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MEASURING IMPACT OF ELECTRONIC BANKING ON CUSTOMERS SATISFACTION: A CASE STUDY MICROFINANCE BANKS OF SINDH

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Abstract
This study examines the impact of electronic banking (e-banking) on customer satisfaction in microfinance banks across Sindh, Pakistan, using the Technology Acceptance Model (TAM) and SERVQUAL framework. Through a quantitative approach, data were collected from 390 customers of five microfinance banks via structured questionnaires. The findings reveal that perceived usefulness, security & privacy, and responsiveness significantly enhance customer satisfaction, while perceived ease of use and reliability were statistically insignificant. The study highlights the need for user-friendly e-banking interfaces and robust security measures to address rural customers' challenges. Results indicate that 67% of customer satisfaction variance is explained by the model, offering actionable insights for banks to optimize digital services.

INTRODUCTION

Technological advancement has changed the whole world. In the digital era internet has played vital role, it has directed the world into globalization and creates numerous challenges for business organizations, and same has changed an entire way of organization to communicate with their clients in service industry, especially for banking industry. In order to complete with them banking industry revolutionized its banking system in form of electronic banking Nitsure, R. R. (2003). According to the Rejón-Guardia, F. (2013) internet banking is e-commerce application and it has come up to make a major profit for banks, and have started by many banks to deliver better customer service and lower cost that provides dual benefit to their customers and them also. This banking system not only benefits to the banks but at the same time it will satisfy the customer needs. (Rachid, H. 2021).

Electronic banking has begun in Pakistan in 1987 when first ATM was introduced in the country but at that time the growth of ATM and issuance of card was very low. After formation of national switches in 1999 the real growth in ATM and card issuance was observed (Shahid, A. 2016). In this journey the key role has been played by State Bank of Pakistan which put major efforts in development of e-banking by delivering enabling environment as a regulator. The total no of 38 banks has been controlled by SBP which are categorized as public banks, private banks and specialized banks. From these banks 26 banks are providing e-banking services having 4% share of total e-banking transitions and growth of 17.7% in value. According to SBP 8.4 million transitions has been occurred with more than one million e-banking users (Tasneem, E. 2014).

Presently E-banking has become norm of the day with the help of many instruments like Computers, Laptops, Mobiles and Tablets. Business organizations mainly focus in generating profit through their sales and services and to become cost effective. Customer satisfaction is often utilized in marketing. It can be defined as a measurement of how products and services that company has provided will match or will be more than customer expectation Rotimi, O. (2014). The degree of customer satisfaction which is influenced by the electronic banking service will play key role in determining electronic service.

Electronic Banking

In the past few decades banking institutions have primarily transferred from traditional banking to electronic banking Zulkifli, Z. (2024). Previously If customers are wanted to deposit or withdraw money they had to go directly to the bank counter, but nowadays they can perform these activities from anywhere via e-banking. The shifts in modernization and technological developments aided banks to develop their client's foundation and services of E-banking (Mushtaq, A. 2024). It enables the users to pay for products electronically that bought online, are central character of e-commerce, the main cause for the extensive e-commerce transactions is the faster expansion and growth of several e-banking system. E-banking usually associated to as online banking and mobile banking, with these two stands that allows the banks to deliver higher quality services to its clients. Abubakar, S. U. (2024) observed that many aspects that have led the companies to adopt e-banking are declining technology cost, cut down processing and operational cost and maximizing online commerce, these payment systems contain numbers of compulsions. Such as convenience, security, cost, acceptability, control, traceability and anonymity.

E-banking is classified into four product services, are Internet banking, phone banking, mobile banking, and SMS banking. And banks are separated into five modes rested on capital ownership. Are state banks, national private banks, local government bank joint venture banks and foreign banks. Rakocevic, R. (2025) defines E-banking is a place though which we can be contacted to our bank accounts via using the internet on personal computer or mobile phones and web browser.

