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Investigating the role of unified theory of acceptance and use of technology (UTAUT) in internet banking adoption context

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ABSTRACT

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Several studies have made known that internet banking (IB) implementation is not only advantageous for banks, but also by perception and experience of IB users. Therefore, little is known about factors propelling user's intention to adopt internet banking in Pakistan. Thus, the purpose of this research is to investigate the role of unified theory of acceptance and use of technology (UTAUT) in internet banking adoption context. A quantitative approach based survey was conducted to collect the data from 398 internet banking users. For statistical analysis structural equation model (SEM) approach was used. The result of this study indicates that, UTAUT model provided a good theoretical foundation in technology adoption investigation. Findings confirmed that all four predictors (performance expectancy, effort expectancy, social influence and facilitating condition) were significant and had significant amount of variance in predicting user's intention to adopt internet banking. Additionally, the IPMA test revealed that performance expectancy was the most important factor among all other variables to predict user's intention towards adoption of internet banking. Lastly, managerial implications, limitations and future recommendations are discussed.

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1. Introduction

E-Commerce is an application of information technology to facilitate business exchanges among different parties. The first online banking service which introduced the internet banking was established in 1994 by Stanford Federal Credit Union (SFCU). According to Yoon (2010) internet banking involves provision of facilities such as accessing accounts, funds transfer, and buying financial products or services online. Internet banking is a banking channel that allows consumers to do a wide range of financial and nonfinancial services through a bank's website (Hoehle et al., 2012).

Internet banking is forecasted to grow sharply within the next few years, affecting the competitive advantage enjoyed by traditional branch bank (Samar et al., 2017). These days in competitive business

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environment, companies must understand that customers hold the key to success (Alnaser et al., 2018). For banks, technology has emerged as a strategic resource for achieving higher efficiency, control of operations, productivity and profitability. For customers, it is the understanding of their anywhere, anytime, anyway banking dream. At the basic level, Internet banking can mean setting up of a web page by a bank to give information about its product and services. At an advance level, it involves provision of facilities such as accessing accounts, funds transfer, and buying financial products or services online. This is called “transactional” online banking (Sathye, 1999). The Internet is believed to change the way firms interact with their customers and thus the way they initiate, develop and terminate relationships with them (Rahi & Ghani, 2016).

Customer choose internet banking because it is convenient and have speedy action (Gupta et al., 2008). Now trend has changed for customer internet banking is convenient while for banking it is a source of cost reduction and better customer service. Liao and Cheung (2002) explained, one of the major forces behind the changes happening to business is technology, which is creating new products, services market opportunities and developing more information and system oriented business and management processes. Information technology is a powerful tool or enabler in the arena of customer service. Weick and Quinn (1999) argued that, with new technologies executives can manage the strategic elements to achieve competitive advantage with minimum transaction costs. Internet banking would help banks present a potentially low cost banking transaction system.

Owing to the adoption of internet banking services will not only beneficial for banks but it will also give the opportunity to banks to satisfy their customers from a distance (Xue et al., 2011). In spite of this, banks are still finding difficulties to fully maximize their operations and this attributes to customer’s unwillingness to adopt internet banking irrespective of the benefits (Martins et al., 2014). Thus, the present study investigates the role of UTAUT in internet banking adoption context. Practically this study will help managers understand customer behaviours and their intentions on how they can perform a transaction via online system that is convenient and cost effective, meanwhile policy makers will get deep insight of their clients that why majority of the banking customers are reluctant to use internet banking.

