Exploring the interrelationships between technological predictors and behavioral mediators in online tax filing: The moderating role of perceived risk

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Abstract

This study investigates the interrelationships between technological predictors and behavioral mediators in explaining users' continuance intention for online tax filing. Building on information systems (IS) success and IS continuance literature, this study proposes an extended conceptual framework by adding perceived functional benefit (PFB) as mediating, perceived risk as moderating, and demographic characteristics as control variables. The data collected, through a web-based survey, from 409 users of e-tax services in an emerging economy are analyzed through covariance-based structural equation modeling. Results confirm that PFB, confirmation of expectation, and satisfaction are the major antecedents of continuance intention for e-tax filing. The study also finds the evidence for the indirect effects of IS success factors on continuance intention through such antecedents. In addition, results suggest that the relationships between PFB and satisfaction as well as between PFB and continuance intention are contingent on the users' levels of perceived risk. The study concludes with the useful implications for academicians and policymakers in the context of an emerging economy.

Keywords: Confirmation, continuance intention, e-tax filing, IS success, functional benefit

Introduction

The introduction of e-tax filing is an initiative of the e-government which denotes the use of information and communication technologies (ICTs), particularly Internet-based applications (Liang & Lu, 2013; Rana & Dwivedi, 2015). The IT led e-tax filing system gains momentum to ensure the access to and delivery of government information and services to citizens, business partners, employees, and other agencies and entities (Bélanger & Carter, 2008; Rose, Persson, Heeager, & Irani, 2015; Shan, Wang, Wang, Hao, & Hua, 2011; Shareef, Archer, & Dwivedi, 2015; United Nations, 2016). However, the success of e-government

projects, such as e-tax filing, depends not only on ICTs but also on the citizens who are the ultimate beneficiaries of these projects (Venkatesh, Sykes, & Venkatraman, 2014).

Realizing the significance of electronic channel, governments around the world are rapidly shifting toward e-tax filing to provide effective and efficient services to their users (DeLone & McLean, 2016; Lallmahomed, Lallmahomed, & Lallmahomed, 2017; Sá, Rocha, & Pérez Cota, 2016; Stefanovic, Marjanovic, Delić, Culibrk, & Lalic, 2016). In this Internet age, citizens are becoming more powerful in most of the countries as they can use various e-government services, such as filing of tax returns, applying for identity cards or driving license on their own through websites or mobile applications (DeLone & McLean, 2016; Shareef et al., 2015; United Nations, 2016; Veeramootoo, Nunkoo, & Dwivedi, 2018). In extending the aim of shifting powers to citizens, current governments provide various online services, including e-tax filing, which is a step toward taxpayers' empowerment (Bhuasiri, Zo, Lee, & Ciganek, 2016; Schaupp, Carter, & McBride, 2010).

The added services and the newly plugged in e-technologies have resonated the motivation and expectations of citizens in adapting governmental e-services (Carter, Weerakkody, Phillips, & Dwivedi, 2016; Shareef et al., 2015). The integral gain of the e-tax filing system is to integrate all the processes involved, such as the preparation of tax documents, submission of tax returns, and the tax payment, at one point, over the web (Chaouali et al., 2016; Chen et al., 2015). E-tax filing helps improve the existing tax filing system while concurrently reduces the monetary cost for taxpayers and governments (Schaupp & Carter, 2010; Veeramootoo et al., 2018).

Adoption and continuance being different concepts may not result from the same set of determinants (Bhattacherjee, 2001; Venkatesh, Thong, Chan, Hu, & Brown, 2011). Continuance intention refers to users' post-adoption intention to continuously use a specific technology (Bhattacherjee, 2001; Nabavi, Taghavi-Fard, Hanafizadeh, & Taghva, 2016). If citizens do not adopt and continuously take advantage of e-government services, then e-government projects may fail, and taxpayers' money may be wasted (Lallmahomed et al., 2017). Nonetheless, most e-government research focuses on factors affecting citizens' attitude toward online public services (Carter et al., 2016; Rana, Dwivedi, & Williams, 2015;

Shareef et al., 2011) and continuance intention toward e-government services, in general, yet e-tax filing is still in infancy (Santhanamery & Ramayah, 2015; Veeramootoo et al., 2018). Historically, researchers borrowed constructs from technology adoption theories such as theory of reasoned action (TRA), theory of planned behavior (TPB), technology acceptance model (TAM), unified theory of acceptance and use of technology (UTAUT), and social cognitive theory to explore users' continuance intention (Nabavi et al., 2016; Venkatesh et al., 2011). Several researchers acknowledged the value of these theories and models in elucidating the initial adoption of information systems (Dwivedi, Shareef, Simintiras, Lal, & Weerakkody, 2016). However, other researchers believed that such theories are not that suitable to underpin continuous usage behavior (Bhattacherjee, 2001; Veeramootoo et al., 2018). In extracting convincing points of view from the extant literature, Bhattacherjee (2001) argued that theories initially developed to explicate consumers' acceptance of information systems provide limited explanation of continuance user behavior.

To address the above identified research gap, this framework extends IS continuance (Bhattacherjee, 2001) and IS success (Delone & McLean, 2003; DeLone & McLean, 2016) models in the context of e-tax filing continuance intention by adding perceived functional benefit (Shareef et al., 2011) as a mediating; perceived risk as moderating; and demographics, such as age, gender, education, and e-tax filing experience as control variables. This research contributes to the e-tax filing continuance literature (Hu, Brown, Thong, Chan, & Tam, 2009; Santhanamery & Ramayah, 2015; Veeramootoo et al., 2018) by proposing an extended framework. The study is the first to formulate moderated mediation mechanism to examine whether the direct and indirect effects of PFB on continuance intention, through satisfaction, are moderated by perceived risk.

The review of extant literature on e-tax filing suggests that most recent research on e-tax filing is conducted from the perspective of developed countries (Carter, Shaupp, Hobbs, & Campbell, 2011; Liang & Lu, 2013; Schaupp et al., 2010). Only a few have investigated e-tax filing from the perspective of developing countries. (Chaouali, Yahia, Charfeddine, & Triki, 2016; Chen, Jubilado, Capistrano, & Yen, 2015; Fakhoury & Aubert, 2015). This research attempts to respond to the recent calls for research on e-tax filing continuance from the perspective of developing countries (Lallmahomed et al., 2017; Rana, Dwivedi, & Williams,

2015). Therefore, this study also contributes to the literature on e-tax filing from the contextual perspective.

We find literature address e-tax filing continuance in the contexts of developing or emerging countries (Hu et al., 2009; Santhanamery & Ramayah, 2015; Veeramootoo et al., 2018) but we cannot find studies in the context of sub-continent, especially Pakistan. Compared with other sub-continent countries, Pakistan has its own social, legal, environmental, political, and technological dynamics which affect its citizens' continuance intention toward e-tax filing. Thus, adopting the e-tax continuance model from another context may not fit with local conditions. Hence, this research enhances the limited understanding on e-tax filing continuance intention by theoretically developing and empirically testing an extended model for e-tax filing continuance from the perspective of developing counties.

In sum, this study aims to ascertain the antecedents of e-tax filing continuance and to explore the role of perceived risk on various relationships among PFB, satisfaction, and e-tax filing continuance intention. For the achievement of these objectives, the following questions are investigated in this study. (1) What are the major antecedents of e-tax filing continuance intention? (2) How do the relationships among PFB, satisfaction, and e-tax filing continuance intention depend upon the level of perceived risk? The proposed framework can be useful for academicians as it extends the debate regarding e-tax filing continuance in the context of emerging countries. Moreover, the implications can be beneficial for governments' IT practitioners who can develop their strategies to gain e-taxpayers' satisfaction and minimize their risk perceptions.

The rest of this paper is structured as follows: the first section is devoted to the literature review followed by the development of hypotheses, and conceptual model related to users' e-tax filing continuance intention. The second section covers the methodology, instrument design, research context, and sample. The third section elaborates on the analysis and the results. The final section comprises of the discussion, implications, limitations, future research, and conclusion.

Literature Review

Technology acceptance and adoption are widely covered in the IS literature (Davis, 1989; Venkatesh, Morris, Davis, & Davis, 2003) but the understanding of continuance intention for IS (Bhattacherjee, 2001; Venkatesh et al., 2014), in general, and citizens' continuance intention for e-tax filing, in particular, is still in its infancy (Hu et al., 2009; Santhanamery & Ramayah, 2015; Veeramootoo et al., 2018). The acceptance and adoption of e-government services have been a topic of interest among IS researchers over past few decades (Dwivedi et al., 2016; Kurfal, Ali, Tokdemir, & Paçin, 2017; Lin, Fofanah, & Liang, 2011; Rana & Dwivedi, 2015; Weerakkody, El-Haddadeh, & Al-Shafi, 2011). Although several studies on the topic have been conducted in various countries (Carter et al., 2016; Gauld, Goldfinch, & Horsburgh, 2010; Gupta, Dasgupta, & Gupta, 2008; Kurfal et al., 2017; Shareef et al., 2011) yet limited studies focus on online tax adoption and continuance.

The extant research on e-tax filing is mainly grounded in various acceptance and adoption theories, such as TPB (Hung, Chang, & Yu, 2006), TAM (Schaupp et al., 2010), UTAUT (Bhuasiri et al., 2016; Carter et al., 2011; Chaouali et al., 2016; Kurfal et al., 2017), IS success model (Chang, Li, Hung, & Hwang, 2005; Chen et al., 2015; Veeramootoo et al., 2018), and expectation-confirmation model of IS continuance (ECM-ISC) (Hsu & Chiu, 2004; Hu et al., 2009; Santhanamery & Ramayah, 2015; Veeramootoo et al., 2018).

The theoretical foundation of this research is based on two widely accepted theories in IS—ECM-ISC (Bhattacherjee, 2001) and updated IS success model (Delone & McLean, 2003). ECM-ISC advocates that confirmation stimulates satisfaction, and satisfaction arouses continuous intention among users, whereas IS success model supports the resonance of continuous intention due to its quality constructs, including information, system, and service quality (Veeramootoo et al., 2018). The proposed framework integrates the drivers of IS success from Delone & McLean (2003) with the IS continuance characteristics from ECM-ISC to explain the continuance intention of e-tax filing.

