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Whether Adoption Drivers Differ between Click-and-mortar and Pure-play E-payment Services?

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Abstract: How could traditional financial institutions attract online users? Should they mimic their online counter-parts, or compete based on an existing offline business? This research compares different effects of the adoption drivers between pure-play and click-and-mortar e-payment services based on a trust-based Valence Framework. Use intention is proposed to be affected by perceived benefit, perceived risk, and trust, which is in turn affected by familiarity, reputation and security protection. 276 subjects' responses about Quick Pay (a pure online third-party payment) and Union Pay (an e-payment service offered by a traditional financial institution) were collected. The data analysis reveals: (1) the pure-play e-payment performs much better than the click-and-mortar e-payment except for information risk and property risk; (2) all the path coefficients are significant except the link between perceived risk and use intention for Union Pay; (3) most of the path coefficients for pure-play e-payment service are stronger than those of click-and-mortar e-payment service, except for the links between perceived benefit and intention, trust and perceived risk, and familiarity and trust. These differences can be attributed to different resource endowments owned by service providers. The results suggest that pure-play and click-and-mortar e-payment should have different focuses when promoting their services.

Keywords: Adoption driver; Omni-Channel; Pure-play; Click-and-mortar; Comparison; Trust-based Valence Framework

1. INTRODUCTION

The use of e-payment services has gained popularity among consumers, but this technology is considered disruptive by traditional banks. Many third-party pure-play e-payment services, such as Apple Pay and Paypal in North America, and Alipay in China, have effectively shaken up local and traditional financial industries. These services have drawn customers away and changed their payment behavior and expectations, while building up a substantial deposit fund during the innumerable transaction processes. To counter this blast wave of change, many banks and credit unions launch an omni-channel strategy and have become click-and-mortar service providers. According to Celent's Digital Panel Research on US Financial Institutions and Digital Payments in 2015, 71% of the surveyed financial institutions suggested that they would explore their own brand of digital payments.

However, thus far, traditional financial institutions have not been successful in building their own e-payment services, due to the lack of user adoption and uptake. Banks and credit unions do not understand online customers and are not familiar with online business practices. A key question is this: When traditional financial institutions promote the adoption of their e-payment services, should they mimic their online counter-parts? This translates into our research questions: 1) What drives user adoption of e-payment services, and 2) are the relevant drivers different between pure-play and click-and-mortar organizations? We believe the drivers differ, because both pure-play and click-and-mortar e-payment services have their own advantages and disadvantages in terms of user perceptions. Only after acknowledging the most important drivers can pure-play and click-and-mortar e-payment service providers effectively and efficiently improve their services and attract more users.

To date, the literature on the adoption of e-payment services has just analyzed the drivers of adoption [1-3]. Few studies, however, compare the differences in the adoption drivers between click-and-mortar and pure-play e-payment services, especially in terms of distinguishing the impact path of those drivers. Most existing research compares the adoption from the perspective of users' demographic or personal traits, as well as the users' cultural, social and economic situations[4]. Our study intends to address that gap in existing research.

Based on a trust-based valence framework[5], we developed a framework to explain and compare the drivers of e-payment services. Those drivers mainly include perceived benefit, perceived risk and trust. Data from 276 users was collected. Questions were asked regarding the respondents' use of two typical pure-play and click-

and-mortar payment services in China, namely Quick Pay of Alipay.com and Online Pay of Union Pay. The framework is empirically validated, and the adoption drivers and their influences on the respondents' intention to use Quick Pay and Union Pay are compared. This research contributes to the understanding of the adoption drivers of e-payment services and understanding the differences between pure-play and click-and-mortar services. Our study, therefore, has the potential to contribute to the field of omni-channel strategy research.

2. THEORETICAL BACKGROUND AND LITERATURE REVIEW

The Technology Acceptance Model[6], the Innovation Diffusion Theory(IDT) [7], and the Unified Theory of Acceptance and Use of Technology (UTAUT)[8] are the most commonly used models in literature dealing with the adoption of e-payment, internet bank and mobile payment services. To achieve a comprehensive understanding, many studies integrate models or extend core models with constructs such as perceived risks, trust, security, self-efficacy, etc.[4, 9]. Thus has made models more and more complex. To simplify the research model, some studies attempted to categorize factors or develop higher-order constructs. For example, Thakur and Srivastava [10] developed a second-order construct of adoption readiness, which integrated perceived usefulness, perceived ease of use, social influence, and facilitating conditions. Luo, Li [11] developed a multi-faceted perceived risk which included seven negative aspects of adoption. Lee [3] integrated various advantages of online banking to form the construct of perceived benefit. Having reviewed these studies, we think the most distinct and inclusive thinking is to divide the drivers of use intention into positive (value/motivation), negative (uncertainty/barrier) aspects, and some subjective or context factors[3, 12, 13].