2 Literature Review

2.1 Theoretical Background

Several studies exist that explore adoption issues of technology therefore, very little research has been done on internet banking adoption issues (Rahi et al., 2017). The most known technology acceptance model (TAM) was designed to investigate the user acceptance of information technology. Basically, TAM is an adaptation of theory of reasoned action (TRA) that proposed system use evaluate by intention of use which is further influenced by attitude and perceived usefulness. Attitude and Perceived usefulness are affected by Perceived ease of usefulness. Perceived usefulness, where user salient belief will be helpful for improving the performance. According to Taylor and Todd (1995) perceived ease of usefulness is a situation where user acts stress free while using of technology. Further research was conducted by other researchers and developed a new model of technology adoption namely; Unified Theory of Acceptance and use of Technology (UTAUT). Since 2003, researchers have applied and tested UTATU model to understand the user’s behaviour towards adoption of technology. It was incorporated to understand online bulletin boards study by Marchewka et al. (2007), instant messengers study by Lin and Anol (2008), and Web-based learning by Chiu and Wang (2008). In internet banking adoption context was studied by Tan et al. (2010). UTAUT model was also studied in cultural context, Im et al. (2011) underpinned the UTAUT model in comparing mp3 player and Internet banking technologies in Korea and the US, while, Yuen et al. (2010) tested the UTAUT model in two groups, that were culturally different i.e. the developed (US and Australia) and developing (Malaysia) countries.

2.2 UTAUT Framework

Unified theory of acceptance and use of technology is the most unique theory which includes dimensions of TRA, TAM, Motivational Model (Davis et al., 1992). TPB is a hybrid model that combines constructs of TAM and TPB (C-TAM-TPB) (Taylor & Todd, 1995), meanwhile, Model of PC Utilization (MPCU) proposed by Thompson et al. (1991), Innovation Diffusion Theory (IDT) by Moore and Benbasat (1996), and lastly Social Cognitive Theory (SCT) by Compeau and Higgins (1995). The UTAUT model postulates that performance expectancy, effort expectancy, social influence and facilitating conditions are the determinants of behavioural intention of users towards adoption of technology.

2.2.1 Performance Expectancy

Performance expectancy (PE), where user perception of performance excel by use of Internet banking on tasks, i.e., individual believes that using Internet banking will help to attain benefits in performing banking operations (Venkatesh et al., 2003). Zhou et al. (2010) elaborated that performance expectancy reflects user's perception towards improvement by using of internet banking like convenience of payment, fast response and service effectiveness. Performance expectancy in other models was described as perceived usefulness, relative advantage, outcome expectancy and extrinsic motivation. In relation to internet banking Alalwan et al. (2014) postulated that performance expectancy is considered as term of utility that encounter during use of internet banking. Performance expectancy has been widely used in order to understand the behavioral intention of users to adopt internet banking (AbuShanab et al., 2010; Martins et al., 2014). Thus, performance expectancy is hypothesized as:

H1: Performance expectancy is positively influence on user's intention to adopt internet banking.

2.2.2 Effort Expectancy

Effort expectancy (EE) is defined as the degree of ease relate with the use of internet banking. Effort expectancy is similar to perceived ease of use (TAM) and complexity (DOI, MPCU). Zhou et al. (2010) demonstrated that when user feels that internet banking is easy to use and does not require much effort, they would have high chances to adopt internet banking. The relationship of effort expectancy on behavioral intention has found significant (Moore & Benbasat, 1991; Thompson et al., 1991). Effort expectancy is positively affect performance expectancy for instance, when users feel that Internet banking is easy to use, and not much efforts are required they will have a high expectation towards acquiring the expected performance (Zhou et al., 2010). Thus, the relationship of effort expectancy is proposed as:

H2: Effort expectancy is positively influence on user's intention to adopt internet banking.

2.2.3 Social Influence

Social influence (SI) is defined as the effect of environmental factors, for instance the opinions of user's friends, relatives (Venkatesh et al., 2003). Like other constructs of UTAUT social influence was derived from subjective norm, social factors and image. The comparison of eight models revealed that the relationship of social influence will be insignificant in voluntary context and becomes significant in mandatory context. According to Martins et al. (2014), social influence will affect user's intention to adopt internet banking services. Similar to this Chaouali et al. (2016) postulated that an individual who believes that important others believe his usage of new product or services will be more inclined to use these products or technology services. Thus, in views of above arguments social influence is hypothesized as:

H3: Social influence is positively influence on user's intention to adopt internet banking.