ECM-ISC is a comprehensive framework to gauge IS continuance intention. However, ECM-ISC does not focus on the technical features of a successful IS, such as information, system, and service quality (Venkatesh et al., 2011). These characteristics play a crucial role, especially when there is no interaction between public service providers and citizens—in

the context of e-tax filing—in developing users' positive attitude toward digital government services (DeLone & McLean, 2016; Rana, Dwivedi, Williams, & Weerakkody, 2015). In this context, features of website quality play an integral role in individuals' confirmation of expectation, PFB, satisfaction, and continuance intention.

The analysis of past studies on e-tax filing shows that most of e-tax filing research has focused on users' acceptance or pre-adoption behavior (Bhuasiri et al., 2016; Carter, Shaupp, Hobbs, & Campbell, 2011; Chaouali et al., 2016; Chen et al., 2015; Dorasamy, Marimuthu, Raman, & Kaliannan, 2010; Floropoulos, Spathis, Halvatzis, & Tsipouridou, 2010; Schaupp & Carter, 2010). However, we find very limited studies on users' post-adoption behavior or continuance intention for e-tax filing (Hu et al., 2009; Santhanamery & Ramayah, 2015; Veeramootoo et al., 2018). Base on decomposed TPB, Hsu and Chiu (2004) had proposed a conceptual model to explore e-service quality and continuance intention. They tested the model using data of 149 e-tax filers from Taiwan to examine their continuance usage intention of e-services. Their findings indicated that interpersonal influence, perceived usefulness, and perceived playfulness were the major drivers of e-service satisfaction which, along with users' internet self-efficacy, consequently resulted in e-service continuance. In a longitudinal study conducted in Hong Kong, Hu et al. (2009) examined the antecedents of e-tax payers service quality and continuance. The results suggested that security, convenience and perceived usefulness were the major drivers of service quality which consequently affected continuance intention. Santhanamery and Ramayah (2015) studied the roles of demographic and personality traits in e-tax filing continuance of Malaysian taxpayers. Their results suggested that personality traits, such as agreeableness, conscientiousness and openness significantly affected continuance intention. Moreover, a significant relationship existed between demographic variables and continuance intention. Recently, based on ECM and D&M IS success model, Veeramootoo et al. (2018) proposed a conceptual model for measuring e-filing continuance usage. They tested their model with a data of 645 e-filing users from Mauritius. Their results suggested that users' e-filing continuance intention was subjective to the system quality, user satisfaction and habit while satisfaction had the strongest effect on e-tax file continuance. Table 1 provides an overview of e-tax filing studies.

Table 1: Overview of studies on e-tax filing

Author(s)	Country	Major Theories	Dependent Variable	Key Findings
Wang (2002)	Taiwan	TAM	BI	Computer self-efficacy affected PEOU, PU and perceived credibility which in turn resulted in users' adoption intention for e-tax-filing.
Wu & Chen (2005)	Taiwan	TAM, TPB, Trust	Adoption intention	By combining TAM and TPB with trust, a conceptual model had been proposed to explain users' e-tax filing intentions. The integrated model significantly explained users' e-tax filing intentions.
Hsu & Chiu (2004)	Taiwan	TPB	E-service continuanc e	Interpersonal influence, perceived usefulness, and perceived playfulness were the major drivers of e-service satisfaction which, along with users' internet self-efficacy, consequently resulted in e-service continuance.
Carter & Bélanger (2005)	USA	TAM, DOI	Intention to Use	Citizen's' intention to use an e-government services was contingent on perceived ease of use and compatibility.
Chang et al. (2005)	Taiwan	TAM, D&M IS success model	BI	Confirmed the role of information and system quality along with perceived credibility as the external variables. Validated TAM in the e-tax filing context.
Fu et al. (2006)	Taiwan	TAM and TPB	BI	Usefulness created inclination in the taxpayers' BI. Moreover, the perceived usefulness, subjective norms and self-efficacy had varied effects among manual and e-tax filers.
Hung et al. (2006)	Taiwan	TPB	Intention	Subjective norms, perceived behavioral control and attitude were the significant predictors of e-tax file intention.
Hu et al. (2009)	Hong Kong	TAM	CIN	Security, convenience and perceived usefulness were the major drivers of service quality which consequently affected CIN.
Ojha (2009)	India	TAM,TPB ,TRA, UTAUT	BI	Perceived ease-of-use, personal innovativeness, relative advantage, performance of e-filing service, and compatibility were the strong predictors of BI.
Chen (2010)	Taiwan	D&M IS success model	Satisfaction	Information and system quality measure was more integral than service quality measures in translating taxpayers' satisfaction.
Dorasamy et al. (2010)	Malaysia	TAM, DOI	BI	Perceived readiness and convenience were the dominant factors in using e-tax filing.
Floropoulos et al. (2010)	Greece	D&M IS Success Model	Satisfaction	Information, system and service quality significantly influenced usefulness and satisfaction while system quality had only a significant effect on satisfaction.
Schaupp & Carter (2010)	USA	Trust, risk	Intention to use	Trust, risk and optimism bias were the major drivers of users' e-file intentions.
Schaupp et al. (2010)	USA	UTAUT, TAM	Intention to use	Performance expectancy, social influence, optimism bias and perceived risk significantly impacted e-filing intentions.

Author(s)	Country	Major Theories	Dependent Variable	Key Findings
Carter et al. (2011)	USA	UTAUT	Intention to Use	UTAUT constructs were confirmed as predictors of e-filing intentions. The study also stressed on integration of UTAUT with other theories, such as social cognition to further understand taxpayers' e-file intentions.
Hussein et al. (2011)	Malaysia	TAM, DOI,	Intention to Use	PEOU, PU, trust of the government, image, compatibility and service quality were the major drivers of e-filing intention.
Chen et al. (2015)	Philippine	D&M IS Success Model	Perceived net benefits	Trust in e-government website was derived from trust in technology and government in general as well as prior experience. Trust in e-government online system influenced three IS quality dimensions which subsequently resulted in net benefits.
Santhanamery & Ramayah (2015)	Malaysia	Personality traits	CIN	Personality traits, such as agreeableness, conscientiousness and openness significantly affected continuance intention. Moreover, a significant relationship existed between demographic variables and continuance intention.
Bhuasiri et al. (2016)	Thailand	UTAUT, SDT, PCT	Intention to Use	Performance expectancy, facilitating conditions, social influence, and perceived credibility emerged as the significant predictors of citizens' intentions to adopt an e-tax filing.
Chaouali et al. (2016)	Tunisia	UTAUT	Behavioral expectation	Performance expectancy, effort expectancy, aspects of social influences and trusting dimensions significantly influenced behavioral intention.
Veeramootoo et al. (2018)	Mauritius	ECM and D&M IS success model	CIN	Users' e-filing continuance usage intention was subjective to the system quality, user satisfaction and habit while satisfaction had the strongest effect on e-tax file continuance.

Note: *UTAUT= Unified Theory of Acceptance and Use of Technology, TAM= Technology Acceptance Model, TPB= Theory of Planned Behavior, DOI= Diffusion of Innovation, TRI: Technology Readiness Index, SDT: Self-Determination theory, perceived risk, and perceived credibility, SCT=social cognitive theory, SNCT= social norms and contingency theory, PCT: Perceived Credibility Theory, CINT: Continuance Intention, BI: Behavioral Intention*

In the following section, we discuss the formulation and substantiation of hypotheses for developing the conceptual model (Figure 1) of this study.

Hypotheses and Conceptual Model Development

ECM-ISC

Building on the information systems (Davis, 1989) and consumer behavior research, Bhattacherjee (2001) proposed ECM-ISC to explain individuals' continuance intentions for IS. Such an intention is individuals' intent and motivation to reuse IS in the future (Bhattacherjee, 2001) and in the case of tax filing, taxpayers' intention to reuse e-tax filing system. Continuance intention for information technology has been a topic of interest among

IS researchers (Bhattacherjee, 2001; Stefanovic et al., 2016; Venkatesh et al., 2014). ECM-ISC reveals that users' IS continuance intention is contingent on their satisfaction and perceived usefulness. Moreover, perceived usefulness and satisfaction are influenced by their confirmation of expectation from their past usage.

Over the past decade, ECM-ISC has emerged as a strong theoretical foundation to explain IS continuance of emerging technologies. ECM-ISC focuses on the post usage behavior of IS, and the model has been used, in various contexts, to explain users' IS continuance intention, such as social networking sites (Lin et al., 2017); cloud storage services (Yang & Lin, 2015); virtual worlds (Zhou, Jin, & Fang, 2014) etc. Wang (2014) applied the ECM-ISC framework to explore the perceived value of m-government continuance in China. He found mobility, security, and perceived values to be the predictors of perceived value, and consequently to the trust in the government/technology. However, only limited studies use the ECM-ISC framework to gauge e-tax continuance intention. Veeramootoo et al. (2018) presented an integrated model, in their study of e-filing continuance, based on the IS success model and expectancy confirmation model. They argued that system quality, user satisfaction, and habit were the significant predictors of e-filing continuance intention. Using a sample drawn from Malaysia, Santhanamery and Ramayah (2015) examined the role of demographic characteristics and personality traits on e-filing continuance usage intention. Hu et al. (2009) employed a longitudinal study to examine the continuance intention for e-tax filing services in Hong Kong. They suggested that service quality and perceived usefulness were the major determinants of continuance intention. These studies validate that ECM-ISC is a promising theory that examines post-adoption or continuance behavior. However, inconsistent findings in the extant literature, on e-filing continuance intention, call for further research on the topic in diversified contexts. Various ECM-ISC constructs and their relationships with respect to e-tax have been developed in the following section.

