

# Online banking services: a meta-analytic review and assessment of the impact of antecedents and consequents on satisfaction

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**Abstract** This paper provides a meta-analysis of the generalizations in the relationships between the antecedents and consequents of satisfaction with online banking services. In total, 118 observations were analysed, with a sample of 49,607 respondents in 39 published articles from studies indexed in ten databases (Jstor, Emerald, PsycINFO, Taylor & Francis, Elsevier Science Direct, Scopus, ProQuest, SciELO, Google Scholar and EBSCO). Specifically, for the data analysis, we used the correlation coefficient  $r$  (plus  $\chi^2$ ,  $f$  test,  $t$  test,  $z$  test and  $\beta$  values). The results showed that constructs related to uncertainty, as evoked by online devices, system performance, quality of device content and online banking device structures, are significant and positive antecedents of consumer satisfaction. We also found that satisfaction with online banking services promotes trust and loyalty. Finally, we also detected that the relationship between reliability, satisfaction and service quality is stronger among Western banking consumers.

**Keywords** Satisfaction · Online services · Bank · Meta-analysis

## Introduction

The concept of customer satisfaction became popular in the marketing field following Oliver's (1981) study, which presented a design for a concept central to the understanding of consumer behaviour. The research conducted by McCullough et al. (1986) and published in the *International Journal of Bank Marketing* was pioneering in terms of investigating satisfaction in the banking sector. Since this publication, numerous other studies have been conducted offering significant development.

This development can be evidenced by the substantial number of studies analysing customer satisfaction in the banking sector (Casaló et al. 2008; Seiler et al. 2013). In a search conducted on ten different databases, we found 452 articles on the topic of bank satisfaction. Note that a large proportion of these studies were carried out in an online context and produced after 2010.

Despite the growing number of publications, questions are prompted by the academic literature that still deserve reflection because there is a significant number of conflicting results. For example, the relationship between reliability and satisfaction can be negative (Ramseook-Munhurrin and Naidoo 2011), positive (Asfour and Haddad 2014; Nguyen et al. 2014) or even neutral (Singh and Kaur 2013). These same differences are detected in other relationships in terms of the antecedent ease of use, which has been found to be positive (e.g. Asfour and Haddad 2014) or neutral (Singh and Kaur 2013).

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To address these conflicting results, we propose to carry out meta-analytic research into satisfaction with online banking service in order to synthesize and generalize the main findings on this topic. In this way, we can produce a systematic review that condenses the findings of investigations into the antecedents and consequents of satisfaction in the banking sector. We seek to advance this knowledge, generate standards for the state of science and discover what is and is not valid in theory (Fern and Moroe 1996).

This study is also important for managers, as the number of consumers who have used online services has increased. Bill Gates recently made a prediction that, by 2030, more than two billion people who currently have no bank account will save money in one and make transactions using mobile channels. A survey by The Financial Brand reported that banks have made major investments in electronic channels. Currently, of the ten major trends in the banking market, six are directly linked to the digital environment through the “expedited deployment of digital delivery, mobile-first design, increased social and digital selling, mass market acceptance of mobile payments, focus on security and authentication, and increased impact of digital disruptors” (The Financial Brand 2015). In addition, with the generalization of the results, it will be possible to understand behaviours that are favourable to the establishment of future relationships.

Based on these academic and managerial implications, this study analysed 39 articles, generating 118 valid observations, which were selected for the systematic review. The analysis used 15 constructs, which were directly related to the antecedents and consequents of satisfaction with online banking.

Through this study, we intend to advance knowledge about satisfaction with the online banking sector in the following respects: (a) we will be able to draw definitive conclusions relevant to this theme because the meta-analysis has the capacity to synthesize and generalize the findings of a phenomenon (Dickersin 2002); (b) we will be able to identify avenues for future research because the systematic review carried out can indicate relationships that are still incipient and could be investigated in the future; and (c) we will be able to offer assistance to banking managers in their decision-making processes because our findings are more consistent than those of traditional primary surveys (Hunter and Schmidt 2004). Thus, the results will enable managers to make more precise decisions to enhance consumer satisfaction in the online banking context.