As for comparing e-payment adoption, most literature employs moderators such as demographics or personal traits, as well as cultural, social, and economic situations [4]. To the best of our knowledge, no one has compared the differences between click and mortar e-payment services and pure-play services. A few researchers have compared different kinds of e-payment services. For example, Mirza and Wallstorm [14] compared private banks with governmental banks. Curran and Meuter [15] compared the diffusion of ATMs, bank-by-phone and online banking. However, they only examined the differences in each factor by using a pared sample t-test. Few studies actually compare drivers on use intention to find the most effective way to attract user.

3. RESEARCH MODEL AND HYPOTHESE

This research adopts and modifies the trust-based valence framework proposed by Kim, Ferrin [5], to compare adoption drivers of pure-play and click-and-mortar e-payment services. In the framework, use intention is proposed to be affected by perceived benefit, perceived risk, and trust, which is in turn affected by familiarity, reputation and security protection.

3.1 The Impact of Perceived Benefit and Perceived Risk on Use Intention

The valence framework is a "cognitive-rationale" customer decision-making model which simultaneously incorporates the perception of risks and benefits. Peter and Tarpey Sr [16] noted that consumers intend to maximize the net valence, which is the difference between the expected positive utility and the negative utility associated with the purchase. The positive utility associated with consumer adoption is referred to as the perceived benefit, and the negative as perceived risk. The valence framework has been used in many studies[17, 18] and has proven to be extremely effective in predicting consumers' purchasing intentions. Yang, Lu [19] applied the valence framework in a mobile payment adoption study. An e-payment service provides an improved payment experience and a wider range of values. Previous studies found that perceived benefits[1, 3, 20] or similar concepts, such as perceived relative advantages[2, 19, 21], are significant drivers for e-payment service use intention. People using an e-payment service also may face all kinds of risks, including fraud, money theft, hacking, information leakage, not receiving after pay, etc. Perceived risk is an important barrier to users who are considering whether or not to use an e-payment service. Previous studies also have found that perceived risk has a significantly negative impact on use intention, which eventually leads to a resistance to adopting e-payment services [10, 11, 20, 22].

When choosing from different e-payment services, users may compare their net valence between perceived

benefit and risk. The click-and-mortar e-payment service established based on a notable tangible offline business, its offline assets, powerful technology and strict regulation make it perceived less risky than a pure-play one. On the contrary, as a new comer in e-payment service, the online usability is not good as a pure-play counter-part, and it requires higher fees and not accepted by so many stores. However, these are advantages of pure-play e-payment services in perceived benefit. Some users might even accept a relatively suspicious pure-play e-payment service, simply because of the payment service's obvious benefits of high convenience, usability and lower cost. Thus, we may infer that for the higher degree perceived risk of pure-play e-payment service, more improvement in perceived benefit is needed to promote same adoption as that of a click-and-mortar one, and for higher degree perceived benefit of pure-play e-payment service, less decreasing of perceived risk is needed. That is to say, improving perceived benefit is more effective in promoting use intention for click-and-mortar e-payment service, while decreasing perceived risk is more effective for pure-play e-payment service. Therefore, our study hypothesizes:

H1 Perceived benefit of pure-play e-payment service has weaker positive impact on use intention than click-and-mortar e-payment service.

H2 Perceived risk of pure-play e-payment service has stronger negative impact on use intention than click-and-mortar e-payment service.

3.2 Impacts of Trust on Use Intention

D. J. Kim et al.[5] incorporate trust and a range of trust-enhancing antecedents in the valence framework, in order to investigate online shopping behavior. They think that trust is more critical in online transactions than in traditional transactions, because building trust is a good strategy for dealing with the uncertainty normally found in the impersonal online situation. In recent years, many studies found it a valid and suitable model to explain the adoption of online banking, mobile banking and mobile payment[23-25].

