

The post-adoption behavior of internet banking users through the eyes of self-determination theory and expectation confirmation model

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Abstract

Purpose – In this era of digital technology, the banking sector has revolutionized its operations by using web-based Internet banking services. However, the success of these financial services is dependent on Internet banking user continuance intention instead of initial adoption. The current study develops a theoretical framework based on three well-known theories, namely the expectation–confirmation theory, self-determination theory (SDT) and the commitment trust theory, to investigate Internet banking user continuance intention towards use of Internet banking services.

Design/methodology/approach – Following positivist paradigm, a research survey was conducted towards Internet banking users of commercial banks. In response, 355 valid observations were retrieved and used for data analysis. For data analysis, this study has used a latest statistical approach, namely structural equation modelling (SEM).

Findings – This study has confirmed that factors underpinning the commitment trust theory, SDT and expectation–confirmation model have significant impact on Internet banking user continuance intention. The research model explained 68.4% of variance in determining Internet banking user continuance intention, which is substantial. The effect size analysis (f^2) indicates that perceived usefulness is the most important factor among all other exogenous variables. The predictive relevance of the research model was found substantial Q^2 50.3%. These findings confirmed that the research model has substantial power to predict Internet banking user continuance intention.

Practical implications – From a managerial perspective, findings of this research give deeper insight into financial advisors, bank managers and policy-makers to understand human motivation and expectation–confirmation factors in order to retain customers and gain return on Information Technology (IT) investment. Additionally, results suggest that attention should be given on user trust, which in turn boosts user intention towards continuance use of Internet banking services. Extension of the self-determination framework contributes to theory and augments e-commerce literature, especially in a post-adoption setting.

Originality/value – There are several studies that investigate Internet banking user pre-adoption behaviour. Therefore, less is discussed about the Internet banking user's post-adoption behaviour. Findings of this study



help financial advisors to comprehensively understand which factor influences Internet banking user behaviour towards continue use of Internet banking services.

Keywords Commitment trust theory, Expectation–confirmation model, The commitment trust theory, Self-determination theory, Internet banking, Structural equation modelling

Paper type Research paper

1. Introduction

The widespread adoption of Internet technology has changed the dynamics of financial industry. With the upsurge of technology, financial industry is changing bricks-and-mortar businesses into innovative financial services such as web-based Internet banking services (Owusu Kwateng *et al.*, 2019). Internet banking is defined as “*a banking channel that allows consumers to do a wide range of financial and non-finical activities by using a bank website*” (Lee and Kim, 2020a). These financial activities may include fund transfer, top-up, utility bill payments, tax payments and downloading bank statement. Internet banking provides an alternative delivery channel for banking operations and bring ease in banking operations (Lee and Kim, 2020a; Merhi *et al.*, 2020). Although there is an exponential growth in Internet bating adoption research Arif *et al.* (2020), Chan *et al.* (2019), Chauhan *et al.* (2019), however, less is discussed about Internet banking user continuance intention (Asnakew, 2020; Thakur, 2014). It is noted that offering consumer- oriented financial and innovative services with advanced IT infrastructure is still a big challenge for financial institutions (Lee and Kim, 2020a; Marakarkandy *et al.*, 2017). This is a call for researchers to examine which factors drive Internet banking user towards continuance use of Internet banking services. To fill this gap, the current study extends the self-determination motivation framework with the commitment trust theory and expectation–confirmation model and investigates Internet banking user continuance behavior towards continuation of Internet banking services.

Internet banking is an emerging delivery channel in financial sector and becoming popular due to round the clock availability. The success of Internet banking is based on continuous use instead of initial adoption (Yuan *et al.*, 2019). The term continuance is defined as the extent wherein technology users intend to continue use of Internet banking services and focus on post-consumption experiences (Jaakonmäki *et al.*, 2018; Rahi *et al.*, 2020; Yuan *et al.*, 2019). Contrary to this, adoption is a degree where a user takes decision to use a particular service at initial stages and intend to use these services (Bhattacharjee, 2001; Lee and Kim, 2020a). According to Yuan *et al.* (2019), retaining a customer is less costly when comparing to obtain a new customer. Therefore, investigating Internet banking user continuance intention is more important than initial adoption of Internet banking services (Bhattacharjee, 2001; Yuan *et al.*, 2019). Despite its several advantages, the Internet banking users are reluctant to use Internet banking services and prefer to use other online banking services such as automated teller machine (ATM) services (Foroughi *et al.*, 2019; Susanto *et al.*, 2016; Yuan *et al.*, 2019). Asnakew (2020) postulated that the Internet banking user continuance intention phenomenon is less studied when comparing to Internet banking adoption studies. Therefore and in line with earlier studies Asnakew (2020), Lee and Kim (2020a, b), Nam *et al.* (2020), Nikou and Economides (2017), Ofori *et al.* (2017), the current study extends the self-determination motivation framework with the commitment trust theory and expectation–confirmation model to investigate Internet banking user continuance intention towards use Internet banking services. The finding of this study gives deeper insight into financial institutions, financial advisors and especially to bank managers to understand human motivational factors, expectation–confirmation and trust factors ,which in turn impact user continuance intention towards continuance use of Internet banking services.