According to Lodhi, K. (2023) financial institutions, clients, persons or businesses can use their account, conduct their business transactions, or receive details on financial outputs or private network with the help of cyberspace via electronic banking system. Zulkifli, Z. (2024 had explained that banking plays a role as financial intermediation on the internet, from this process whereby customers are capable to access use and control their accounts on the internet. Since mid of the 1990s, an integral shift has been occurred in banking delivery system concerning to the use of self-centered service mediums like electronic banking, Primarily the operation of automated teller machines (ATMs) and online banking. Investigating the customer outlook, Trisnawati, N. (2024) exposed that consumers look for convenience, transactional efficacy, core banking product's choice, and approach to competitive yield and charges. On other side, Rahman, M. M. (2023) mentioned that banks network has been lifted by internet banking as an entrance obstacle to the retail banking while bring in charges clarity as customer can toady effortlessly assimilate the prices online. Faster commoditization of fundamental services and products are also bringing by the price transparency. They also mentioned that many new strategies that traditional retail banking is developing to cope with internet-only banks. Internet-only banks are the financial institutions that have not any physical place. However, they don't have services like cash

management and hence they are unanticipated to command the subdivision of retail banking in the long run (Yirsaw, B. G. 2023).

Technology Acceptance Model (TAM)

Technology Acceptance Model (TAM) is based on two constructs: perceived usefulness, introduced the level of people's trust that the usage of modern technology will enhance the performance of the job and perceived ease of use, defines the level of people's trust that usage of such modern technology would need minimum effort Gazi, M. A et al., (2025) philosophers of TAM seen the model as a strong and miserly concept and pursued to deliver leaders of the banks, marketing executives, and Internet banking service deliverer with strategies to increase their e-banking policy, attribute, and interests to enhance the percentage of clients' adoptions of e-banking (Sriwidadi, T. 2024).

Problem Statement

After amid COVID-19 pandemic various avenues have gotten importance in service sector specially in banking sector. Majority of banks have switched their operations from manually to e-banking through use of ATMs, Mobile Apps, Online banking, and inclusion of AI in delivering services. These rapid changes on the one hand are opportunities but on the other hand it creates hurdles for many customers to perform banking transactions through e banking operations. Many customers feel insecure doing E-banking, unreliable and even threat of fraudulent or bogus transactions. Such issues faced by customers pose problematic situation for banking industry to capture more value from customers. In order to find out the solution of these issues this study has been designed to address customers' problems. Therefore banks are working with more enhanced features and reduced costs for ease of customers. The majority customers of microfinance banks are from rural remote areas thus they are unable to perform online banking or may use other features of e banking.

Research Objectives

RO1: To examine the relationship between perceived ease of use and customer satisfaction in microfinance banks of Sindh

RO2: To examine the effect of security & privacy on customer satisfaction in microfinance banks of Sindh.

RO3: To investigate the impact of reliability on customer satisfaction in microfinance banks of Sindh.

RO4: To confirm the relationship between responsiveness and customer satisfaction in microfinance banks of Sindh.

RO5: To integrate the role of perceived usefulness in measuring customer satisfaction in microfinance banks of Sindh.

Literature Review

Electronic Banking

E-banking is speedily adopting by banks and financial institutions from all over the world. Electronic banking, also referred as online banking is the most valuable blessings of possessing worldwide internet links which has made baking much easier, less time absorbing and assured-banking enable its' users to pay invoices, obtain payments, even make transactions with international users comfortably and safely although retaining the time required for those services very short (Brodska, I. 2019)

E-commerce and online banking

E-commerce and online banking are presently preferred by various banks. These are also recognized as offering innovative products in banking institutions. By the support of online banking and e-commerce minor banks can produce possibility to run in the battle of larger banks, so they can be able to do what larger banks are doing. Clients who desire to acquire more excellence in products in new and modernized techniques can use these services rapidly (Almestarihi, R. 2020). According to Arora, S. (2022) that customers of the e-banking can also acquire various types of banking services like transferring of funds to various accounts, also execution of various banks transactions and examine how much amount of money remains in their wallet through online banking and e-commerce. Presently in advanced time, every individual possesses personal computer at their living place and they can comfortably perceived informative data associated with transaction. Wanyembi, G. (2012) observed that customer can effortlessly acquire information about personal

