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Technology Leadership, Brand Equity, and Customer Loyalty in Mobile Banking: Moderating Role of Need for Uniqueness

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Technology Leadership, Brand Equity, and Customer Loyalty in Mobile Banking: Moderating Role of Need for Uniqueness

Completed Research Paper

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Abstract

Most of previous studies on mobile banking focus on the initial adoption by drawing upon the technology acceptance theories, while the post-adoption issues (e.g., loyalty) have been rarely examined. To fill this research gap, based on brand equity theory and symbolic value theory, we propose a research model to articulate the relationship between technology leadership, brand equity, and customer loyalty, as well as the moderating role of need for uniqueness. A survey from users of two mobile banking service providers was conducted to empirically examine the proposed research model and hypotheses. The results show that (1) technology leadership positively affects brand equity which in turn positively affects customer loyalty, and (2) need for uniqueness strengthens the relationship between technology leadership and brand equity and between brand equity and customer loyalty. The implications for theory and practice are also discussed.

Keywords: technology leadership, brand equity, customer loyalty, need for uniqueness, symbolic value, post-adoption.

Introduction

Mobile banking refers to the use of mobile terminals to access banking networks via the wireless application protocol (Zhou 2011). Following the wide penetration of mobile phones and the stability of mobile communication technologies, the mobile banking services have been rapidly developed and will go on developing (Mallat et al. 2004). As mobile banking is closely relevant to users' financial information which is very sensitive, whether or not users would like to adopt mobile banking services has attracted a lot of scholars' attention (Gu et al. 2009; Luarn et al. 2005; Luo et al. 2010).

Like all the technology acceptance studies, previous studies on mobile banking focus on understanding the factors that affect users intention to adopt mobile banking services at the initial-adoption stage by drawing upon technology acceptance model (TAM) (Gu et al. 2009; Lin 2010; Luarn et al. 2005; Zhou 2011), unified theory of acceptance and use of technology (UTAUT) (Luo et al. 2010; Zhou et al. 2010), task-technology fit theory (TTF) (Zhou et al. 2010), information systems (IS) success model (Chung et al. 2009; Zhou 2011), theory of planned behavior (TPB) (Luarn et al. 2005), trust theory (Chung et al. 2009; Gu et al. 2009; Kim et al. 2009; Lin 2010; Luo et al. 2010; Zhou 2011) and risk theory (Luo et al. 2010). Although these studies provide insightful explanations for users' initial adoption behavior, it may be not so appropriate to apply them in the research on the post-adoption of mobile banking.

At the initial adoption stage, as users have no first-hand experience about mobile banking, they are worried about the potential risks (e.g., performance risk, financial risk, time risk, privacy risk, psychological risk, social risk and physical risk) (Luo et al. 2010) and the effectiveness of technology (e.g., perceived usefulness and perceived ease of use) (Gu et al. 2009), thus trust and technological factors are regarded as the key determinants (Gu et al. 2009; Zhou 2011). However, following the development and maturity of mobile banking and the experience accumulation of users, the technological uncertainty and risks may lose their influences on user behavior at the post-adoption stage.

More importantly, along with the prevalence of online-to-offline business and increase of mobile payment needs, whether or not a bank can provide good mobile banking services has been considered as a critical factor for bank selection (Zhou 2013). In this case, all the banks are engaging in the development of their mobile banking services to attract and retain customers. Therefore, at the post-adoption stage, the research focus has shifted from how to motivate users to adopt a bank's mobile banking services to how to build customer loyalty in a competitive market with rapid technology evolution because loyalty is regarded as an important determinant of continuance behavior, repeat purchase or revisit (Cornaggia et al. 2015).

The technological competences to provide mobile banking services vary across different banks, as reflected by the quality of different mobile banking services. Some banks may be in a leading position while the others may be lagging behind the competition. To capture the differences in technological competences across different mobile service providers, Xu et al. (2014) proposed a term namely technology leadership which refers to consumers' perceptions of a service provider's technology innovation efforts. Thus, it is interesting to know whether or not technology leadership can exert its impact on customer loyalty. So the first research question of this study can be interpreted as

RQ1: Whether or not and how technology leadership can affect customer loyalty?

Brand equity theory can be used to explain the underlying mechanism about the relationship between technology leadership and customer loyalty (Johnson et al. 2006). Brand equity is defined as "a consumer's personal identification with focal brand and the brand's relevance to the consumer's personal situation" (Xu et al. 2014, p.711). As using a leading mobile banking service not only provides users with some functional utilities but also delivers some personal and social meanings (e.g., reputation and status) for consumers (Escalas et al. 2005), technology leadership may have an indirect effect on customer loyalty through brand equity. Thus, to answer the first research question, we will empirically examine the relationship between technology leadership, brand equity, and customer loyalty.