Users' Satisfaction

Users' satisfaction, which is individuals' evaluation of past positive or negative experience, is a standard measure of IS success (DeLone & McLean, 2016) and continued intention (Bhattacherjee, 2001). DeLone and McLean (2003) considered user satisfaction as a long-term factor affecting individuals' use/intention to use and net benefits. In the e-government

context, citizens' satisfaction reflects their pleasant experience due to the fulfillment of their routine tasks. Satisfaction, which is an integral byproduct of IS, creates inclination in the behavioral intent of users. Users' satisfaction with public services, such as e-tax filing, and their continuance intention to use these services assures the success of public services.

Generally, satisfaction or dissatisfaction is understood as a result of past positive or negative experience (Porumbescu, 2016). User satisfaction is a fundamental construct in the IS success model and ECM-ISC (Bhattacherjee, 2001; Chou, Min, Chang, & Lin, 2010). This study focuses on individuals' satisfaction with their experience related to the quality of e-government websites along with their perceived usefulness and confirmation of experience. Many studies, based on ECM-ISC, have confirmed the significant positive effect of users' satisfaction on consumers' continuance intention for information technologies, in general (Hong, Tai, Hwang, Kuo, & Chen, 2017) and e-tax filing continuance, in particular (Hsu & Chiu, 2004; Veeramootoo et al., 2018).

Individuals' continuance intention, which is their commitment to post-adoption, is contingent on their satisfaction (Bhattacherjee, 2001). Citizens' prior experience with online channels plays an important role in forming their satisfaction levels. Therefore, the success/failure of these channels broadly depends upon citizens' satisfaction/dissatisfaction with the services and their continued usage of e-government platforms (Teo, Srivastava, & Jiang, 2008). Research has affirmed a significant positive effect of citizens' satisfaction on their continuance intention for e-government (Hong et al., 2017; Sá et al., 2016). Therefore, we posit the following:

H1: Users' satisfaction with e-tax filing systems is positively associated with their continuance intention toward such systems.

Functional Benefit

Literature on technology acceptance establishes perceived usefulness as a strong factor in resonating user adoption and usage behavior (Davis, 1989). Similarly, perceived usefulness has been presented by DOI's construct for relative-advantage, which believes that perceived innovation is better than its precursor (Moore & Benbasat, 1991). Venkatesh et al. (2003) used UTAUT to present performance expectancy as the antecedent of behavioral intention and subsequently of usage. They defined performance expectancy as the degree to which

individuals believe that using systems can help them achieve specific benefits. In addition, they argued that perceived usefulness and relative advantage are related to performance expectancy (Venkatesh et al., 2003). By integrating these two factors, Shareef et al. (2011) introduced PFB as the predictor of e-government adoption, which they defined as "The degree to which citizens perceive the overall functional benefits, absolute and relative—including cost, time, efficiency, and effectiveness of using an e-government system—instead of using traditional government physical office," (p. 31). PFB encompasses multiple aspects, such as the behavioral and economic aspects of e-tax filing. Therefore, we employed PFB instead of perceived usefulness in the ECM-ISC model.

Citizens may find certain benefits in the e-tax filing system, which may help them save time and cost in performing various tasks compared with traditional paper-based tax filing (Bélanger & Carter, 2008; Gilbert, Balestrini, & Littleboy, 2004; Shareef et al., 2011). Adopting the e-tax filing systems makes citizens take advantage of relative benefits, such as effectiveness, availability, accessibility, and time/cost savings. We argue that high functional benefits can increase citizens' satisfaction and continuance intention for e-tax.

H2: Users' PFB from e-tax filing systems is positively related to their satisfaction with such systems.

H3: Users' PFB from e-tax filing systems is positively related to their continuance intention toward such systems.

Confirmation of Expectation

On the basis of ECM-ISC, user satisfaction is a consequence of their confirmation of expectation and the perceived usefulness of IS. Users develop their expectations from IS, and the confirmation of their expectations, resulting from their actual use, determines their satisfaction (Bhattacherjee, 2001). E-government users' confirmation of expectation is defined as the extent to which users receive their expected benefits by using e-government services. Literature shows that the confirmation helps in attaining positive effects on individuals' satisfaction and subsequently on their continuance intention (Bhattacherjee, 2001). Citizens' decision for e-tax usage is influenced by their initial expectations from e-tax websites and their actual post usage experience. After visiting online tax filing websites, the extent to which citizens' expectation are met can affect their PFB and satisfaction levels with

online systems. Citizens' PFB and satisfaction can determine their likelihood of using the online tax filing system continually. Thus, the study formulates the following hypotheses.

H4: Users' confirmation of expectation from e-tax systems is positively associated with their PFB.

H5: Users' confirmation of expectation from e-tax filing systems is positively related to their satisfaction with such systems.

IS Success Model

IS success models by DeLone and McLean (1992, 2003) are a significant development toward IS success measurement. In their study of 1992, they set the basis of IS success theory by proposing a theoretical model. They argued that system and information quality indicate user satisfaction, resulting in individual and organizational impacts (DeLone & McLean, 1992). They further proposed that the components in this IS success model are interrelated and interdependent (Floropoulos et al., 2010). Following the evaluation of several contributions to their initial model, DeLone and McLean proposed a 10-year update in 2003. In this updated model, along with system and information quality, they proposed the service quality of IS as the predictor of intentions to use and user satisfaction, resulting in a net benefit. In their latest monograph in this series, DeLone and McLean (2016) further extended the literature on IS success by identifying critical IS success drivers and guidelines for their measurement.

Several studies have empirically investigated various relationships among the measures of the IS success model in various fields (Wang, Wang, & Liu, 2015). However, few studies integrate such relationships in the perspective of e-government websites, such as e-tax continuance intention (Stefanovic et al., 2016; Wang & Liao, 2008). Sambasivan, Wemyss, and Rose (2010) extended DeLone and McLean's IS success model by adding constructs of trust, facilitating condition, and web design quality. Through their study, conducted in Malaysia, they found website design quality among other constructs to be strongly linked to users' intention and actual user behavior. Lee & Chung (2009) conducted a study in Korea and used the modified IS success model of DeLone and McLean to investigate the determinants of trust and satisfaction in mobile banking. Contrary to the design quality of interface effect on customers' trust and satisfaction, they found significant effects of system

and information quality on these constructs. To assess e-government success factors in Taiwan, Wang and Liao (2008) also adapted the IS success model and found significant support for all the postulated relationships except for the system quality and use.

These examples, from literature, reinforce the integration of DeLone and McLean's model with other relevant constructs to understand and explain IS success. DeLone and McLean (2016) verified that despite having several studies on IS success, consensus on the variables measuring IS success was still lacking. They argued that the "causes" of IS success were generally confused with the "outcome" which was a success itself. Moreover, they proposed information, system, and service quality among other causes or drivers of IS success.

While reporting the taxes, no physical interaction exists between citizens and government agents; thus, high-quality e-tax websites may play a critical role in lessening citizens' risk perceptions and forming their satisfaction, which subsequently results in their continuance intention to use e-government websites to fulfill their tasks. Government websites must provide high-quality information and services to citizens (Teo et al., 2008). Therefore, the success of such websites depends upon their quality in terms of their availability, information, and service. The quality experienced by citizens helps them retain their prior beliefs in the relative usefulness of websites.

The quality of governments' e-tax filing websites refers to citizens' overall evaluation of efficiency and effectiveness of its services. High-quality e-tax filing websites offer users with efficient services in terms of time, cost, and communication; whereas, the effectiveness may be seen from convenience, ease of information retrieval, and personalization. High-quality e-tax filing system facilitates citizens at each step of their relationship with the government and reinforces the perceived benefit of the system by bridging up the gap which was formed due to lack of face-to-face interaction. The diverse and heterogeneous users of public electronic services may reveal different levels of satisfaction toward such services depending upon their perceived quality of these websites in terms of service, information, and system.

Realizing e-tax web facilities is contingent on citizens' satisfaction and their continued use of such facilities, Bhattacherjee (2001) affirmed that satisfaction toward e-government web services assessed citizens' psychosomatic state, which concerned their intellectual judgment of their experiences with web services. Upon receiving satisfactory experience with such

government services, citizens' trust and support for government initiatives of exercising such services may improve. Factors contrary to satisfactory experience may instate a decline in the positive attitude toward government initiatives of creating e-services. In addition, Hong et al. (2017) argued that satisfactory experience with the interface and content of e-government services offered played an important role in predicting citizens' continuous intention for e-government.

In line with the updated IS success model (Delone & McLean, 2003) we have selected information, system, and service quality to study the success of e-tax systems. DeLone and McLean (2003) defined information quality in terms of its timeliness, accuracy, completeness, and relevance of IS. Moreover, the information quality of e-government websites, such as e-tax can be of high quality if it is relevant, complete, accurate, and up-to-date. Information of e-government websites can also be measured in terms of the degree to which the needs of citizens regarding the accuracy, reliability, conciseness, and precision of information are fulfilled (Floropoulos et al., 2010). Literature shows a consensus on the critical attributes of information quality (Valaei & Baroto, 2017). IS quality refers to the necessary characteristics of IS itself, such as flexibility of the system, stability, reliability, user-friendly interface, ease of use, response time, and security (Delone & McLean, 2003; Floropoulos et al., 2010). The system quality of e-government websites refers to users' perception of websites' accessibly, availability, convenience, flexibility, and reliability (DeLone & McLean, 2016). Finally, service quality refers to the overall expectation of consumers regarding various services, such as availability and readiness of services, safety of transactions, and individual attention (Delone & McLean, 2003; Floropoulos et al., 2010). A high-perceived website quality of e-tax systems in the perspective of information, system, and service may lead to the confirmation of citizens' expectation and perceived benefit. These outcomes eventually lead to users' satisfaction and continuance intention. Thus, we posit the following:

H6: Perceived high quality of e-tax filing website dimensions (information, system, and service) positively influence (a) PFB and (b) confirmation of expectation.

H7: E-tax filing websites' perceived quality dimension (i.e., information, system, and service) affects continuance intention directly and indirectly through confirmation of expectation, PFB, and satisfaction.