banking transactions through mobile banking, online banking or via web browsing. Customers can use comfortably of online banking facility and authorize clients of banking organizations to perform transactions like convey their payments, aware regarding to recent credit, evaluation of bank reports related to dealings, easily explore and obtain entire past data associated to accounts. Moreover, significance of cyberspace is increasing swiftly in baking institutions, it gives profit to those financial institutions as well as clients but in most scenarios, it is not compulsory that those organizations who accept E-banking would acquire victory they can experience disappointment due to lack of creativity in web structure and further reasons (Farah, M. A. 2023). It is not important that every institutions of emerging republics can deliver these facilities, but few organizations deliver details related to their output on their network only, this is the cause that most of banks client can't be relax to control monetary matters or performing transaction via online banking Obro-Adibo, G. (2024).

Development and Acceptance of Online and Mobile Banking

There are three stages identified for the usage and progress of home banking: (1) early adoption, (2) expansion, and (3) exploitation. By using terminal based modem connections with the assistance of a phone line, some previous adopters such as banks and customers were initiated the electronic banking. This developed into smart client side software that enabled links with the institution either straightly by a landline (After) via the Online (Internet). In the second stage most of financial institutions began to provide online banking services that were chosen by the crowds, that is the reason we called it expansion. The exploitation phase was utilized by all banks and then stopped the 2nd phase throughout the turn of the era. Sites were favored exceeding the customer-side code, and ultimately that were the single option to operate the web banking (Granić, A. 2015).

The Technology Acceptance Model (TAM) could be used to inspect what inspires customers to adopt modern technologies. TAM can also be used to internet banking (Li & Honglei, 2005).The overlying judgment from investigation that used TAM on home based banking shows that the greatest important drives are comprehended usefulness and comprehended trustworthiness (S Bisht, 2012). Perception about ease of use has not any straight substantial impact on the aim to usage of e- banking, whereas it can incidentally be responsible for impacting perceived usefulness.

Customer Satisfaction

When an organization satisfies the needs and wants of customers it is said to be customer satisfaction. In order to do this banking organizations has to understand the needs and wants of customers which plays a vital role in banking industry, but unfortunately most of state banks are unconscious or flop to perform this. In this regard's customers become unsatisfied and it also directly affects the banks credibility and loyalty. Nowadays understanding the customer's perceived expectations regarding to the product or service is more competitive in the starting point, when customer owns full trust and belief on the services of banking organizations that means satisfaction in customers mind is built. This satisfies promises; thus, customer will not switch to the rival banks and services Kumar, R. P.(2024). Customer satisfaction plays significant role in modern technology because modernized product and services are innovatively in market and the organizations invest greater amount of money on it but when clients doesn't sense of satisfaction to use these internet services then it generates issues for the many banking organizations and become unsuccessful to obtain return due to lower acceptance of services from customer edge.