2. Literature review

2.1 Theoretical background

The current study extends the self-determination theory (SDT) with expectation–confirmation theory and the commitment trust theory. According to [Asnakew \(2020\)](#), a single framework could not reveal complete understanding of the phenomenon. Alternatively, an extended model provides robust results and more powerful prediction. The SDT includes factors such as external regulation, intrinsic regulation, introjected regulation and identified regulation ([Deci and Ryan, 1985](#)). Similarly, the expectation–confirmation theory comprises four main constructs, namely expectation–confirmation, perceived usefulness, satisfaction and user continuance intention ([Bhattacharjee, 2001](#)). In addition to that the trust commitment theory is incorporated with single construct, namely trust. The importance of these theories is confirmed in earlier studies of [Li and Liu \(2014\)](#) and [Lin et al. \(2005\)](#). According to [Li and Liu \(2014\)](#), perceived usefulness positively influences on technology user satisfaction. Authors like [Lin et al. \(2005\)](#) have shown a positive influence of expectation on user continuance intention. In another research conducted by [Nikou and Economides \(2017\)](#), the SDT is extended with a technology acceptance model (TAM) and shows a significant impact in predicting individual continuance intention. Concerning with the commitment trust theory, authors like [Berraies et al. \(2019\)](#) postulated that in an online platform trust showed a positive impact on user continuance intention towards use of tech services and boosts user confidence. The newly developed research model is depicted in [Figure 1](#).

2.2 Expectation–confirmation theory

Expectation–confirmation theory has been used in marketing research to study customer pre- and post-purchase behavior from initial acceptance to continuance use of services ([Lin et al., 2005](#)). Expectation–confirmation is different from customer satisfaction disconfirmation model (CS/D) as it does not include a perceived performance variable. In the expectation–confirmation model, the perceived performance is captured in satisfaction and confirmation; consequently, it is not necessary to add perceived performance in a new expectation–confirmation model ([Bhattacharjee, 2001](#)). The expectation–confirmation theory is different from other technology adoption theories such as unified theory of acceptance and use of technology and TAM that focus on user pre-behavior instead of post-adoption behavior. Therefore, the expectation–confirmation theory examines users' behavior in both pre-behavior (expectation) and post-behavior (perceived performance) perspective while

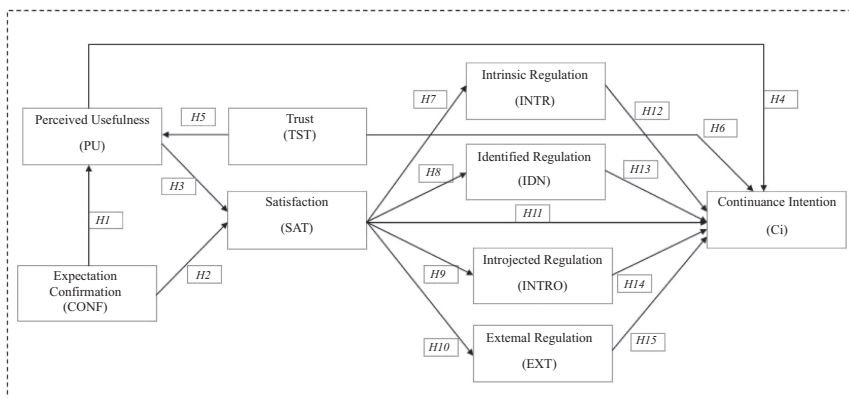


Figure 1.
The proposed
research model

using an information system (Lin *et al.*, 2005). Expectation–confirmation theory comprises four main constructs, namely expectation–confirmation, perceived usefulness, satisfaction and user continuance intention (Bhattacharjee, 2001).

Confirmation is defined as user perception of expected benefits during the use of Internet banking and service performance (Bhattacharjee, 2001). Earlier studies have revealed significant impact on perceived usefulness and satisfaction (Cheng, 2014; Lin *et al.*, 2005; Lin and Wang, 2012). Therefore, perceived usefulness is the extent wherein a user perceives that using Internet banking will enhance job performance (Samar *et al.*, 2017; Venkatesh *et al.*, 2003). In information system studies, expectation–confirmation theory is investigated by several researchers (Li and Liu, 2014; Lin *et al.*, 2005). According to Li and Liu (2014), perceived usefulness positively influences user satisfaction. Similarly, Lin *et al.* (2005) indicated a positive influence of expectation on user continuance intention. Thus, the current study underpinned confirmation and perceived usefulness in Internet banking continuance intention and proposed the following hypothesis:

- H1. Expectation–confirmation positively relates to perceived usefulness.
- H2. Expectation–confirmation positively relates to user satisfaction.
- H3. Perceived usefulness positively relates to user satisfaction.
- H4. Perceived usefulness positively relates to user continuance intention.

2.3 *The commitment trust theory*

In high perceived risk environment such as Internet, companies use trust factor as base of their services. The commitment–trust theory explained trust as consumer intention or belief towards a product or service. Trust is triggered during transactional exchange between two parties and linked to the level of confidence, reliability and integrity that one party has on others (Morgan and Hunt, 1994). According to Gefen (2000), trust is a set of beliefs comprising competency, honesty and benevolences of service providers. Competency indicates one party perception on other's skills and abilities. Similarly, honesty is a service provider's sincerity and determination towards fulfilling promises. The last belief is known as benevolence, which refers to company concern about customer for mutual benefits (Gefen, 2000; Handarkho Yonathan and Harjoseputro, 2019; Morgan and Hunt, 1994). Several researchers have found that trust is an important factor to create a long-term customer relationship and significantly influences user intention to buy a particular product or service (Aldas-Manzano *et al.*, 2011; Gefen, 2000; López-Miguens and Vázquez, 2017; Morgan and Hunt, 1994). In an online context, Berraies *et al.* (2019) asserted that in online business trust played an important role to enhance customer intention to buy online. In the banking sector, trust helps managers to retain their customers using online banking services (Thakur, 2014). Authors like Zoghalmi *et al.* (2018) postulated that in an online environment, a bank website should contain information to reduce customer risk, which in turn enhances trust. Prior studies have confirmed a significant relationship between trust and acceptance of Internet banking services (Aldas-Manzano *et al.*, 2011; Asnakew, 2020; Gefen, 2000; López-Miguens and Vázquez, 2017; Morgan and Hunt, 1994). Therefore and backup by earlier studies, trust is hypothesised as follows:

