurity, dissatisfied clients, product defects and poor business practices, damage to physical assets, disruption of business processes and system failures. (Deloitte, 2018a) Suggested a framework as a possible solution of reduction of operational risks. The framework consisted of four categories:1) Design: designing of operational risk programs for identification, measurement and mitigation of operational risk, 2) Operate: Management of services for improvement in operations, 3) Master: Detection of emerging risks through updated modes and propose strategies for risk reduction that supports decisions about risks,4) Transform: Combination of experienced governance, risk and compliance related technologies with inclusion of automated processes for updating operation risk management.

Cyber risk : Cebula and Young in 2010 defined cyber risk as underlying operational risks with information and technical assets that affects confidentiality, availability or coherence of information or informative systems. Cyber risks affect Fintech from three perspectives: 1) Confidentiality issues deals with disclosure of information to the third party or data breaching. 2) Availability issues deals with disruption of organizational processes. 3) Integrity issues involves wrong use of systemic information. (Hyun-Sun Ryu, 2018a) documented that both fraudulent activity and hacker act of intruding resulted in monetary loss along with user's privacy which is a considerable issue while adopting Fintech. Online banking frauds are increasing day by day in Pakistan. (Financial Stability Review, 2017) The survey highlighted key Cyber risks associated with Fintech were: financial losses associated with data insecurity, defaulting of computerized systems because of spyware and malware viruses, operational deficiency in financial services and automated solutions provided by financial institutions and poor impact on reputation of financial institutions. Prescott and Larose in 2016 documented that cyber security risks and data secrecy have strong relation and are potential threats for use of financial technology. The report highlighted a case of Dwolla, a small level Fintech startup in USA provide financial solutions with completely secured and protected financial transactions for customers. But all in vain because they have lost their customer's useful information when they face a cyber-attack, indicated that company's cyber-security was not up to date in regard to customer's requirements. In result the company was fined with 100 thousand USD by US Consumer Financial protection Bureau (CFPB). The State Bank of Pakistan Financial Stability Review 2017 reported that cyber security risks are positioned among the top ten risks currently faced by financial system of the country, but the situation is controllable. State Bank of Pakistan as a central ruling authority still working in collaboration with banks to mitigate these associated risks. (Kwok, 2017) Highlighted the opportunities related to Fintech through a strategic approach with articulation of Fintech uncertainties. Through the review of literature on GFC regulatory and Fintech associated risks, the study focus on formulating and implementing the policies for effective handling of cyber-attacks through comprehensive mechanisms and promoted institutionalized cyber security.

Regulatory Uncertainty (Legal risk) : (Hyun-Sun Ryu, 2018a) defined legal risk as hidden legal status with no universally accepted regulations for Fintech. The study also documented that strict and unclear financial regulations especially nonfinancial firms, were a major hurdle for growth and adoption of Fintech in financial market of Korea. (Zetzsche et al., 2017) Fintech plays a transformation role in finance and challenges its rules and regulations at an unrivalled rate. They in their study focused on firms that are early entrants in financial sector and considered Fintech, a preferable option and highlighted the associated legal risks and regulatory uncertainties. The companies and authorized financial regulators cannot understand the associated risks and negative consequences obtained with Fintech. So this little confidence resulted in unfamiliar, ineffective and less efficient financial regulations. (Lee and Shin, 2018, Rizvi, 2018) highlighted the challenges faced by Fintech including: regulatory uncertainty, technical concerns, and data security issues. Regulatory uncertainty is a hurdle for Fintech because there were no procedures to follow. Ioannis Anagnostopoulos on 2018 studied the effects of fintech and regulatory technology on regulators and banks. This paper describes the process disruptions associated with digital finance and its significance for financial industry when technology advancement is a challenge for banks and systems of regulation globally. Meja Pejkovska on 2018 studied the potential negative effects of financial technology on the financial sector providing financial services on a global scale. The study proved the influential role of Fintech firms on the traditional financial firms with unsuitable present state of Fintech regulations in the territories which negatively effects the financial services industry on global scale including: cyber security risks, compliance risks and regulatory risks. The regulatory authorities need to develop appropriate regulatory policies for reducing associated risks with the use of digital finance.