Further, the impact of technology leadership on customer loyalty through brand equity may be contingent upon certain conditions. Specifically, we focus on the individual differences and try to understand whether or not the relationship between technology leadership, brand equity and customer loyalty varies across different individuals. As the underlying mechanism about the role of brand equity relies on the social meanings delivered by the technology usage behavior (Escalas et al. 2005), the extent to which

users care about these social meanings will determine the strengths of the proposed relationships. According to the symbolic value theory, this individual difference can be captured by the concept of need for uniqueness (Smith et al. 2007). Need for uniqueness refers to "the individual's tendency to seek individuality through the adoption and use of symbolic products or innovations, which represents a kind of counter-conformism" (Arbore et al. 2014, p. 90). When users have a strong need for uniqueness, they will more likely to chase social meanings of the technology usage behavior and the brand equity mechanism will work better. Therefore, the second research question is

RQ2: Whether or not need for uniqueness moderates the relationship between technology leadership, brand equity, and customer loyalty?

This study can contribute to prior literature on mobile banking in two ways. First, this is the first study, to the best of our knowledge, which examines the factors influencing customer loyalty towards mobile banking services at the post-adoption stage drawing upon the brand equity theory. Second, this study defines the boundary conditions under which technology leadership affect brand equity which in turn influences customer loyalty by proposing and empirically testing the moderating effect of need for uniqueness.

The remainder of the paper is organized as follows. First, we review the literature on mobile banking based on which we propose a research model that integrates the brand equity theory and symbolic value theory. Second, the procedures to conduct the survey are introduced and the data analysis results are reported. Finally, the theoretical implications, practical implications and limitations of the paper are discussed.

Theoretical Development

Mobile Banking

Previous studies on mobile banking stress on the antecedents of mobile banking adoption intention. As shown in Table 1, TAM (Davis 1989), UTAUT (Venkatesh et al. 2003), TTF (Goodhue et al. 1995), TPB (Ajzen 1991), IS success model (DeLone et al. 2003), trust theory (McKnight et al. 2003), and risk theory (Jacoby et al. 1972) have been used to explain users' mobile banking adoption intention or behavior. These theories can be classified into two categories in terms of the types of factors examined in the theories. In general, there are two types of factors namely technology-related factors and uncertainty-related factors. Theories focusing on the technology-related factors include TAM, UTAUT, TTF, and IS success model, while those focusing on the uncertainty-related factors include trust theory and risk theory. TPB can be regarded as a general theory about individual behavior which may be associated with both technology- and uncertainty-related factors. Specifically, TAM highlights two technology-related factors namely perceived usefulness and perceived ease of use, while UTAUT postulates four key factors including performance expectancy, effort expectancy, social influence, and facilitating conditions. TTF emphasizes the fit between task characteristics and technology characteristics and IS success model takes information quality, system quality, and service quality as three key determinants of behavior intention and satisfaction.

Either trust theory or risk theory is closely associated with the uncertainty involved in the mobile banking service adoption behavior. Risk theory treats uncertainty as one aspect of risk which is regarded as a combination of both the perceived probability (uncertainty) of the consequences and the importance of those consequences (Peter et al. 1975). In contrast, trust theory states that trust can help consumers overcome perceptions of uncertainty and trusting behavior reflects one's willingness to be vulnerable to another (McKnight et al. 2003). Within the research context of mobile banking services, trust theory suggests that how three trusting beliefs (competence, benevolence, and integrity) are formed based on disposition to trust, structural assurance, and situational normality and how trusting beliefs affect the trusting behavior (i.e., adoption behavior or intention) (Chung et al. 2009; Gu et al. 2009; Kim et al. 2009; Lin 2010; Luo et al. 2010; Zhou 2011). In contrast, risk theory postulates that perceived risks are a multi-dimensional construct with the components of performance risk, financial risk, time risk, privacy risk, psychological risk, social risk and physical risk (Luo et al. 2010).

However, most of these studies are conducted in the research context of initial adoption stage. Post-adoption issues have less been examined. In the two studies relevant to the post-adoption behavior,

Chung et al. (2009) tested the relationships between information quality, system quality, and service quality and satisfaction, and Yu et al. (2009) proposed an instrument of the post-adoption customer perception of mobile banking services with six dimensions namely security service, interactivity, relative advantage, ease of use, interface creativity, customer satisfaction. Although these studies provided some initial insights about post-adoption behavior of mobile banking services, they have not touched the most important issue in the post-adoption stage: how to build customer loyalty that drives users' sustained participation. This issue is especially important nowadays given the intense competition in mobile banking market (Cornaggia et al. 2015).