2.2.4 Facilitating Condition

Facilitating conditions (FC) is defined as the effect of organizational and technical infrastructure to support the use of Internet banking, such as user's knowledge, ability, and resources (Venkatesh et al., 2003). Facilitation condition was similar as perceived behavioural control and compatibility. Authors like Venkatesh et al. (2012) stated that facilitating condition refers to consumers perception of the resources and support available to perform a behaviour. In order to perform internet banking users requires to have certain skills such as configuring and operating computers and connecting to the internet (Martins et al., 2014). Thus, facilitating condition is hypothesised as:

H4: Facilitating condition is positively influence on user's intention to adopt internet banking.

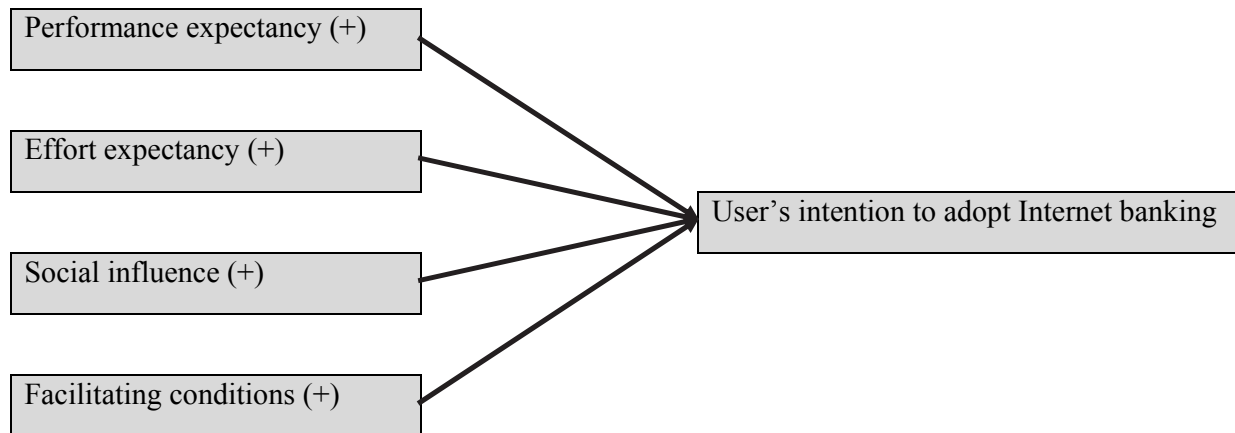


Fig. 1. Theoretical framework

3 Research Methods

3.1 Data collection and Sampling

Quantitative approach was used to verify the influence of unified theory of acceptance and use of technology on user's intention to adopt internet banking in Pakistan. This study is followed positivists paradigm. Positivists believe in employing quantitative approaches for data analysis and support objectivity to define their ontological statements (Mazuri et al., 2017). Thus, questionnaire was developed to measure the respondent's observation and perception towards internet banking technology. The survey was conducted in two large cities namely Lahore and Islamabad in order to have an appropriate sample representativeness of the population.

For sampling, convenience sampling method was used in this study. Convenience sampling is defined as a process of data collection from population that is close at hand and easily accessible to researcher (Rahi, 2017). Hair (2003) illustrated that convenience sampling allows researcher to complete interviews or get responses in a cost effective way. Seven hundred and fifty internet banking users were approached to get their observations towards internet banking adoption. The participation was voluntary and the survey was conducted over the period of one month from 09 September 2017 to 10 October 2017. Bank staff were requested to complete the survey within a period of four week. Therefore, three hundred and ninety eight (398) valid questionnaires with a response rate of 53% were received for data analysis.

3.2 Measurement

A questionnaire was developed for the survey using construct and items from literature. The questionnaire was created and administrated in English language. The survey questionnaire is divided into two parts. The first part of the questionnaire is inquired demographic profile of the respondents. While, the second part of the questionnaire holds measurement items of performance expectancy, effort expectancy, social influence, facilitating condition and users intention to adopt internet banking and are adapted from Venkatesh et al. (2012) and Rahi et al. (2017). Each item was measured on a seven-point Likert scale, ranging from 1 (strongly disagree) to 7 (strongly agree).