## Satisfaction of bank users in online contexts

Satisfaction represents a psychological state resulting from the comparison of performance outcomes and performance expectations within a consumer experience (Oliver 1981). Satisfaction can be regarded as a cognitive process (Oliver and DeSarbo 1988) or as an affective process (Mano and Oliver 1993). Based on these definitions, the satisfaction construct has been analysed in various ways in recent decades. The factors that contribute to satisfaction have been consolidated in many different models, methods and paradigms.

In the banking context, investigating satisfaction has gained importance for three reasons (Delone and Mclean 1992). First, there are numerous studies on the measurement of customer satisfaction with banks. Second, there are reliable methods for measuring this construct. In addition, satisfaction is important for the realization of long-term goals and directly associated with the success of companies (Cooil et al. 2007).

Studies on satisfaction with banks have evolved in various contexts, services and countries. Several studies have evaluated the antecedents and consequents of satisfaction. The antecedents of banking satisfaction in online contexts have been investigated, for example, in terms of ease of use (Liébana-Cabanillas et al. 2013), convenience (Kaura 2013), privacy (Shirzad and Beikzad 2014) and security (Nguyen et al. 2014). In addition, constructs such as perceived quality (Lai et al. 2009) and satisfaction with problem management (Mansori et al. 2014) have also been objects of study. The consequents of customer satisfaction that have been evaluated include trust (Sanchez-Franco 2009) and loyalty (Casaló et al. 2008).

The systematic review detected 13 antecedents and two consequents of satisfaction with online banking. This selection was based on the assumption, in the case of meta-analytical analyses, that at least three relations are needed with the investigated construct (Moher et al. 2009). Table 1 summarizes the analysed constructs.

Some of the detected antecedent constructs are related to uncertainty behaviour evoked by online devices (e.g. reliability, assurance, reputation, privacy and security), especially in banking contexts (Sampaio et al. 2017). This occurs because reliability tends to appraise overall services in a positive way and, consequently, raises the level of satisfaction (Roche 2014). It is critical for consumers to have a guarantee that the organization will deliver what it has promised, which, if it does, will have a positive impact on satisfaction (Roche 2014). Reputation minimizes any risk perception associated with the context of analysis, because it invokes beliefs among its groups of reference: in this case, the image of the financial institution (Methlie and