Potential Moderator

Perceived Risk

Risk denotes individuals' understanding of potential gains and losses (Pavlou, 2003). Risk cannot be measured objectively; thus, literature focuses on assessing users' perceived risk (Bélanger & Carter, 2008; Schaupp et al., 2010). Perceived risk is a relevant component in the early stages of citizens' e-tax adoption because, at this stage, consumers are not much confident and aware of public services. Therefore, determining users perceive risk in declaring online tax returns and their willing to rely on e-tax websites to obtain and provide personal information is important. Online taxpayers may have concerns about privacy apprehensions and financial costs they incur because of the lack of protection of their confidential information. Literature highlights the negative association of users' perceived risk in e-tax systems and their willingness to interact with such online systems (Carter & Bélanger, 2005; Schaupp et al., 2010).

Compared with paper-based tax filing, online tax filing is more prone to citizens' risk perceptions. Absence of face-to-face interaction, growing cyber-attacks, and involvement of individuals' financial information in e-tax filing have stimulated consumers' risk (Schaupp et al., 2010). Thus, citizens' perceived risk is relevant in examing their continuance intention toward e-tax filing. Several dimensions of perceived risk have been discussed in the literature, including financial, performance, psychological, physical, social, and time risks (Pavlou, 2003). Instead of focusing on a certain dimension, this research regards perceived risk as a global measure of potential uncertain negative outcomes from e-tax systems.

Citizens' growing risk perceptions due to frequent cyber-attacks has shattered citizens' confidence in public services. Under these circumstances, we must understand how governments should respond to the needs of citizens. The provision of psychological and financial benefits to citizens may help reduce their risks and lead to enhanced satisfaction and positive attitude toward government e-services. Citizens' PFB from e-tax filing may

overcome their high-risk perceptions and help improve their satisfaction which will result in their continuance intention.

Although Literature provides enough support for the adverse effects of perceived risk on IS adoption yet little consideration to the moderating effects of perceived risk has been paid. The review of extant literature, on e-tax filing, reveals that perceived risk has been considered as a barrier to the e-tax filing behavior (Bhuasiri et al., 2016; Schaupp & Carter, 2010; Veeramootoo et al., 2018). In addition, the literature supports the positive association among PFB, satisfaction, and IS adoption behavior. Furthermore, literature on IS continuance suggests the positive effects of satisfaction on continuance intention (Bhattacherjee, 2001; Venkatesh et al., 2011). However, literature on e-tax filing does not consider users' risk perceptions in these relations. This study argues that the relationships among users' PFB, satisfaction, and continuance intention are subject to users' level of perceived risk. Such relationships may reinforce on low perceived risk and may reduce due to high-risk perception.

Therefore, the effects of PFB on satisfaction/continuance intention may be different for the various levels of risk perceptions. Similarly, satisfaction may result in continuance intention differently at different levels of perceived risk. The following hypotheses have been proposed to explore the moderating effects of perceived risk:

H8a: Compared with high PR, low PR strengthens the relationship between PFB and satisfaction.

H8b: Compared with high PR, low PR strengthens the relationship between PFB and continuance intention.

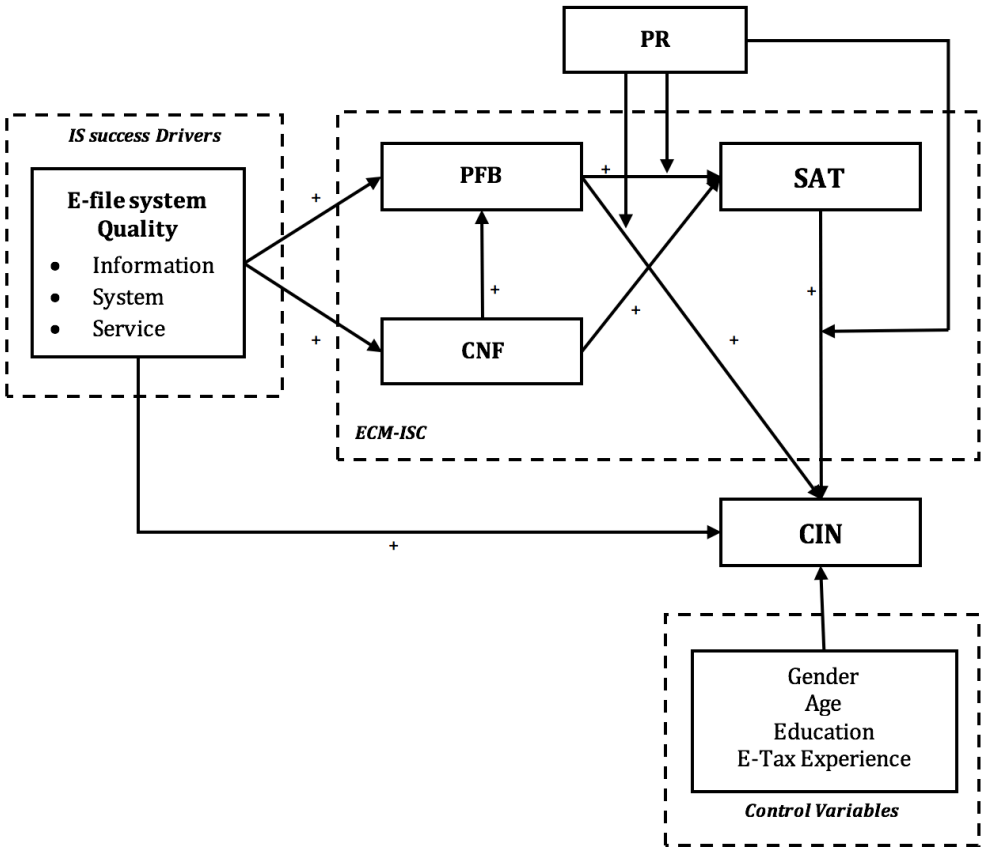
H8c: Compared with high PR, low PR strengthens the relationship between satisfaction and continuance intention.

Control Variables

Recent literature suggests contradictory results related to the impact of demographic characters on e-government usage (Gauld et al., 2010; Stefanovic et al., 2016; Venkatesh et al., 2014). For instance, Stefanovic et al. (2016) did not find any significant impact of gender, age, and income on intention to use. Contrary to this, with data from rural India, Venkatesh et al. (2014) empirically confirmed the impact of demographics, such as gender, education,

and income on e-government portal usage. However, they did not find any significant impact of age on e-government portals. Therefore, this study incorporates citizens' demographics, such as "gender," "age," "education," and "previous experience" in the context of e-tax services, as covariates.

On the basis of the above theoretical background, the conceptual model (Figure 1) showing hypothesized direct and indirect relationships among independent and dependent variables has been proposed. The framework suggests that the quality dimensions of e-government websites positively affect PFB and confirmation of expectation, which in turn affect users' satisfaction that finally leads to the continuance intention of e-tax services. Moreover, individuals' demographics, such as gender, age, education, and past e-tax experience, have been incorporated as control variables.



Note: PFB= Perceived Functional benefit, CNF= Confirmation of expectation, PR= Perceived risk, SAT= Satisfaction, CIN= Continuance Intention

Figure 1: Conceptual Model

Method

Context

To test the conceptual model, the data has been collected, through an online survey, targeted toward Pakistani taxpayers. In Pakistan, e-government services are emerging rapidly. According to the highlights of UN E-Government Survey (United Nations, 2016), Pakistan is grouped under the middle level of E-Government Development Index with an overall rank of 159. The government of Pakistan initiated e-services, in 2002, by establishing an Electronic Government Directorate (EGD). These days almost every public department, in Pakistan, has its website facilitating citizens in availing themselves of various online services. Citizens of Pakistan can apply online for various types of cards, such as National Identity Card (NID), Pakistan Origin Card (POC) and also Family Registration Certificate (FRC) through the online ID issuance system of National Database and Registration Authority (NADRA). They can receive the cards, at their homes, without visiting any government office. Likewise, citizens can also renew or extend the date of validity of their passport through the Directorate General of Immigration and Passports' online portal service from anywhere in the world. Along with these online services, citizens can also file their online tax returns through Federal Board of Revenue (FBR), Pakistan. This study is intended to investigate the e-tax continuance behavior of those Pakistani citizens who have certain experience with these services.

Sample and procedure

A brief introduction to the research was provided at the beginning of a structured questionnaire along with the links to the e-tax website to facilitate the respondents' understanding of the research. The respondents were contacted to participate in the survey during the tax return period. This helped the participants to share their fresh experience rather than imagining a hypothetical situation that they had not experienced. No personal information concerning respondents' identity was collected, and they were ensured that the data would be researched for the academic purposes only; moreover, their responses will remain confidential. At the beginning of the survey, the respondents were asked, whether they already had used the e-tax services and only those responses were considered, in the

analysis, where the response was a 'yes' to this question. The questions were asked using the English language mainly due to three reasons: firstly, to retain the essence of the original scale; secondly, most of the e-government websites including e-tax (the field of this study) are currently available in the English language; thirdly, our respondents are the adopters of these services.

To have a representative sample, quotas for each province were assigned as per population distribution. Subsequently, the respondents were selected from the active taxpayer list available at FBR website (FBR, 2018). These respondents were briefed about the study, by telephone, and those having e-tax filing experience and a willingness to participate in the study were invited to participate in an online survey. Although more than one thousand invitations were sent to the potential respondents yet 582 completed surveys were received. We further eliminated 71 cases with atypical responses such as the responses from the participants who took too much (i.e., more than 15 minutes) or too little time (i.e., less than a minute) to complete the survey. Another 106 cases, having e-tax filing experience less than a year, were removed. The final sample of 409 consisted of 69.9% males and 30.1% females (Table 2).

Table 2: Sample Demographics

Measure	**Item**	**Frequency**	**Percentage**
Gender	Male	286	69.9
	Female	123	30.1
Age	Below 25 years	70	17.1
	25 to 34 years	203	49.6
	35 to 44 years	110	26.9
	45 years and above	26	6.4
Education	College degree and below	143	35.0
	Above college degree	266	65.0
Internet usage	Less than 3 years	29	7.1
	3 to 5 years	51	12.5
	More than 5 years	329	80.4
E-tax experience	1 to 2 years	118	28.9
	2 to 3 years	147	35.9
	More than 3 years	144	35.2
Occupation	Public Sector Employee	124	30.3
	Private Sector Employee	135	33.0
	Personal Business	72	17.6
	Other	78	19.1

N= 409

Majority of the respondents were between the ages of 25 to 34 years and had at least a college degree. All the respondents were regular internet users and a high proportion of the

respondents (i.e., 80.4 %) had internet usage experience of more than five years. E-tax filing experience varied from less than two years (i.e., 28.9%) to more than three years (i.e., 35.2%). The sample consists of 30.3% public employees, 33% private sector employees and 17.6% entrepreneurs.