III. THEORETICAL CONTRIBUTION

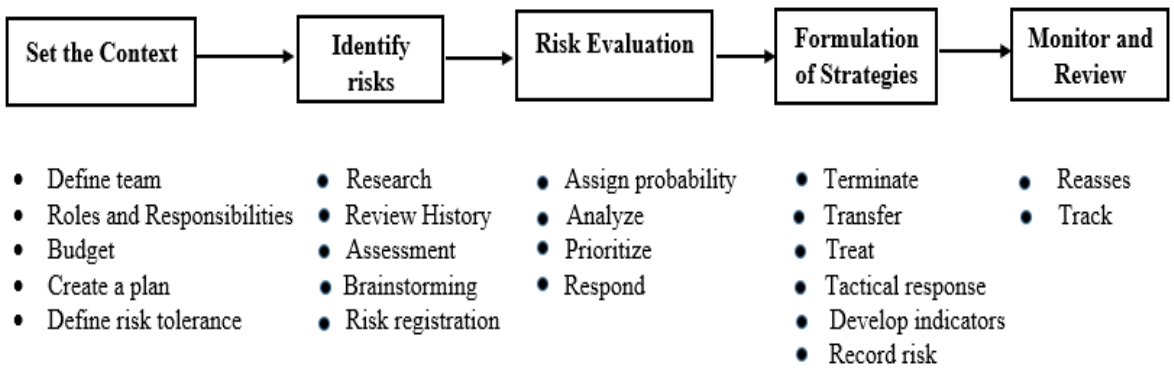
Theory of Perceived risk and Technology Acceptance Model: Bauer in 1960 proposed theory of consumer risk, highlighted that perception of risk by consumers implied uncertainty for the poor consequences of decision made. These perceived risks hesitate the consumer from adoption of digital services. (Yong-Hui Li and Jing-Wen Huang, 2009) Integrated theory of perceived risk with TAM for determining the adoption intention of e-shopping channel. The people from Pakistan has a positive potential for using digital financial services but risk perception negatively effects their Fintech adoption intention. TAM provides theoretical foundation for describing the individual's adoption of technology services. (Bruner and Kumar, 2005) Documented TAM as the individual adoption of technology based upon the evaluation of perception about ease of use, perceived usefulness, attitude and intention towards its usage. Several researches applied TAM perceived benefits for increasing the adoption of Fintech. This study considered only the perceived risks associated with Fintech that hesitate the people from its adoption. (Li-Min Chuang, 2017) Applied TAM model for understanding the behavioral intention of consumers towards Fintech through integration of service trust and brand. (Chua Chang Jin, 2019) A study on consumer adoption of digitalized financial products and services in Malaysia, implied (TAM) with the consumer awareness as a mediator. The study highlighted the factors effecting adoption of Fintech products and services and proved the negative effect of perceived risks on consumer awareness of Fintech products and services. (Zhongqing Hu et al., 2019) Proposed extended TAM that considered perceived risk, an important determinant of customer's trust for Fintech adoption and proved negative influence of perceived risk on Fintech adoption intention.

Theory of Reasoned Action (TRA) : (Ajzen & Fishbein, 1977) The theory is widely applied for prediction of human behavior and explained behavioral intentions (determinant of an individual's attitude) as the driver of individual behavior. In short, believe on positive consequences leads to positive attitude about the behavior and believe in negative outcomes will lead to negative attitude about the behavior. TRA states that behavioral intention has two predictors: 1) Attitude: positive or negative feelings while performing specific behavior (Al-Mamary et al., 2016) and 2) Subjective norms: thinking of social pressure. (Hu et al., 2019) They studied that positive attitude is an essential requirement for adoption of new technologies. Subjective norms significantly influence consumer's technology adoption criteria. (Ooi Chee Keong, Tang Kin Leong and Chong Jia Bao, 2020) Applied TRA and proved perceived risks negatively affect the Fintech adoption intention.

Risk Management framework : (The master card foundation and IFC (International Finance Corporation), 2016) proposed the risk management framework, applied by institutions offering digital financial services. The framework (figure 2) is based upon the ISO 31000 business standards for risk mitigation. Risk management process consisted of five steps: 1) Establishing the context: Develop the risk management team, define roles and responsibilities, set plan and budget with description of risk tolerance profile, 2) Identification of risks: research, brainstorm and register the risks, 3) Risk evaluation: assign probability and analyze the risk, respond accordingly, 4) Formulation of strategies: terminate, transfer and risk treatment strategies and 5) Monitoring and Review: risk reassessment and track record. The current study considered firm auditors as risk management team, assign them roles, they identify different risks associated with digital financial services: strategic risk, operational risk, cyber

and legal risk. Auditors evaluate risk then formulate and implement risk termination, risk transfer and risk treatment strategies. Finally they review and monitor the risk mitigation. (Ussahawanitchakit), 2015) documented the moderating effect of competency level of audit committee for managing best practices for internal audit in manufacturing companies of Thailand. The study proved the positive moderating role of audit committee for integrated risk assessment. Effective digital financial transaction are based upon the development of effective protective strategies by auditors. Institute of Internal Auditors on 2018 highlighted the importance of new innovations in digital finance along with the role of internal and external auditors for minimizing the threat of associated unknown risks through development of strategies and audit plans for risk assessment and risk mitigation in financial institutions (Geoffery P. Miller, 2014). The study determined the moderating influence of auditors protective strategies in reducing Fintech perceived risks.