**Table 1** Relational constructs regarding satisfaction of online banking users

Construct	Definition	Studies in the meta-analysis
Ease of use	Ease on the part of the user in accessing information and services in the online environment	Sadeghi and Hanzae (2010), Ahmad and Al-Zúbi (2011), Ramseook-Munhurrin and Naidoo (2011), Liébana-Cabanillas et al. (2013), Tsai et al. (2014), Asfour and Haddad (2014)
Reliability	Accuracy and reliability with respect to the service expected by the customer	Lai et al. (2009), Ramseook-Munhurrin and Naidoo (2011), Ping et al. (2012), Singh and Kaur (2013), Roche (2014), Asfour and Haddad (2014), Nguyen et al. (2014), Masrek et al. (2014), Shirzad and Beikzad (2014)
Information content	Accuracy of the content targeted at the interests and needs of consumers	Pikkarainen et al. (2006), Yoon (2010), Ahmad and Al-Zúbi (2011), Zhu and Chen (2012), Marakarkandy and Yajnik (2013)
Convenience	Easy access to content and purchasing of products and services	Ahmad and Al-Zúbi (2011), Ramseook-Munhurrin and Naidoo (2011), Singh and Kaur (2013), Kaura (2013)
Website design	Aesthetics of the virtual environment that makes it more attractive and pleasant	Yoon (2010), Ramseook-Munhurrin and Naidoo (2011), Ahmad and Al-Zúbi (2011), Zhu and Chen (2012), Momeni et al. (2013)
Efficiency	System performance and effectiveness in accessing banking products and services	Herington and Weaven (2009), Ariff et al. (2013), Shirzad and Beikzad (2014), Asfour and Haddad (2014)
Assurance	Accuracy in relation to providing the promised service	Santouridis and Kyritsi (2014), Roche (2014), Ariff et al. (2013)
Reputation	Credibility of the brand perception of the financial institution	Methlie and Nysveen (1999), Jamal (2004), Ramseook-Munhurrin and Naidoo (2011), Narteh (2013), Roche (2014)
Privacy	Trust level for the privacy policies established by the banking system, which will generate commitment to using the electronic system	Ahmad and Al-Zúbi (2011), Ariff et al. (2013), Asfour and Haddad (2014), Shirzad and Beikzad (2014)
Service quality	Difference between the expectation and the services performed by the bank in the online context	Lai et al. (2009), Rod et al. (2009), Santouridis and Kyritsi (2014), Sanayei and Jamshidi (2011), Zhu and Chen (2012), Narteh (2013), Butt and Aftab (2013), Unyathanakorn et al. (2014), Thakur (2014), Asfour and Haddad (2014), Rostami et al. (2014), Ahmad Al-Hawari (2014)
Satisfaction with problem recovery	The company's ability to respond to and meet the needs of its customers	Santouridis and Kyritsi (2014), Fiebig and de Freitas (2011), Ping et al. (2012), Ariff et al. (2013), Roche (2014), Nguyen et al. (2014), Shirzad and Beikzad (2014)
Security	Behaviour associated with the perception of financial risk concerning fraud from online transactions	Cockrill et al. (2009), Sadeghi and Hanzae (2010), Yoon (2010), Ahmad and Al-Zúbi (2011), Ramseook-Munhurrin and Naidoo (2011), Ping et al. (2012), Singh and Kaur (2013), Momeni et al. (2013), Nguyen et al. (2014), Roche (2014)
Speed	Speed associated with the availability and access to information and transactions in the virtual environment	Yoon (2010), Ahmad and Al-Zúbi (2011), Momeni, et al. (2013)
Trust	Psychological state in which the consumer believes in the promise established by another party	Shergill and Li (2005), Sanchez-Franco (2009), Cockrill et al. (2009), Aldas-Manzano et al. (2011), Sanayei and Jamshidi (2011), Zhu and Chen (2012), Butt and Aftab (2013), Kaura (2013), Thakur (2014)
Loyalty	Predisposition to maintain a relationship, including favourable intentions to pay more for a product or service, engaging in repurchase and word-of-mouth dissemination	Methlie and Nysveen (1999), Rosa and Kamakura (2002), Shergill and Li (2005), Casaló et al. (2008), Aldas-Manzano et al. (2011), Tong et al. (2012), Butt and Aftab (2013), Momeni et al. (2013), Ariff et al. (2013), Kaura (2013), Unyathanakorn et al. (2014), Ahmad Al-Hawari (2014), Thakur (2014)



Nysveen 1999). The privacy that is recognized as a crucial element for consumers to adopt online technology, and hence obtain positive levels of satisfaction (Ariff et al. 2013) and finally security, tends to promote positive correlations with satisfaction, given that security is directly related to risks associated with financial fraud and loss of personal data (Cockrill et al. 2009).

Other antecedents are linked with system performance (e.g. efficiency, satisfaction with problem recovery and speed). Again, the relationship expectations are positive. In this case, a positive relationship between efficiency and satisfaction is expected, given that consumers value aspects related to the speed of navigation through the digital platform, such as transaction confirmations and online bank statements (Shirzad and Beikzad 2014; Asfour and Haddad 2014). The dimension of satisfaction with problem recovery is one of the most significant dimensions for explaining client satisfaction (Roche 2014), since it is related to the extent to which dissatisfaction with a service will be solved, which, in this case, cannot be achieved by technology, but by people. In addition, a significant positive correlation between high-speed navigation and satisfaction is expected, since time-saving has been a crucial element in users' more positive evaluation of digital platforms (Liao and Cheung 2002).

Other antecedents are related to the quality of device content (e.g. information content, convenience and service quality). Regarding information content, this is recognized as a key element in the digital platform for client access (Yoon 2010), as it will guide the client through the platform. Therefore, a positive and significant correlation between this factor and satisfaction is expected. In relation to convenience, a positive correlation with satisfaction is also expected, since it is possible to presume that the lesser the amount of physical and mental effort required to carry out a purchase, the more favourable the appraisal of the offered service and, thus, the greater the satisfaction of consumers (Kaura 2013). It is also inferred that a positive correlation will be found between service quality and satisfaction. Earlier research reinforces such a presumption (Butt and Aftab 2013; Ariff et al. 2013), insofar as the perception of service quality is directly associated with the degree to which the digital platform actually and effectively facilitates a purchase and service delivery (Zeithaml et al. 2002).