Table 1. Literature Review on Mobile Banking

Theory	Independent Variables	Dependent Variables	References
Technology acceptance model (TAM)	• Perceived usefulness • Perceived ease of use	• Intention	(Gu et al. 2009; Lin 2010; Luarn et al. 2005; Zhou 2011)
Unified theory of acceptance and use of technology (UTAUT)	• Performance expectancy • Effort expectancy • Social influence • Facilitating conditions	• Intention • Adoption	(Luo et al. 2010; Zhou et al. 2010)
Task-technology fit theory (TTF)	• Task technology fit	• Adoption	(Zhou et al. 2010)
IS success model	• Information quality • System quality • Service quality	• Intention • Satisfaction	(Chung et al. 2009; Zhou 2011)
Theory of planned behavior (TPB)	• Perceived credibility • Perceived self-efficacy • Perceived financial cost	• Intention	(Luarn et al. 2005)
Trust theory	• Trust belief • Disposition to trust • Structural assurance • Situational normality	• Intention	(Chung et al. 2009; Gu et al. 2009; Kim et al. 2009; Lin 2010; Luo et al. 2010; Zhou 2011)
Risk theory	• Perceived risk	• Intention	(Luo et al. 2010)

To reveal the customer loyalty formulation process, we propose a research model based on the brand equity theory and symbolic value theory (see Figure 1). In this model, technology leadership is proposed to affect customer loyalty through brand equity, and need for uniqueness moderates the relationship between technology leadership and brand equity and between brand equity and customer loyalty.

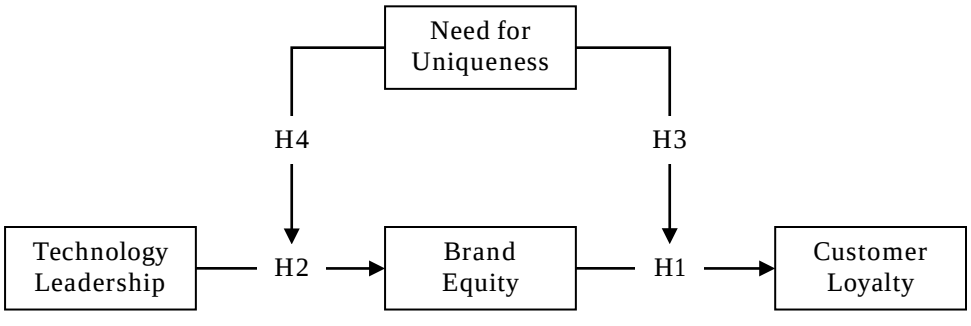

Figure 1. Research Model

Brand Equity Theory

Brand equity is conceptualized as "a consumer's personal identification with the brand and the brand's relevance to a consumer's situation, which goes beyond the effects of performance/instrumental values of the product/service" (Xu et al. 2014, p.715). Brand equity theory suggests that even two brands can bring same instrumental values to a consumer, if the consumer considered one brand to be more favorable, s/he will believe this brand as more valuable. The extra value is generated not based on the functions of the product or service but the social meanings delivered by the brand name per se (Escalas et al. 2005). That is to say the extra value captures the value a brand adds to a product or service in comparison with the same product or service without the brand name (Keller 1993; Simon et al. 1993).

The extra value or the social meaning of brand is derived from the association between the brand and the consumer. It reflects the extent to which brand fits a customers' personality and lifestyle (Johnson et al. 2006). Regarding brand as a person with certain identity, the brand equity captures the degree to which the identity of brand is overlapped with the customer's own identity. Therefore, brand equity is always described as brand association (Keller 1993; Rego et al. 2009; Yoo et al. 2000).

According to brand equity theory, brand equity is positively associated with customer loyalty (Johnson et al. 2006). Customer loyalty has been treated as a multi-dimensional construct with three components namely cognitive loyalty, affective loyalty, and conative loyalty (Oliver 1999). Cognitive loyalty refers to a consumer's preference for one brand over its alternatives due to the attributes of a brand such as performance and price. Affective loyalty is defined as consumers' preference toward the brand in terms of cumulatively satisfying usage experiences. Conative loyalty is a consumer's desire or intention to repurchase the brand. As cognitive loyalty is based on the calculus of performance and price which is related to the instrument value rather than the extra value, it may be irrelevant to brand equity (Xu et al. 2014). The conative loyalty is more similar with the behavioral intention rather than the psychological commitment to the product or service. Thus, only affective loyalty which accurately reflects the commitment notion of the definition (Oliver 1999) is used in this study.

As brand equity describes the consistency between a consumer's self-identity and the product or service s/he purchases (Johnson et al. 2006), previous studies further argue that this consistency can develop a feeling of affinity and increase the consumer's preference to the brand (Del Rio et al. 2001). The marketing literature also suggests that self-identity expressiveness and identification have positive impacts on consumers' positive attitude toward the product or service (Thorbjornsen et al. 2007). Thus, brand equity should be positively associated with customer loyalty.

