5-15-2012

DEVELOPMENT AND VALIDATION OF AN INSTRUMENT TO MEASURE THE SERVICE-CHANNEL FIT OF ELECTRONIC BANKING SERVICES

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Abstract

Electronically mediated self-service technologies in the banking industry have impacted the way banks service consumers. Despite a large body of research on electronic banking channels, no study has been undertaken to empirically explore the fit between electronic banking channels and banking services. Therefore, we developed and validated a service-channel fit conceptualization and an associated survey instrument. We initially investigated industry experts' perceptions towards the concept of 'service-channel fit' (SCF). The findings demonstrated that the concept was highly valued by bank managers. Next, we developed a parallel survey instrument to measure the perceived service-channel fit of electronic banking channels. The instrument was developed using expert rounds and two pretest evaluations. Central to the scale development was the measurement of the SCF construct. Drawing on IS strategy and alignment literature, we created a parallel instrument allowing us to calculate the SCF across three unique service-channel fit dimensions, including service complexity, service importance and service routine. To test the research model, data were collected from 340 consumers in New Zealand using Internet banking applications for two different banking tasks. The results have important theoretical and practical implications for how clients should be serviced through electronically mediated electronic banking channels.

Keywords: Electronic banking, Technology Adoption, Technology Acceptance, Survey Research.

1 Introduction

Since the early 1970s, the proliferation of new information and communication technologies within the financial industry has significantly influenced the way banks service consumers. In particular, self-service technologies have enabled banks to pursue an electronically mediated multi-channel strategy and nowadays ATMs, telephone banking, Internet banking, and mobile banking are all efficient means for selling products and servicing customers. For the consumer, these electronic banking channels eliminate the need to visit a branch, and offer convenient access to bank accounts. Banks also benefit from self-service technologies as they can cut costs incurred by the traditional branch network. However, usage rates suggest that banks are missing out on the opportunity to move even more customers to self-service technologies. For example, each month, 73% of all European banking customers use ATM machines, although only 24% use Internet banking services (DB Research 2009). Similarly, although most North American and Australasian retail banks offer phone banking and mobile banking services, only 5-10% of all consumers have used them (Forrester Research 2010). Moreover, consumers favor specific electronically mediated self-service technologies for specific banking service activities. For instance, Internet banking is often used for simple service activities (e.g., domestic transactions) as well as more complicated products categories, such as international payments, credit card applications and financial loans (DB Research 2009; Forrester Research 2010). In contrast, complex financial transactions are seen to be difficult to perform on mobile phones due to their hardware limitations, such as small screens and clumsy input mechanisms (Venkatesh and Ramesh 2006). Consequently, consumers tend to use mobile devices for simple banking transactions in situations where they need instant access to their accounts and other banking channels are not in reach (e.g., checking their account balance before purchasing goods at a point of sale).

These varying usage patterns indicate that each self-service technology has inherent capabilities that align with certain types of banking services – and clash with others. This suggests the notion of a "fit" between a given self-service technology and specific banking services. Furthermore, it seems reasonable to assume that the better the "fit" between channel and banking services, the higher will be consumers attitudes towards electronic banking channel and the more useful they will find it. Despite a substantial body of knowledge on electronic banking services to date, there has been little research investigating the fit between electronic banking channels and banking services. There been also been little research into how the service-channel fit (SCF) impacts a consumer's attitude towards a specific electronic banking channel and their usefulness perceptions.

To address this gap, we conceptualize the service-channel fit construct and develop and validate a survey instrument. The research findings should interest both academics and practitioners as they shed light on an important conceptual issue that also has significant practical value for banks and other financial institutions. Specifically, the current study pursues two major goals. First, we aim to conceptualize the service-channel fit construct and develop scales to effectively measure the perceived fit between banking tasks and electronic banking channels. Second, we empirically validate the scales and examine the nomological network of the service-channel fit construct.