- H5. Trust positively relates to perceived usefulness of Internet banking.
- H6. Trust positively relates to Internet banking user continuance intention.

2.4 *Self-determination theory and satisfaction*

SDT is a macrolevel motivational framework and explained user extrinsic and intrinsic motivation towards a particular object (Deci and Ryan, 1985). Extrinsic motivation occurs

through external punishments or rewards and categorized into external regulation, introjected regulation, intrinsic regulation and identified regulation (Ryan, 1991). Therefore, intrinsic motivation refers wherein individuals are engaged in such activities that bring satisfaction and enjoyment (Nikou and Economides, 2017). The intrinsic motivation incorporates three types of human psychological motivation, namely perceived competency, perceived autonomy and relatedness (Nikou and Economides, 2017). The current study outlined extrinsic motivation to examine Internet banking user satisfaction and continuance intention towards use of Internet banking services. The first factor of extrinsic motivation is intrinsic regulation, which directs to Internet banking user pleasure, satisfaction and personal interest. Second, identified regulation indicates individual psychological feelings for acknowledgement and being own. Third, introjected regulation includes user lack of confidence, feeling of worth and prevention guilt that users have about services. Extending to this, the external regulation indicates rewards, avoidance of punishments, compliance, anxiety and threats that an individual received from external environment towards use of technology (Deci and Ryan, 1985; Lin *et al.*, 2009; Ryan, 1991).

The role of satisfaction is examined with the self-determination framework to see user motivation towards continuance use of technology and e-learning (Lin *et al.*, 2009; Standage *et al.*, 2005). According to Ghani *et al.* (2017), a satisfied user affects user behavior to continue use of services. Satisfaction is found to be an important antecedent of human extrinsic motivation (Lin *et al.*, 2009; Standage *et al.*, 2005). Authors like Lin *et al.* (2009) postulate that satisfaction positively impacts external regulation, introjected regulation, intrinsic regulation and identified regulation. Similarly, Standage *et al.* (2005) stated that satisfaction boosts user confidence and enhances Internet use external regulation, introjected regulation, intrinsic regulation and identified regulation. A recent study conducted by Nikou and Economides (2017) integrates TAM) and SDT and showed a significant influence on intrinsic motivational factors on user intention. In addition to that a study conducted by Chen and Jang (2010) confirmed that need satisfaction has a significant impact on self-determination motivational factors. Following the above arguments, the researcher has proposed the following hypotheses:

- H7. Satisfaction positively relates to intrinsic regulation.
- H8. Satisfaction positively relates to identified regulation.
- H9. Satisfaction positively relates to introjected regulation.
- H10. Satisfaction positively relates to external regulation.
- H11. Satisfaction positively relates to Internet banking user continuance intention.

2.5 Self-determination theory and continuance intention

In service marketing literature, the Internet banking service issue is widely studied in the pre-adoption context (Cheng, 2020; Martins *et al.*, 2014). In contrary, there is little research on Internet banking user continuance intention, which reflects to post-adoption issues instead of pre-adoption (Asnakew, 2020; Rahi and Abd. Ghani, 2019c). The literature has emphasized that retaining a customer is easier than bringing a new customer into a business cycle (Asnakew, 2020; Lee and Kim, 2020a; Shao, 2019; Yuan *et al.*, 2019). According to B. Kim and Oh (2011), banks need to understand Internet banking user behaviours in both pre- and post-adoption setting. In pre-adoption cases, marketers' focus is to engage a potential customer. Therefore, the post-adoption phase helps organizations to retain customers for a long-term relationship (Kim and Oh, 2011; Montazemi and Qahri-Saremi, 2015; Sunday and Vera, 2018). It is argued that initial adoption of Internet banking service is short-term and temporary and varies with user response whether he/she satisfied or dissatisfied (Kim and Oh, 2011; Kim,

2012; Montazemi and Qahri-Saremi, 2015). In the post-adoption setting, authors like Deci and Ryan (1985) indicated that self-determination motivational factors enhance user confidence towards use of services. The above argument is also confirmed by Kim (2012), Lin et al. (2009) and, Standage et al. (2005). Therefore and supported by Deci and Ryan (1985, 2000), Kim and Oh (2011), Lin and Anol (2008), Lin et al. (2009), Montazemi and Qahri-Saremi (2015), Standage et al. (2005), the relationship between the self-determination motivational framework and Internet banking user continuance intention is proposed as follows:

- H12. Intrinsic regulation positively relates to Internet banking user continuance intention.
- H13. Identified positively relates to Internet banking user continuance intention.
- H14. Introjected positively relates to Internet banking user continuance intention.
- H15. External regulation positively relates to Internet banking user continuance intention.