3.3 Respondent's Profile

Sample demographics are depicted in Table 1. Majority of the respondents were females (58.5%) while males were (41.5%). The age of the respondents 8.5% is for less than 20 years, 38.4% that counts at age between 21 to 30 years, 24.4% for 31 to 40 years, 12.1% for those respondents who have age between 41 to 59 years, 11.1% was customer having age 51 to 60 and above 60 there were only 5.5% respondents.

The study also assessed the education level of the respondents. Findings revealed that most of the participants had graduate level qualification (n=198, 49.7%) followed by those who had post graduate qualification (n=121, 30.4%). The number of respondents who had attended high school were only 41, and 27 respondents who had attended high school. While the participant who had qualification below high school were at the lowest level (n=11, 2.8%). These findings revealed that the educated respondents were more inclined towards internet banking as compared with uneducated respondents (below high School, 2.8%).

This study has revealed the occupation of the respondents. The results showed that the highest number of respondents were employed (n= 223, 56%) followed by unemployed participants (n=71, 17.8%). There were only 55 respondents with self-employed title. The respondents with pensioner had the second lowest number (n=33, 8.3%) while students had the lowest number (n=16, 4%).

Table 1
Demographic Profile of the Respondents

Demographic	Category	Frequency (n=398)	Percentage (%)
Gender	Male	165	41.5
	Female	233	58.5
Age	< 20	34	8.5
	21-30	153	38.4
	31-40	97	24.4
	41-50	48	12.1
	51-60	44	11.1
	> 60	22	5.5
Education (Level)	Below High School	11	2.8
	Attended High School	27	6.8
	Attended College	41	10.3
	Graduate	198	49.7
	Post Graduate	121	30.4
Occupation	Student	16	4
	Employed	223	56
	Self-employed	55	13.8
	Unemployed	71	17.8
	Pensioner	33	8.3

Note: (--) denotes 0% of the total respondents

4 Data Analysis and Results

Structural equation modeling (SEM) is a technique for estimating the causal relationship among variables. There are two types of SEM techniques namely covariance-based technique and variance based techniques. The variance based technique using Partial Least Square (PLS) is appropriate for this study. Smart PLS3.0 software is used to estimate the research model (Ringle et al., 2015). Following two-stage analytical procedure, measurement model is analysed first to assess the reliability and the validity and then structural model is tested.

4.1 Measurement Model

The measurement model was evaluated for construct reliability, indicator reliability, convergent validity and discriminant validity. Cronbach's (α) is recommended to ensure reliability therefore, Composite Reliability (CR) is also preferred (Henseler et al., 2009).

4.2 Convergent Validity

Convergent validity is ascertained by examining indicator loadings. Fig. 2 depicted results where, factor loading values supported by Chin (1998) as recommended threshold level of 0.6. All the values were above than 0.6 which indicate the convergent validity.