2 Theoretical Background

2.1 Information and communication technologies in service operations

Today, banks use ICT and self-service technologies to streamline the business operations and service clients more efficiently. The degree to which the traditional customer service encounter is facilitated (or mediated) by ICT differs across each banking channel. For instance, Internet banking services are designed to service clients via ICT and no human-customer interaction occurs when clients bank online. In contrast, if customers are serviced by banking personnel in physical branches, the bank clerk employs technology as an aid to improve the face-to-face contact (e.g., if the service rep performs the transaction on a computer terminal). The current study focuses on the technology-

generated customer contact (or self-service) and no human-to-human interaction is considered by our research (Froehle 2006; Froehle and Roth 2004). Below, we refer to electronic banking channels, such as mobile, Internet, phone and ATM banking. In the current study, electronic banking channels are defined as IS artefacts that provide representations of one or more banking service domains. This implies that electronic banking channels provide features that are designed to support functions in those banking service domain(s).

Individual adoption and acceptance of electronic banking channels has been researched extensively and several authors have used (or extended) various theoretical frameworks, such as diffusion of innovation theory (DOI) (Rogers 1995), theory of reasoned action (TRA) (Fishbein and Ajzen 1975), TAM (Davis 1989) and the theory of planned behavior (TPB) (Ajzen 1991). For example, Tan and Thompson (2000) developed a research model investigating the factors impacting on the adoption of electronic banking services in Singapore. Their findings confirmed that consumers' attitude and perceived behavioral control factors, rather than subjective norms, have a significant impact on consumers' intentions to use electronic banking services (Tan and Thompson 2000). Several other research studies investigated the acceptance of electronic banking services by using modifications of TAM (Cheng et al. 2006; Lai and Li 2005). Suh and Han (2002), for instance, added trust to TAM to explain customer acceptance of electronic banking applications. The findings indicated that trust has a stronger effect on a customer's attitude than perceived ease of use in the electronic banking context (Suh and Han 2002).

The underlying theoretical frameworks (e.g., TRA/TAM or TPB) are very general research models. Given the parsimony of these underlying theoretical frameworks, much of the existing research on electronic banking channels does not aim to specifically explain how or why consumers choose different technology channels (see Venkatesh 2006). In particular, "Individual technology-adoption research has not considered service characteristics or channel characteristics beyond what may be specified in models like TAM and UTAUT and can be augmented by a focus on service design and constructs, such as service characteristics, to determine how and why consumers choose a particular service channel" (Venkatesh 2006, p.509). Our literature review confirmed this claim although a number of studies have examined the distinctive characteristics of various banking tasks and how those characteristics impact on the suitability of the task for a particular electronic banking channel. For example, Sayar et al. (2007) defined domestic transfers, standing orders and account inquiries as simple and standardized banking tasks. In contrast, credit products (e.g., mortgages, personal loans, credit cards) as well as investment products (e.g., buying property, stock securities, bonds) were characterized as complex transactions (Sayar and Wolfe 2007). Others examined the ways in which the perceived importance of financial products influence consumers' propensity to purchase financial products online (Barczak et al. 1997; Black et al. 2002; Lee 2002; Morrison and Roberts 1998). Likewise, individuals' preferences and routine with financial products also impact on their channel choice (Black et al. 2002; Lee 2002; Morrison and Roberts 1998).

2.2 Fit theory

The theoretical grounding for this study comes from prior research on task-technology fit (TTF) (Goodhue and Thompson 1995). TTF is defined as the extent to which the capabilities of a particular technology match, or fit, the needs of a particular task (Dishaw and Strong 1999). TTF theory argues that individuals using information systems exhibiting high TTF will view the technology/task combination as useful and form positive attitudes towards the technology. Since its introduction, the TTF model has been applied in a diverse range of IS contexts (Dishaw and Strong 1999; Staples and Seddon 2004; Zigurs et al. 1999). However, most researchers have studied the TTF of specific technologies in mandatory and organizational use settings. The present study intends to adapt the TTF to examine not specific technologies, but rather delivery channels. The specific context is voluntary use of electronic banking channels at the individual level.

3 Research Model and Hypotheses

The research model guiding this study is shown in Figure 1. The subsequent sections discuss the depicted constructs proceeding from left to right. .