3. Research methodology

3.1 Instrument development

All measurement items were adapted in Internet banking continuance intention context, taken from the literature. The construct trust was adapted from the measure defined by Vatanasombut et al. (2008) and included four items. Perceived usefulness and expectation–confirmation were adapted from Bhattacharjee (2001), containing three items for each construct, and three items of satisfaction were adapted from Ghani et al. (2017). Identified regulation and introjected regulation were adapted from Standage et al. (2005), containing three items for each construct. Measurement items of intrinsic regulation and external regulation were adapted from Lin et al. (2009) and Standage et al. (2005), containing four items for each construct, and three items of continuance intention were adapted from Samar Rahi et al. (2018). All construct items were measured using a seven-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree).

3.2 Sampling and data collection

This study investigates Internet banking user continuance intention; therefore, research survey was administered towards customers of commercial banks of Pakistan. For data collection, commercial banks were selected from Lahore city. The survey was conducted during a time period of four weeks in September 2019. A total of 675 Internet banking users were requested to fill the questionnaire using convenience sampling approach. Convenience sampling approach is the most appropriate approach in social science studies (Rowley, 2014). Additionally, the list of the respondents was not available due to security issue. Consequently, the convenience approach was the most appropriate approach for this study. Among 675 questionnaires, 370 were returned with a response rate of 54.8%. Out of 370 questionnaires, 15 were discarded due to inappropriate answers. Thus, 355 valid questionnaires were used for inferential analysis. This study includes demographic variables such as age, gender and education. Descriptive analysis revealed that respondents with age range less than 20 were accounted 34.6%, respondents age 21 to 30 were found 40%, respondents with age range of 31–40 were accounted 20.6% and respondents with age of 41–50 were found only 7.1%. Therefore, no response was found for age range from 51 to 60. Concerning with respondents education, majority of the respondents (61.1%) were educated and had master level education, 27.5% had bachelor level of education and only 1.4% of the respondents had primary level of education. Descriptive analysis showed that there were 52.4% male and 47.6% females participated in the Internet banking survey.

3.3 Testing common method bias

According to Podsakoff *et al.* (2003), common method bias issue could arise in a study that uses single source data. Thus, we examined common method bias using Harman's single factor test (Rahi, 2018). No significant common method bias was found in the data as the maximum variance explained by a single factor was 28.9%, which is less than 50% and acceptable as recommended by Podsakoff *et al.* (2003).

4. Data analysis and results

For the purpose of data analysis structural equation modelling (SEM) was used. Rahi (2017) defined SEM "a statistical technique for testing and estimating causal relations using a combination of statistical data and qualitative causal assumptions". Within SEM, partial least squares (PLS) approach was used. PLS approach is suitable when a study's aim is towards prediction or theory development (Hair *et al.*, 2016b). In addition, we followed the two-step procedure as suggested by Anderson and Gerbing (1988), namely measurement model and structural model. Measurement model evaluates construct validity and reliability. Therefore, structural model estimates path testing, coefficient of determination R^2 and the corresponding t-values. Smart PLS software version 3.2.7 is used for SEM.

4.1 Measurement model

The measurement model includes the assessment convergent validity and discriminant validity of the constructs. Convergent validity was assessed with factor loading, average variance extracted (AVE), Cronbach's alpha (α) and composite reliability (CR) of the constructs. Factor loadings of the items were greater than 0.60 as suggested by Chin (1998a) which indicate adequate convergent validity of the constructs. Construct reliability was tested using Cronbach's alpha and composite reliability. For construct reliability, the values of Cronbach's alpha and CR should be greater than 0.70 as suggested by Henseler *et al.* (2009). All the constructs have Cronbach's alpha and CR above the recommended value of 0.70 indicating good reliability of the constructs. Finally, convergent validity was also assessed with AVE. In order to achieve adequate convergent validity, the values of AVE should be greater than 0.5 (Fornell and Larcker, 1981). All the constructs have adequate AVE higher than 0.50 indicating good convergent validity of the constructs. The results of measurement model are exhibited in Table 1.

The discriminant validity of the construct was determined by the square root of AVE. According to Fornell and Larcker (1981), items should differentiate among constructs and are required to measure distinct concepts. In this study, discriminant validity was measured using the Fornell and Larcker (1981) criterion. In order to achieve an adequate discriminant validity, the square root of AVE should be greater than all correlations between each pair of constructs (Chin, 1998b). Table 2 showed that all diagonal values (square root of AVE) are greater than off-diagonal values (correlation the constructs), established by the discriminant validity of the measure.

4.2 Structural model

The theoretical model was further tested to estimate hypothesized causal association or path coefficient, coefficient of determination R^2 , significance level using corresponding t-values, Stone-Geisser's Q^2 and effect size (f^2) as suggested by (Hair *et al.*, 2016b).

4.2.1 Hypothesis testing. The hypotheses were assessed using the bootstrapping procedure with 5,000 resample, as suggested by (Hair *et al.*, 2016b). Table 3 shows the results of PLS estimates inclusion path coefficient (β), t-statistics and significance level of the hypothesised relationship.