Within our research context, because the usage of mobile banking services is visible to others (Lin 2010), using certain mobile banking services not only has instrumental values but also delivers signals to others reflecting a customer's identity and taste. Thus, when a customer considers a certain mobile banking service to be fit with his/her identity, s/he will more like the service and form a commitment to this service. Therefore, we propose that

H1: Brand equity positively affects customer loyalty.

Consumers' perceptions about the extent to which their mobile banking service providers lead the technological innovation in the market will have a positive impact on brand equity. Individuals have a tendency to build a good image, chase for superiority (Fisher et al. 1992) and avoid social risks (Lutz et al. 1973). Brand equity theory assumes that a consumer tries to achieve the fit between his/her self-identity with the identity of the product or service (Johnson et al. 2006). As individuals would like to position themselves as fashion leaders, the brand equity can be formed only when the product or service is leading. Therefore, we propose that

H2: Technology leadership positively affects brand equity.

Symbolic Value Theory

Brand equity theory proposes that brand equity captures the extra value beyond the instrumental value and the extra value is derived from the social meaning or the identity association between brand and

customer (Keller 1993; Simon et al. 1993). However, whether or not the extra value is cared by customers determines the extent to which the brand equity mechanism works.

Symbolic value theory is another complementary theory that explains when consumers care about the so called extra values. The notion of symbolic value is associated with the notion of consumer needs (Smith et al. 2007). Park et al. (1986) identified three basic consumer needs namely functional needs, experiential needs, and symbolic needs. Functional needs refer to those satisfying consumption-related problem. Experiential needs are those associated with sensory pleasure and cognitive stimulation. Symbolic needs are those empowering self-enhancement, role position, group membership or ego-identification. The first two needs can be satisfied by the actual performance of the product or service while the symbolic needs can be satisfied by the extra value derived from social meanings and brand association. Thus, the concept of symbolic value is consistent with the concept of extra value in brand equity theory.

Beyond distinguishing symbolic value from functional or instrumental value (as done by brand equity theory), symbolic value theory further identifies the individual differences in symbolic actions. Specifically, need for uniqueness which is defined as the individual's tendency to seek individuality has been regarded as the most important factor to capture the individual difference (Hong et al. 2006). When an individual has a strong need for uniqueness, s/he will try his/her best to distinguish him/herself form others by adopting certain products or services that cannot be used by others as the symbol (Arbore et al. 2014).

We propose that need for uniqueness will moderate the relationship between brand equity and customer loyalty and between technology leadership and brand equity. Specifically, when a customer of mobile banking service has a strong need for uniqueness, s/he will pay more attention to whether or not there is a symbol can be used to reflect his/her identity (Arbore et al. 2014). In this case, the customer will take brand equity (i.e., the consistency between the brand identity and self-identity) as a critical decision factor during the loyalty formulation process. In contrast, if a customer does not have a need to be unique, s/he randomly selects one brand with excellent performance and neglects what the brand name is. Thus, whether or not the brand is fit with his/her identity becomes not so important. Therefore, we propose that

H3: Need for uniqueness strengthens the relationship between brand equity and customer loyalty.

Individuals with strong need for uniqueness heavily rely on the symbols that can send signals to reflect his/her identity (Arbore et al. 2014). These individuals have strong desires to demonstrate that they are different from others by searching for the symbols. Technology leadership provides an opportunity for these individuals to show that they are different, consistent with their self-identities. Thus, when need for uniqueness is high, the relationship between technology leadership and brand equity is strong. In contrast, for those individuals with weak need for uniqueness, they don't rely on the symbols to reflect their identities. In this case, using leading technology is not an appropriate symbol to reflect their identities, so the relationship between technology leadership and brand equity should be weak. Therefore, we propose that

H4: Need for uniqueness strengthens the relationship between technology leadership and brand equity.

Methodology

Research Setting

To test the research model and hypotheses, we collected data from customers of two banks in China. Bank A was originally a state-owned bank founded in 1951 and was transformed into a stock corporation in 2009. It is listed as one of the top-five merchant banks in China. The online banking services and mobile banking services were respectively available since 2002 and 2012. Bank B is the first joint-stock merchant bank founded in 1987. It is ranked the sixth in size and has carried out its online banking services in 1997 and mobile banking services in 2010. Bank B is widely regarded as a bank with leading mobile banking services and it won an excellent mobile banking award in 2013, so it is used to represent the bank with high technology leadership. In contrast, Bank A is taken as the bank with low technology leadership. To ensure the appropriateness of this selection, we took technology leadership as the manipulation check and we expected that the scores of technology leadership should be high for Bank B and low for Bank A.

Measures

All constructs were measured with the items adapted from prior empirical studies with adjustments to fit with the specific research context. Seven-point Likert scales were used for all measures. Specifically, the measures for technology leadership, brand equity, and customer loyalty were adapted from Xu et al. (2014). Need for uniqueness was measured with the items adapted from Arbore et al. (2014). Since the survey was conducted in China, all the instruments were translated into Chinese adopting a translation committee approach (Van de Vijver et al. 1997). The measures for the constructs were shown in Table 2.