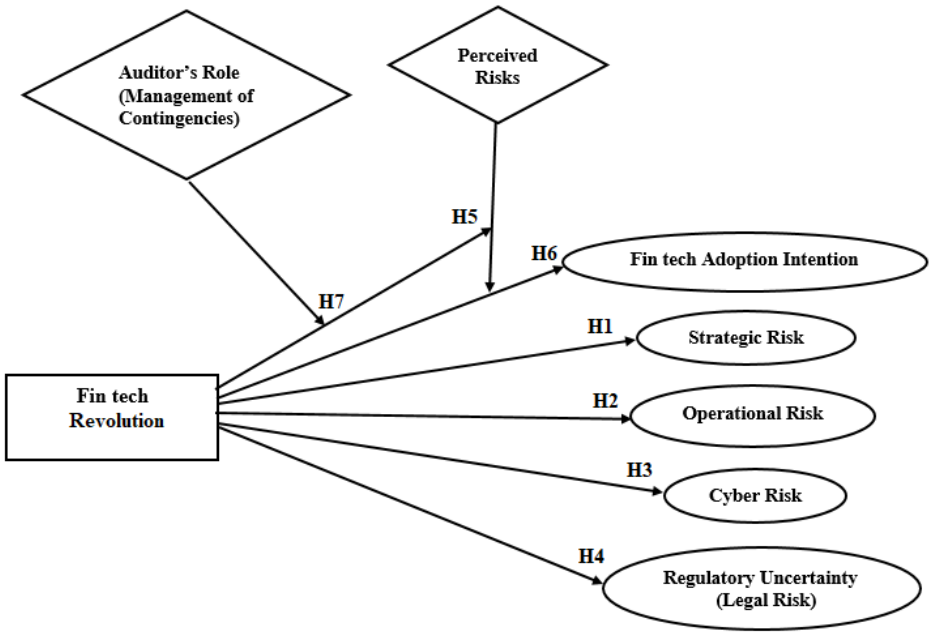
Figure 2: Risk Management Framework



Source: (The master card foundation and IFC (International Finance Corporation) Handbook, 2016)

Conceptual Model : The study considered quantitative research and developed a conceptual model that describe the interrelationships between Fintech revolution, perceived risks and Adoption intention and the risk management through Auditor's development of protective strategies. Figure 2 below shows conceptual model.

Figure 2: Conceptual Model



Source: Author's own source

Hypothesis Development

H1: There is a positive relationship between Fintech revolution and strategic risk.
H2: There is a positive relationship between Fintech revolution and operational risk.
H3: There is a positive relationship between Fintech revolution and cyber risk.

H4: There is a positive relationship between Fintech revolution and regulatory uncertainty (legal risk).
H5: There is a positive relationship between Fintech revolution and perceived risks.
H6: Perceived risks moderates the relationship between Fintech revolution and Fintech Adoption Intention
H7: Auditor's role (Management of Contingencies) moderates the relation between Fintech revolution and perceived risks.

IV. RESEARCH METHODOLOGY

To examine the above propositions, this study considers multi-method quantitative analysis involving both quantitative data collection and data analysis procedures. Table 1 below shows the questionnaire adopted from previous studies used for Data collection from 20 Fintech companies in Pakistan. There are total 230 questionnaires but we got only 200 because some of them are incomplete and some are misplaced. Simple random sampling is employed to collect data from sample size of 200 respondents including financial managers, operational managers, financial auditors and employees in Fintech companies. Econometric modeling formed the basis for regression analysis by using Stata version 14.0.

Table 1: Questionnaire items and constructs

Factor	Symbol	Items	References
Fintech Revolution	FR	4	(Zhongqing Hu et al., 2019) and (Hyun-Sun Ryu, 2018a)
Strategic Risk	SR	3	(Basel Shahin, 2011)
Operational Risk	OPR	3	(Hyun-Sun Ryu, 2018a)
Cyber Risk	CR	3	(Hyun-Sun Ryu, 2018a)
Regulatory Uncertainty (Legal Risk)	RU	4	(Hyun-Sun Ryu, 2018a)
Auditor's Role in Mitigation of Contingencies	AR	5	(Juma Bananuka et al., 2018) and (Firehiwet, 2017)
Fintech Adoption Intention	AI	4	(Hyun-Sun Ryu, 2018a)

Econometric Modelling: We develop our model by considering risk factors including strategic risk, operational risk, cyber risk and regulatory uncertainty that are strongly influenced by increasing Fintech revolution. The increase in perceived risks can significantly influence adoption intention for Fintech. We incorporate auditors in the proposed model as a moderator to analyse their role in the management of these risks. The relationship between Fintech revolution, perceived risk factors, adoption intention and auditor's role can be estimated as:

$$SR = \alpha_0 + \alpha_1 FR + e_1 \quad (1)$$
$$OPR = \alpha_0 + \alpha_1 FR + e_1 \quad (2)$$
$$CR = \alpha_0 + \alpha_1 FR + e_1 \quad (3)$$
$$RU = \alpha_0 + \alpha_1 FR + e_1 \quad (4)$$
$$PR = \alpha_0 + \alpha_1 FR + e_1 \quad (5)$$
$$AI = \beta_0 + \beta_1 FR + \beta_2 PR + e_2 \quad (6)$$
$$PR = \beta_0 + \beta_1 FR + \beta_2 AR + e_2 \quad (7)$$

V. RESULTS AND INTERPRETATION

Descriptive Statistics : The table 2 below shows the descriptive statistics of the demographics used for respondents from 20 Fintech companies in Pakistan. The mean value of Gender is 1.275, indicating higher frequency of males.The mean value of Age is 2.215, indicating higher frequency of people with age 26-30 years.The mean value of Education is 2.36 indicating highest number of postgraduates. The highest number of respondents are financial auditors with mean value 2.47. People use Fintech services occasionally with mean value 2.16 The highly associated risk with Fintech is Cyber risk with mean value 2.26.

Table 2: Descriptive Statistics

Variable	Mean	Standard deviation
Gender	1.275	0 .4476348
Age	2.215	0.9071325
Education	2.36	0.6875782
Job Role	2.47	0.9970308
Financial Service Usage	2.16	0.9638699
Highly Associated Risk	2.26	1.052587
Total	200	100.0

Reliability Analysis : Reliability test calculates the internal consistency of all the items of the study through values of Cronbach's alpha. In Table 3, the overall Cronbach alpha for all the items is 0.794 indicates strong internal consistency. The values of Cronbach alpha for FR, SR and OPR are 0.512, 0.600 and 0.651 indicates good internal consistency, CR, RU and AR indicates high internal consistency with values 0.705, 0.743 and 0.793 respectively. AI has low value of 0.304.