Measurement

To ensure the content validity of the scale, almost all the items have been adapted from the well-established literature as follows: quality measures from Stefanovic et al. (2016) and Wang & Liao (2008); perceived risk from Carter & Bélanger (2005) and Schaupp et al. (2010); functional benefit from Carter & Bélange (2005); Shareef et al. (2011); Satisfaction, confirmation and continuance intention from (Bhattacherjee, 2001). All the latent constructs, in the survey, were measured using four items each except for confirmation of expectation which was measured by three items (see Appendix-A). These latent variables were measured on a 7-point Likert scale anchored between "strongly disagree" to "strongly agree."

To test the content and face validity of the instrument one focus group, sharing the similar demographics as of the main sample, was conducted. The participants were briefed on this research and consulted to make sure that the questionnaire actually measures the intended constructs in terms of clarity, formatting, relevance and language. Further, we selected 50 respondents from the population for the pre-testing of the instrument. This was followed by debriefing which refers to the discussion on the questions and related problems, with the respondents, after the questionnaire has been completed.

Analysis and Results

In view of our conceptual model, structural equation modeling has been used to evaluate the direct, indirect and interaction effects. In business research, the use of structural equation modeling has become quite prevalent due to its advantages of testing the measurement and the structural models thus allowing the researcher to test the psychometric properties of the scale and causal relationships (Hair, Wolfinbarger, Money, Samouel, & Page, 2011). Covariance-based structural equation modeling (CB-SEM), having no limitation with respect to goodness of model fit measures, is a preferred technique for theory testing and

confirmation as compared to less rigorous partial least squares approach (Kline, 2010). Thus, in this study, we have used CB-SEM for validating the measurement properties and testing the hypothesized relations. In this pursuit, conforming to the two-step for model testing by Anderson and Gerbing (1988), before testing the proposed hypotheses – through structural regression model – psychometric properties of the latent constructs have been assessed through the CB-SEM approach using AMOS 24. One of the assumptions of the covariance-based SEM procedures is multivariate normality. The skewness and kurtosis values for each of the items were analyzed and found to be under the acceptable range of -1 to 1 (Hair et al., 2011; Kline, 2010). However, coefficient of multivariate kurtosis value (Mardia's coefficient) shows a deviation from the normality assumption as its value is 118.843 with a critical ratio of 26.568 which is greater than the suggested value of 1.96 (Byrne, 2016). To address this issue boot-strapping has been employed (Kline, 2010).

Psychometric properties

A confirmatory factor analysis, together with all the latent constructs, was carried out to test the reliability and validity of the scale. An assessment of measurement model's goodness of fit indices indicate an adequate model fit as all the model fit measures ($\chi 2/df = 1.439$; goodness of fit index (GFI) = 0.917; comparative fit index (CFI) = 0.975; Tucker-Lewis index (TLI) = 0.971; root mean square error of approximation (RMSEA) = 0.033; standardized root mean square residual (SRMR) = 0.037) were under the recommended levels (L. Hu & Bentler, 1999).

While assessing the psychometric properties of the instrument, its reliability was assessed in terms of composite reliability (ρ) and internal consistency (α) ; whereas, its validity was assessed by the convergent and the discriminant validity (Fornell & Larcker, 1981; Henseler, Ringle, & Sarstedt, 2015; Nunnally, 1978; Voorhees, Brady, Calantone, & Ramirez, 2016). For the scale validity, α and ρ values were assessed and found to be higher than 0.7 for all the constructs; thereby, establishing the reliability of the scale (Table 3).

The convergent validity can be evaluated through factor loadings and average variance extracted (Fornell & Larcker, 1981). The factor loadings for each item of the eight formative constructs were significant at $p< 0.001$. In addition, the average variance extracted for each latent construct exceeded 0.5; thus, indicated the presence of convergent validity (Table 3).

Generally in business and psychology research, Fornell and Larcker's (1981) criteria was used for testing discriminant validity. However, recently Henseler, Ringle, & Sarstedt (2015) reasoned that the Heterotrait-monotrait (HTMT) ratios should be preferred as they prove better measure of discriminant validly as compared to the traditional Fornell and Larcker's (1981) criteria. Voorhees, Brady, Calantone, & Ramirez (2016), proposed new guidelines for discriminant validity. They suggested that, for rigorous discriminant validity assessment, both Fornell and Larcker's (1981) (AVE>Shared variance) and Henseler et al.'s (2015) HTMT criteria (HTMT> 0.85) should be used simultaneously. Examination of HTMT values (Table 3) suggested that all the latent constructs in the measurement model were adequately discriminated as the HTMT values for each of the latent construct was below 0.85 (Henseler et al., 2015; Voorhees et al., 2016). Moreover, the evidence for discriminant validity was also established via Fornell and Larcker's (1981) criteria as the square root of AVE for each latent construct was higher than the inter-construct correlations (Table 3).

Table 3: Scale reliability and validity

α	CR	AVE	Constructs	INQ	SYQ	SEQ	PFB	SAT	CNF	PR	CIN
0.867	0.867	0.619	Information Quality (INQ)	**0.787**	0.593	0.640	0.598	0.434	0.574	0.161	0.541
0.849	0.850	0.587	System Quality (SYQ)	0.593	**0.766**	0.645	0.554	0.508	0.555	0.211	0.572
0.822	0.822	0.537	Service Quality (SEQ)	0.634	0.644	**0.733**	0.612	0.475	0.577	0.143	0.567
0.893	0.897	0.686	Perceived Functional Benefit (PFB)	0.607	0.559	0.611	**0.828**	0.675	0.701	0.249	0.774
0.847	0.848	0.583	Satisfaction (SAT)	0.430	0.509	0.472	0.680	**0.764**	0.633	0.462	0.751
0.813	0.815	0.595	Confirmation (CNF)	0.571	0.556	0.572	0.698	**0.626**	**0.771**	0.234	0.628
0.809	0.809	0.516	Perceived Risk (PR)	-0.164	-0.214	-0.137	-0.254	-0.471	-0.239	**0.718**	0.358
0.890	0.891	0.672	Continuance Intention (CIN)	0.545	0.564	0.565	0.778	0.747	0.622	-0.371	**0.820**

Note: Values in the diagonal are the square root of average variance extracted (AVE), below the diagonal are inter-construct correlations and above the diagonal are Heterotrait-Monotrait ratio (HTMT) of correlation, HTMT values have been calculated from SmartPLS 3.2, α=Cronbach's Alpha, CR = Composite Reliability

Common method variance

There is a consensus, in behavioral research, on the possible issue of common method variance (CMV) which is the "variance that is attributable to the measurement method rather than to the constructs the measures represent" (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003, P. 879). Cross-sectional data collected from a single source for the causes and outcome

variables – as is the case in this study – may probably lead to a common method bias which may result in inflated or deflated results (Podsakoff et al., 2003). There may be varied and complicated causes leading to CMV in survey design, thus there is no direct solution to fully address CMV issue (Guide & Ketokivi, 2015; Podsakoff et al., 2003). To minimize the CMV, Guide and Ketokivi (2015) suggested this issue must be addressed right from the research design phase. Thus, to control CMV, multiple procedural and statistical remedies were applied. First, we used established scales, with high reliability measures, for each latent construct. Second, to avoid respondents' identity concerns and possible socially desirable response, the instrument did not include any items revealing respondent's identity. Moreover, respondents were assured of the anonymity of their responses. Third, Harman's single factor procedure has been used to see if a single factor explains the majority of variance (Podsakoff et al., 2003). An un-rotated factor solution with all the items in the study resulted in eight components explaining 68.539% cumulative variance with eigenvalues greater than 1. However, the first component explained only 37.447% of variance which is significantly below the recommended criteria of 50% (Podsakoff et al., 2003). Fourth, a confirmatory factor analysis was carried out by loading all the items to a single common factor. The results of single factor model measures (χ2/df=6.530; GFI=0.612; AGFI= 0.557; CFI= 0.657; TLI=0.633; RMSEA= 0.116; Standardized RMR = 0.096) were much worse than the measurement model with eight latent constructs, indicating that a common factor is not a serious threat.

Model testing

After testing the psychometric properties of the scale, the structural model was used to assess direct, indirect and interaction effects in the conceptual model. We used the bootstrap procedure with maximum likelihood to calculate bias-corrected confidence intervals through AMOS 24. The assessment of the structural model fit resulted in χ^2 value of 912.142 with 626 degrees of freedom. The normed χ^2 was 1.457 which was quite below the recommended values of 3.0 (Hu & Bentler, 1999). Other fit indices also adequately fulfilled the recommended criteria as the values of GFI = 0.899, CFI = 0.962, TLI = 0.957, RMSEA = 0.033 and Standardized RMR = 0.061 were all within the range for an acceptable model fit (Hu & Bentler, 1999).

Table 4 summarizes the standardized estimates for each direct effect in the structural model along with standard errors, bootstrap confidence intervals and two-tailed p-values. Majority of the proposed relationships are significantly supported. All the website quality dimensions have a significant positive effect on confirmation of expectation and PFB except for the effect of system quality on PFB. However, direct effects of quality dimensions on continuance intention are not significant.