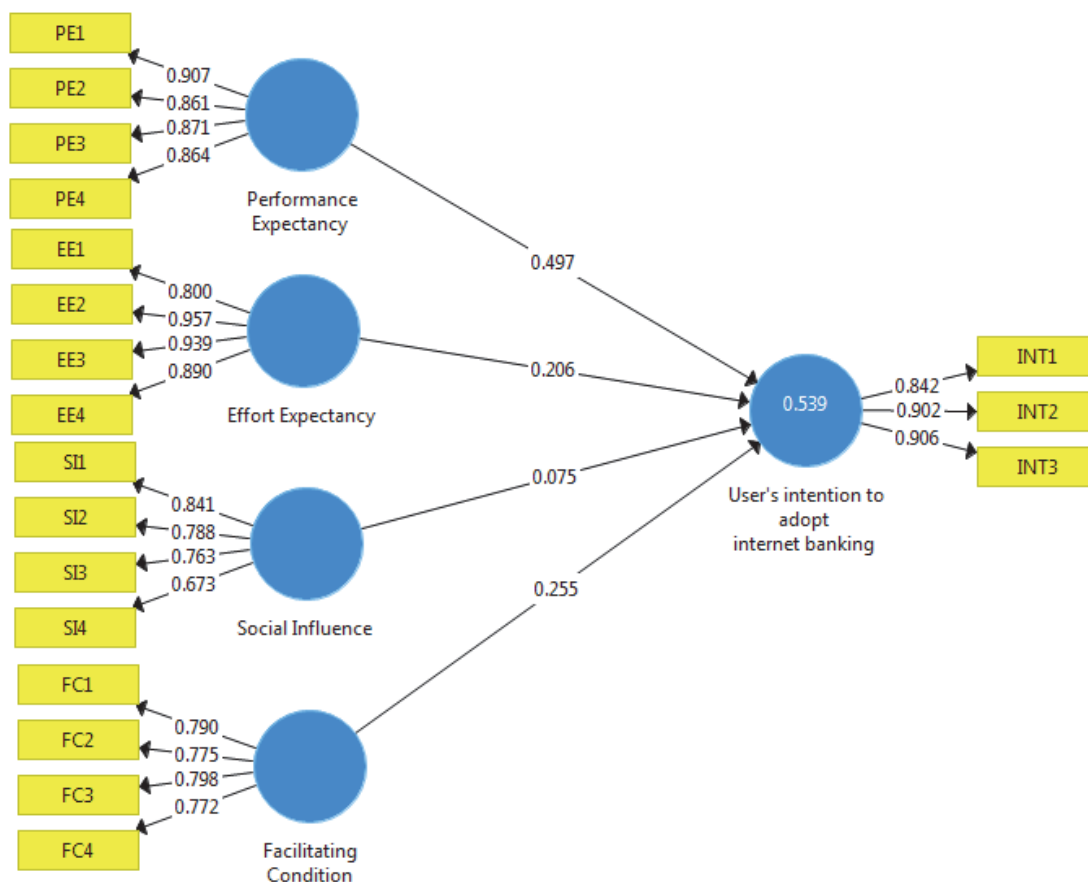


Fig. 2. Measurement model

Convergent validity of measurement model is also assessed through average variance extracted and composite reliability. The average variance extracted that reflects the overall amount of variance in the indicators accounted for latent construct. Further to this measurement model needs to be assessed composite reliability. Thus, the convergent validity was confirmed through estimation of average variance extracted (AVE) by recommended values of Fornell and Larcker (1981) as it must be greater than 0.5. Composite reliability (CR) degree where the construct indicator represent the latent construct, values exceeded 0.7 recommended by Hair et al. (2011). Table 2 depicted the results of measurement model.

Table 2
Results of Measurement Model

Constructs	Loading	(α)	CR	AVE
Performance Expectancy	PE	0.899	0.930	0.767
Internet banking is useful to carry out my tasks.	0.907			
I think that using Internet banking would enable me to conduct tasks more quickly.	0.861			
I think that using Internet banking would increase my productivity.	0.871			
I think that using Internet banking would improve my performance.	0.864			
Effort Expectancy	EE	0.919	0.944	0.808
My interaction with Internet banking would be clear and understandable.	0.800			
It would be easy for me to become skillful by using Internet banking.	0.957			
I would find Internet banking easy to use.	0.939			
I think that learning to operate Internet banking would be easy for me.	0.890			
Social Influence	SI	0.774	0.852	0.591
People who influence my behavior think that I should use Internet banking.	0.841			
People who are important to me think that I should use Internet banking.	0.788			
People in my environment who use Internet banking services have a high profile.	0.763			
Having Internet banking services is a status of symbol in my environment.	0.673			
Facilitating Condition	FC	0.791	0.864	0.615
I have the resources necessary to use the internet banking.	0.790			
I have the knowledge necessary to use the internet banking.	0.775			
Internet banking is compatible with other technologies I use.	0.798			
A specific person is available for assistance of internet banking difficulties.	0.772			
User's intention to adopt internet banking	INT	0.859	0.914	0.781
I intend to continue using Internet banking in the future.	0.842			
I will always try to use Internet banking in my daily life.	0.902			
I plan to continue using Internet banking frequently.	0.906			

4.3 Discriminant Validity

Discriminant validity of the constructs was evaluated by using Fornell and Larcker (1981). Discriminate validity is measured by examining the correlation between the measures of the potential overlapping constructs (Fornell & Larcker, 1981). According to (D. Compeau et al., 1999) the average variance shared between each construct and its measure should be greater than the variance shared between the constructs and other constructs. As seen in Table 3 all, all the diagonal values (square root of AVE) are greater than off-diagonal values (correlations between the construct).