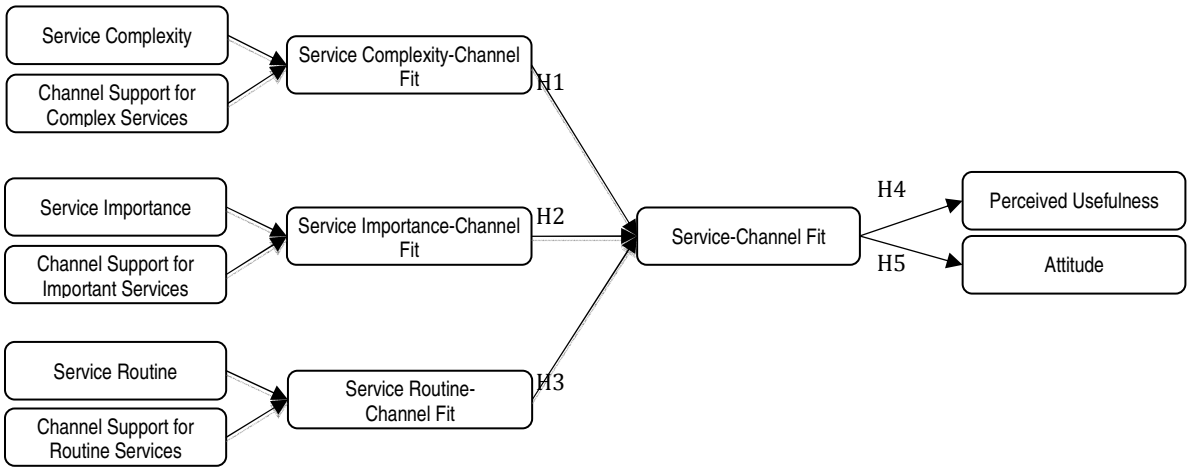

Figure 1. Conceptual Research Model and Associated Hypotheses

Drawing from the task-technology fit research, service-channel fit is defined as the user's perception of the correspondence between a banking service and the suitability of a particular electronic banking channel to support a given banking service. Banking services include the various kinds of financial and non-financial transactions a consumer may wish to conduct with his or her bank. The existing literature suggests that banking tasks can be characterized along a variety of dimensions. Three such dimensions are identified below:

Service Complexity. The level of service complexity is defined as the perceived difficulty individuals experience when performing a given banking service. This definition is based on Campbell's (1988) framework on task complexity in service environments. It is well documented that service complexity is an influential factor for consumers to use electronically mediated service channels. For example, Nadkarni and Gupta (2007) developed and tested a research model of perceived website complexity. This model suggested that perceived service complexity impacts on the users' willingness to utilize websites (Nadkarni and Gupta 2007). Using a survey instrument, the authors found support that perceived complexity negatively influenced consumers' intentions to use the services offered on websites (Nadkarni and Gupta 2007). Studies focusing on electronic banking adoption (Mäenpää et al. 2008; Sayar and Wolfe 2007) and service operations have discovered similar findings. Service complexity negatively influences the perceived usability of electronically mediated cannels (Barczak et al. 1997; Black et al. 2002; Lee 2002; Morrison and Roberts 1998). We found several studies that established the relationship between task complexity and technology-fit perceptions. Particularly, literature around task-technology fit has recurrently argued that task complexity should be an integral component of the task-technology fit construct (Shirani et al. 1999; Zigurs et al. 1999). Given that consumers use many banking services by completing a task (e.g., applying for a mortgage, withdrawing cash), we argue that banking services typify the kinds of tasks traditionally studied in task-technology fit research. Thus, we hypothesize:

H1: *Service complexity-channel fit* will be positively associated with *service-channel fit*.

Service Importance. Service importance is defined as the level of perceived salience individuals accord to specific banking services (Reinsch and Beswick 1990). Literature on electronic banking channels confirms that perceived service importance is an influential aspect of how well users believe that an electronic banking channel supports a given banking service (Sayar and Wolfe 2007). For example, Katuri and Lam (2003) characterized transactions according to their degree of importance of transaction amount, degree of importance of transaction type, and degree of importance of transaction cost (Katuri et al. 2003). The authors argued that consumers select or reject Internet banking

applications depending on the perceived importance of the transaction (Katuri and Lam 2007). Also, certain transactions, such as mortgages or financial loans, impact a consumer's personal life significantly and over a longer time-span, and are thus perceived as being of high importance, whereas account inquiries are often seen as low-importance services (Sayar and Wolfe 2007). The service operations literature also found that consumers view certain transactions as being more salient than others – which influences organizational channel management (Reinsch and Beswick 1990). Based on this, we argue that perceived service importance moderates the level of perceived service-channel fit in the context of electronic banking. Depending on whether consumers view specific banking services as particularly important, they might (or might not) select a given banking channel. Thus, we hypothesize:

H2: *Service importance-channel fit* will be positively associated with *service-channel fit*.