Table 2. Constructs and Items

Constructs	Items	References
Technology Leadership	TL1. My mobile banking provider keeps rolling out state-of-the-art technologies. TL2. My mobile banking provider frequently introduces technological innovations for its customers. TL3. My mobile banking provider is always among the first that introduce the latest generation of technology. TL4. My mobile banking provider always deploys innovative technologies to the market before others.	(Xu et al. 2014)
Brand Equity	BE1. The brand of my mobile banking provider reflects my personal lifestyle. BE2. My mobile banking provider's brand fits well with my personality. BE3. I can identify with my mobile banking provider's brand BE4. If my mobile banking provider were a person, I would like to take him or her out for dinner. BE5. I would like to wear clothing with the logo of my mobile banking provider's brand on it.	(Xu et al. 2014)
Customer loyalty	AL1. I take pleasure in being a customer of my current mobile banking provider. AL2. My mobile banking provider takes the best care of its customers. AL3. There is presence of reciprocity in my relationship with my mobile banking provider. AL4. I have feelings of trust toward my mobile banking provider.	(Xu et al. 2014)
Need for uniqueness	UQ1. I often think of the things I buy and do in terms of how I can use them to shape a more unusual personal image. UQ2. I am often on the lookout for new products or brands that will add to my personal uniqueness. UQ3. I actively seek to develop my personal uniqueness by buying special products or brands. UQ4. Buying and using products that are interesting and unusual assists me in establishing a distinctive image.	(Arbore et al. 2014)

Data Collection Procedure

Three hundred questionnaires were distributed to each of the two commercial banks located in a large metropolitan area in southern China. There are 142 branches for Bank A and 78 branches for Bank B in the city. Five branches were randomly selected from each bank and at least 60 questionnaires were collected from each branch. Every respondent was given a gift as a token of thanks after they finished the questionnaire. Convenience sampling approach was adopted to distribute questionnaires. To encourage

their participation, we distributed questionnaires in different branches while they were waiting. Finally, we obtained 386 valid responses and the demographic profile of respondents was shown in Table 3.

Table 3. Demographics

		Frequency	Percentage (%)
Gender	Male	166	43.0
	Female	220	57.0
Age	18-20	14	3.6
	21-23	51	13.2
	24-26	63	16.3
	27-35	111	28.8
	36-45	100	25.9
	46-60	36	9.3
	Higher than 60	11	2.8
Mobile banking experience	Less than 0.5 year	47	12.2
	0.5-1 year	108	28.0
	1-3 years	138	35.8
	3-5 years	70	18.1
	5-7 years	16	4.1
	7-10 years	6	1.6
	Over 10 years	1	0.3
Annual family income	Lower than 50,000 CNY	48	12.4
	50,000-150,000 CNY	155	40.2
	150,000-300,000 CNY	68	17.6
	300,000-500,000 CNY	33	8.5
	500,000-700,000 CNY	43	11.1
	700,000-1000,000 CNY	12	3.1
	Higher than 1000,000 CNY	27	7.0
Occupation	State-Owned Enterprise	184	47.7
	Private Enterprise	58	15.0
	Foreign Enterprise	21	5.4
	Students	65	16.8
	Self-Employment	51	13.2
	No Occupation	5	1.3
	Others	2	0.5

Further, to ensure the appropriateness of selecting Bank A and Bank B, we took technology leadership as the manipulation check. As shown in Table 4, the values of the four items of technology leadership for Bank A ranged from 2.71 to 2.92 while the values for Bank B ranged from 5.86 to 6.08. F test suggested that the technology leadership for Bank B was significantly higher than that for Bank A, so using these two banks to represent the banks with different levels of technology leadership was acceptable. Further,

because this study focuses on the post-adoption behavior, all the respondents should have certain experience in using mobile banking services

Table 4. Manipulation Check

	Bank A (Low technology leadership)		Bank B (High technology leadership)		F
	Mean	Std. Dev	Mean	Std. Dev	
TL1	2.89	1.511	6.08	0.866	601.652**
TL2	2.92	1.597	5.90	0.895	475.468**
TL3	2.71	1.424	5.86	0.824	656.326**
TL4	2.76	1.367	5.87	0.796	695.237**

Note: TL = Technology Leadership.

Data Analysis

Partial least squares (PLS) approach was used to analyze the data. It was selected because, compared to the first generation of statistic techniques, it could simultaneously and systematically test the measurement model and structural model. Compared to other structural equation modeling (SEM) techniques such as co-variance based method, PLS is more appropriate for dealing with the sample with small sample size and abnormal distribution (Hair et al. 2011). Specifically, SmartPLS was used in the data analysis. Following the recommended two-stage analytical procedures (Hair et al. 1998), the measurement model and structural model were examined respectively.