Table 3: Results of Reliability Analysis

Variables	FR	AI	SR	OPR	CR	RU	AR	Overall
No. of Items	4	4	3	3	3	4	5	26
Cronbach's alpha	0.512	0.304	0.600	0.651	0.705	0.743	0.793	0.794

Correlation Analysis: The coefficient of correlation represents the degree and direction of relationship between dependent and independent variables (Daniel Arkkelin, 2014). Table 4 below shows statistically significant ($p<0.01$) weak to moderate correlation between FR, AI, SR, OPR, CR, RU and AR with value of r ranging between 0.1-0.4 indicates the presence of linear relationship between a pair of criterion variables for each predictor variable. AI has negative but statistically insignificant relationship with SR, OPR, CR, RU and AR.

Table 4: Results of Correlation Analysis

		FR	AI	SR	OPR	CR	RU	AR
FR	**Pearson Correlation**		-0.203**	0.387**	0.443**	0.420**	0.447**	0.313**
	Sig.(2-tailed)	**1**	0.004	0.000	0.000	0.000	0.000	0.000
AI	**Pearson Correlation**			-0.134	-0.018	-0.078	-0.107	-0.176
	Sig.(2-tailed)		1	0.058	0.800	0.274	0.131	0.013
SR	**Pearson Correlation**				0.465**	0.295**	0.299**	0.465**
	Sig. (2-tailed)			1	0.000	0.000	0.000	0.000
OPR	**Pearson Correlation**					0.203**	0.248**	0.458**
	Sig. (2-tailed)				1	0.004	0.000	0.000
CR	**Pearson Correlation**						0.793**	0.205**
	Sig. (2-tailed)					1	0.000	0.004
RU	**Pearson Correlation**							0.348**
	Sig. (2-tailed)						1	0.000
AR	**Pearson Correlation**							
	Sig. (2-tailed)							1

'**' Correlation is significant at the 0.01 level (2-tailed), '*' Correlation is significant at the 0.05 level (2-tailed).

Data Normality : Skewness/Kurtosis Normality test is applied for determining the normality of the data. Variable is considered close to normal if its skewness and kurtosis have values between -1.0 and + 1.0. Table 5 below shows that skewness and Kurtosis value of all variables lie between -1.0 and + 1.0, indicating normality of data.

Table 5: Skewness/Kurtosis tests for Normality

Variable	Skewness	Kurtosis
FR	0.0144	0.8065
SR	0.3269	0.3830
OPR	0.0247	0.2079
CR	0.0000	0.0008
RU	0.0001	0.1211
AI	0.9735	0.9280
AR	0.0000	0.1860

Regression Analysis : Bluman in 2009 highlights the role of Regression analysis in determining the nature and strength of influential relationship between criterion and predictor variables.

Model Summary

Table 6: Results of Model Summary

Criterion Variable	Model	R	R^2	Adjusted R^2	Standard Error of the Estimate (SE)	Multicollinearity	
						VIF	1/VIF=T
SR	**1**	0.387	0.149	0.145	0.67682	1.000	1.000
OPR	**2**	0.443	0.196	0.192	0.67598	1.000	1.000
CR	**3**	0.420	0.176	0.172	0.66060	1.000	1.000
RU	**4**	0.447	0.200	0.196	0.50152	1.000	1.000
PR	**5**	0.367	0.134	0.130	0.73582	1.000	1.000

Table 6 above represents results of regression analysis model summary for model 1, 2, 3, 4 and 5. R indicates strength of relationship between variables. R-square indicates the proportion of variance accounted for in the dependent variable because of changes in independent variable. Adjusted R-square shows model accuracy. VIF is Variance inflation factor, and I/ VIF is defined as tolerance, both are used for detecting multi-collinearity. For model 1, the strength of relationship between FR and SR is 38.7%, the proportion of variance experienced by SR because of changes in FR is 15%, model accuracy is 13% and SE is 67.68%. For model 2, R is 44.3%, the proportion of variance experienced by OPR is 67.59%, model accuracy is 19.2% and SE is 67.59%. For model 3, the strength of relationship between FR and CR is 42%, R-square is 17.6%, and Adjusted R-square is 17.2%. For model 4, R is 44.7%, R-square is 20%, and model accuracy is 19.6%. For model 5, PR is the dependent variable and the strength of relationship with FR is 36.7%, proportion of variance explained is 13.4% and model accuracy is 13%. All the models have VIF <10 and T>0.1 indicating absence of multi-collinearity.

ANOVA : ANOVA is the analysis of variance, determines the statistical significance of regression model for the prediction of strategic risk, operational risk, cyber risk and regulatory uncertainty and perceived risks.

Table 7: Results of ANOVA

Criterion Variable	Model		Sum of Squares	Degree of freedom	Mean Square	F-statistics	Sig.
SR	**1**	Regression	15.929	1	15.929	34.774	0.000
		Residual	90.702	198	0.458		
		Total	106.631	199			
OPR	**2**	Regression	22.053	1	22.053	48.261	0.000
		Residual	90.476	198	0.457		
		Total	112.528	199			
CR	**3**	Regression	18.460	1	18.460	42.301	0.000
		Residual	86.406	198	0.436		
		Total	104.866	199			
RU	**4**	Regression	12.454	1	12.454	49.513	0.000
		Residual	49.801	198	0.252		
		Total	62.255	199			
PR	**5**	Regression	16.637	1	16.637	30.727	0.000
		Residual	107.203	198	0.541		
		Total	123.840	199			

In Table 7, the ANOVA for model 1, 2, 3, 4 and 5 shows F-statistics for SR, OPR, RU and PR is 34.774, 48.261, 42.301, 49.513 and 30.727 respectively. All models have degree of freedom 1 and significance level 0.000 ($p<0.01$) shows that Fintech revolution in each model significantly predicts strategic risk, operational risk, cyber risk, regulatory uncertainty and perceived risks.