Service Routine. Service routine refers to a regular procedure usually followed by banking customers to perform a given banking service. Service routine has been frequently used in the IS and service operations literature to study consumer perceptions of electronic channels. Many authors have argued that the level of routine with which individuals perform services influences their perceptions of it (Goodhue and Thompson 1995; Karimi et al. 2004; Suh 1999; Zigurs et al. 1999). Particularly, research on task-media fit and task-technology fit research has established that task routineness impacts the fit between a given media (or technology) and the tasks performed by individuals. For example, Goodhue and Thompson (1995) argued that task routineness impacts the perceived task-technology fit of information systems. The authors suggested that "the strongest effect of task characteristics on TTF was from non-routine tasks. They found that individuals engaged in more non-routine tasks related their information systems lower on data quality, data compatibility, data locatability, training/ease of use, and difficulty of getting authorization to access data" (Goodhue and Thompson 1995, p. 226). As part of a study conducted to research the effect of media richness of technologies in organizations, Suh (1999) suggested that routine activities are more appropriate for lean communication channels. Once the task would become routine for the user, individuals would not require a rich media because they would feel familiar with the task. In contrast, non-routine activities would require richer communication media (Suh 1999). As noted previously, banking services are closely related to the concept of tasks that have been studied in prior TTF research. In the context of e-banking, consumers pursue a task when they access a given banking service. Thus, we hypothesize:

H3: *Service routine-channel fit* will be positively associated with *service-channel fit*.

In order to validate the nomological network of the service-channel fit construct, we hypothesize that the service-channel fit construct positively impacts on a consumer's attitudes and the perceived usefulness of a given channel for a particular banking service. Previous literature on task-technology fit has confirmed similar causal relationships between TTF constructs and these variables in various technology use contexts (e.g., group communication technologies, email, personal computers) (Goodhue and Thompson 1995; Karimi et al. 2004; Suh 1999; Zigurs et al. 1999). Thus, we hypothesize:

H4: S*ervice-channel fit* will be positively associated with *perceived usefulness of channel use*;

H5: S*ervice-channel fit* will be positively associated with *attitude towards channel use*.

4 Relevance check conducted with German banks

An exploratory investigation was conducted investigating practitioners' perceptions towards the proposed task-channel fit concept (Rosemann and Vessey 2008). Overall, nine high level managers from three German banks were interviewed with regard to the relevance of the service-channel fit concept for their bank operations and planning. Table 1 introduces the research participants.

Bank	Participant	Participants job description
A	1	Product manager developing and outsourcing electronic banking channels.
B	2	A member of the management board and acts as the CIO of Bank B.
	3	Managing director overseeing the IT infrastructure for private clients.

	4	Director of IT architecture for the private business division.
	5	Senior product manager in the e-services division for corporate clients.
C	6	Board member and CEO of Bank C.
	7	Board member of Bank C and responsible for customer services.
	8	Divisional head for customer service of Bank C.
	9	Product manager for Bank C focusing on mobile banking applications.

Table 1. Research Participants Interviewed for the Relevance Check of the SCF Concept

During the interviews, a simplified version of the SCF model was introduced and then discussed with each manager. Most discussions lasted between 50 and 60 minutes and were recorded and transcribed afterwards. To analyse the data, open and axial coding techniques commonly used for grounded theory studies were applied (Strauss and Corbin 1998). The codes were visualized in a data matrix to highlight similarities and differences between the various codes (Miles and Huberman 1994). Bank A and B are traditional Banks while Bank C solely focuses on "non-face-to-face" channels, such as mail, facsimile, email as well as its ATM, telephone, Internet and mobile banking applications.