Constructs	Items	Loadings	(α)	CR	AVE
Trust (TST)	TST1: Internet banking always presents trustworthy information	0.807	0.920	0.944	0.809
	TST2: Internet banking can be relied upon to do what I expect	0.954			
	TST3: Internet banking is something that I have great confidence in	0.935			
	TST4: Internet banking provides services I completely trust	0.895			
Expectation–confirmation (CONF)	CONF1: My experience with Internet banking was better than what I expected	0.975	0.968	0.979	0.941
	CONF2: The various features of Internet banking were better than what I expected	0.960			
	CONF3: Overall, most of my expectations towards Internet banking website were confirmed	0.975			
Continuance intention (Ci)	Ci1: I intend to continue using Internet banking in the future	0.833	0.856	0.912	0.777
	Ci2: I will always try to use Internet banking in my daily life	0.901			
	Ci3: I plan to continue using Internet banking frequently	0.908			
<i>External regulation (EXT)</i>	EXT1: Various bank promotions and advertisements motivate me to use Internet banking	0.912	0.890	0.923	0.750
	EXT2: Using the Internet banking service helps to improve the way others treat me	0.837			
	EXT3: Using the Internet banking service is what I am supposed to do	0.940			
	EXT4: I get into trouble on financial tasks if I do not use the Internet banking service	0.764			
<i>Identified regulation (IDN)</i>	IDN1: the Internet banking service helps me to improve my financial tasks	0.920	0.866	0.909	0.770
	IDN2: I can learn the skill for using Internet banking	0.883			
	IDN3: I can apply what I learn from the Internet banking in my daily life	0.826			
<i>Intrinsic regulation (INTR)</i>	INTR1: I enjoy the use of Internet banking service	0.909	0.899	0.930	0.768
	INTR2: The features of Internet banking are attractive	0.860			
	INTR3: Using the Internet banking website is an enjoyment	0.870			
	INTR4: The features of Internet banking are enjoyable	0.865			
Introjected regulation (INTRO)	INTRO1: I want others to feel that I am performing my tasks better than before using of Internet banking	0.867	0.881	0.927	0.808
	INTRO2: I would feel bad if I did not use the Internet banking service for banking transactions	0.930			
	INTRO3: Once I stop using the Internet banking service, I feel my confidence decreases	0.899			

Table 1.
Measurement model

(continued)

The post-adoption behavior

Constructs	Items	Loadings	(α)	CR	AVE
<i>Perceived usefulness (PU)</i>	PU1: Using Internet banking improves my working and living performance	0.852	0.853	0.911	0.773
	PU2: Using Internet banking improves my working and living effectiveness	0.885			
	PU3: Overall, Internet banking website is useful	0.900			
<i>Satisfaction (SAT)</i>	SAT1: I feel satisfied with using Internet banking website	0.796	0.802	0.871	0.628
	SAT2: I feel contented with using Internet banking service	0.772			
	SAT3: Internet banking is according to my expectations	0.817			
	SAT4: Overall, I am satisfied with Internet banking service	0.784			

Table 1.

Constructs	CONF	Ci	EXT	IDN	INTR	Intro	PU	SAT	TST
Confirmation (CONF)	0.970								
Continuance intention (Ci)	0.752	0.881							
External regulation (EXT)	0.296	0.472	0.866						
Identified regulation (IDN)	0.063	0.170	0.044	0.877					
Intrinsic regulation (INTR)	0.513	0.658	0.456	0.104	0.876				
Introjected regulation (INTRO)	0.323	0.464	0.272	0.108	0.297	0.899			
Perceived usefulness (PU)	0.534	0.709	0.320	0.137	0.585	0.405	0.879		
Satisfaction (SAT)	0.351	0.436	0.227	0.099	0.305	0.223	0.299	0.792	
Trust (TST)	0.280	0.438	0.257	0.055	0.377	0.182	0.349	0.145	0.900

Table 2. Discriminant validity using Fornell–Larcker criterion

Hypothesis	Relationship	Path coefficient (β)	SE	<i>t</i> -statistics	<i>p</i> -values
H1	CONF → PU	0.474	0.048	9.877***	0.000
H2	CONF → SAT	0.267	0.057	4.688***	0.000
H3	PU → SAT	0.157	0.056	2.812**	0.003
H4	PU → Ci	0.369	0.066	5.626***	0.000
H5	TST → PU	0.216	0.053	4.054***	0.000
H6	TST → Ci	0.135	0.045	2.984**	0.001
H7	SAT → INTR	0.305	0.046	6.685***	0.000
H8	SAT → IDN	0.099	0.049	2.012*	0.022
H9	SAT → INTRO	0.223	0.049	4.554**	0.000
H10	SAT → EXT	0.227	0.056	4.029***	0.000
H11	SAT → Ci	0.168	0.040	4.245***	0.000
H12	INTR → Ci	0.231	0.053	4.323***	0.000
H13	IDN → Ci	0.050	0.027	1.817*	0.035
H14	INTRO → Ci	0.141	0.041	3.442***	0.000
H15	EXT → Ci	0.136	0.044	3.085**	0.001

Note(s): * $p < 0.05$; ** $p < 0.01$ and *** $p < 0.001$ (one-tailed)

Table 3. Summary of hypothesis testing

The current study extends the SDT with expectation–confirmation theory and the commitment trust theory to investigate Internet banking user’s continuance intention.