Hypothesis testing : Unstandardized b-coefficient is slope of the line and standardized beta coefficients are the coefficients of regression, both determines the direction of relationship of Fintech Revolution with strategic risk, operational risk, cyber risk, regulatory uncertainty and perceived risk,

Table 8: ß-Coefficients

Criterion Variable	Model		(Unstandardized Coefficients)		(Standardized Coefficients)	t-value	Sig.
			B	Standard Error	ß		
SR	**1**		1.990	0.291		6.848	0.000
			0.437	0.074	0.387	5.897	0.000
OPR	**2**		1.583	0.290		5.455	0.000
		(Constant)	0.514	0.074	0.443	6.947	0.000
CR	**3**	FR	2.049	0.284		7.224	0.000
			0.471	0.072	0.420	6.504	0.000
RU	**4**		2.596	0.215		12.055	0.000
			0.387	0.055	0.447	7.037	0.000
PR	**5**		1.953	0.316		6.182	0.000
			0.447	0.081	0.367	5.543	0.000

In Table 8 the results of B coefficient and *ß* coefficient for model 1, ß=0.387, t= 5.897, p-value 0.000 (P<0.001) represents the strong positive relation of FR with SR. Results were successfully supported Hypothesis H1. For model 2, *ß*=0.443, t= 6.947, p-value 0.000 (P<0.001) represents the strong positive relationship of FR with OPR, supporting Hypothesis H2. For model 3, *ß*=0.420, t= 6.504, p-value 0.000 (P<0.001) represents the strong positive relationship of FR with CR. So, Hypothesis H3 was successfully supported. For model 4, *ß*=0.447, t= 7.037, p-value 0.000 (P<0.001) represents the strong positive relationship between FR and RU, successfully supported H4. For model 5, *ß*=0.367, t= 5.543 (t>1.96), p-value 0.000 (P<0.001) represents the strong positive relation between FR and PR. Hypothesis H5 was successfully supported. All the models were statistically significant, so increase in Fintech revolution increases associated risk factors.

Moderating Role of perceived risk : For model 6, simple linear regression is applied for determining the moderating role of perceived risk between FR and AI. (Aiken, L.S. and West, S.G.. 1991) Moderation analysis is conducted in two steps: first, fit a regression model (Block 1) direct effect is analyzed between Fintech revolution and Adoption intention. Secondly, interaction term is added to the direct effect (Block 2). Then significant effect of the new Interaction term (FR*PR) is analyzed. If both effects are significant, indicated that moderation is occurring. There are two conditions for determining the type of moderation occurred: 1) if the effect of FR and AI are insignificant with the interaction term added, then complete moderation has occurred, 2) If the effect is significant with the interaction term added, then partial moderation has occurred.

Model Summary

Table 9: Results of Model Summary

Model 6	R	R^2	Adjusted R^2	Standard Error of the Estimate	Change Statistics		
					R^2Change	F-Change	Significant F-Change
1	0.247	0.061	0.052	0.69141	0.061	6.406	0.002
2	0.300	0.090	0.076	0.68250	0.029	6.178	0.014

In table 9 the results of moderation analysis for model 6 shows value of R-square with main effect (effect of Fintech revolution on Adoption Intention) is 0.061, and indicated variable in block 1 explained 6.1% proportion of variance. After Block 2 interaction terms (FR*PR) added, model as a whole explained 9% of variance in AI. The value of R-square change is 0.029, indicated perceived risks explained additional 3% of variance in AI. The model represents statistically significant contribution of moderator with value of F-change=6.178 (t>1.96) and p-value= 0.000 (p<0.001).

ANOVA

Table 10: Results of ANOVA

Model 6		Sum of Squares	Degree of freedom	Mean Square	F-statistics	Sig.
1	Regression	6.125	2	3.062	6.406	0.002
	Residual	94.175	197	0.478		
	Total	100.300	199			
2		9.002	3	3.001	6.442	0.000
		91.298	196	0.466		
		100.30	199			

In above table 10, F-statistics (F (3, 196) =6.442 with p=0.000 (p<0.001), indicated statistical significance of the model 6.

7.6.3 Hypothesis Testing

Table 11: ß-Coefficients

Model 6		(Unstandardized Coefficients) B	Standard Error	(Standardized Coefficients) ß	t-value	Sig.
1	FR	-0.162	0.081	-0.147	-1.984	0.049
	PR	-0.137	0.067	-0.152	-2.044	0.042
2	FR	0.833	0.408	0.760	2.041	0.043
	PR	0.849	0.402	0.943	2.112	0.036
	Interaction_term	-0.257	0.104	-1.667	-2.485	0.014

The table 11 measures moderation influence of perceived risk on the relationship between FR and AI for model 6. The direct effect of FR and PR on adoption intention is significant with p-value of 0.000 ($p < 0.05$), indicated presence of moderation effect. The indirect effect with the interaction term is also significant with p-value of 0.14 ($p< 0.05$). Significance of both effects shows partial moderation. Negative sign shows the decrease in Fintech adoption intention with the increase in perceived risk, H6 successfully supported.