Measurement Model

Reliability and validity of the constructs were assessed in the measurement model. Reliability can be evaluated by checking the composite reliability (CR), Cronbachs alpha and average variance extracted (AVE). As shown in Table 5, the alpha and CR values for all the constructs were above 0.7 and the AVE values for all the constructs were above 0.5, suggesting that these constructs were with good reliabilities (Fornell et al. 1981).

Table 5. Reliability

	AVE	Composite Reliability	Cronbachs Alpha
Customer loyalty (AL)	0.834	0.953	0.933
Brand equity (BE)	0.701	0.903	0.857
Need for uniqueness (UQ)	0.906	0.975	0.966
Technology leadership (TL)	0.928	0.981	0.974

The validity assessment includes convergent and discriminant validity assessments. Convergent validity can be evaluated by checking the loadings of constructs, while the discriminant validity can be evaluated by checking whether or not the loadings on the expected construct are higher than the loadings on other constructs. As shown in Table 6, the loadings on the expected constructs were high enough and significant, and greater than those on other constructs, suggesting good convergent validity and discriminant validity for these constructs (Fornell et al. 1981).

Table 6. Cross-loadings

	AL	BE	UQ	TL
AL1	**0.930**	0.753	0.633	0.490
AL2	**0.941**	0.751	0.648	0.489
AL3	**0.872**	0.721	0.564	0.439
AL4	**0.908**	0.721	0.618	0.464
BE1	0.738	**0.877**	0.674	0.571
BE2	0.701	**0.888**	0.641	0.494
BE3	0.636	**0.774**	0.528	0.353
BE4	0.620	**0.805**	0.627	0.502
UQ1	0.658	0.735	**0.960**	0.607
UQ2	0.625	0.680	**0.962**	0.604
UQ3	0.649	0.717	**0.969**	0.614
UQ4	0.665	0.716	**0.961**	0.645
TL1	0.495	0.558	0.629	**0.948**
TL2	0.504	0.564	0.617	**0.962**
TL3	0.451	0.509	0.593	**0.951**
TL4	0.509	0.567	0.603	**0.947**

Note: AL = Customer Loyalty, BE = Brand Equity, UQ = Need of Uniqueness, TL = Technology Leadership.

Structural Model

The PLS results for the structural model were shown in Figure 2. The results showed that the relationship between brand equity and customer loyalty ($\beta = 0.729$, $t = 21.157$) and the relationship between technology leadership and brand equity ($\beta = 0.582$, $t = 12.445$) were significant, lending supports to H1 and H2. Sobel's z test suggested that the indirect effect of technology leadership on customer loyalty though brand equity was significant ($\beta = 0.424$, $z = 10.718$). The results also showed that need for uniqueness positively moderated the relationship between brand equity and customer loyalty ($\beta = 0.133$, $t = 3.139$) and between technology leadership and brand equity ($\beta = 0.278$, $t = 7.263$), so H3 and H4 were supported.

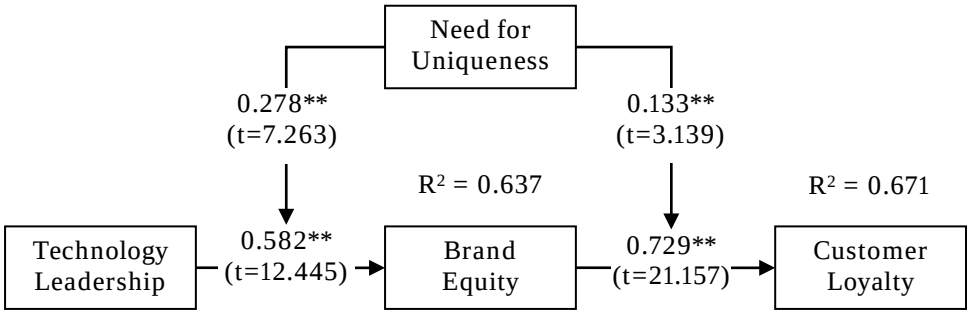

Figure 2. PLS Results

Discussions

Theoretical Contributions

The study makes two key theoretical contributions to mobile banking literature. First, this study examines the customer loyalty formulation process at the post-adoption stage by drawing upon brand equity theory. Previous studies on mobile banking focused on the initial mobile banking adoption by addressing a variety of technology acceptance theories such as TAM and UTAUT (Gu et al. 2009; Lin 2010; Luarn et al. 2005; Zhou 2011). In this study, considering the theoretical importance of understanding customer loyalty at the post-adoption stage, we propose and empirically examine a research model of customer loyalty. Further, given the social visibility of the usage of mobile banking services, we point out that brand equity plays an important role in the loyalty building process. More importantly, rather than focusing on one specific mobile banking service, we introduce the concept of technology leadership into the customer loyalty research. This construct can better capture the intense competition between different mobile banking service providers and view the loyalty formulation from a comparative perspective.