The last antecedents are linked to online banking device structures (e.g. ease of use and website design). In this case, we expect a positive relationship between satisfaction and ease of use (Tsai et al. 2014; Asfour and Haddad 2014). This is explained by the assumption that the satisfaction of consumers increases when they can access user-friendly digital platforms (Cockrill et al. 2009), since they will be able to complete the desired service in a faster,

albeit less bureaucratic, way (Tsai et al. 2014). Positive relationships are equally expected between design and satisfaction, as already observed in research conducted in this area (Zhu and Chen 2012; Momeni et al. 2013). This is based on the presumption that design is a key feature in providing better usability, thus affecting the success of the digital platform (Yoon 2010).

For the consequent constructs of satisfaction, we investigate the trust and loyalty construct. In the case of the relationship between satisfaction and trust, prior results showed a predominance of positive associations. This proposition is supported by the fact that satisfaction with service delivery helps to raise the perception of integrity concerning the transnational partner (Morgan and Hunt 1994). Finally, a positive relationship between satisfaction and loyalty is expected, since satisfied consumers will be more willing to repurchase and circulate positive word of mouth, as verified by studies pertaining to this context (Ahmad Al-Hawari 2014; Thakur 2014).

## Methodological design

The methodological process began with a systematic review of the literature regarding satisfaction surveys of online banking. The systematic review considered the relationships between potential antecedents and consequents of satisfaction, as well as satisfaction itself. The systematic review considered studies on satisfaction with online banking services. We also calculated the relationships and moderations between the various factors.

The methodological procedure was divided into four stages. First, we developed the registration protocol and eligibility criteria. Second, we defined the sources of information. Third, we collected the relevant articles and extracted the research variables. Finally, we defined the data manipulation methods and combined the results. Figure 1 presents the step-by-step methodological process for this meta-analysis.

### Registration protocol and eligibility criteria

In the first stage, we developed a registration protocol and the eligibility criteria to specify the characteristics of the study. These characteristics included scientific research articles on satisfaction with banks' online services. Only research papers written in English, Spanish or Portuguese from the databases cited in this manuscript were included. These languages are known to the authors, while the papers only appeared in scientific journals.



**Fig. 1** Step-by-step approach used in the methodological process for this meta-analysis

<b>Step 1</b>	<p style="text-align: center;"><b>Registration protocol and eligibility criteria</b></p> <ul style="list-style-type: none"> <li>• Scientific paper written in English, Spanish or Portuguese</li> </ul>
<b>Step 2</b>	<p style="text-align: center;"><b>Collection process and variable searched</b></p> <ul style="list-style-type: none"> <li>• Search for key elements (satisfaction, online, bank) in full texts (452 articles)</li> <li>• Filtering process 1: excluded quality researches (211 articles)</li> <li>• Filtering process 2: excluded studies that did not contain the object variables of this meta-analysis (116 articles)</li> <li>• Filtering process 3: excluded studies applied in the offline banking context (86 articles)</li> <li>• Final sample analysed (39 articles)</li> </ul>
<b>Step 3</b>	<p style="text-align: center;"><b>Analysis procedure</b></p> <ul style="list-style-type: none"> <li>• Coding process</li> <li>• Constructs identification (13 antecedents and two consequents of satisfaction with online banking services)</li> <li>• Analysis (29 articles, generating 188 effect sizes)</li> </ul>

### Definition of information sources

Information was extracted from studies indexed in ten principal databases: Jstor, Emerald, PsycINFO, Taylor & Francis, Elsevier Science Direct, Scopus, ProQuest, SciELO, Google Scholar and EBSCO. The same databases have been used in other meta-analyses (e.g. Ladeira et al. 2016).

### Collection process and variables searched

The collection process was based on a set of terms, which included “satisfaction”, “online” and “bank”. The proposed terms were searched in the fields of “document title” and “abstract” in the aforementioned databases. The studies were investigated from the perspective of the proposed variables (antecedents and consequents of satisfaction). In addition, we analysed possible relationship moderators, that is, sample size and country of origin of the research.

In total, 452 articles were selected with the satisfaction theme applied to the area of banks. However, 211 articles were not included in the final samples due to being qualitative studies or studies without the presentation of statistical results. From the total number of articles selected, 116 studies were not analysed because they did not contain the object variables for this meta-analysis. An additional 86 articles were removed because they applied research in the traditional context (offline). In turn, we arrived at a final sample of 39 articles, which generated 118 observations relevant to the analysis in this paper.