Many studies have found that trust directly influences the widespread usage of an e-payment service [26-29].A user's trust in an e-payment service is the user's subjective belief that their payment will be processed in accordance with their expectations [23, 26]. Trust can be a crucial strategy when dealing with an uncertain future [5], because trust increases users' confidence and reduces fears and worries. Given the higher degree of uncertainty for pure-play e-payment service (compared to pure-play e-payment), it is even more critical for pure-play e-payment vendors to help overcome uncertainty by building trust. Therefore, we hypothesize:

H3: Trust in pure-play e-payment service has a stronger direct positive impact on the use intention than click-and-mortar e-payment service.

Kim[30] found that trust can both directly and indirectly influence purchase intentions, by decreasing the perception of risk or increasing the perception of benefits. Previous studies have found that trust has a positive effect on perceived benefits and consequently on use intention of e-payment services [11, 23, 24, 31]; and also negatively impacts perceived risk and consequently the use intention [11, 23, 25, 32]. A pure-play payment system has advantages in terms of online benefits, but also perceived as being relatively more risky because it operates in a purely virtual context. Thus, if users trust in a pure-play payment vendor, they perceived more benefits by reducing their suspicion, saving their efforts in terms of search and comparison, increasing the productivity of money transfers and decreasing transaction costs. However, for their nature of pure virtual, even users' trust increased, the decreasing of perceived risk will lesser than click-and-mortar e-payment. Therefore, we hypothesize that:

H4: Trust in pure-play e-payment service has a stronger positive impact on perceived benefit than that of click-and-mortar e-payment service

H5: Trust in pure-play e-payment service has a weaker negative impact on perceived risk than that of click-and-mortar e-payment service

3.3 Antecedents of Trust

Many determinants of trust have previously been studied. We only examine the influence of a firm's reputation, user familiarity, and perceived security protection on trust, because we are more interested in how attributes of e-payment vendors influence user's trust. Hence, calculative-based trust[31], situational normality[31], and personality-based antecedents, such as a user's propensity to trust as well as their

expectations [27, 33], are not studied. A firm's reputation reflects the customers' perception of that firm's capability to deliver the promised service effectively. Reputation relates to the credibility of the organization, and the reliability of the firm's engagement with users [34]. A positive reputation helps to formulate and maintain users' confidence in an e-payment vendor's ability, benevolence, and integrity[5]. Previous studies have found that a positive firm reputation is significant in establishing trust in that firm's e-payment service[27]. Familiarity is defined as a consumer's degree of acquaintance with the subject, including the consumer's knowledge of the provider and understanding of that provider's operation[5]. Familiarity with a system will help users to understand how best to use that system[35], as well as to develop concrete ideas of what to expect next. These make users feel less uncertain, consequently more likely to judge the provider to be trustworthy. Previous studies have found that familiarity positively affects the establishment of trust in e-payment services[36]. Perceived security protection refers to the users' perception of a firm's capabilities and the measures the firm will take to protect the consumer's property security and information from unauthorized use. Privacy protection, security protection and structural assurance have been proved positively affect trust building [2, 27].

A click-and-mortar e-payment service has gained good reputation in mortar field, users is likely to infer that the vendor may continue to offer a good service in new field. It also has good prestige in technical capabilities, regulations and reliability in traditional financial transaction fields. These improve user confidence with regard to their privacy confidentiality and property safety. In these fields, pure-play e-payment has relative disadvantages. On the contrary, it has established user's familiarity from previous online experience and knowledge. But the later comer click-and-mortar e-payment service not yet. Thus, to enhance trust, improving reputation and perceived security protection is more effective for a pure-play, while establishing familiarity is more effective for click-and-mortar service. Therefore:

H6: Reputation of pure-play e-payment service has stronger positively impact on users' trust than that of click-and-mortar e-payment service.

H7: Familiarity with pure-play e-payment service has weaker positively impact on users' trust than that of click-and-mortar e-payment service.

H8: The perceived security protection of pure-play e-payment service has stronger positively impact on users' trust than that of click-and-mortar e-payment service.

4. METHODOLOGY

A survey research method was used to test the research hypotheses. During the survey, respondents were asked to express their opinions regarding 24 statements about two e-payment services, namely Quick Pay of Alipay and Online Pay of Union Pay. The two services were chosen because they are typical pure-play and click-and-mortar e-payment services, both having similar business models and functions. Table 1 provides an overview of the measurements and their sources. All constructs are measured using the five-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). Revisions were made based on a pre-test, involved 17 respondents, to improve both the validity and understandability of the instrument. Respondents were reached via Questionnaire Star's (an online questionnaire service,www.sojump.com) paid questionnaire service. To help achieve sample diversity, we asked Questionnaire Star to solicit respondents covering different age groups, occupations and regions. Finally, we collected a total of 276 respondents' valid answers.