Moderating Role of Auditor: For model 7, regression analysis determines the moderating role of Auditor in mitigation of perceived risks. Block 1 involve the direct effect between FR and PR. In Block 2, interaction term is added to the direct effect. Then significant effect of the new Interaction term is analyzed. If both effects are significant, indicated that moderation is occurring. For complete moderation, the effect of FR and auditor's role in management of contingencies are insignificant with the interaction term added. For partial moderation, the effect of FR and AR are significant with the interaction term added.

Model Summary

Table 12: Results of Model Summary

Model 7	R	R^2	Adjusted R^2	Standard Error of the Estimate	Change Statistics		
					R^2Change	F-Change	Significant F-Change
1	0.244	0.060	0.050	0.68956	0.060	6.232	0.002
2	0.294	0.087	0.073	0.68130	0.027	5.804	0.017

In table 12 moderation analysis shows value of R-square with main effect (effect of Fintech revolution on perceived risks) is 0.060 indicated variable in block 1 explained 6% proportion of variance. After Block 2 interaction terms added, model as a whole explained 8.7% of variance in perceived risks. The value of R-square change is 0.027, indicated auditor's role in management of contingencies explained additional 2.7% of variance in perceived risks. The model represents statistically significant contribution of moderator with value of F-change=5.804 and p-value= 0.017 (p<0.001).

ANOVA

Table 13: Results of ANOVA

Model 7		Sum of Squares	Degree of freedom	Mean Square	F-statistics	Sig.
1	**Regression**	5.927	2	2.963	6.232	0.002
	Residual	93.672	197	0.475		
	Total	99.599	199			
2		8.620	3	2.873	6.190	0.000
		90.978	196	0.464		
		99.599	199			

In above table 13, F-statistics (F (3, 196) =6.190 with p=0.000 (p<0.001), indicated statistical significance of the model 7.

Hypothesis Testing

Table 14: ß-Coefficients

Model 7		(Unstandardized Coefficients)		(Standardized Coefficients)	t-value	Sig.
		B	**Standard Error**	***ß***		
1	**FR**	-0.163	0.082	-0.147	-1.978	0.049
	AR	-0.133	0.067	-0.148	-1.996	0.047
2	**FR**	0.817	0.415	0.738	1.970	0.050
	AR	0.840	0.409	0.937	2.053	0.041
	Interaction term	-0.254	0.106	-1.640	-2.409	0.017

The table 14 shows the influence of Auditor's risk management role on the relationship between FR and PR. The direct effect of FR and Auditor's role on perceived risks is significant with p-value of 0.000 ($p < 0.05$), indicated presence of moderation effect. The significant level improves when interaction term is added with p-value of 0.17 ($p < 0.05$). Significance of both effects shows partial moderation. Negative sign shows the decrease in perceived risks with the increase in auditor's development of protective strategies. So, Hypothesis 7 was successfully supported.

Practical Implementation: The results of the study offer practical implications for Fintech companies, potential users of digital financial services, policy makers and auditors in Fintech companies. The study provides insights regarding the risk factors that hesitate the Fintech adoption in Pakistan. The auditors in Fintech companies can mitigate these associated risks through protective strategies and motivate the people for Fintech adoption in using financial services. As a result of risk mitigation, the growth in Fintech sector can be improved in a developing nation like Pakistan.

Limitations: The study focused on specific types of Fintech services: mobile transactions, internet banking, digital lending, personal financing and Fintech softwares. Further studies may consider other types of services provided by Fintech like ethereum, Bitcoin, crowdfunding etc. The study focused on specific set of perceived risk factors identified from previous studies. Further studies may include other risk factors that hesitate the people Fintech service adoption. The results of the study are less generalizable because sample was limited to the firms using Fintech in Pakistan. Pakistan is a developing country and has technology adoption framework different from other cultures.

VI. DISCUSSION

This study extends the previous studies regarding financial technology adoption and highlight the risk factors including strategic risk, operational risk, cyber risk and regulatory uncertainty that hesitate the people from adoption of digital finance for using financial services. The benefits from Fintech can never be ignored but the emerging risks play a challenging role for Fintech companies. For testing hypothesis, Regression analysis conducted through Stata version 14.0. The study shows that all perceived risks increases with the increase in Fintech revolution. The results proved that relationship between Fintech revolution and Fintech adoption intention was negatively influenced by perceived risk. The study proved that auditor's development of effective protective

strategies can possibly play a moderating role in mitigation of perceive risks. The results of the study provide strong evidence for Fintech adoption in financial industry.

VII. CONCLUSIONS

Results from regression analysis proved all 7 hypotheses statistically significant with the proposed models. There is a positive statistically significant relationship of Fintech revolution with perceived risks, strategic risk, operational risk, Cyber risk and regulatory uncertainty. The study also proved that the presence of perceived risks negatively influences Fintech adoption intention in this era of Fintech revolution. The study also proved that Fintech firm's auditors moderates the relationship between Fintech revolution and perceived risks through development of effective protection strategies for management of perceived risks.

Acknowledgements: We are grateful to two university supervisors for their constructive comments, which significantly improved the analysis of our results.

Conflict of interest: No potential competing interest was reported for this study.

Funding: No financial support was received for the research, authorship and publication of the study.