### Analysis procedure

The review process started with the coding of the data. We included the titles of the articles and journals, the name(s) of the author(s), the year of publication, the statistical indices of the studied relationships, the reliability indices, the number of variables of the scales applied, and descriptions of the application area of research (East versus West) and sample size (small versus large).

Fifteen constructs were selected according to the criteria used in several meta-analyses. The constructs had to include at least three relationships with satisfaction (Moher et al. 2009). The selected variables were ease of use, reliability, information content, convenience, website design, efficiency, assurance, reputation, privacy, service quality, satisfaction with problem recovery, security, speed, trust and loyalty.

Specifically, for the data analysis, we used the correlation coefficient  $r$  as a metric variable to measure the size of the effect on the variables of the study. For studies that did not report the correlation  $r$ , we collected  $\chi^2$ ,  $f$  test,  $t$  test,  $z$  test or  $\beta$  values. These correlations were converted into a correlation coefficient using the procedure recommended by Hedges and Olkin (1985). Random method analysis, following Hunter and Schmidt (2004), was also used. Finally, once the relationship was found to be significant, we calculated the fail-safe number. This number is used to indicate how many studies, which show an insignificant relationship, are required to reject the findings (Rosenthal and Rubin 1991). These procedures follow the same logic as other meta-analytic studies, such as those of Kirca et al. (2005), Pan and Zinkhan (2006) and De Matos and Rossi (2008).





Two researchers performed the article codification and confirmed that the extracted data had an 85% rate of agreement. For disagreements, the researchers conferred and offered a joint interpretation, reaching a consensus on what should be extracted.

## Data analysis and results

The articles used in the meta-analysis included articles on satisfaction with online banking published since 1999. There was a large concentration of studies published in the last 5 years (82% of the articles). The recent concentration of this work reinforces the importance of this meta-analysis. Table 2 presents a summary of the characteristics of the investigated studies.

In addition to the features shown in Table 2, we performed a correlation analysis to determine whether there was a significant relationship between the year of publication and the sample size. The data show a significant negative correlation ( $r = -.228$ ,  $p < .05$ ). This result demonstrates that more recent surveys were conducted using smaller samples.

The final sample was 49,607. The alpha coefficients of the constructs associated with satisfaction ranged from .586 to .94. The alpha coefficients measuring satisfaction ranged from .646 to .959. The effect sizes ranged from  $-.37$  to .86.

**Table 2** Characteristics of the collected studies

Publication	Year	Percentage
	1999	2.6
	2005	1.7
	2006	0.9
	2008	0.9
	2009	11.1
	2010	6.8
	2011	14.5
	2012	7.7
	2013	27.4
	2014	26.5
Banking sector publication	Yes	No
	13.9%	86.1%
Bank type investigated	Public	Private
	43.1%	56.9%
Number of investigated banks	(One)	(More than one)
	72.9%	27.1%
Country of origin	Eastern culture	Western culture
	79.7%	20.3%

## Analysis of the direct relationships of the constructs

The results obtained by the meta-analysis of the antecedents and consequents of satisfaction with online banking are presented in Table 3.

The first constructs analysed were related to uncertainty behaviour as evoked by online devices. The relationship between reliability and satisfaction, presented in Table 3, was significant and positive ( $r = .459$ ). Previous research confirms this result (Masrek et al. 2014; Shirzad and Beikzad 2014). The fail-safe number was 2539. A positive and significant effect was also demonstrated between service assurance and satisfaction ( $r = .237$ ). The number of studies with conflicting results necessary to refute the result (fail-safe drawer) is 97. This result supports the relationship between satisfaction and the need for service to be delivered as promised (Culiberg and Rojek 2011; Ariff et al. 2013).