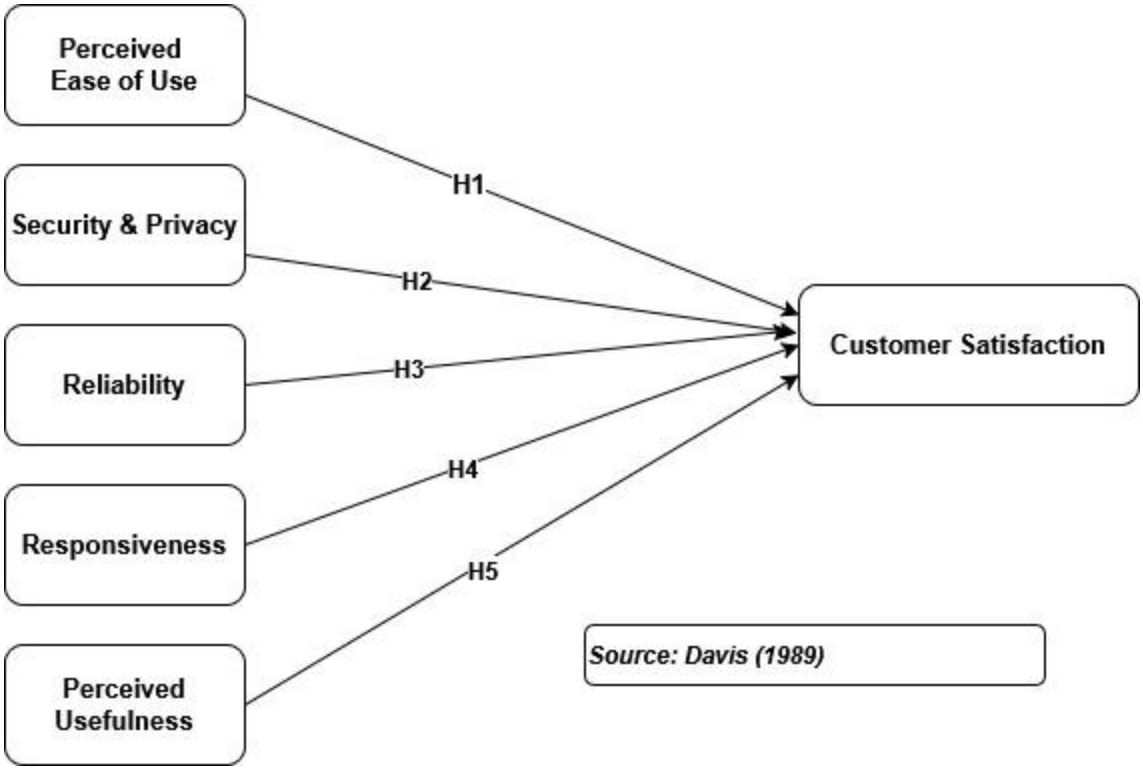
In the perspective Alrajawy, I. (2018) a satisfied customer repeatedly purchase products from the same seller, gives the positive response, spread the positive world of mouth and motivate others to buy the products from that seller, this is the reason of why designing satisfied customer base is crucial in the competitive market. Customer's satisfaction is the evaluation of opinions, is frequently being used over the period. As reported by Ramadhani, F., (2018) achievement in online banking is the estimation of in what way the service supplied by online banks has matched the clients perceived performance. It is specified by Kurniawan, D.,(2021) that the ability which proved greater value to its consumers that is supportive in developing a

character, enhancing consumer foundation and dragging more possible consumers to the internet bank website. Thus, greater value improves the level of user satisfaction. On the perspective of Fayad, R., & Paper, D. (2015), clients who use internet banking are continually satisfied with it, are more likely to be loyal to it and they are willing use the service again and again in the following time.

If there is greater number of satisfied customers with the use of internet banking services, they will have largely secure and over lasting relationships with each other and the extra loyal behavior will be exposed by them (Taherdoost, H. 2018).

Conceptual Framework

Conceptual framework for this study has been developed on the basis of technology acceptance model (TAM) of Davis, F. D. (1989) other technological application as spreadsheet applications Mathieson, K. (1991); electronic mail (Szajna B 1996); web site browsing (Morris & Dillon 1997); websites (Koufaris M 2002).



Research Hypotheses

H1: *There is significant positive relationship between perceived ease of use and customer satisfaction of microfinance banks of Sindh.*

H2: *There is significant positive relationship between security & privacy and customer satisfaction of microfinance banks of Sindh.*

H3: *There is significant positive relationship between reliability and customer satisfaction of microfinance banks of Sindh.*

H4: *There is significant positive relationship between responsiveness and customer satisfaction of microfinance banks of Sindh.*

H5: *There is significant positive relationship between perceived usefulness and customer satisfaction of microfinance banks of Sindh.*

Research Methodology

This study has been carried out by adapting deductive quantitative approach in which a already tested model of Technological Acceptance Model (TAM) used. The primary source of data collection was used in which a structured survey questionnaire used. Data was collected from the customers of Khushali Microfinance bank, U microfinance bank, HBL Microfinance bank, Finca microfinance bank

and APNA microfinance bank working across Sindh. Main focus of data collection was from those customers who are using android phone or they are able to use online banking through ATM or any other mode of online transaction.