Table 1. Variables measurement

Second-order	First-order	Indicator	Item	Source
Perceived Benefit (PerB) formative - formative	Network Benefit (NetB)	NetB1	I can use XXX on a computer, or any other devices	self
		NetB2	I can use XXX to pay many merchants or stores	[21]
	Financial Benefit (FinB)	FinB1	I can get interest from my account with XXX	[37]
		FinB2	I use XXX because it can save me transaction fees.	
	Usability (Usab)	UsaB1	Login and authentication in XXX is quick	[38]
		UsaB2	Login and authentication in XXX is not complicated.	
		UsaB3	Using XXX enables me to save time	[2]
		UsaB4	Using XXX is easy and user friendly	
Perceived Risk (PerR) formative -	Commodity Risk (ComR)	ComR1	Using XXX protects me from getting a non-working or defective product.	[5]
		ComR2	Using XXX, if I receive an unsatisfied product, I could ask for a return and refund.	self
	Property Risk	PropR1	When transferring money by XXX, I am afraid that I will lose money.	[3]
	Information risk	InfoR1	I think XXX collects too much personal information.	[3]

formative	[39]	InfoR2	I am afraid that XXX uses my personal information for other purposes without my permission.	[10]
		InfoR3	I am afraid that using XXX will let unauthorized persons or companies get my personal information.	
Perceived Security Protection (SecPro)(formative)		SecPro1	XXX can protect my information very well.	[33]
		SecPro2	XXX can protect my property very well.	
		SecPro3	If my money is stolen, I think I could get compensation from XXX.	
Reputation (Repu)(reflective)		Repu1	XXX has a good reputation	[33]
		Repu2	XXX's provider has good reputation	
User Familiarity (Fam)(reflective)		Fam1	I am familiar with XXX.	[5]
		Fam2	I am familiar with the process of XXX.	
Trust (Trust)(reflective)		Trust1	I believe XXX is trustworthy.	[31]
		Trust2	I believe that XXX has my best interests in mind	
Use Intention (Intend)		Intend1	I like to use XXX to complete financial transactions.	[33]

We employed a pared samples t-test (run by SPSS) to identify the differences in respondents' attitudes toward the two e-payment services. The results (Table 2) indicate that Quick Pay performs much better than Union Pay because it achieves significantly higher scores on most constructs except for information risk and property risk.

Table 2. Comparison between Quick Pay and Union Pay: pared samples t-test

	Paired difference		Sig.		Paired difference		Sig.
Pair 1	QNetB - UNetB	.43321	.000	Pair 7	QRepu - URepu	.37184	.000
Pair 2	QFinB - UFinB	.69675	.000	Pair 8	QFam - UFam	.63899	.000
Pair 3	QUsab - UUsab	1.79061	.000	Pair 9	QSecPro - USecPro	.29603	.008
Pair 4	QComR - UcomR	-1.21661	.000	Pair 10	QTrust - UTrust	.32491	.000
Pair 5	QInfoR- UInfoR	-.08664	.355	Pair 11	QIntend - UIntend	1.93863	.000
Pair 6	QPropR - UPropR	.04693	.343				

Note: Variable codes beginning with Q hereinafter refer to variables in Quick Pay model; those with U refer to Union Pay model.

5. RESULTS

We used Partial Least Square, performed by SmartPLS 3.0, to assess the model. A resampling techniques-bootstrapping (1000 samples and CI=95%) is used to evaluate the significance of the estimates. PLS was chosen over Covariance-based (CB) SEM because our research is exploratory and predictive. Another reason we used PLS is that PLS is more suitable for handling a complex model with both formative and reflective variables than is CB-SEM. As we included hierarchical constructs in the model, we follow the Becker, Klein [40] two-stage approach to assess the measurement model and structural model. The two-stage approach was chosen over the repeated-indicator approach, because it works best when a formative hierarchical construct in an endogenous position is involved [41].