Overall, the discussions indicated that the participants perceived the SCF idea as a valuable concept for banks. They agreed that banks would not have well-established instruments to judge which banking tasks fit each banking channel best. For instance, participant six argued: "For us, as a direct bank, a [measure of] SCF for electronic banking services would be very interesting. Currently, we are re-considering the product-mix for our banking channels. Having a SCF tool would be very helpful here." The interviews also revealed that currently all three banks still were in a "trial and error" mode with their electronic banking applications. For example, one respondent stated: "Our team spent EUR 300,000 for designing a mobile banking application. Only 27 customers registered for this service, and five of those never used the service. In addition, out of the 22 users, 14 were banking staff. As a result, we terminated the service." This participant added that a SCF instrument could potentially prevent such mis-investments. In summary, all managers confirmed that a SCF instrument would be beneficial for banks. It was also interesting to note that all managers welcomed the inclusion of a relevance check in this study and they indicated that they appreciated being involved in academic research. These interviews thus provided us a basis for finding our SCF concept to possess relevance.

5 Research Method

5.1 Scale Development

We first reviewed the existing literature for items that had been developed and validated in prior research. Particularly, scales were identified that had previously measured the outcome variables – perceived usefulness (Bhattacherjee 2001) and attitude towards electronic banking channels (Lai and Li 2005; Taylor and Todd 1995). These scales were adapted to the context of this study. New items were developed for the SCF dimensions based on their construct definitions (listed in Table 2).

We considered measuring consumers' intentions to use electronic banking channels but decided otherwise for several reasons. First, the current survey instrument was already comprehensive and we wanted to avoid overburdening respondents by asking them to reply to an even longer survey instrument. Second, research on task-technology fit found mixed results on the influential role of TTF constructs on use behavior. For example, some authors found correlations between task-technology fit constructs and use behavior (Staples and Seddon 2004) whereas others found contrary results (Goodhue and Thompson 1995). Finally, there is strong theoretical evidence that perceived usefulness and attitude constructs are reliable predictors for technology use behavior (Davis 1989). We have stayed faithful to this literature base and focused on predicting the antecedents of intentions to use electronic banking channels.

Next, we organized two judgment rounds consisting of experts relevant to the study's context. The main goal of these expert rounds was to assess the content validity of the scales as well as the wording of the items. The eight judges included two marketing professors, two senior IS researchers, two bank staff, a finance professor and a currency trader. The judgment rounds were organized as face-to-face interviews lasting between 60 and 90 minutes each. Each judge was asked to evaluate the content

validity of the SCF dimensions as well as to re-examine the items collected for this study. Subsequent to the interviews, the scales were refined appropriately in light of the experts' recommendations.

The third stage of scale development involved two pretests of the survey instrument. The first pretest involved five University staff (two administrative staff, one academic staff, and two PhD students) who were asked to complete the survey instrument on paper. Subsequently, each respondent was interviewed to understand if they found items unclear or ambiguous or if they felt confused by some sections of the questionnaire. In addition, the instructions, structure, and length of the questionnaire were discussed. This feedback was then used to modify the survey instrument. The second pretest included 15 University staff/PhD students researching information systems. These participants were asked to complete the online survey and provide feedback about the structure of the survey and wording of the items.

5.2 Data Collection

We collected data from consumers using electronic banking channels in New Zealand. In an ideal situation, the SCF construct would be tested by gathering data from respondents for all electronic banking channels and for a variety of banking services. However, this research design appeared infeasible for two reasons. First, combining items for a number of banking services (e.g., account inquiries, domestic transactions, international payments, applying for credit cards and/or mortgages) with four electronic banking channels (ATMs, telephone, Internet, and mobile) would increase the length of the questionnaire immensely. Second, due to varying adoption rates, it seemed unlikely that respondents would be able to reply to questions related to all electronic banking channels. For this study, we focused on a single banking channel and on two different banking services. Internet banking was selected as the banking channel. First, most consumers in New Zealand have experience with Internet banking applications and should have well-formed beliefs about most common functionalities of these services. AC Nielsen (2008) reports that more than two-thirds of all New Zealanders frequently access online banking. Second, all New Zealand banks offer a wide range of financial products on Internet banking including simple, medium and complex banking products.

In order to create a meaningful comparison, account inquiries (e.g., checking account balance, viewing transaction history, inspecting account statements) and financial loans applications (e.g., applying for bank overdrafts, home loans, personal loans, mortgages) were selected to test the perceived SCF construct regarding Internet banking services. We collected data by using two different versions of the instrument (one for account inquiries and another for financial loan applications). The two versions differed slightly from each other to reflect the nature of the corresponding banking service. We conducted a nationwide online survey with the assistance of a market research firm. In total, we collected 340 responses (170 responses for each banking service) from consumers using electronic banking channel for banking services.