Targeted Population/Sampling

Active customers of various microfinance banks working in Sindh are targeted population of this study. Convenient sampling method has been used to collect the data. As the population is defined therefore Taro Yamane (1967) formula was used to define the sample size for this study. The details of targeted population and sample size are given in table 1.

Table 1:

Name of Microfinance Bank	Branches in Sindh	Active Customers	Sample	Questionnaires Distributed
Khushali Microfinance Bank	60	4200	100	150
HBL Microfinance Bank	50	3500	90	140
U Microfinance Bank	59	3440	90	140
FINCA Microfinance Bank	13	800	50	100
APNA Microfinance Bank	28	1800	60	120
Total	**210**	**13,740**	**390**	**650**

Measurement Scales

In this study different measurement scales were used for each construct with the support of prior literature with satisfied reliability and validity. The perceived usefulness & perceived ease of use scale of Davis, 1989 – Technology Acceptance Model was used in both constructs were consist of four items respectively. Security & Privacy scale was adapted from Yousafzai et al., 2009; Liao et al., 1999 consist of four items. While reliability & responsiveness scale were taken from SERVQUAL scale of Parasuraman, A., Zeithaml, V. A., & Berry, L. L. (1988) scale. For measuring customer satisfaction Oliver, (2014); Anderson & Srinivasan, (2003) scale was used at five point likert scale as 1=Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree & 5=Strongly Agree. In second part of questionnaire demographic profiling of customers of microfinance banks were developed.

Table 2: Measurement Scales

Construct	*Indicator Code*	*Indicator Statement*
Perceived Usefulness	PU1	*Increase banking efficiency*
Davis, 1989 scale	PU2	*Improves productivity*
	PU3	*Useful for banking needs*
	PU4	*Improves service quality*
Perceived Ease of Use	PEOU1	*Easy to learn e banking*
Davis, 1989 scale	PEOU2	*Easy to navigate*
	PEOU3	*Require little effort*
	PEOU4	*Quick task completion*
Security & Privacy	SP1	*Safe sharing of personal info*
Yousafzai et al., 2009; Liao et al., 1999 scale	SP2	*Ensures privacy of data*
	SP3	*Protected against fraud*
	SP4	*Uses advanced security tech*
Reliability	REL1	*Error free service*
Parasuraman, A., Zeithaml, V. A., & Berry, L. L. (1988) scale.	REL2	*Correct transaction*
	REL3	*System availability*

	REL4	*Dependable system*
Responsiveness	RES1	*Fast response to queries*
Parasuraman, A., Zeithaml, V. A., &	RES2	*Quick customer support*
Berry, L. L. (1988) scale.	RES3	*Available help when needed*
	RES4	*Clear instructions provided*
Customer Satisfaction	CS1	*Overall satisfaction*
Oliver, (2014); Anderson &	CS2	*Expectations meet*
Srinivasan, (2003) scale	CS3	*Happy with service*
	CS4	*Will continue using it*

Data Analysis

The collected responses from customers of microfinance banks of Sindh are statistically analyzed by using SPSS latest version for extracting descriptive analysis in which frequency & percentage of sample contributed in study techniques were used. In the second phase partial least square (PLS) technique was applied through Smart PLS 4.0 for determining the inferential analysis in which reliability, validity, model fitness, regression techniques were used to determine the impact of E banking on customer satisfaction for hypotheses testing Kock, N. (2016).