Bank reputation had a significant and positive effect on customer satisfaction ( $r = .639$ ; FSN = 2838), confirming the results of previous research (Shirzad and Beikzad 2014). Our results support the assumption that reputation is an important antecedent of satisfaction (Narteh 2013; Roche 2014). On the other hand, privacy was not significant enough to explain the satisfaction of banking customers. The significance level was  $p = .072$ . This result shows that no statistical evidence was found to support a positive association between the level of confidence in the privacy policies of banks and customer satisfaction, as presented in previous research (Ariff et al. 2013). These results may appear to be surprising. Thus, it would be worthwhile conducting more studies to test this relationship, since only a few such studies have been found in the course of writing this paper ( $n = 4$ ). In turn, it can be argued that strong heterogeneity is promoted concerning the effect sizes investigated ( $Q = 650,321$ ;  $p < .001$ ). Finally, we observed that security was directly related to the perception of financial risk (Cockrill et al. 2009) and quite significant in explaining consumer satisfaction ( $r = .429$ ; FSN = 1.571).

We also analysed constructs that are related to system performance. In this case, efficiency was not a significant variable ( $p = .63$ ) for the development of satisfaction with online banking. This finding conflicts with some results in the literature (Ariff et al. 2013; Shirzad and Beikzad 2014), which could be related to the small number of studies considered. This relationship showed a large discrepancy in the effect sizes produced. Satisfaction with problem recovery was also not found to be associated with customer satisfaction ( $p = .067$ ). The results do not confirm this construct as a significant variable in order to explain consumer satisfaction in online banking services. On the other hand, we found a positive and significant relationship



**Table 3** Descriptive statistics and effect sizes of the antecedents and consequents

Relationship	<i>o</i>	<i>k</i>	<i>N</i>	<i>R</i>	ES	$\rho$	Sig (1)	CI	$Q^2$	Sig (2)	FSN
Ease of use	6	6	2524	.543	.582	.804	.003	.356 to .952	1,647,289	.000	4161
Reliability	9	11	4567	.336	.362	.459	.000	.240 to .633	680,080	.000	2539
Information content	5	5	1421	.616	.640	.764	.000	.572 to .877	314,178	.000	3255
Convenience	4	8	2616	.509	.535	.726	.001	.337 to .894	1,289,159	.000	4666
Website design	5	7	2227	.382	.418	.558	.011	.145 to .805	797,228	.000	1535
Efficiency	4	4	1231	.488	.572	.776	.063	– .056 to .972	1,353,654	.000	NC
Assurance	3	3	1972	.192	.201	.237	.000	.147 to .324	7411	.025	94
Reputation	5	5	4279	.403	.431	.639	.007	.207 to .863	1,191,108	.000	2838
Privacy	4	4	1210	.419	.482	.651	.072	– .069 to .925	650,321	.000	NC
Service quality	12	18	5478	.578	.621	.792	.000	.637 to .885	2,474,189	.000	25,975
Satisfaction with problem recovery	7	8	4190	.379	.437	.575	.067	– .045 to .875	3,298,029	.000	NC
Security	10	10	4011	.346	.351	.429	.000	.283 to .556	230,075	.000	1571
Speed	3	3	761	.420	.435	.484	.001	.211 to .688	36,919	.000	154
Trust	9	9	3790	.527	.550	.710	.000	.510 to .838	807,153	.000	5855
Loyalty	14	17	17,601	.603	.642	.818	.000	.624 to .917	8,117,277	.000	22,856

*o* = number of studies that tested the relationship; *k* = number of observations; *N* = sample; *R* = simple average of the analysed correlation; ES = weighted average, adjusted for the effect sizes drawn from studies;  $\rho$  = weighted average, corrected for the sample and reliability obtained in studies; sig (1) = degree of significance of the effect size ( $\rho$ ); CI = confidence interval (minimum and maximum);  $Q^2$  = heterogeneity test at the individual and aggregate level; sig (2) = significant degree of the heterogeneity test ( $Q^2$ ); and FSN = fail-safe number, i.e. number of items needed for a false result

between speed and satisfaction ( $r = .484$ ,  $p < .01$ ; FSN = 154). Thus, we have consolidated previous studies that had already confirmed this relationship (Yoon 2010; Ahmad and Al-Zúbi 2011).

All of the quality device content indicated positive relationships with the satisfaction construct. In turn, information content was significant in explaining customer satisfaction with online banking. The strength of this relationship was  $r = .764$ , with 3255 studies required to reject this result. Convenience had a positive and significant relationship with satisfaction ( $r = .726$ ), pointing to great consistency according to the FSN, with 4666 surveys with contrary results needed to refute this association. The assumption is confirmed in the literature (Kaura 2013) because convenience is one of the main reasons why customers use online banking services. Finally, service quality presented a significant and strong effect with satisfaction ( $r = .792$ ) and a considerable fail-safe number (25,075). The literature supports this relationship, including in the context of online banking (Sanayei and Jamshidi 2011; Unyathanakorn et al. 2014).