Table 4: Structural model results (direct Effects)

Relationship	Std. Estimate	SE	Bootstrap Confidence intervals		P-values
			Lower	Upper	
INQ → CNF	0.267	0.082	0.133	0.404	0.001
SYQ→CNF	0.246	0.085	0.099	0.375	0.006
SEQ→CNF	0.246	0.084	0.116	0.393	0.003
INQ→PFB	0.188	0.076	0.064	0.311	0.018
SYQ→PFB	0.088	0.086	-0.051	0.230	0.310
SEQ→PFB	0.187	0.080	0.058	0.317	0.017
CNF→PFB	0.433	0.070	0.315	0.544	0.001
CNF→SAT	0.290	0.083	0.146	0.420	0.001
PFB→SAT	0.464	0.082	0.331	0.596	0.001
PR→SAT	-0.230	0.049	-0.317	-0.155	0.001
PFB→CIN	0.438	0.075	0.308	0.556	0.001
SAT→CIN	0.275	0.065	0.171	0.385	0.001
PR→CIN	-0.200	0.040	-0.269	-0.135	0.001
INQ→CIN	0.054	0.061	-0.047	0.154	0.348
SYQ→CIN	0.081	0.064	-0.023	0.188	0.206
SEQ→CIN	0.068	0.075	-0.052	0.197	0.321
Gender→CIN	0.042	0.037	-0.020	0.102	0.273
Education→CIN	-0.006	0.037	-0.067	0.055	0.859
Age1→CIN	0.071	0.045	-0.002	0.145	0.106
Age2→CIN	0.046	0.046	-0.024	0.122	0.287
Age2→CIN	-0.005	0.041	-0.079	0.061	0.850
Exp1→CIN	0.090	0.042	0.023	0.162	0.032
Exp2→CIN	0.071	0.045	-0.001	0.149	0.108

Note:

- *INQ = Information Quality, SYQ= System Quality, SEQ= Service Quality, CNF= Confirmation of Expectation, PFB= Perceived Functional Benefit, PR= Perceived Risk, SAT= Satisfaction, CIN= Continuance Intention, P-values are two-tailed significance*
- *Control variables are dummy coded, Gender =[Male=1, Female=0], Education= [Colle and below=0, Above college =1], Age 1= [25 to 34 years = 1, Otherwise = 0], Age 2=[35 to 44 years=0, Otherwise =0], Age 3= [45 years and above=1, Otherwise =0], Exp 1= [2 to 3 years=1, Otherwise=0], Exp 2= [More than 3 years =1, Otherwise= 0]*

Mediating effects

Hypothesis 7 posits the direct and indirect effects of e-tax website quality dimensions (i.e., information, system, and service) on continuance intention through confirmation of expectation, PFB and satisfaction. Direct effects of the quality dimensions on continuance intention information are presented in Table 4 and Table 5 provides total indirect effects along with standard errors, bootstrap confidence intervals and p-values. All the direct effects are not significant while the total indirect effects are significant this shows that the relationship between quality dimensions and continuance intention is fully mediated by the intervening variables i.e., confirmation of expectations, PFB, satisfaction. Specific indirect effects were also calculated to further explore the effects of quality dimensions on continuance intention though each indirect path (see Appendix B).

Table 5: Total indirect effects

Indirect effect	Estimates	SE	Bootstrap Confidence intervals		P-values
			Lower	Upper	
INQ → CIN	0.193 (0.214)	0.052 (0.061)	0.114 (0.122)	0.285 (0.325)	0.001 (0.001)
SYQ → CIN	0.129 (0.144)	0.049 (0.056)	0.049 (0.055)	0.212 (0.245)	0.010 (0.009)
SEQ → CIN	0.186 (0.213)	0.054 (0.067)	0.104 (0.113)	0.286 (0.338)	0.001 (0.001)

Note:

- *INQ = Information Quality, SYQ= System Quality, SEQ= Service Quality, CIN= Continuance Intention*
- *Values in the parentheses are the unstandardized, SE= Standard error, P-values are two-tailed*

Moderating effects

In Hypothesis H8a,b,c, it was hypothesized that perceived risk moderate the pathways among functional benefit and satisfaction; functional benefit and continuance intention; and satisfaction and continuance intention. To estimate such moderated mediation effects, we used Process macro for SPSS (Model 59) which allows measurement of such moderated mediation effects and is less affected by the sample size (Hayes, 2013). Control variables were also included as covariates in the estimation. The results of the procedure (Table 6) indicate that PFB significantly effects Satisfaction ($b=0.537$, $p<0.0001$) and this effect is moderated by Perceived Risk ($b=-0.181$, $p<0.001$). Similarly, PFB significantly effects Continuance Intention ($b=0.482$, $p<0.0001$) and this effect is moderated by Perceived Risk ($b=-0.125$, $p<0.01$). However, the moderating effect of Perceived Risk on the relationship

between Satisfaction and continuance Intention is not significant. Figure 2 to 4, further illustrate the moderating effects of Perceived Risk.

Table 6: Moderating effect of Perceived Risk

Predictors	Outcome (SAT)					Outcome (CIN)				
	b	*se*	*t*	*LLCI*	*ULCI*	*b*	*se*	*t*	*LLCI*	*ULCI*
Constant	-0.268**	0.124	-2.161	-0.512	-0.024	-0.241*	0.106	-2.270	-0.451	-0.032
Gender	0.021	0.081	0.264	-0.138	0.181	0.071	0.069	1.027	-0.065	0.207
Edu	0.115	0.078	1.479	-0.038	0.268	0.016	0.067	0.236	-0.115	0.146
Age1	0.257**	0.101	2.533	0.058	0.456	0.052	0.087	0.591	-0.120	0.223
Age2	0.211	0.112	1.883	-0.009	0.430	0.020	0.096	0.204	-0.169	0.208
Age3	0.187	0.184	1.018	-0.174	0.548	-0.196	0.157	-1.243	-0.505	0.114
Exp1	-0.065	0.092	-0.704	-0.246	0.116	0.178*	0.079	2.264	0.023	0.333
Exp2	-0.087	0.094	-0.922	-0.271	0.098	0.131	0.080	1.627	-0.027	0.288
PFB	0.537***	0.038	14.003	0.462	0.613	0.482***	0.041	11.655	0.401	0.564
PR	-0.282***	0.038	-7.384	-0.357	-0.207	-0.095*	0.035	-2.714	-0.163	-0.026
SAT						0.287***	0.043	6.686	0.203	0.371
PFB*PR	-0.181***	0.034	-5.367	-0.247	-0.114	-0.125**	0.041	-3.080	-0.206	-0.045
SAT*PR						-0.063	0.042	-1.481	-0.146	0.021
R^2	0.471					0.617				
F	35.44***					53.157***				

Note:
- *PFB= Perceived Functional Benefit, PR= Perceived Risk, SAT= Satisfaction, CIN= Continuance Intention*
- *Control variables Age, Gender, Education and E-Tax Exparience are dummy coded*
- **p<0.05, **p<0.01, ***p<0.001*

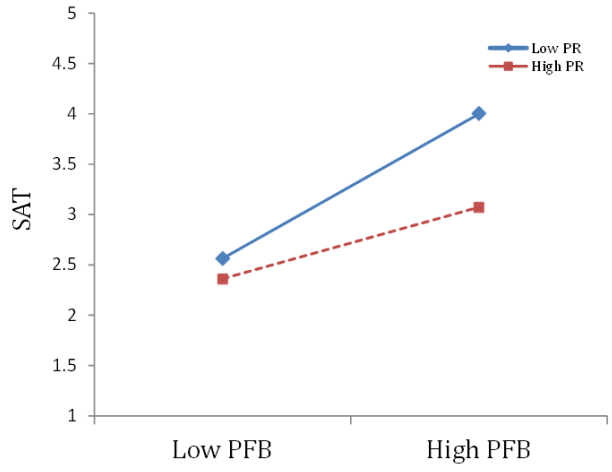


Figure 2: Moderating effect of PR on the relationship between PFB and SAT

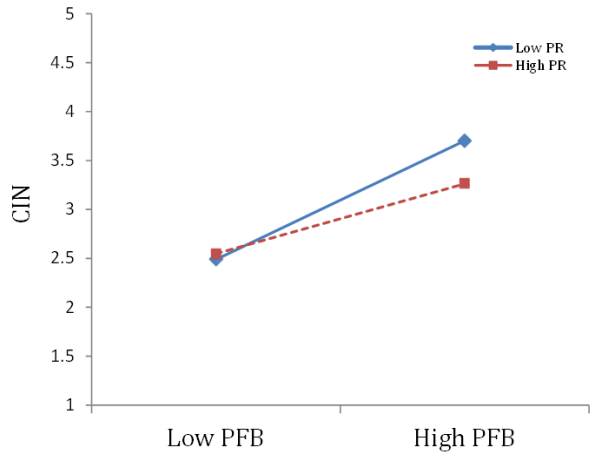


Figure 3: Moderating effect of PR on the relationship between PFB and CIN

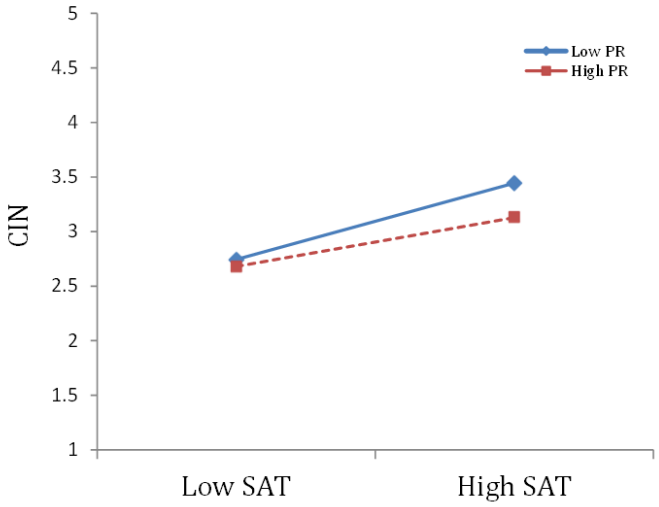


Figure 4: Moderating effect of PR on the relationship between PFB and SAT

Discussion

On the basis of the literature on IS success (Delone & McLean, 2003) and IS continuance (Bhattacherjee, 2001), this research presents a comprehensive model of citizens' e-tax continuance in an emerging economy, such that these services are at the initial phase of their development. In this model, we propose that IS success drivers, such as quality of e-tax

websites, influences citizens' continuance intention for e-tax filing directly and indirectly through confirmation of expectation, PFB, and satisfaction.