Descriptive Analysis

Table 3: Demographic Profile of Customers

Demographic Item		No of Responses	Percentage
Gender	G1 (M)	203	52
	G2 (F)	187	48
	Total	**390**	**100%**
Marital Status	MS1 (M)	320	82
	MS 2 (S)	70	18
	Total	**390**	**100%**
Customer Type	CT1 (Depositor)	112	28.7
	CT2 (Borrower)	278	71.3
	Total	**390**	**100%**
Customer Life	CL1 (1 to 3 years)	243	62.3
	CL2 (5 years or more)	147	37.7
	Total	**390**	**100%**
E Banking Type	EBT1 (ATM)	345	88.4
	EBT2 (App)	45	11.6
	Total	**390**	**100%**

The demographic part of survey questionnaire categorized into i-e: Gender with coding G1 for male & G2 for female, the results reveal that there are 203 (52%) male customers and 187(48%) female customers of microfinance banks of Sindh have given response about their customer satisfaction level through e banking. Marital Status with coding MS1 for married & MS2 for single, as the results suggest that there are 320(82%) customers were married and 70(18%) customers were single. Customer type with coding CT1 for depositor & CT2 for borrower, the results pictured out that there are 112(28.7%) were depositors and 178(71.3%) were the borrower as the operations of microfinance are mainly based on micro credit for development of small & medium enterprises such as live stock etc. Customer life with coding CL1(1 to 3 years) & CL2(more than five years), thus results suggest that 243(62.3%) customers had banking experience of 1 to 3 years while 147(37.7%) customers have banking experience five or more than five years and finally E Banking type with coding EBT1 (ATM Users) in

which 345(88.4%) were users and 45(11.6%) customers are using banking Apps have contributed in this study.

Inferential Analysis

The partial least square (PLS) approach was used to extract the inferential analysis by using Smart PLS 4.0 version. Reliability analysis (Nunnally, J. C. 1978), Validity Test (Shepard, L. A. 1993), & AVE (Hair Jr, J. F., 2021) for measuring relationship between indicator items & construct were applied in measurement model and in structural model regression for hypotheses testing through bootstrapping technique (Tibshirani, R. 1985), & R square (Palm, R. 2013) for determining the model fitness techniques were used. The results are mentioned in Table 4.

Table 4: Measurement Model Results (Reliability & Convergent Validity)

Construct	*Indicator Code*	*Loadings*	*Comp. Reliability*	*Cronbach's Alpha*	*AVE*
Perceived Usefulness	PU1	.76	0.78	0.74	0.58
	PU2	.78			
	PU3	.72			
	PU4	.71			
Perceived Ease of Use	PEOU1	.72	0.80	0.75	0.60
	PEOU2	.74			
	PEOU3	.73			
	PEOU4	.71			
Security & Privacy	SP1	.68	0.83	0.79	0.56
	SP2	.71			
	SP3	.75			
	SP4	.70			
Reliability	REL1	.67	0.84	0.80	0.58
	REL2	.69			
	REL3	.73			
	REL4	.66			
Responsiveness	RES1	.71	0.78	0.74	0.59
	RES2	.77			
	RES3	.72			
	RES4	.70			
Customer Satisfaction	CS1	.72	0.76	0.75	0.54
	CS2	.72			
	CS3	.72			
	CS4	.69			

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The results of table 4 reveal the measurement of internal consistency of constructs i-e: composite reliability value is greater than 0.70 for all constructs, each constructs correlation with each other is also greater than for 0.70 value of cronabch's alpha, convergent validity (value of AVE is also greater than 0.50 for all constructs which shows that indicators of all variables are sharing sufficient variance with their constructs and finally each indicator with loadings value greater than 0.70 shows a good representation of construct. Thus it is evident that the results of this study are reliable and valid to reach the final conclusion.

Structural Model

After the successful validation of measurement model through loadings, AVE. The model has been run through smart PLS for testing hypotheses. Five hypotheses were tested as PU → CS(H1), PEOU → CS(H2), SP → CS(H3), REL → CS(H4), RESP → CS(H5), at the confidence interval 95%, significance

level p<0.05, β (Path Coefficient) value and t-value greater than 1.96.