In the last antecedents linked to banking device structures, we also found significant relationships, in particular, a significant and positive relationship between ease of use and satisfaction. The strength of this relationship was  $r = .804$ , while the number of studies required to reject this finding was FSN = 4161. These results agree with the theory that users' perceptions about the means by which

they find information and conduct banking transactions are important elements of customer satisfaction (Tsai et al. 2014). These results support research with similar findings (Liébana-Cabanillas et al. 2013; Asfour and Haddad 2014). The relationship between website design and satisfaction was also significant and positive, with  $r = .558$ . The fail-safe number was 1535, confirming the results of previous studies in the literature (Yoon 2010; Ahmad and Al-Zúbi 2011).

In the consequents analysis, two constructs were found to be consequents of satisfaction with online banking: trust and loyalty. There was a positive and significant relationship ( $r = .710$ ) between satisfaction and trust. The number of contrary results needed to refute this hypothesis is considerable: FSN = 5855. Therefore, we can confirm that the classical theory of traditional marketing provides a positive connection between these two factors, while extending it to the context of online banking (Sanchez-Franco 2009; Sanayei and Jamshidi 2011).

The relationship between satisfaction and consumer loyalty was the final relationship studied. This relationship has been tested and confirmed in the literature (Casaló et al. 2008; Ahmad and Al-Zúbi 2011), as well as confirmed by the results of this meta-analysis. We observed a very strong relationship between the two factors ( $r = .818$ ), while the number of articles needed to reject the finding is high (FSN = 22,856).



### Analysis of the moderators for sample size and country of origin

To investigate possible moderators that could interfere with the magnitude of the effect sizes, and following the recommendation of Hunter and Schmidt (2004), an analysis of moderation was performed for the following variables: sample size (large versus small) and country of origin study (West versus East). We also sought to analyse the moderation of the type of sample (students versus non-students) and the type of bank (private versus public). Such analysis, however, was not possible due to an insufficient number of cases reporting these factors.

The considered variables play a moderating role when the  $Q$  statistic corresponding to the heterogeneity of the effect size is greater than 25% (Hunter and Schmidt 2004) and when the number of observations is greater than 10. Smaller samples are too insufficient to establish a moderating relationship, with a low statistical power of the sample threatening the confidence of the results (Hunter and Schmidt 2004). In this regard, we conducted a moderation analysis in terms of reliability, service quality and loyalty.

In testing the moderating effect of sample size, we observed a nonsignificant relationship between reliability and satisfaction ( $F = .463, p = .513$ ) and between service quality and satisfaction ( $F = .854, p = .369$ ). We also found statistical support for a relationship between satisfaction and loyalty ( $F = .480, p = .499$ ). Therefore, an overestimation of the effects, due to small sample sizes, as is often the case, was not supported (Pan and Zinkhan 2006).

For the second moderating effect, the country of origin of the research, the results show that the produced effect sizes were significantly higher in the samples from the West in the case of the antecedents of satisfaction (reliability and satisfaction:  $F = 12.502, p = .007, M_{\text{west}} = .42, M_{\text{east}} = -.31$ ; service quality and satisfaction:  $F = 13.597, p = .002, M_{\text{west}} = .62, M_{\text{east}} = .14$ ). No moderating effect due to country of origin was found for the relationship between loyalty and satisfaction ( $F = 1.528, p = .234$ ). This finding partially confirms the assumption that Western consumers have higher consumption characteristics due to individualistic personalities (Hofstede 1994).

### Conclusion

This paper has proposed integrating quantitatively studies in order to evaluate satisfaction with banks, exclusively in the online context, in the form of a systematic review involving meta-analytic research. Thus, a total of 15 preceding constructs and two subsequent constructs were

derived from 118 observations distributed across 13 dimensions of satisfaction.

The meta-analysis revealed several consistencies among the empirical studies. Therefore, the meta-analysis provided interesting results for a better understanding of the status quo concerning satisfaction with the online banking environment because most of the background constructs found in the literature are not equal to those in the offline context. We conclude that some of the factors generating satisfaction in the online environment are almost unique to this context.