5.1 Measurement Model Assessment

As shown in Table 3, the Composite Reliability (CR) scores all exceed the 0.6 threshold recommended by Chin [42], and this result implies sufficient reliability of reflective measurement. Following the suggestions of Fornell and Larcker [43], Average Variance Extracted (AVE) scores which exceed the threshold of 0.50 demonstrate convergent validity. The square root of AVE (the diagonal of the Matrix in Table 3) for each construct is greater than each construct's correlation with other constructs (non-diagonal of the Matrix), and this result exhibits sufficient discriminant validity. To further test convergent and discriminant

Table 3. Reliability and validity for reflective measurement

	AVE	CR	Loading	Fam	Repu	Trust
QFam	0.774	0.872	0.894	0.880		
			0.865			
QRepu	0.701	0.823	0.918	0.521	0.837	
			0.748			
QTrust	0.728	0.842	0.863	0.503	0.558	0.853
			0.842			
UFam	0.684	0.812	0.831	0.827		
			0.823			
URepu	0.685	0.813	0.869	0.499	0.828	
			0.784			
UTrust	0.678	0.808	0.812	0.486	0.475	0.823
			0.835			

validity,Gefen, Straub [44] suggest that each indicator should have a higher loading on its own respective construct (loadings above 0.70) than on any other construct (cross-loadings below 0.60). All of the constructs passed this criterion.

To assess the reliability of a formative construct, Diamantopoulos and Siguaw [45] suggested that non-multicollinearity is required. The correlations among the first-order constructs of PerB and PerR are all far below 0.8. This shows that PerB and PerR are better measured formatively in second orderPavlou and El Sawy [46]. As shown in Table 4, all Variance Inflation Factor (VIF) scores are below 3.3, which meet Petter, Straub [47] criteria for reliability of first-order formative constructs. To evaluate convergent and discriminant validity of a formative construct, most loadings are significant at the $p<0.05$ level, except QInfoR1. According to Bollen and Lennox [48], non-significant items of formative constructs are allowed to be retained, in order to preserve content validity and ensure the entire domain is being measured, especially in the absence of multicollinearity. Following their guidance, we keep the indicator of InfoR1 for measuring InfoR.

Table 4.Reliability and validity for formative measurement

Higher order	Lower order	VIF	loading	p-value	Higher order	Lower order	VIF	loading	p-value
Second-order constructs and first-order constructs									
QPerB	QNetB	1.463	0.747	0.000	UPerB	UNetB	1.259	0.697	0.000
	QFinB	1.130	0.458	0.000		UFinB	1.346	0.732	0.000
	QUsab	1.520	0.957	0.000		UUsab	1.468	0.892	0.000
QPerR	QComR	1.054	0.982	0.000	UPerR	UComR	1.002	0.967	0.000
	QInfoR	1.216	0.310	0.005		UInfoR	1.388	0.284	0.017
	QPropR	1.237	0.368	0.001		UPropR	1.387	0.218	0.048
First-order construct and indicators									
QNetB	QNetB1	1.140	0.868	0.000	UNetB	UNetB1	1.099	0.819	0.000
	QNetB2	1.140	0.769	0.000		UNetB2	1.099	0.793	0.000
QFinB	QFinB1	1.080	0.389	0.016	UFinB	UFinB1	1.049	0.526	0.000
	QFinB2	1.080	0.992	0.000		UFinB2	1.049	0.944	0.000
QUsab	QUsab1	1.895	0.445	0.000	UUsab	UUsab1	1.970	0.698	0.000
	QUsab2	1.943	0.440	0.000		UUsab2	1.808	0.623	0.000
	QUsab3	1.497	0.855	0.000		UUsab3	1.568	0.870	0.000
	QUsab4	1.565	0.902	0.000		UUsab4	1.667	0.809	0.000
QInfoR	QInfoR1	1.305	0.075	0.722	UInfoR	UInfoR1	1.336	0.758	0.002
	QInfoR2	1.875	0.915	0.000		UInfoR2	1.700	0.923	0.000
	QInfoR3	1.746	0.497	0.049		UInfoR3	1.709	0.654	0.007
QComR	QComR1	1.114	0.847	0.000	UComR	UComR1	1.351	0.858	0.000
	QComR2	1.114	0.775	0.000		UComR2	1.351	0.879	0.000
QSecPro	QSecPro1	1.776	0.768	0.000	USecPro	USecPro1	1.466	0.692	0.000
	QSecPro2	1.732	0.964	0.000		USecPro2	1.423	0.911	0.000
	QSecPro3	1.246	0.572	0.000		USecPro3	1.081	0.554	0.000

5.2 Structure Model Assessment

Explanatory power is examined by the coefficient of determination (R^2) of the main endogenous variables and the Goodness of Fit (GoF) of the overall model. The R^2 values (see Figure 1,2) all exceed the cut-off value of medium effect(small$\geqslant$0.02, medium$\geqslant$0.13; large$\geqslant$ 0.26) according to Cohen [49], indicating that dependent variables can be strongly or moderately explained. This result indicates that both models have a high level of explanation power in GoF criteria.