Second, this study identified the boundary conditions under which technology leadership affects brand equity and brand equity affects customer loyalty by integrating the symbolic value theory and brand equity theory. Previous studies applying brand equity theory in the analysis may stress on the main effects of brand equity (Xu et al. 2014). The contingent factors that moderate the relationships between brand equity and its antecedents and consequences have been rarely examined. In this study, we figure out that need for uniqueness is a key individual factor that affect the effectiveness of the brand equity mechanisms. Specifically, when need for uniqueness is high, the relationship between technology leadership and brand equity and between brand equity and customer loyalty both can be strengthened. This interactive mechanism can be further used in the research using brand equity theory.

Practical Implications

This study also has several practical implications. First, mobile banking service providers should recognize that customer loyalty is determined by brand equity. Therefore, when providing mobile banking services to customers, banks should pay attention not only to the performance of their services but also to customers' self identities so as to achieve the fit between customer identity and brand. Second, technology leadership is found to be an approach to enhance brand equity, so mobile banking service providers should increase their mindfulness about the fashion wave of technology to keep their leading position. Third, this study indicates that when need for uniqueness is high, the relationships between technology leadership and brand equity, and between brand equity and customer loyalty will stronger. Thus, for those individuals chasing for uniqueness, mobile service providers should pay more attention to technology leadership.

Limitations

This study also suffers some limitations. First, a convenience sample was used in the analysis, so the generalizability of the conclusion should be further examined in future research by applying a random sampling method. Second, the study was conducted in China which is with a collectivistic national culture, whether or not the conclusion can be applied to other countries with individualistic culture should be further tested (Hofstede et al. 2010). Finally, because this study focused on understanding the customer loyalty formulation process from the brand equity perspective, some other factors such as satisfaction and trust were not included in the study. Future research can add more constructs in the model to increase the R-squares.

References

Ajzen, I. 1991. "The Theory of Planned Behavior," *Organizational Behavior and Human Decision Processes* (50:2), pp 179-211.

Arbore, A., Soscia, I., and Bagozzi, R. P. 2014. "The Role of Signaling Identity in the Adoption of Personal Technologies," *Journal of the Association for Information Systems* (15:2), pp 86-110.

Bhattacherjee, A. 2001. "Understanding Information Systems Continuance: An Expectation-Confirmation Model," *MIS Quarterly* (25:3), pp 351-370.

Chung, N., and Kwon, S. J. 2009. "Effect of Trust Level on Mobile Banking Satisfaction: A Multi-group Analysis of Information System Success Instruments," *Behaviour & Information Technology* (28:6), pp 549-562.

Cornaggia, J., Mao, Y., Tian, X., and Wolfe, B. 2015. "Does banking competition affect innovation?," *Journal of Financial Economics* (115:1), pp 189-209.

Davis, F. D. 1989. "Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology," *MIS Quarterly* (13:3), pp 319-340.

Del Rio, A., Vazques, R., and Iglesias, V. 2001. "The Effects of Brand Associations on Consumer Response," *Journal of Consumer Marketing* (18:5), pp 410-425.

DeLone, W. H., and McLean, E. R. 2003. "The DeLone and McLean Model of Information Systems Success: A Ten-Year Update," *Journal of Management Information Systems* (19:4), pp 9-30.

Escalas, J., and Bettman, J. 2005. "Self-Construal, Reference Groups, and Brand Meaning," *Journal of Consumer Research* (32:3), pp 378-389.

Fisher, R. J., and Price, L. L. 1992. "An investigation into the social context of early adoption behavior," *Journal of Consumer Research* (19:3), pp 477-486.

Fornell, C., and Larcker, D. F. 1981. "Evaluating Structural Equation Models with Unobservable Variables and Measurement Error," *Journal of Marketing Research* (18:1), pp 39-50.

Goodhue, D. L., and Thompson, R. L. 1995. "Task-Technology Fit and Individual Performance," *MIS Quarterly* (19:2), pp 213-236.

Gu, J. C., Lee, S. C., and Suh, Y. H. 2009. "Determinants of Behavioral Intention to Mobile Banking," *Expert Systems with Applications* (36:9), pp 11605-11616.

Hair, J. F., Anderson, R. E., Tatham, R. L., and Black, W. C. 1998. *Multivariate Data Analysis*, (5th ed.) Prentice-Hall: Upper Saddle River, NJ.

Hair, J. F., Ringle, C. M., and Sarstedt, M. 2011. "PLS-SEM: Indeed a Silver Bullet," *The Journal of Marketing Theory and Practice* (19:2), pp 139-152.

Hofstede, G., Hofstede, G. J., and Minkov, M. 2010. *Cultures and Organizations: Software of the Mind*, (3rd Edition ed.) McGraw-Hill: New York.