Table 3
Discriminate validity of Measurement Model

Constructs	Effort Ex- pectancy	Facilitating Condition	Performance Ex- pectancy	Social In- fluence	User's in- tention
Effort Expectancy	0.899				
Facilitating Condition	0.14	0.784			
Performance Expectancy	0.368	0.295	0.876		
Social Influence	0.119	0.102	0.09	0.769	
User's intention to adopt internet banking	0.433	0.438	0.655	0.17	0.884

Note: Bold values indicate the square root of AVE of each construct

Discriminate validity was measured with cross-loading criteria. Cross loading can be done by comparing an indicator's outer loadings on the associated constructs and it should be greater than all of its loading on the other constructs. Table 4 shows that all the loadings are greater than the correspondent cross-loadings.

Table 4
Loading and Cross Loadings

Items	Effort Expectancy	Facilitating Condition	User's intention	Performance Expectancy	Social Influence
EE1	0.800	0.142	0.363	0.344	0.104
EE2	0.957	0.142	0.435	0.342	0.124
EE3	0.939	0.11	0.415	0.337	0.101
EE4	0.890	0.109	0.332	0.296	0.097
FC1	0.159	0.790	0.346	0.241	0.068
FC2	0.156	0.775	0.34	0.259	0.079
FC3	0.066	0.798	0.343	0.234	0.077
FC4	0.059	0.772	0.346	0.192	0.096
INT1	0.337	0.367	0.842	0.569	0.118
INT2	0.443	0.383	0.902	0.566	0.163
INT3	0.366	0.411	0.906	0.601	0.168
PE1	0.302	0.255	0.564	0.907	0.052
PE2	0.393	0.284	0.612	0.861	0.143
PE3	0.299	0.285	0.599	0.871	0.071
PE4	0.286	0.199	0.508	0.864	0.040
SI1	0.075	0.08	0.164	0.059	0.841
SI2	0.148	0.117	0.125	0.076	0.788
SI3	0.093	0.071	0.134	0.073	0.763
SI4	0.044	0.034		0.08	0.673

4.3.1 Heterotrait-Monotrait Ratio (HTMT)

An alternative method to assess discriminant validity is suggested by Henseler et al. (2015). Discriminant validity can be assessed through multitrait and multimethod matrix, namely the Heterotrait-Monotrait Ratio (HTMT).

Table 5
Heterotrait-Monotrait Ratio (HTMT)

Constructs	Effort Expectancy	Facilitating Condition	Performance Expectancy	Social Influence	INT
Effort Expectancy	---				
Facilitating Condition	0.164 CI:90 (0.082,0.261)				
Performance Expectancy	0.402 CI: 90 (0.32, 0.491)	0.346 CI: 90 (0.272, 0.426)			
Social Influence	0.138 CI:90 (0.067,0.23)	0.125 CI:90 (0.055,0.191)	0.109 CI:90 (0.051,0.169)		
User's intention to adopt _internet banking	0.484 CI:90 (0.386,0.576)	0.532 CI:90 (0.443, 0.601)	0.742 CI:90 (0.66,0.822)	0.198 CI:90 (0.113,0.288)	---

4.4 Structural Model Evaluation

The measurement model result indicates that constructs reliability, indicator reliability, convergent validity, and discriminant validity of the construct are satisfactory. Thus, the construct can be used for

structural model. In order to assess the structural model lateral collinearity test (VIF), R^2 values and corresponding t-values were evaluated.