5.3 Service-channel fit calculation

A key purpose of this research was the assessment and calculation of the fit between a given banking service and Internet banking. Drawing on IS strategy and alignment literatures, a parallel instrument was created in order to determine TCF across the identified dimensions. Our objective was to develop a measure of service-channel fit by calculating a fit score from individuals' perceptions of the characteristics of a banking service and the suitability of a banking channel to address such characteristics. We felt that this would comprise a richer and more robust approach to assessing TCF than by attempting to assess it via a set of reflective indicators (Chan et al. 1997; Venkatraman 1989).

SCF dimension		**Items**
		SCF – service characteristics
Service complexity	COMP1	In general, applying for a financial loan is complex.
	COMP2	Overall, a financial loan is a complicated banking transaction.
	COMP3	Generally, applying for a financial loan is an easy-to-do banking service.
	COMP4	I would find it straightforward to apply for a financial loan.
		SCF – channel suitability

Service complexity (parallel)	CCOMP1	Internet banking is well suited for complex banking transactions.					
	CCOMP2	Internet banking is well suited for complicated banking transactions.					
	CCOMP3	Internet banking is well suited for easy-to-do banking service.					
	CCOMP4	Internet banking is well suited for straightforward banking transactions.					
		SCF – service characteristics					
Service routine	ROUT1	Applying for a financial loan is a banking transaction I routinely perform.					
	ROUT2	I regularly apply for a financial loan.					
	ROUT3	I often apply for a financial loan.					
	ROUT4	A loan application is a banking transaction I frequently do.					
		SCF – channel suitability					
Service routine (parallel)	CROUT1	Internet banking is well suited for banking transactions I routinely perform.					
	CROUT2	Internet banking is well suited for banking transactions I regularly do.					
	CROUT3	Internet banking is well suited for banking transactions I often do.					
	CROUT4	Internet banking is well suited for banking transactions I frequently do.					
		SCF – service characteristics					
Service importance	IMPOR1	A loan application is an ordinary banking transaction to me.					
	IMPOR2	Applying for a loan is commonplace banking service.					
	IMPOR3	Applying for a financial loan is a major transaction in my mind.					
	IMPOR4	A financial loan application is a serious banking transaction for me.					
	IMPOR5	Applying for a financial loan will influence my personal finances significantly.					
		SCF – channel suitability					
Service importance (parallel)	CIMPOR1	Internet banking is well suited for ordinary banking transactions.					
	CIMPOR2	Internet banking is well suited for commonplace banking transactions.					
	CIMPOR3	Internet banking is well suited for major banking transactions					
	CIMPOR4	Internet banking is well suited for serious banking transactions.					
	CIMPOR5	Internet banking is well suited for banking transactions that influence my personal finances significantly.					
Correlations of reflective constructs and reliability measures (Complete dataset)		Correlations of latent variables			Reliabilities of reflective constructs		
			ATT	PU		CR	Cronbach α
		ATT	0.93		ATT	0.95	0.92
		PU	0.64	0.90	PU	0.91	0.86
*Note, in the sake of brevity, we only listed the parallel instrument here.							

Table 2. SCF scales used to collect data

For each individual service characteristic item, a parallel channel suitability item was created, so as to allow us to determine the extent of the fit (or lack thereof) the respondent would perceive between the service and the channel for that specific service dimension. For instance, comp1 asks individuals whether they view financial loan applications as complicated. Ccomp1 then inquires whether the individual views Internet banking as well suited for complicated banking transactions. The responses to these two items can be compared to determine an indicator of the fit of the particular channel to that aspect, or dimension, of the particular service. We applied the moderation approach to compute the fit scores. Fit as moderation has been frequently used by other researchers aiming to compute fit between two variables by capturing interaction effects (Chan et al. 1997; Goodhue and Thompson 1995; Parker and Van Witteloostuijn 2010).