The predictive powers are tested by the magnitude of the path coefficients between constructs, together with corresponding p-values indicating the path significance (shown in Figure 1, 2 and Table 5).

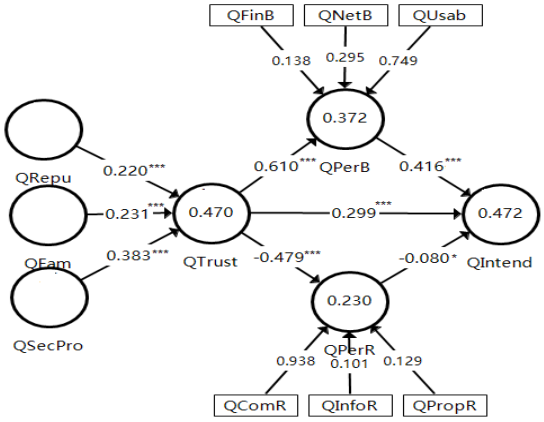

Figure 1. PLS results for Quick Pay

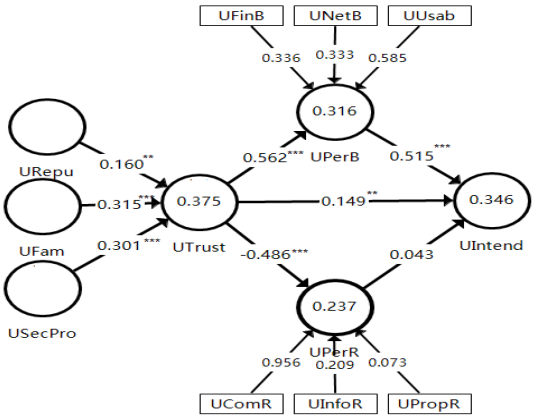

Figure 2. PLS results for Union Pay

Note: *indicates p< 0.1, ** indicates p< 0.05, and *** indicates p< 0.001.

The hypotheses are tested by comparing the path coefficients between QP and UP. We followed Sarstedt and Wilczynski [50] parametric approach. They modify Chin [51] parametric approach for paired samples, since Chin's approach is used to compare path coefficients among independent subgroups. The results (shown in Table 5) show that all the path coefficients in the Quick Pay model are significantly stronger than the corresponding paths in the Union Pay model, except for the links between Perceived Benefit and Intend, Trust and Perceived Risk, and Familiarity and Trust. Thus, H1, H2, H3, H4, H5, H6, H7, H8 are all supported.

Table 5. Path coefficients and a comparison of Quick Pay and Union Pay

		Quick Pay		Union Pay		Path Coefficient Difference				
		Path coefficient	p-value	Path coefficient	p-value	QP-UP	t value	p value	Compare	Hypothesis
H1	PerB-Intend	0.416	0.000	0.515	0.000	-0.099	-22.839	0.000	QP<UP	Support
H2	PerR-Intend	-0.080	0.078	0.043	0.298	-0.123	-29.034	0.000	QP>UP	Support
H3	Trust-Intend	0.299	0.000	0.149	0.037	0.15	25.805	0.000	QP>UP	Support
H4	Trust-PerB	0.610	0.000	0.562	0.000	0.048	17.758	0.000	QP>UP	Support
H5	Trust-PerR	-0.479	0.000	-0.486	0.000	0.007	3.208	0.002	QP<UP	Support
H6	Repu-Trust	0.220	0.000	0.160	0.019	0.06	15.665	0.000	QP>UP	Support
H7	Fam-Trust	0.231	0.001	0.315	0.000	-0.084	-21.636	0.000	QP<UP	Support
H8	SecPro-Trust	0.383	0.000	0.301	0.000	0.082	22.455	0.000	QP>UP	Support

Trust and use intention is supposed to be separately mediated via perceived benefit and perceived risk. Preacher and Hayes [52] refer to these kinds of mediators as single-step multiple mediators. Following their guidance, we get rid of the link between Trust and PerR when we test the mediate effect of PerB. Table 6 shows the mediate effect analysis results. The specific indirect effects of PerB (a*b) is significant in the QP model. When PerB is added, the direct effect(c=0.591) between Trust and Intend decreases to c'(=0.299), and both of them are significant. This suggests a partial mediation. The same conclusions can be drawn for PerB in the UP model and PerR in the QP model. However, in the UP model, PerR is regarded as having no mediate effect (p=0.331).