Internet banking user's continuance intention was jointly predicted by perceived usefulness, trust, intrinsic regulation, external regulation, identified regulation and introjected regulation. The model explains 68.4% of variance in Internet banking user's continuance intention which is substantial, as suggested by Cohen (1988). With respect to path coefficient and significance level, results showed that expectation–confirmation had a significant influence on perceived usefulness and user satisfaction ($\beta = 0.474$, t -value 9.877 and significance $p < 0.000$; $\beta = 0.267$, t -value 4.688 and significance $p < 0.000$), confirming H1 and H2. Perceived usefulness had a significant influence on user satisfaction and Internet banking user continuance intention ($\beta = 0.157$, t -value 2.812 and significance $p < 0.001$; $\beta = 0.369$, t -value 5.626 and significance $p < 0.000$); hence, H3 and H4 are supported. Similarly, trust had showed a significant impact on perceived usefulness and user continuance intention and statistically confirmed H5 and H6 ($\beta = 0.216$, t -value 4.054 and significance $p < 0.000$; $\beta = 0.135$, t -value 2.984 and significance $p < 0.001$).

Concerning with Internet banking users' satisfaction and self-determination constructs, results revealed that satisfaction has a significantly influence on intrinsic regulation and identified regulation ($\beta = 0.305$, t -value 6.685 and significance $p < 0.000$; $\beta = 0.099$, t -value 2.012 and significance $p < 0.05$), thus confirming the H7 and H8. User satisfaction had a significant influence on introjected regulation and external regulation and confirmed H9 and H10 ($\beta = 0.223$, t -value 4.554 and significance $p < 0.000$; $\beta = 0.227$, t -value 4.029 and significance $p < 0.000$). Satisfaction had showed a significant influence on Internet banking user continuance intention and confirmed H11 ($\beta = 0.168$, t -value 4.245 and significance $p < 0.000$). Beside confirmation of user satisfaction and SDT constructs, we tested the direct relationship between self-determination constructs and Internet banking user continuance intention. Findings revealed that intrinsic regulation and identified regulation had a significant influence on user continuance intention ($\beta = 0.231$, t -value 4.323 and significance $p < 0.000$; $\beta = 0.050$, t -value 1.817 and significance $p < 0.05$). Finally, introjected regulation and external regulation exhibited a significant influence on user continuance intention and confirmed H14 and H15 ($\beta = 0.141$, t -value 3.442 and significance $p < 0.000$; $\beta = 0.136$, t -value 3.085 and significance $p < 0.001$).

4.2.2 Evaluating effect sizes (f^2) and Stone-Geisser's Q^2 . According to Rahi (2017), bootstrapping results can show you the significance level p -value; therefore, it does not reveal exact effect size of the constructs. In view of that, the effect size of the constructs was tested using effect size (f^2) analysis. Cohen (1988) suggested that (f^2) values 0.35, 0.15 and 0.02 are reflected substantial, medium and small effect sizes, respectively. Table 4 exhibited (f^2) values with endogenous and exogenous variables. Evidence showed that perceived usefulness had medium effect size; therefore, all other exogenous variables demonstrated small effect size in Internet banking user's continuance intention. The predictive relevance of

Internet banking users continuance intention Construct	R^2	Q^2	(f^2)	Decision
<i>Continuance intention</i>	68.4%	50.3%		
Trust			0.047	Small
External regulation			0.044	Small
Identified regulation			0.008	Small
Intrinsic regulation			0.092	Small
Introjected regulation			0.051	Small
Perceived usefulness			0.247	Medium
Satisfaction			0.078	Small

Table 4.
Effect size analysis

Note(s): f^2 : 0.02, small; 0.15, medium and 0.35, substantial

the model was checked with Stone-Geisser’s Q^2 . We assessed predictive relevance Q^2 using the blindfolding procedure, as suggested by Hair *et al.* (2016b). In order to achieve acceptable predictive relevance of the model, it is recommended that values should be greater than 0 indicating that outlined model has predictive relevance for a certain endogenous construct (Cohen, 1988; Hair *et al.*, 2016b). Additionally, predictive relevance values Q^2 of 0.35, 0.15 and 0.02 are considered as large, medium and small predictive relevance of the model. Therefore, the present study model revealed substantial predictive relevance Q^2 0.503 meaning that the theoretical model has substantial power to predict Internet banking users continuance intention. Table 4 shows the values of coefficient of determination R^2 , effect sizes (f^2) and predictive relevance Q^2 .

4.3 Importance performance matrix analysis (IPMA)

The present study integrates two well-known theories such as expectation–confirmation theory and SDT in order to investigate Internet banking user’s continuance intention. The complexity of the model demands to highlight important factors among integrated model. Thus, for managerial implications, we employed a post-hoc importance performance matrix analysis (IPMA). IPMA estimates the importance and performance of the latent constructs. Importance scores are derived from SEM; therefore, performance scores are estimated by rescaling the latent variables score range 0 for lowest to 100 for the highest (Rahi and Abd. Ghani, 2019b). The results of the IPMA can be seen in Table 5.

Results as depicted in Table 5 revealed that perceived usefulness is the most important factor; therefore, user satisfaction is the second most important factor for managerial consideration. Factors such as trust, expectation–confirmation and intrinsic regulation had intermediate level of importance to predict Internet banking user intention. It is interesting to note that the latent construct expectation–confirmation had the highest performance; however for managerial implications, it is not an important construct to be taken into consideration.

Figure 2 shows the importance and performance of the latent constructs. It can be seen that perceived usefulness and users satisfaction are the most important constructs to attain Internet banking user continuance intention. Thus, it is suggested that managers and policy-makers should focus on perceived usefulness and satisfaction of the Internet banking users in order to boost Internet banking usage.