REFERENCES

1. Aiken, L. S., & West, S. G. (1991). Multiple regression: Testing and interpreting interactions. Thousand Oaks, CA: Sage.
2. Anagnostopoulos, I. (2018). Fintech and regtech: Impact on regulators and banks. *Journal of Economics and Business, 100*, 7-25.
3. Andrea Minto Moritz, V. M. (2017, October). Separating apples from oranges: identifying threats to financial stability originating from FinTech. *Capital Markets Law Journal, 12*(4), 428-465.
4. Arkkelin, D. (2014). *Using SPSS to Understand Research and Data Analysis.* Psychology Curricular Materials. Book 1, Valparaiso University.
5. Badara, M. S. (2017, Feburary 20). The Relevant of Contingency Theory and Stewardship Theory on the Internal Audit Research. *Journal of World Economic Research, 6*(2), 17-22.
6. Barakat, A. a. (2013). Bank governance, regulation, supervision, and risk reporting: Evidence from operational risk disclosures in European banks. *International Review of Financial Analysis, 30*(2), 254-273.
7. Bluman, A. (2009). *Elementary Statistics A Step By Stp approach.* McGrawHill.
8. Bauer, R. (1960). Consumer behavior as risk taking, in Dinamic Marketing for a Changing World, Hancock, Robert Spencer, ed. Chicago, IL: . American Marketing Association, 389-398
9. Board, F. S. (2017). Financial Stability Implications from FinTech Supervisory and Regulatory Issues that Merit Authorities Attention.
10. Choi, Y. J. (2019). Feasibility of the Fintech Industry as an Innovation Platform for Sustainable Economic Growth in Korea. *Sustainability, 11*(19), 5351.
11. Chua Chang Jin, L. C. (2019). Factors affecting the consumer acceptance towards fintech products and services in malaysia. *International Journal of Asian Social Science, 9*(1).
12. Corporation, T. M. (2016). *Digital Financial Services and Risk Management: A Handbook.* World Bank Group. Retrieved from http://documents1.worldbank.org/curated/en/226461531293264583/pdf/Digital-financial-services-and-risk-management-handbook.pdf
13. Deloitte. (2018b). FinTech: Regulatory Challanges and Financial Crime Exposure.
14. Deloitte. (2018a). Operational Risk Management: Solution Suite for Banking and Securities. Retrieved from https://www2.deloitte.com/content/dam/Deloitte/us/Documents/regulatory/us-regulatory-operational-risk-management-solution-suite-for-banking-and-securities.pdf
15. Dirk Zetzsche, R. B. (2017). From FinTech to TechFin: The Regulatory Challenges of Data-Driven Finance, Working Paper Series 2017. *SSRN Electronic Journal*. Retrieved from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2959925
16. Douglas W Arner, J. B. (2015). The Evolution of Fintech: A New Post-Crisis Paradigm? *Georgetown Journal of International Law , 47*, 1271–1285.
17. Fishbein, I. A. (1977). Attitude-Behavior Relations: A Theoretical Analysis and Review of Empirical Research. *Psychological Bulletin, 84*(5), 888-918.
18. Gregorio, C. A. (2017). *Fintech and Entrepreneurial Finance: what´s coming next?* Retrieved from http://repositori.uji.es/xmlui/bitstream/handle/10234/170463/TFG%20_2017_MariscalGregorio_CristinaArume.pdf?sequence=1