In order to compute the TCF using the moderation approach, Venkatraman's formula [x=(y*z)] was applied to the data. Venkatraman (1989) recommended using product terms in order to represent fit as moderation. Multiplying the values obtained for the moderator (in context of this study – service characteristics) with the values obtained for the predictor variable (in context of this study – channel suitability) would reflect the joint effect of both 'sides' of the service-channel fit. A high service-channel fit would be represented by a high product outcome whereas a low product outcome would imply a low service-channel fit. Following this approach, the service characteristic*channel suitability product scores at the item level were computed. Next, we averaged the moderation scores for each SCF dimension and used the mean scores were used as formative indicators for the TCF construct in subsequent data analyses.

5.4 Data analysis

Partial Least Squares (PLS) was used to analyze the data. PLS simultaneously analyzes how well the measures relate to each construct and whether the theoretical hypotheses at the theoretical level are

true. In contrast to covariance based structural equation modeling (SEM) techniques, PLS can handle formative indicators that are required to evaluate the SCF construct using the moderation approach. SmartPLS (version 2.0) was selected as the software package to perform the data analysis (Ringle et al. 2010). We ran the data analysis three times in order to account for the financial loan, account inquiries, and the aggregated answers for both versions of the questionnaire. We argue that the theoretical assumptions should not differ from one banking service to another. Prior to assessing the research model, we checked the data for common method variance (CMV). Following Podsakoff et al. (2003), Liang et al. (2007) introduced a technique in PLS to test for common method bias. We followed this procedure. The results showed that the R^2 values in the unexplained variance factor were very low for all items. Further, the factor loadings of the unexplained variance variable were very low. Both results indicate that CMV was not present among the data.

6 Results

6.1 Measurement Model

Reflective measures. We initially inspected the psychometric properties of both reflective constructs (attitude towards Internet banking and perceived usefulness). Both scales exhibited reliability as evidenced by Cronbach alpha values of .80 or greater. We proceeded to examine convergent and discriminant validity using confirmatory factor analysis. Specifically, we inspected item loadings and performed an AVE analysis. All item loadings exceeded .80 and the results showed that all AVEs were consistent with Fornell and Larcker's (1981) guidelines exceeding the 0.50 threshold value (see Table 2 for more detailed information). Given that extensive body of knowledge in this field, these findings were expected and are not reported in detail here.

Formative measures. When inspecting formative measures, one should evaluate item weights because they 'form' the latent variable. The results confirmed that all the weights associated with the service-channel fit construct were statistically significant at least at the $p< 0.05$ level. Unlike reflective indicators, where multicollinearity between construct items is desirable (illustrated by high Cronbach's alpha or internal consistency scores), excessive multicollinearity in formative constructs is undesirable (Petter et al. 2007). To ensure that multicollinearity is not present, the variance inflation factor (VIF) statistic can be used to determine if formative measures are too highly correlated (Petter et al. 2007). We checked the VIF statistics for all formative measures. All VIF values ranged between 1.1 and 2.7 indicating that multicollinarity was not present among the formative measures as it is fairly low.

6.2 Structural Model

Hypothesis 1 was supported as service complexity-channel fit significantly contributed to the service-channel fit construct. All weights were relatively high and well balanced in both datasets. Similarly, hypothesis 2 was supported as shown by the significant weights between the service importance-channel fit dimension and the service-channel fit construct. Hypothesis 3 was also supported as the service routine-channel fit significantly contributed to the service-channel fit construct.

Table 3 includes the structural model results. Table 3 also shows the variance explained in the outcome variables. Our conceptualization of the service channel fit construct explained 64% of variance in the perceived usefulness construct and 46% in the attitude variable (if inspecting the results obtained from the complete dataset). Hypothesis 4 was supported as service-channel fit was a significant predictor of consumers' attitudes towards channel use. Hypothesis 5 was also supported as service-channel fit was a significant predictor of consumers' attitudes towards electronic banking channels.