The results have been drawn with the help of covariance-based structural equation modeling which provides significant support for the proposed conceptual model. The overall variance explained (R2 = 68%) for the continuance intention shows the high explanatory power of the proposed model. H1 positing the positive effect of users' satisfaction on their e-tax filing continuance intention is accepted as ($\beta = 0.275$, $p < 0.001$). This finding substantiates the literature on users' satisfaction and continuance intention relation, in general (Bhattacherjee, 2001; Hsu & Chiu, 2004) and in e-tax filing ,in particular (Teo et al., 2008; Veeramootoo et al., 2018). The confirmation of users' satisfaction and continuance intention relationship, in e-tax filing context ,reaffirms the robustness of this association (Valaei & Baroto, 2017; Venkatesh et al., 2011).

Results provide a strong support for H2 and H3 that suggest that PFB from e-tax filing is positively associated with satisfaction with e-tax filing ($\beta = 0.464$, $p < 0.001$) and continuance usage intention ($\beta = 0.338$, $p < 0.001$). These strong positive effects show that e-tax filing is useful and beneficial to taxpayers. Relative benefits that citizens perceive include convenience/accessibility while reducing waiting time and leading to quick response. Our results are consistent with the literature showing that citizens may adopt e-tax services perceiving that such services can provide them with relative advantages as compared with traditional governments (Carter & Bélanger, 2005; Gilbert et al., 2004). Shareef et al. (2011), in their study conducted in Canada, also affirmed PFB as a significant driver of e-government adoption.

H4 proposes a positive relationship between citizens' confirmation of expectation from e-tax systems and their PFB, thereby accepting that the former significantly affects the latter ($\beta = 0.433$, $p < 0.001$). This benefit has been derived from perceived usefulness and relative advantage (Shareef et al., 2011), and ECM-ISC literature (Bhattacherjee, 2001; Venkatesh et al., 2011) confirms the perceived positive effect of confirmation of expectation on perceived usefulness. Therefore, this finding is in line with the literature on e-tax filing (Thominathan Santhanamery & Ramayah, 2014).

H5 postulates a relationship between confirmation of expectation and satisfaction with e-tax systems. Findings support this hypothesis as confirmation of expectation significantly affects satisfaction ($\beta = 0.290$, $p < 0.001$). This result is consistent with the findings of ECM-ISC in various contexts (Bhattacherjee, 2001; Thominathan Santhanamery & Ramayah, 2014; Veeramootoo et al., 2018; Venkatesh et al., 2011). H4 and H5 indicate the significance of confirmation of expectation in developing users' PFB and satisfaction, which are essential antecedents of e-tax filing continuance.

In H6, the perceived quality of e-tax website dimensions (i.e., information, system, and service) are suggested to positively influence (a) PFB and (b) confirmation of expectation. Information quality has significant positive effects on PFB ($\beta = 0.188$, $p < 0.01$) and confirmation of expectation ($\beta = 0.267$, $p < 0.01$). Moreover, service quality has significant positive effects on PFB ($\beta = 0.187$, $p < 0.01$) and confirmation of expectation ($\beta = 0.246$, $p < 0.01$). However, the effect of system quality is significant only on the confirmation of expectation ($\beta = 0.246$, $p < 0.01$), not on PFB ($\beta = 0.088$, $p = 0.310$). The study finds significant support for the proposed mediating role of confirmation of expectation, PFB, and satisfaction on the relationship between e-tax websites' perceived quality dimensions and continuance intention. The direct effects of information ($\beta = 0.054$, $p = 0.348$), system ($\beta = 0.081$, $p = 0.206$), and service ($\beta = 0.068$, $p = 0.321$) quality on continuance intention are insignificant. Results related to these direct effects of information, system, and service quality on continuance intention should be interpreted with caution as these insignificant values are due to mediating variables. In the absence of these mediating variables, the relationship between quality constructs and e-tax filing continuance are significant. Nevertheless, the total indirect effects of information ($\beta = 0.193$, $p < 0.01$), system ($\beta = 0.129$, $p < 0.01$), and service ($\beta = 0.186$, $p < 0.01$) quality on continuance intention are significant. Direct effects of e-tax websites' quality dimension on continuance intention are insignificant; whereas, indirect effects are significant. Thus, the relationship between the dimensions of e-tax websites and continuance intention are fully mediated by intervening variables. Consequently, H7 is supported. These empirical results confirm that, while e-government website characteristics, such as information, system, and service quality play an important role in forming citizens' future usage intention, understanding the role of key

intervening variables, such as confirmation of expectation, functional benefit, and satisfaction is necessary. These results are broadly consistent with the literature on IS success (Lee & Chung, 2009; Stefanovic et al., 2016; Teo et al., 2008; Veeramootoo et al., 2018).

Perceived risk has a significant moderating effect on the relationship between PFB and satisfaction [β = -0.181, p < 0.001]. The negative estimate indicates that the relationship between PFB and satisfaction strengthens with the decrease in the extent of perceived risk. Consequently, compared with high perceived risk, low perceived risk strengthens the relationship between PFB and satisfaction, thereby supporting H8a. Moreover, the interaction effect of perceived risk on the relationship between PFB and continuance intention is also significant [β = -0.125**, p < 0.01]. Therefore, compared with high perceived risk, low perceived risk strengthens the relationship between PFB and continuance intention, lending support to H8b. Finally, the interaction effect of perceived risk on the relationship between satisfaction on continuance intention is not significant [β = -0.063, p < 0.10]. Though perceived risk doesn't have a significant effect on the relationship between satisfaction and continuance intention; nonetheless, the role of perceived risk is relevant in determining citizens' future usage intention for e-tax services. Extant literature has considered perceived risk as an antecedent of intention to e-tax filing (Hsu & Chiu, 2004; Hung et al., 2006; Schaupp et al., 2010; Veeramootoo et al., 2018). No empirical evidence is available regarding the role of perceived risk on relationships among functional benefit, satisfaction, and continuance intention. This study contributes to the literature on e-tax filing continuance by providing an empirical evidence for the role of perceived risk as a moderating variable on relationships among functional benefit, satisfaction, and continuance intention.

The results show statistically insignificant association between any of the control variables and continuance intention except for the e-tax experience between 2 to 3 years. The insignificant effects of gender and age contradict with the previous literature (Santhanamery & Ramayah, 2015) that suggests the significant effects of these variables on e-tax filing continuance. However, these results are consistent with Stefanovic et al. (2016) who did not find any significant effect of age and gender on intention to use e-government services.

Theoretical Implications

From theoretical perspective, this research makes significant contributions by enhancing our current understanding of IS continuous intention to e-tax filing. Online tax filing is mostly assessed from acceptance and adoption perspective. However, adoption and continuance intention, as distinct behavioral concepts, cannot be measured using the same theoretical foundation (Bhattacherjee, 2001). Therefore, instead of employing classical theories of technology adoption, such as TAM, TPB, and UTAUT, this study builds on technical and behavioral aspects of e-tax filing continuance to make a compelling theoretical argument and proposes a comprehensive framework. To incorporate the technical and behavioral aspects of continuance intention, this study builds on ECM-ISC and IS success model. In addition, the study contributes to the literature on IS continuance by adding PFB as a mediating, perceived risk as a moderating, and users' demographics as control variables.

E-tax filing research has focused on the trusting anatomy for e-tax filing system. The authors do believe that trust has the fundamental impact on e-government service adoption and continuance. However, the dynamics of trust are broader, ambiguous and time-consuming. Based on the verdicts of past studies, the authors have opted for an alternative and more user-centric constructs, such as PFB, confirmation, satisfaction and risk to better portray the acceptance of e-tax filing system.

The literature on e-tax filing has generally considered quality variables as the direct predictors of continuance behavior (Nabavi et al., 2016; Veeramootoo et al., 2018). This research extends, such a finding, by exploring the direct and indirect effects of quality constructs. In the literature on e-tax filing, perceived risk has been studied as a barrier to its adoption (Schaupp et al., 2010). This study makes another notable contribution by assessing the effects of high or low perceived risk conditions on relationships among functional benefit, satisfaction, and continuance intention. Results reveal that low-risk condition results in strengthened relationships between PFB and satisfaction as well as between PFB and continuance intention.

The three quality constructs from the IS success model enhance the confirmation among taxpayers, allowing them to extract the desired functional benefit and satisfaction. The empirical results, laid in this study, prove that the relationships among system quality,

confirmation, PFB, and satisfaction strengthen our intuition of using ECM-ISC in connection with the IS success model as the theoretical basis for measuring continuous intention for e-tax filing services. The explained variance *(R^2 = 68%)* of continuous intention suggests that ECM-ISC and IS success models may be used together in the future to extract convincing results for measuring e-government continuance usage.

Practical Implications

Governments' responsibility does not end with only providing infrastructures. They must understand the diverse needs of taxpayers, who may be having technological or psychological issues in the use of such services. Governments spend much financial and human resources to setup e-tax services. However, these investments do not guarantee the success of such services because of the heterogeneous nature of e-tax users and their various preferences. The benefits extracted from such the e-tax filing system are not unidirectional as governments are also the beneficiaries of these systems due to their efficient revenue collection (Veeramootoo et al., 2018).

The results of this study will be beneficial to the policymakers as, based on these findings, they can develop strategies to better improve e-filing services which will result in enhanced citizens continues usage intention. Results suggest that to understand citizen's continuance intention for e-services, e-government policymakers must focus not only on technical characteristics, such as website quality but also on citizens' psychological characteristics, such as their confirmation of expectation, satisfaction, PFB, and perceived risk.

Results affirm that website quality plays a significant role in users' decision about continuous usage. Thus, policymakers must focus on this aspect of e-tax filing websites (Floropoulos et al., 2010). Specifically, they must improve the quality of the systems, information, and services that they offer through such channels. In addition, high-quality e-tax websites in terms of information, content, feedback, security, and privacy may result in conformity of users' expectation; thereby, increasing their PFB and satisfaction, which subsequently results in continuance intention.