4.5. Lateral Collinearity Assessment

According to Kock and Lynn (2012) although vertical collinearity are met, lateral collinearity (predictor- criterion collinearity) may sometimes misled the findings. Thus, Lateral collinearity was assessed with collinearity statistics VIF. The values of VIF 3.3 or higher, indicate a potential collinearity Diamantopoulos and Siguaw (2006). Table 6 depicted the results of lateral collinearity assessment.

Table 6
Results of Lateral Collinearity Assessment

Constructs	User's intention to adopt internet banking
Effort Expectancy	1.167
Facilitating Condition	1.103
Performance Expectancy	1.244
Social Influence	1.023
User's intention to adopt internet banking	---

Table 6 showed the inner VIF values of the independent variables users intention to adopt internet banking that needs to be examined. The multicollinearity are less than 5 and 3.3, indicating lateral multicollinearity is not a concern in this study (Hair et al., 2014).

4.6. Hypotheses Testing

Hypotheses were tested by running a bootstrapping procedure with a resample of 5000, as suggested by Hair et al. (2014). Table 7 shows the PLS estimation results.

Table 7
Hypothesis Testing

#	Constructs	B	S.E	t-values	P-Values	Results
H1	PE-> INT	0.497	0.048	10.316	***	Supported
H2	EE-> INT	0.206	0.047	4.384	***	Supported
H3	SI-> INT	0.075	0.032	2.324	**	Supported
H4	FC-> INT	0.255	0.043	5.950	***	Supported

Note: Significance level where, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Structural model results revealed that all four hypotheses have significant relationships with their respective endogenous variables. The relationship between performance expectancy and user's intention to adopt internet banking is supported by H1: ($\beta = 0.497$, $p < 0.000$). Effort expectancy has significant influence on user's intention to adopt internet banking and supported by H2: ($\beta = 0.206$, $p < 0.000$). Next to this, H3 showed that social influence is positively related with users intention to adopt internet banking ($\beta = 0.075$, $p < 0.001$). Lastly, H4 is supported by ($\beta = 0.255$, $p < 0.000$) which indicated that facilitating condition has positive influence on user's intention to adopt internet banking.

4.7 Evaluating Effect Size

The results of the current research show that R^2 values for user's intention to adopt internet banking was 0.539 which is acceptable as suggested by Cohen (1988). Researchers also assessed the effect size of (f^2). As suggested by Cohen (1988) stated that P value can show the effect exists however, it does not reveal the size of the effect. Thus, the effect size of (f^2) was assessed. Additionally, predictive relevance of research model was assessed through Q^2 also known as Stone-Geisser's Q^2 . Based on the blindfolding procedure, Q^2 evaluates the predictive validity of a model via PLS. Q^2 values are

greater than 0 showed that the model has predictive relevance for a certain endogenous construct (Cohen, 1988). Table 8 shows the results of f^2 and Q^2 .

Table 8

Evaluating Effect Size

Path	Constructs	R^2	Q^2	f^2	Decision
	Intention	0.453	0.394		
H1	PE -> INT			0.431	Large
H2	EE -> INT			0.079	Small
H3	SI -> INT			0.012	Small
H4	FC -> INT			0.128	Small

Note: f^2 : 0.02, small; 0.15, medium; 0.35, large

Table 8 presents the effect size of f^2 and it can be seen that H2, H3 and H4 have small effect sizes, whereas H1 has a large effect size on user's intention to adopt internet banking in Pakistan. The values of Q^2 is greater than 0 (0.394) that signifies research model has good predictive relevance.

4.8 Importance performance matrix analysis (IPMA)

IPMA builds on PLS estimates of the structural equation model relationship and includes an additional dimension to the analysis of that latent constructs (Hair et al., 2016). In current research model importance performance matrix analysis was performed using user's intention to adopt internet banking as the target variable. Importance performance matrix map showed that, performance expectancy has the highest importance level to influence user's intentions to adopt internet banking.