Table 6.Mediate effects of perceived benefit and perceived risk

		Trust-PerB-Intend	Trust-PerR-Intend	Total mediate (ft=aBbB+aRbR)	CI	
					2.5%	97.5%
QP	Indirect effect (a*b)	0.254 (0.000***)	0.038 (0.089*)			
	Direct with M (c')	0.299 (0.000***)	0.299 (0.000***)			
	Direct without M (c)	0.591 (0.000***)	0.591 (0.000***)			
	Mediate effect	Partial(59%)	Partial(8%)	0.292	0.207	0.428
UP	Indirect effect (a*b)	0.289 (0.000***)	-0.021 (0.331)			
	Direct with M (c')	0.148 (0.034**)	0.147 (0.034**)			
	Direct without M (c)	0.416 (0.000***)	0.416 (0.000***)			
	Mediate effect	Partial (41%)	No mediate	0.268	0.207	0.428
	Difference (fcQP-UP)			0.024	-0.102	0.193

The total mediate effect for the model is to simply the sum of the specific indirect effects, that is $f_t=a_1b_1+a_2b_2$. The difference between two specific mediate effects can be measured by $f_c =a_1b_1-a_2b_2$. To evaluate the significance of f_t and f_c, we follow Cheung [53] approach of Percentile Bootstrap Confidence Intervals (CI). We construct 95% Bootstrap CI on EXCEL by obtaining all the f_t or f_c calculated from 1,000 bootstrap resamples. Zero is not in the middle of the 2.5th and 97.5th percentiles of f_t (0.207, 0.428) in the QP model, indicating that the total mediate effect (=0.292) is significant. Similarly, the total mediate effect in model UP (=0.268) is significant (CI:0.207, 0.428). As zero is included in the CI of f_c (-0.102, 0.193), the difference between the total mediate effects in the QP model and UP model is not significant.

6. CONCLUSION AND DISCUSSION

Firstly, all the path coefficients are significant except the link between perceived risk and use intention for Union Pay; the same path coefficient for Quick Pay (-0.045) is also relatively weak.

This finding is consistent with Wan, Chen [54] study, based on a trust-based valence framework, which concluded that perceived risk did not have a significant impact on willingness. Weir, Douglas [38] found that a user's intention to use e-banking will be driven by usability and convenience features, rather than the user's perceptions of the system's security. Users will not welcome complex security mechanisms unless and until their perceptions of a potential threat increase to a certain point. Thus, we may infer that Chinese users are more concerned about perceived benefits, rather than perceived risks, when they select an e-payment service. As reported in 2011 in China, only 0.05% of e-payment service users faced actual, real monetary losses, yet 33.8% of users reported a security problem. Therefore, even when users report their perceived risks, they don't really worry about those risks, because the user seldom experiences those risks actually occur, and will therefore still use the system.

Secondly, to promote use intention, the effect of improving perceived benefit is more powerful for Union Pay, however, the effect of decreasing perceived risk, and enhancing trust are more powerful for Quick Pay.

From the path coefficients comparison, we can get that some improvement in perceived benefit could lead to a greater level of intention to use Union Pay (UP:0.515 vs. QP:0.416), rather than Quick Pay. On the contrary, some improvement in trust (QP: 0.299 vs. UP:0.149) and perceived risk (QP:-0.080 vs. UP:0.043) could lead to a greater level of intention to use Quick Pay, rather than Union Pay. This seems reasonable. Because Union Pay is a click-and-mortar payment system which was developed from a notable tangible bankcard system, users care less about the security and trustworthiness of the Union Pay system. Comparatively, users care more about Union Pay's online benefits, which are relatively weak, in that as Union Pay is very new in the field of online payment services. Moreover, as Lu, Yang [23] revealed, China's mainstream banking institutions, are state-owned and, at least to a certain extent, monopolies in the payment industry. When accessed as an online service, Union Pay, seemingly sticking to its old attitude towards users, lacks user friendliness. Conversely, however, users worry less about the benefits of Quick Pay, since the system performs much better in terms of usability, network benefits and financial benefits than does Union Pay (see Table 3). As a pure-play payment system, Quick Pay has a natural advantage in terms of online benefits, but Quick Pay is also perceived as being relatively more risky and less trustworthy than Union Pay, because it operates in a purely virtual context.