Generally, user's decisions are influenced by perceived benefits and the results indicate that PFB is a major predictor of continuance for e-tax filing. So, policymakers need to effectively communicate the functional benefits of using e-tax filing system. Policymakers should

strategize the formulation of e-tax filing system to elucidate its benefits to users. Abolishing technical glitches and complexities allows e-governments to create motivation among taxpayers in extracting functional benefits, which are significant drivers of continuous intention for the e-tax filers. As PFB is linked to the understanding of facilitation to the e-taxpayers, the policymakers should devise e-tax filing systems which are quick and responsive. To augment the efficiency of e-tax filing system and its continuous usage, government can facilitate taxpayers by providing user's manuals, online help desks and 24 hours assistance.

Moreover, we must not forget perceived risk, which stays as a never-ending feeling in the behavioral intent of users unless addressed appropriately (Schaupp & Carter, 2010). High-risk perceptions weaken relationships among PFB, satisfaction, and continuance intention but users' decisions are generally based on the perceived gains rather than losses (Kahneman & Tversky, 1979). Therefore, governments must highlight the potential benefits of online channels to mitigate risk perceptions. In addition, policymakers must take initiatives to reduce users' concerns by updating e-tax filing systems' security and assuring users the privacy and security of their personal information. Moreover, policymakers may offer incentives to online tax filers, such as tax rebates upon changes in tax policies.

In areas where internet facilities are not adequate, government may develop regional centers where taxpayers may access e-filing systems. Government may also install internet enabled kiosks to access various e-tax services at public places. As e-tax paying systems are multifaceted, personal on-site assistance should be provided by the tax collection departments to assist smooth transactions. Furthermore, educating users through seminars and webinars on the usage of e-tax systems should be often exercised. Through training and online tutorials, the policymakers can intensify the e-tax filing usage among taxpayers. Not only the use of such system will be extended but also the knowledge and skills of taxpayers will be enhanced. Moreover, appropriate marketing of online channel would attract taxpayers for using e-tax filing system.

Lastly, user-friendly and technology-enabled e-tax filing services can create an environment to match users' expectations, wherein they can benefit from government e-tax services. The level of service to taxpayers can be improved by providing up-to-date information, on web

portals, about tax services, documentation, and new government policies. The facility of e-services through government web-portals is an innovative process that needs continuous improvement. The smart use of ICTs may permit governments to maximize their capabilities and offer quality services to the taxpayers.

Conclusion

E-tax filing is a potential research area in academics as it has a direct impact on countries' economy, which subsequently affects various institutions directly linked with the public. The study contributes to the literature on e-tax filing by providing a theoretical underpinning and an empirical evidence for e-tax filing continuance intention in an emerging economy context. Most research on e-tax filing has focused on initial adoption, and this study extends the previous research by providing a compelling understanding of continuous usage behavior. The study provides an extended framework of e-tax filing continuance by incorporating behavioral constructs from ECM-ISC and technological constructs from the IS success model combined with PFB and perceived risk. The empirical results confirm the combination of ESC-ISC, and D&M IS success model provides an adequate foundation for studying IS success and continuance such as e-tax filing.

Limitations and Future Research

The research discusses an important issue of e-tax filing continuance intention in the context of an emerging economy, but certain limitations exist. These limitations should be considered before making conclusions based on the findings. First, this study does not assess users' actual e-tax filing behavior but has developed a theoretical framework for measuring e-tax filing continuance intention. Users' actual e-tax filing behavior may not necessarily result from continuance behavior (Dwivedi et al., 2017; Veeramootoo et al., 2018). Second, this research has included quality constructs from the IS success model and behavioral constructs from ECM-ISC, but other important variables such as, habit, trust, self-efficacy, and social influence may influence continuance intention. Future research can incorporate such constructs to further extend this model and offer robust findings. Third, although ex-ante and ex-post efforts are made to avoid CMV yet self-reported measures in a cross-sectional design may be subject to CMV and may result in inflated relationships. Fourth, the

rapid environmental changes with respect to technology may have a favorable impact on users' attitude toward e-tax filing. Thus, a longitudinal study may provide good insights into variations in consumers' attitude over the period. Fifth, e-tax filing behavior may vary across different platforms, such as personal computers and portable devices as well as mobile applications. Future research may test the proposed model across different platforms and compare its validity through mobile applications versus websites. Sixth, the surveys have been carried out in English language because most government websites, in the field of study, are offered in English; moreover, the purpose was to retain the essence of the original scales. However, this may have caused comprehension problems to certain respondents. Finally, future research can also explore the role of social media, such as social networks, blogs, discussion forums, and wikis on users' continuance intention of e-tax filing. This impact may vary among various age groups and help policymakers design e-tax services catering to the needs of users from different age groups.

Appendix-A: Latent constructs' measures

Constructs with items	Loadings
Information Quality adapted from Stefanovic et al., (2016) and Wang & Liao (2008)	
• E-tax filing system provides accurate information.	0.799
• E-tax filing system provides clear information.	0.847
• E-tax filing system provides relevant information.	0.754
• E-tax filing system provides up-to-date information.	0.743
System Quality adapted from Stefanovic et al., (2016) and Wang & Liao (2008)	
• It is convenient (easy to use) to access e-tax filing system.	0.800
• E-tax filing system is reliable.	0.756
• E-tax filing system is flexible (user-friendly).	0.790
• E-tax filing system allows information to be readily accessible to me.	0.715
Service Quality adapted from Stefanovic et al., (2016) and Wang & Liao (2008)	
• E-tax filing system is always ready to help.	0.733
• E-tax filing system is available at all times.	0.750
• E-tax system gives you individual attention.	0.748
• Transactions within the e-tax filing system are secure and protect privacy.	0.698
Confirmation adapted from Bhattacherjee (2001)	
• My experience with using e-tax filing system was better than what I expected.	0.777
• The service level provided by e-tax filing was better than what I expected.	0.799
• Overall, most of my expectations from using e-tax filing were confirmed.	0.736
Functional Benefit adapted from Carter & Bélanger (2005) and Shareef et al., (2011)	
• Using e-tax filing website enhances overall efficiency.	0.738

Constructs with items	Loadings
• Using e-tax filing website makes it easier to perform tasks.	0.854
• Using e-tax filing website improves the quality of decision-making.	0.854
• It does not take too much time to seek service from the e-tax filing website, as compared to traditional government service.	0.860
Satisfaction adapted from Bhattacherjee (2001)	
How do you feel about your overall experience of using the e-tax filing?	
• Very dissatisfied . . . Very satisfied	0.750
• Very displeased . . . Very pleased	0.792
• Very frustrated . . . Very contented	0.756
• Absolutely terrible . . . Absolutely delighted	0.756
Perceived Risk adapted from Carter & Bélanger (2005) and Schaupp et al., (2010)	
• I will feel uneasy psychologically if I use the internet to file my tax filing.	0.667
• Use of e-tax filing system may cause my personal information to be stolen.	0.698
• I think it would be unsafe to use e-tax filing methods because of the privacy and security concerns.	0.781
• I believe that there could be negative consequences by using an e-tax filing system.	0.722
Continuance Intention adapted from Bhattacherjee (2001)	
• I intend to continue using the e-tax filing in future.	0.856
• I intend to continue using e-tax filing rather than using any alternative means.	0.834
• I will continue using the e-tax filing in future.	0.817
• I will continue using the e-tax filing for my income tax returns.	0.770

Appendix-B: Specific indirect effects

Path	Estimate	SE	Bootstrap Confidence intervals		P-values
			Lower	Upper	
INQ→CNF→PFB	0.134	0.050	0.064	0.227	0.001
INQ→CNF→PFB→SAT	0.051	0.023	0.023	0.100	0.001
INQ→CNF→PFB→SAT→CIN	0.016	0.009	0.007	0.040	0.000
INQ→CNF→PFB→CIN	0.056	0.023	0.026	0.104	0.001
INQ→CNF→SAT	0.074	0.030	0.034	0.136	0.000
INQ→CNF→SAT→CIN	0.024	0.012	0.011	0.054	0.000
INQ→PFB→SAT	0.084	0.035	0.034	0.144	0.012
INQ→PFB→SAT→CIN	0.027	0.013	0.010	0.054	0.007
INQ→PFB→CIN	0.091	0.042	0.030	0.167	0.017
SYQ→CNF→PFB	0.124	0.050	0.053	0.214	0.004
SYQ→CNF→PFB→SAT	0.048	0.020	0.021	0.087	0.002
SYQ→CNF→PFB→SAT→CIN	0.015	0.007	0.007	0.033	0.001
SYQ→CNF→PFB→CIN	0.052	0.023	0.023	0.099	0.003
SYQ→CNF→SAT	0.069	0.036	0.022	0.139	0.003
SYQ→CNF→SAT→CIN	0.022	0.012	0.007	0.050	0.002
SYQ→PFB→SAT	0.039	0.041	-0.016	0.121	0.255
SYQ→PFB→SAT→CIN	0.012	0.014	-0.005	0.041	0.242
SYQ→PFB→CIN	0.043	0.043	-0.019	0.125	0.252
SEQ→CNF→PFB	0.128	0.052	0.058	0.230	0.002
SEQ→CNF→PFB→SAT	0.049	0.022	0.022	0.096	0.001
SEQ→CNF→PFB→SAT→CIN	0.016	0.008	0.007	0.036	0.001
SEQ→CNF→PFB→CIN	0.054	0.024	0.025	0.107	0.002
SEQ→CNF→SAT	0.071	0.033	0.031	0.143	0.002
SEQ→ CNF →SAT→CIN	0.023	0.012	0.010	0.054	0.001
SEQ→ PFB→SAT	0.087	0.043	0.024	0.165	0.015
SEQ→PFB→SAT→CIN	0.027	0.015	0.009	0.061	0.008
SEQ→PFB→CIN	0.094	0.048	0.027	0.181	0.015

Note:

– *INQ = Information Quality, SYQ= System Quality, SEQ= Service Quality, CNF= Confirmation of Expectation, PFB= Perceived Functional Benefit, PR= Perceived Risk, SAT= Satisfaction, CIN= Continuance Intention, P-values are two-tailed significance, , SE= Standard error*

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