On the other side social influence has the highest performance and indicated that it is not important variable to predict user's intention to adopt internet banking. For managers, it is important to focus on performance expectancy and facilitating condition in order to increase user's intention towards adoption of internet banking. The level of importance and performance can be seen in Fig. 3.

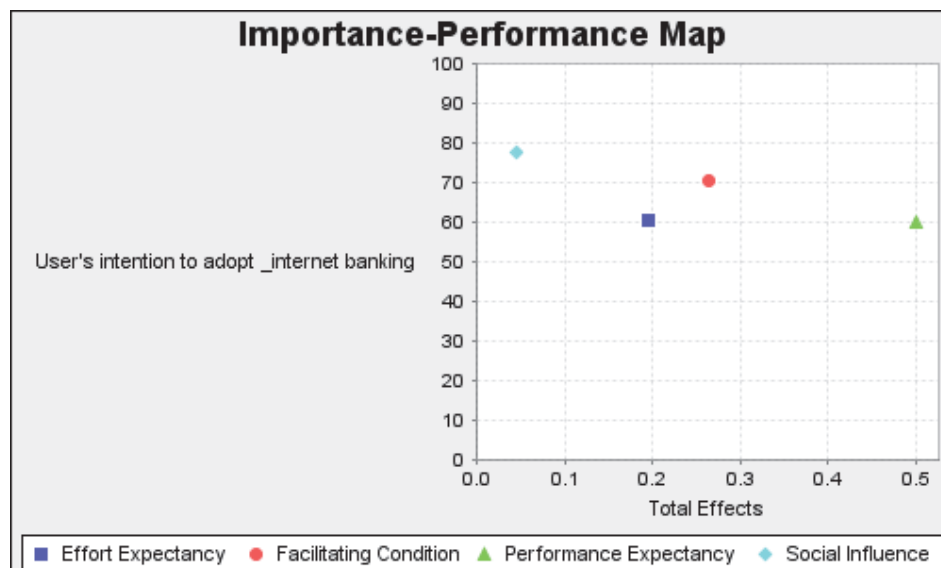


Fig. 3. Importance performance matrix analyses (IPMA)

5. Discussion and Conclusion

This study extended the body of knowledge in the area of technology adoption. Previous studies have tried to find internet banking adoption issues with service quality perspective factors and had ignored the technology context in internet banking usage (Rahi, 2015, 2016). Thus, the present study has tried to examine internet banking issues with unified theory of acceptance and use of technology (UTAUT) in Pakistan. UTAUT model was developed in western culture, therefore testing of UTAUT model in South Asian country is noteworthy. The results have indicated a support of UTAUT findings with Venkatesh et al. (2003). Performance expectancy was significant with user's intention to adopt internet banking suggested that users having more performance expectancy had more inclined towards adoption of internet banking. Interestingly, the effect of sizes revealed that social influence, facilitating condition and effort expectancy had small effect sizes in predicting of user's intention to adopt internet banking.

6. Theoretical and Managerial Implications

In theoretical perspective, this study has tested UTAUT model in south Asian region and has proved that performance expectancy, effort expectancy, social influence and facilitating condition are the main factors in order to increase the user's intention to adopt internet banking in Pakistan. The findings of this study suggest that performance expectancy was the most influential factors among all other UTAUT factors (social influence, effort expectancy, and facilitating condition). Additionally, Importance performance matrix analysis (IPMA) also indicated that performance expectancy is the most important variable in predicting of user's intention to adopt internet banking. Thus, managerial action should be taken on the improvement of performance expectancy of the internet banking. Methodologically, this study has used structural equation modelling (SEM), to validate the measurement and structural model.

6.1 Limitations and directions for Future Research

Like any other research, this research has some limitations that should be considered before interpreting the findings. The first concern is generalizability of the results, since the present study has used non-probability sampling approach. Second, this study is cross-sectional and measures the internet banking user's behaviour at one point in time that may be less generalizable as compared with longitudinal study. Future research can extend UTAUT model with other variables such as website design, assurance, reliability and e-customer service in order to get more in-depth knowledge about factors propelling user's intention to adopt internet banking.

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