Hong, S.-J., and Tam, K. Y. 2006. "Understanding the adoption of multipurpose information appliances: The case of mobile data services," *Information Systems Research* (17:2), pp 162-179.

Jacoby, J., and Kaplan, L. B. Year. "The Components of Perceived Risk," 3rd Annual Conference of the Association for Consumer Research1972, pp. 382-393.

Johnson, M., Hermann, A., and Huber, F. 2006. "The Evolution of Loyalty Intentions," *Journal of Marketing* (70:2), pp 122-132.

Keller, K. 1993. "Conceptualizing, Measuring, and Managing Customer-based Brand Equity," *Journal of Marketing* (57:1), pp 1-22.

Kim, G., Shin, B. S., and Lee, H. G. 2009. "Understanding Dynamics between Initial Trust and Usage Intentions of Mobile Banking," *Information Systems Journal* (19:3), pp 283-311.

Lin, H. F. 2010. "An Empirical Investigation of Mobile Banking Adoption: The Effect of Innovation Attributes and Knowledge-Based Trust," *International Journal of Information Management* (31:3), pp 252-260.

Luarn, P., and Lin, H. H. 2005. "Toward an Understanding of the Behavioral Intention to Use Mobile Banking," *Computers in Human Behavior* (21:6), pp 873-891.

Luo, X., Li, H., Zhang, J., and Shim, J. 2010. "Examining Multi-Dimensional Trust and Multi-Faceted Risk in Initial Acceptance of Emerging Technologies: An Empirical Study of Mobile Banking Services," *Decision Support Systems* (49:2), pp 222-234.

Lutz, R. J., and Reilly, P. J. 1973. "An exploration of the effects of perceived social and performance risk on consumer information acquisition," *Advances in consumer research* (1:4), pp 393-405.

Mallat, N., Rossi, M., and Tuunainen, V. K. 2004. "Mobile banking services," *Communications of the ACM* (47:5), pp 42-46.

McKnight, D. H., Choudhury, V., and Kacmar, C. 2003. "Developing and Validating Trust Measures for e-Commerce: An Integrative Typology," *Information Systems Research* (13:3), pp 334-359.

Oliver, R. 1999. "Whence Consumer Loyalty," *Journal of Marketing* (63:4), pp 33-44.

Park, C. W., Jaworski, B., and Maclnnis, D. J. 1986. "Strategic Brand Concept-Image Management," *Journal of Marketing* (50:4), pp 135-145.

Peter, J. P., and Trapey, L. 1975. "A Comparative Analysis of Three Consumer Strategies," *Journal of Consumer Research* (2), pp 29-37.

Rego, L., Billett, M., and Morgan, N. 2009. "Consumer-based Brand Equity and Firm Risk," *Journal of Marketing* (73:6), pp 47-60.

Simon, C., and Sullivan, M. 1993. "The Measurement and Determinants of Brand Equity: A Financial Approach," *Marketing Science* (12:1), pp 28-52.

Smith, J. B., and Colgate, M. 2007. "Customer Value Creation: A Practical Framework," *Journal of Marketing Theory and Practice* (15:1), pp 7-23.

Thorbjornsen, H., Pedersen, P. E., and Nysveen, H. 2007. "This Is Who I Am: Identity Expressiveness and the Theory of Planned Behavior," *Psychology & Marketing* (24:9), pp 763-785.

Van de Vijver, F. J. R., and Leung, K. 1997. *Methods and Data Analysis for Cross-Cultural Research*, (Sage Publications: Thousand Oaks, CA.

Venkatesh, V., Morris, M., Davis, G. B., and Davis, F. D. 2003. "User Acceptance of Information Technology: Toward a Unified View," *MIS Quarterly* (27:3), pp 425-478.

Xu, X., Thong, J. Y. L., and Venkatesh, V. 2014. "Effects of ICT Service Innovation and Complementary Strategies on Brand Equity and Customer Loyalty in a Consumer Technology Market," *Information Systems Research* (25:4), pp 710-729.

Yoo, B., Donthu, N., and Lee, S. 2000. "An Examination of Selected Marketing Mix Elements and Brand Equity," *Journal of Academy of Marketing Science* (28:2), pp 195-211.

Yu, T.-K., and Fang, K. 2009. "Measuring the post-adoption customer perception of mobile banking services," *CyberPsychology & Behavior* (12:1), pp 33-35.

Zhou, T. 2011. "An Empirical Examination of Initial Trust in Mobile Banking," *Internet Research* (21:5), pp 527-540.

Zhou, T. 2013. "An empirical examination of continuance intention of mobile payment services," *Decision Support Systems* (54:2), pp 1085-1091.

Zhou, T., Lu, Y., and Wang, B. 2010. "Integrating TTF and UTAUT to Explain Mobile Banking User Adoption," *Computers in Human Behavior* (26:4), pp 760-767.