5. Discussion

Findings of the SEM showed that Internet banking user continuance intention is jointly predicted by perceived usefulness, trust, intrinsic regulation, external regulation, identified regulation and introjected regulation and confirmed that the underpinned factor significantly influences user continuance intention. The relationship between expectation and perceived usefulness was found significant and consistent with previous study conducted by Lin *et al.*

Latent constructs	Importance (total effect of the latent variable Continuance intention)	Performance (index values)
Trust	0.213	60.003
Expectation– confirmation	0.252	71.320
External regulation	0.130	61.437
Identified regulation	0.049	67.891
Intrinsic regulation	0.231	59.770
Introjected regulation	0.136	63.194
Perceived usefulness	0.420	66.017
Satisfaction	0.312	70.708

Table 5. Importance performance matrix analysis (IPMA)

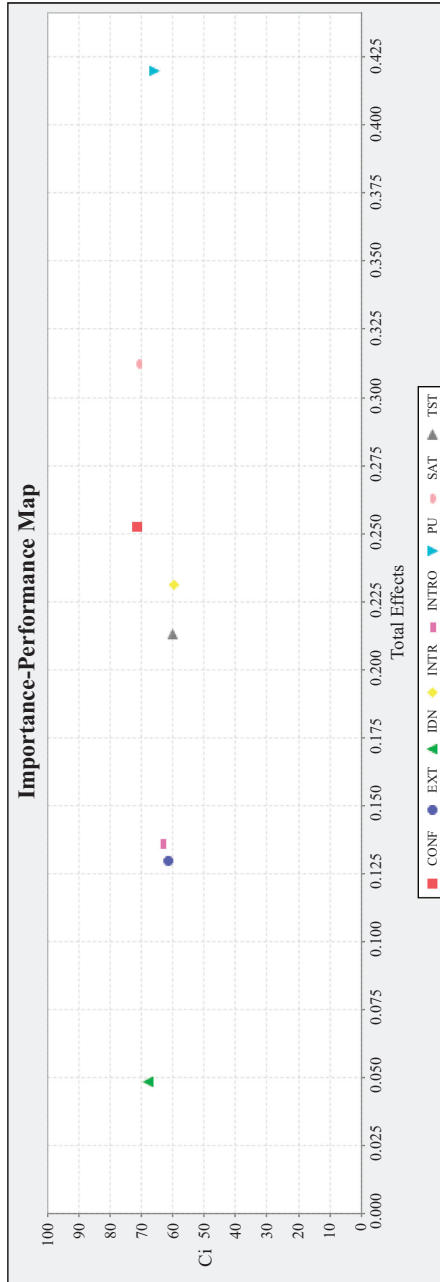


Figure 2. Importance and performance map (priority map) of IPMA for the customer's intention to adopt Internet banking

(2005). Expectation–confirmation had showed a positive influence in user satisfaction and in line with (Hoehle *et al.*, 2012; Tsai *et al.*, 2014). Similarly, perceived usefulness had showed a significant impact on user satisfaction and Internet banking user continuance intention and in line with Bhattacharjee (2001). Concerning with trust, it is noted that trust has a significant influence in perceived usefulness and Internet banking user continuance intention. The role of satisfaction is studied widely and linked with self-determination constructs. Results showed that satisfied Internet banking users have more inclined towards intrinsic regulation, identified regulation, introjected regulation and external regulation. Satisfaction had showed a significant influence on intrinsic regulation and identified regulation and consistent with earlier studies Deci and Ryan (1985), Lin *et al.* (2009). Internet banking user satisfaction had a significant influence on introjected regulation and external regulation and consistent with previous studies Deci and Ryan (1985), Lin *et al.* (2009), Ryan (1991). These finding revealed that a satisfied user enhance introjected regulation and external regulation of the Internet banking users.

The direct relationship of Internet banking user satisfaction was tested and confirmed. It is found that the satisfied user is inclined towards continuance use of Internet banking services and in line with Lin *et al.* (2009), Rahi *et al.* (2018), Standage *et al.* (2005). Earlier studies indicate a positive and significant relationship between SDT and technology user continuance intention. Therefore, the current study examined the causal relationship between intrinsic regulation, identified regulation, introjected regulation, external regulation and Internet banking user continuance intention. The results of the SEM confirmed that intrinsic regulation and identified regulation had a significant influence on Internet banking user continuance intention towards use of Internet banking services and in line with Deci and Ryan (1985), (Deci and Ryan, 2000), Lin and Anol (2008), Lin *et al.* (2009), Standage *et al.* (2005). Thereafter, constructs like introjected regulation and external regulation unveiled a significant influence on user continuance intention and supported by Deci and Ryan (1985, 2000), Lin and Anol (2008), Lin *et al.* (2009) and Standage *et al.* (2005). Aside of these relationships, this study revealed 68.4% of variance in Internet banking user continuance intention which is substantial. These findings confirmed that extension of SDT was valid with expectation–confirmation theory and trust to investigate Internet banking user continuance intention.