	Account Inquiries	Financial Loans	Complete dataset
Hypothesis 1	Weight: 0.30***	Weight: 0.30*	Weight: 0.25*
Hypothesis 2	Weight: 0.18*	Weight: 0.48**	Weight: 0.21*
Hypothesis 3	Weight: 0.47***	Weight: 0.32*	Weight: 0.61**
Hypothesis 4	Coefficient: 0.66***	Coefficient: 0.47***	Coefficient: 0.68***
Hypothesis 5	Coefficient: 0.28*	Coefficient: 0.20**	Coefficient: 0.26**
R^2—Usefulness	(R^2=0.652)	(R^2=0.461)	(R^2=0.646)
R^2—Attitude	(R^2=0.438)	(R^2=0.222)	(R^2=0.465)
* significant at p< 0.05, ** significant at p<0.01 and *** significant at p<0.001			

Table 3. Structural model results

7 Discussion and Conclusions

First, the current study contributes to IS adoption and acceptance theory. Our conceptualization of the service-channel fit construct identified three unique dimensions underlying consumers' perceptions of the service channel fit. We provided empirical evidence of the validity of our conceptualization and instrument, and demonstrated that our model performs well in predicting two key variables commonly used in adoption research – perceived usefulness and attitude towards electronic channels. Adapting task-technology fit theory for this purpose appeared to be well suited for extending the well theorized use constructs because: "it is clear from extensive work on TAM that usefulness is a key...therefore, it would be fruitful to investigate the antecedents of usefulness in order to provide design-oriented advice...a good conceptual starting point for such an endeavor may be an augmented task-technology fit model that would provide finer and more focused design advice in specific task contexts" (Benbasat and Barki 2007, p. 215). Second, this study also contributes to the TTF construct specification and measurement. The TTF theory was developed within an organizational context characterized by involuntary use. So far, little is known about how this concept can be applied at the individual level (Staples and Seddon 2004). This study has started to address this issue by developing and validating a survey instrument to measure the SCF of electronic banking channels.

The third contribution is to banks and financial institutions distributing their products and services through electronic banking channels. For example, the findings suggest that perceived service complexity influences the perceived service-channel fit of electronic banking channels. Banks could pursue different strategies to act in response to these findings. First, they could offer only simple to medium-complex banking products on electronic banking channels and deliver the more sophisticated banking products only via face-to-face branch banking. That way, consumers could manage simple to medium-complicated transactions via self-service technologies and visit the branch only if they were interested in more sophisticated transactions. Banks could also consider discouraging consumers from performing these transactions in physical branches (e.g., by charging a small extra fee for conducting such simple transactions in a branch). Consequently, customers would have an incentive to perform these transactions electronically. This would positively impact on the cost structure of banks since cost savings could be achieved due to less staff involvement and reduced overhead costs.

Our findings also suggest that perceived service importance plays an influential role for the perceived service-channel fit of electronic banking channels. Banks can use these findings and integrate them in their strategies for high-importance services and those banking transactions that have a long lasting impact on consumers' finances including superannuation products, financial loans, insurance products etc. For instance, alternative technologies/applications could be used to guide customers when performing high-importance transactions via self-service technologies. If consumers visit a banking website where they can purchase superannuation products, banks could offer chat rooms or perhaps call-centre support via Skype or 0800 numbers in order to support customers during the product selection process. These mechanisms could potentially positively influence consumers' perceptions of the service-channel fit of Internet banking for high-importance banking services.

Our study also confirmed that consumers view service routine as highly important for the perceived service-channel fit of electronic banking. Banks possess historic data on the customer-to-bank

relationship. Therefore, banks know which kind of products customers have purchased in the past. Using data-mining tools, banks could provide personalized support for those services a customer performs routinely/non-routinely. For instance, if customers frequently use Internet banking for account inquiries it is likely that they have developed a routine for those transactions. Thus, inclusion of a chat function, as described earlier, for customers who frequently use these transactions would be an inappropriate use of the bank's resources. In contrast, if consumers have developed no routine for a particular banking service (e.g., a loan application, or an international transaction), a chat function could be well suited because it could increase the customer's perception of the service-channel fit for non-routine banking transactions.

This research has some limitations that could serve as a springboard for future research. We tested the SCF construct solely in context of one electronic banking channel – Internet banking. However, future studies could replicate our study in new contexts (e.g., different electronic channels or additional banking tasks) or testing the stability of the scales over time. Another avenue for future research is to apply the SCF theory to different industries deploying similar self-service technologies as banks (e.g. airline industry, supermarkets etc.). In addition, longitudinal observations could be used to assess how the service-channel fit of electronic banking channels changes over time, as self-service technologies and methods change.

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