19. Hu, Z. D. (2019). Adoption Intention of Fintech Services for Bank Users: An Empirical Examination with an Extended Technology Acceptance Model. *Symmetry*, *11*(3), 340.
20. Huang, Y.-H. L.-W. (2009). Applying Theory of Perceived Risk and Technology Acceptance Model in the Online Shopping Channel . *World Academy of Science, Engineering and Technology 53.1*, 919 -925.
21. Juma Bananuka, S. K. (2018). Internal Audit Function, Audit Committe's Effectiveness and Accountability in the Uganda Statutory Corporations. *Journal of Financial Reporting and Accounting*, *16*(1), 138-157.
22. Kim, Y. C. (2016). The adoption of mobile payment services for Fintech. *International Journal of Applied Engineering Research, 11*(2), 1058–1061.
23. KPMG. (2019). *The Plus of Fintech 2018.* Retrieved July 20, 2019, from https://assets.kpmg/content/dam/kpmg/xx/pdf/2019/02/the-pulse-of-fintech-2018.pdf
24. Kudinska, I. R. (2016). Inna Romănova, Marina Kudinska , (2016), Banking and Fintech: A Challenge or Opportunity?, in (ed.) Contemporary Issues in Finance: Current Challenges from Across Europe (Contemporary Studies in Economic and Financial Analysis). *98*, 21-35.
25. Kumar, G. C. (2005). Explaining consumer acceptance of handheld Internet devices. *Journal of Business Research*, *58*(5), 553-558.
26. Kwok, A. W. (2017). Emergence of Fintech and cybersecurity in a global financial centre Strategic approach by a regulator. *Journal of Financial Regulation and Compliance*, *25*(4), 422-434.
27. Li-Min Chuang, C.-C. L.-K. (2017). The Adoption of Fintech Service: TAM perspective. *International Journal of Management and Administrative Sciences (IJMAS)*, *3*(7), 1-15.
28. Loncarski, I. (2016). Risk Management. *Risk Management*, *18*(1), 1-3.
29. Mackenzie, A. (2015). The Fintech Revolution. *London Business School Review*, *26*, 50-53.
30. Malthus, J. M. (2010). Audit Committee Effectiveness: A Public Sector Case Study. *Managerial Auditing Journal*, *25*(5), 427-443.
31. Miller, G. P. (2014). The Role of Risk Management and Compliance in Banking Integration. *NYU Law and Economics Research Paper No. 14-34,*. Retrieved from https://ssrn.com/abstract=2527222 or http://dx.doi.org/10.2139/ssrn.2527222
32. Ooi Chee Keong, T. K. (2020). Perceived Risk Factors Affect Intention to Use FinTech. *Journal of Accounting and Finance in Emerging Economies*, *6*(2), 453-463.
33. Pakistan, S. B. (2017). Financial Stability Review. Retrieved from http://www.sbp.org.pk/FSR/2017/boxes/Box-6.1.pdf
34. Pejkovska, M. (2018). Potential negative effects of Fintech on the financial services sector Examples from the European Union, India and the United States of America.
35. Peter GOMBER, R. J. (2018). On the Fintech revolution: Interpreting the forces of innovation, disruption and transformation in financial services. *Journal of Management Information Systems*, *35*(1), 220-265.
36. Philippon, T. (2016). *The Fintech Opportunity (No. w22476).* National Bureau of Economic Research: Cambridge, MA,. Retrieved from https://www.nber.org/papers/w22476
37. Prescott, N. a. (2016). *FinTech Companies Face Big Privacy Challenges in 2016.* VC Experts Blog. Retrieved from https://blog.vcexperts.com/2016/08/09/fintech-companies-face-big-privacy-challenges-in-2016/
38. Puttikunsakon, A. a. (n.d.). Best internal audit practices and achieving organizational success: An empirical examination of ISO 9000 manufacturing firm in Thailand. *6th International Trade and Academic Research Conference (ITARC)*, (pp. 105-125). UK.
39. PWC. (2017). *Global FinTech Report 2017, Redrawing the lines:FinTech's growing influence on Financial Services.* Retrieved from https://plsadaptive.s3.amazonaws.com/eco/files/event_content/tLwGKbJIzYmtKPlBUegFGrD0z2nl6cC8hnuYQNG3.pdf?X-Amz-Content-Sha256=UNSIGNED-PAYLOAD&X-Amz-Algorithm=AWS4-HMAC-SHA256&X-Amz-Credential=AKIAIFDCUHI33FU3JW5A%2F20210505%2Fus-east-1%2Fs3%2Faws4_reque
40. Qasif Shahid, L. R. (2016). *Seeding Innovation – A Framework for Rooting FinTechs in Pakistan.* Technical Report. FinSurgents. Retrieved from https://karandaaz.com.pk/topics/innovation-payments-and-infrastructure-payments-system/
41. R.A., B. (1960). Consumer Behavior as Risk Taking. In: Dynamic Marketing for a Changing World. Ed. R.S. Hancock. Proceedings of the 43rd Conference of the American Marketing Association. 389-398.
42. Rickert, P. et al. (2017). *Forging the Future: How financial institutions are embracing fintech to evolve and grow.* KPMG. Retrieved from https://assets.kpmg/content/dam/kpmg/ke/pdf/thought-leaderships/Forging-with%20bleeds.pdf
43. Ryan, O. (2017). *Strategic risk: A cornerstone of risk transformation.* Deloitte. Retrieved from https://www2.deloitte.com/content/dam/Deloitte/global/Documents/Risk/gx-ers-risk-transformation.pdf

44. Ryu, H.-S. (2018a). Understanding Benefit and Risk Framework of Fintech Adoption: Comparison of Early Adopters and Late Adopters.
45. Ryu, H.-S. (2018b). What makes users willing or hesitant to use Fintech?: the moderating effect of user type. *Industrial Management and Data Systems, 118*(3), 541-569.
46. Schueffel, P. (2016). Taming the Beast: A Scientific Definition of Fintech . *Journal of Innovation Management*, 32-54.
47. Shahin, B. (2011). Evaluating the Effectiveness of Strategic Planning within the Middle Eastern Public Sector.
48. Shin, I. L. (2018). Fintech: Ecosystem, business models,investment decisions, and challenges. *Business Horizons, 6*(1), 35-46.
49. Syed Kumail Abbas Rizvi, B. N. (2018). Is Pakistan Ready to Embrace Fintech Innovation? . *The Lahore Journal of Economics*, 151-182.
50. Treleaven, P. (2015). Financial regulation of fintech. *The Journal of Financial Perspectives, 3*(3), 1-14.
51. Weldu, F. (2017, November). Assessment of the Effectiveness of Internal Auditing Performance: A Case study of Selected Branches of Dashen Bank in Mekelle, Ethiopia.
52. Yaser Hasan Al-Mamary, M. M.-N. (2016). A Critical Review of Models and Theories in Field of Individual Acceptance of Technology. *International Journal of Hybrid Information Technology, 9*(6), 143-158.
53. Young, J. J. (2010). *A Taxonomy of Operational Cyber Security Risks. Technical Note CMU/SEI-2010-TN-028*. Software Engineering Institute, Carnegie Mellon University. SEI publications. Retrieved from http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.204.4058&rep=rep1&type=pdf
54. Zhongqing, S. D. (2019). Adoption Intention of Fintech Services for Bank Users: An Empirical Examination with an Extended Technology Acceptance Model.