The results of hypotheses test reveal that the hypothesis 1; perceived usefulness significantly determines customer satisfaction with (positive β=0.40, p=0.000, t-value-4.25; thus this hypotheses found supported. Hypothesis 2; perceived ease of use positively and significantly determine the customer satisfaction with (positive β=0.12, p=0.058, t-value=1.90; thus this hypotheses was not found supported because this hypotheses was not found statistically significant due to p value is not less than 0.05 and t-value is also less than cut off value 1.96. Hypothesis 3; security & privacy positively & significantly impact customer satisfaction with (positive β=0.15, p=0.025, t-value=2.25; thus this hypotheses found supported. Hypothesis 4; reliability has significant positive impact on customer satisfaction with (positive β=0.10, p=0.122, t-value=1.55; thus this hypotheses was not found supported because this hypothesis was not found statistically significant due to p value is not less than 0.05 and t-value is also less than cut off value 1.96, finally hypothesis 5; responsiveness positively & significantly impact customer satisfaction with (positive β=0.21, p=0.004, t-value=2.90; thus this hypotheses found supported. For confirming the applicability of partial least square the bootstrapping at 5000 observations were also applied and the results of bootstrapping have also confirmed that the hypotheses 1,3,5 were found statistically significant while hypotheses 2,4 were not found statistically significant due to contraction in threshold values of p, beta coefficient and t-values respectively.

Table 5: Hypotheses Testing

Hypothesis	Path	β (Path Coefficient	t-value	p-value	Decision
H1	PU→ CS	0.40	4.25	0.000	Supported
H2	PEOU→ CS	0.12	1.90	0.058	Not Supported
H3	SP → CS	0.15	2.25	0.025	Supported
H4	REL → CS	0.10	1.55	0.122	Not Supported
H5	RESP → CS	0.21	2.90	0.004	Supported

Model Fitness (Regression Analysis)

The multiple regression technique has been used to measure the level of variance of dependent variable predicted by dependent variable through R square test run by Smart PLS 4.0 version. The results of R square= 0.67 reveals that there is 67% variance is available to predict the customer satisfaction through independent variables. While left 33% is still gap available to be predicted in future.

Table 6: R Square

Construct	R^2	Adjusted R^2
Customer Satisfaction	0.67	0.66

Discussion & Conclusion

The major focus of this study was to measure the impact of TAM model & SERVQUAL on customer satisfaction of microfinance banks of Sindh. Although study has tried best to provide in-depth insights in determining customer satisfaction. The results of this study confirm that there is positive significant impact of technology acceptance model (TAM), SERVQUAL on customer satisfaction of microfinance banks of Sindh. Out of five hypotheses three was found statistically significant while perceived ease of use construct of TAM & Reliability of SERVQUAL were not statistically significant to determine customer satisfaction. Customers feel discomfort in using technology and feel distrusted in sense of reliability for doing e banking. As already quoted by researcher that majority customers of microfinance banks of Sindh are from rural areas, farmers thus they are unable to use technology in performing online transactions therefore it is strongly concluded that banks should pay attention to develop banking Apps user friendly as customers may use these frequently. Due to fraudulent

transaction, deduction of unnecessary online charges, internet packages cost develops distrust among customers; therefore banks should also pay attention to make online banking reliable or cheap for customers. It is also evident that customers have shown positive consent towards importance of online banking in saving time to travel to bank for perform any kind of transaction. Customers also feel secure in banking and feeling satisfied in quick responsiveness but on the other hand customers have also shown their grievances that help line fone banking should be improved in the large interest customer satisfaction. The findings of this study are in alignment with prior studies and are cross validated through statistical results.

Future Directions

The researcher has carried out best efforts to overcome all the research insights in this field of study but due to time & other constraints this study has left space for future researcher to conduct study on this topic with different ways i-e:

This study has only used mono research method while future researchers may conduct this study by using qualitative research approach or mix method for data collection.

This study has used adopted questionnaire future research may be conducted on self developed questionnaire. The data was collected from customers of microfinance banks of Sindh only so data cannot be generalized in all banking sector or in other service sectors therefore future research would also be conducted in commercial banks of Sindh or in other service sectors. Two hypotheses i-e; perceived ease of use and reliability was not found statistically significant to determine customer satisfaction future research may also be conducted in this context to draw reasons of this.

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