Thirdly, strengthening the element of trust could not only directly enhance user's intention to try the system, but also indirectly enhance use intention by increasing the perceived benefit or decreasing perceived risk. Some

enhancement in trust could increase perceived benefits (QP:0.610 vs. UP:0.562) more so for Quick Pay than Union Pay, but will decrease perceived risk(QP:-0.479 vs. UP:-0.486) more so for Union Pay than Quick Pay.

That means perceived risk of Quick Pay is more difficult to overcome by enhancing trust, while conversely, trust in Quick Pay can be more easily transferred to perceived benefit, simply because of the system's pure-play nature.

Fourthly, to enhance trust, the effect of familiarity is more powerful for Union Pay, while conversely, reputation and perceived security are more powerful for Quick Pay.

From Lu, Yang [23] point of view, consumer trust of an old payment service could be transferred to a relatively new service. As originated from Alipay, Quick Pay uses the same account of Alipay and a similar interface, thus enabling users to quickly become familiar with Quick Pay, making the system feel much more user friendly. Although Union Pay's better reputation and perceived security as a brick-and-mortar payment system could be transferred to the new field of online services, familiarity could not be so easily transferred, because the human interaction associated with traditional payments is very different from what occurs during a purely virtual online payment. The better performance of Quick Pay in user familiarity makes it a less important and effective way to improve trust. Comparatively, some improvement in the relative weak fields of reputation and perceived security protection could lead to a greater level of trust in Quick Pay.

7. CONTRIBUTIONS AND LIMITATIONS

Our research makes an important contribution to the existing literature on the adoption of e-payment services, by comparing pure-play and click-and-mortar e-payment services. Most research has compared the adoption of e-payment service using moderator variables such as demographics or personal traits, as well as cultural, social and economic situations. Few existing studies have compared e-payment services from the perspectives of cross-channel business. For brick-and-mortar financial institutions which want to launch an omni-channel strategy, how to attract users across channels and promote the diffusion of online services based on an existing offline business has not been studied. Studies on omni-channel topics are still in the minority[55], especially within the financial industry. This study not only enriches existing omni-channel studies, but also offers a new perspective for e-payment adoption research.

By extending comparisons to the extent of impact paths, this research helps enrich the understanding of the most effective ways to enhance the adoption of pure-play and click-and-mortar systems. Curran and Meuter[15] compared the diffusion of ATMs, bank by phone and online banking. However, they used a pared sample t-test to exam the descriptive differences in each driver, rather than examining the differences among impact paths. This study has examined the differences in adoption drivers between the two types of payment systems, as well as the most effective way for those systems, respectively, to promote use intention.

As a network product, the value of any payment service will increase if the number of user increases, and that service will correspondingly attract more and more new users. Both pure-play and click-and-mortar e-payment services need to attract cross-channel users. The following are managerial implications for the two e-payment systems: Firstly, both pure-play and click-and-mortar e-payment service providers should not trade perceived benefit for perceived security, and this is especially true for click-and-mortar e-payment services. Secondly, to more effectively improve use intention, click-and-mortar e-payment services should pay more intention to improving perceived benefits, while pure-play e-payment services should concentrate on increasing user trust and decreasing perceived risk. Thirdly, as a new player in the e-payment service industry, click-and-mortar companies should value and follow internet payment's "native interface," as implemented by pure-play companies to increase the level of user familiarity. Pure-play services should pay more attention to establishing their reputation and perceived security protection.

The online survey raises the problem of generalizability. This study selected only perceived benefit, perceived risk and trust as the latent factors which may impact e-payment service use intention. Our study did not consider the demographic profiles of the respondents, which may influence the relationship between the independent and dependent variables. However, many other factors have been cited as being important in past studies. Furthermore, why perceived risks do not have a significant influence on use intention in UP model is a question deserving further study in the future.

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