5.1 Theoretical implications

This study offers multiple contributions to the theory and e-commerce literature. First, it sheds light on intern banking user post-adoption behaviour, which is continuance intention to use Internet banking services instead of Internet banking adoption. Earlier studies have focused on Internet banking adoption extensively Martins *et al.* (2014) and Rahi and Abd. Ghani (2019a); therefore, discussion about post-adoption behaviour of Internet banking users is rare. Thus, the current study enriches the e-commerce literature by studying Internet banking user behaviour in a continuance context. Second, the current study provides a comprehensive theoretical framework with the extension of SDT and expectation–confirmation theory. SDT is inclusive kind of motivational framework and previously investigated in online learning Chen and Jang (2010) and in determining online brand community behaviour by Kelley and Alden (2016). Therefore, the extension of SDT with the expectation theory discloses avenues for future researchers. Third, the commitment trust theory is mingled between the expectation–confirmation theory and SDT in order to investigate the impact of trust on perceived usefulness and Internet banking user continuance intention. Findings confirmed that trust enhances user perceived usefulness and behavioural intention towards use of Internet banking. These findings contribute to the theory and e-commerce literature, specifically in the context of Internet banking.

5.2 Practical implications

The findings of this study provide various practical implications for establishing user friendly Internet banking websites. First, this study extends the self-determination motivational framework with expectation–confirmation theory and the commitment trust theory to examine Internet banking user continuance intention. The extension of SDT indicates that altogether perceived usefulness, trust, intrinsic regulation, external regulation, identified regulation and Introjected regulation explained 68.4% of variance in Internet banking user continuance intention, which is substantial (Cohen, 1988). These findings suggested that deeper understanding about underpinned factors including perceived usefulness, trust, intrinsic regulation, external regulation, identified regulation and Introjected regulation will help policy-makers, managers and financial advisor to better design Internet banking services. Taking into consideration both motivational and technology acceptance factors had showed a significant impact in engaging Internet banking user for continuance use of Internet banking services. Finally, IPMA showed that perceived usefulness is the most important factor in determining Internet banking user behavior towards continuance use of Internet banking services. Therefore, managers and financial advisor must be taken into consideration the website usefulness, user satisfaction and external human motivational factor in order to better design Internet banking services.

5.3 Methodological implications

Like theoretical and practical implications, this study also contributes to method by several means. The current research has followed a positivist paradigm and carried out a underquantitative research approach, which followed empirical data analysis. In order to fill this condition, the author used a latest statistical approach for data analysis, namely SEM. Assessing data with SEM is one of the core strength of this study. SEM is a “*statistical technique for testing and estimating causal relations using a combination of statistical data and qualitative causal assumptions*”. For structural equation model estimation, Smart-PLS software version 3.2.7 is used. Second, the respondents of this study are actual Internet banking users, and data collected using a survey questionnaire directed towards commercial banks of Pakistan. A total of 355 valid responses were collected from Internet banking users. The number of responses are considered substantial as it is higher than 200 as suggested by Hair *et al.* (2016a) and (Rahi, 2018). Therefore, it is predictable that results obtained from such a data set increased reliability and validity of the data and enhance the generalizability of the research model. It is noted that calculating sample size is one of the critical issue in social sciences studies. Therefore, the present study has incorporated prior-power analysis using G-Power software to get adequate sample size. Finally, common method variance (CMV) bias is assessed with Harman’s single factor test. According to Podsakoff *et al.* (2003), common method bias issue occurs when the study uses single source data. In order to mitigate common variance bias, Harman’s single factor test is applied that enriches the reliability and validity of the data set.

6. Conclusion

The aim of this study is to investigate Internet banking user continuance intention with the extension of SDT, expectation–confirmation theory and the commitment trust theory. Findings of the SEM indicate that altogether perceived usefulness, trust, intrinsic regulation, external regulation, identified regulation and introjected regulation explained 68.4% of variance in Internet banking user’s intention towards continuance use of Internet banking services. The effect size analysis (f^2) indicates that perceived usefulness is the most important factor among all other exogenous variables. This showed that perceived

usefulness of Internet banking website is important to boost Internet banking user confidence. Although the research model showed substantial variance in Internet banking user continuance intention, it is important to examine the predictive relevance of the research model. Consequently, the predictive relevance of the research model was tested using Stone-Geisser's Q^2 method. Findings of the predictive relevance analysis exhibited that the research model has substantial predictive power Q^2 50.3% to predict Internet banking user's continuance intention. Next to this, IPMA is incorporated to see which factor has more power when assessing Internet banking user continuance intention. Results of the IPMA indicate that perceived usefulness is the most important factor; therefore, user satisfaction is the second most important factor for managerial consideration. Factors such as trust, expectation–confirmation and intrinsic regulation had intermediate level of importance to predict Internet banking user intention. These findings confirmed that the newly developed research model is theoretically valid and has substantial power to predict internet banking user continuance intention.

6.1 Limitation and future research implications

Although this study addresses numerous theoretical and empirical issues connected to the Internet banking user's adoption and continuance usage behaviour, it is important to acknowledge study limitations for future research. First, the outcome variable of this study is Internet banking user continuance intention, which is predicted by motivational and technology factors. Therefore, it is suggested that future researcher should focus on Internet banking user's actual usage to get deeper insight into Internet banking user's behaviour. Second, the respondents of this study are from commercial banks therefore examining the behaviour of Islamic banking users could reveal interesting findings. Third, the SDT is a comprehensive motivational framework and comprises two types of dimension, namely extrinsic and intrinsic motivations. This study is conducted under extrinsic motivational factors; hence, future researcher may study intrinsic human motivational factors to understand user behaviour towards tech and Internet banking services. The current study is cross-sectional and investigates Internet banking user continuance intention towards use of Internet banking at one point of time. Therefore, future researchers may employ a newly proposed model in a longitudinal context. Finally, this study is conducted in south Asian region; therefore, replicating this model in other region could enhance generalizability of the research model.

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