Ease of use was one background construct that had a stronger relationship than found in the case of offline banking. Similarly, service quality, information content, convenience, reputation, website design, speed, reliability, security and assurance were also significant antecedent variables, which explained the satisfaction with online banking.

These data constitute robust findings because these include converging results on the positive relationship between customer satisfaction, ease of access to information (Ahmad and Al-Zúbi 2011; Tsai et al. 2014), service quality (Sanayei and Jamshidi 2011; Unyathanakorn et al. 2014), accuracy of the information provided to consumers (Yoon 2010), ease of information and service access (Kaura 2013), bank reputation (Sanayei et al. 2011), aesthetics of the banking environment (Yoon 2010), speed of information queries and transactions (Ping et al. 2012; Nguyen et al. 2014), service precision (Shirzad and Beikzad 2014), security (Nguyen et al. 2014) and assurance (Ariff et al. 2013).

The meta-analysis also revealed some inconsistencies, which deserve theoretical consideration and additional empirical effort. Only three of the antecedent constructs (privacy, satisfaction with problem recovery and efficiency) did not offer sufficient significance to make predictions. Therefore, we are unable to analyse their correlation with safety and generate a fail-safe number.

Of the resulting constructs, trust and loyalty were positively and significantly related to satisfaction. This result represents and confirms the theory that satisfaction is a guiding element of future behaviour and favourable to establishing long-term relationships (Oliver 1997).

There was also confirmation of the moderating effect of culture and the relationship between the antecedents of reliability, service quality and consumer satisfaction. These findings agree with the classical theory of Hofstede (1994), who attributes higher consumerist characteristics to Western cultures.





## Implications and future directions for theory and research

The objective of this study was to summarize and analyse the research on customer satisfaction with online banking and to identify paths for future research. Our results provide modest support for electronic commerce research and applications. Furthermore, the results suggest a model for studying the online environment and possible methodological moderators. We hope that these results provide insight into the analysis of satisfaction with online banking and represent an opportunity to increase academic and market research on the topic.

In practice, there are numerous applications that can be informed by these results. First, managers should prioritize their investment in pursuing customer satisfaction, as this approach will impact consumers' key future behaviour intentions. This finding supports the assumption that satisfaction influences trust and loyalty, which are long-term profitability generators for companies (Oliver 2010).

Second, mobile applications must attempt to provide mechanisms that enable easy access. Organizations should focus increased resources on the development of mobile applications because 72% of consumers between the ages of 18 and 34 have accessed banking information via a smartphone (The Financial Brand 2015). Third, managers should be aware of how quickly their bank responds to the needs of consumers and respond to the calls for the training and development of service teams, so that they have the autonomy and knowledge necessary to meet the needs of consumers and make use of the immediate channels for contact with consumers.

Fourth, banks should be aware of the layout and content of the information provided in online banking environments because the information provided and the web design are important elements in maintaining the satisfaction of bank users.

Fifth, security and brand investments are essential to the perception of established service and security. Sixth, consumers' service expectations are essential to, as well as guide, their satisfaction with online banking.

The current study provides various academic contributions. The relationships identified through the systematic review promote a theoretical framework for the main antecedents and consequents of satisfaction with online banking. This framework provides opportunities for researchers and academics to enhance their research on satisfaction with online banking. The meta-analytic technique used allowed for an empirical generalization of the subject. Empirical generalizations are important to the advancement of knowledge.

Briefly, our results reinforce the need to improve the empirical analysis of satisfaction with online interactions.

This framework is central to the investigation of satisfaction and the development of different constructions.

Based on the evidence from this meta-analysis, research has made significant progress towards a better understanding of the construct of satisfaction and the nomological network of online banking. Despite this progress, there are several knowledge gaps regarding satisfaction and its relationships to other factors, suggesting new lines of research.

Meta-analyses have several advantages but involve inherent limitations. One limitation is the amount of data collected. Relationships with a significant number of observations (perceived quality and loyalty) will tend to provide more accurate estimates of the magnitude of the effects in relation to other constructs. Second, the relationships analysed here include variables used in primary research. Therefore, our model should be considered a summary of the most commonly studied constructs. For example, flexibility, risk and support services have been important for assessing satisfaction in the online context, but due to the unavailability of data, we were unable to include these constructs in our meta-analysis. Third, because of the limited number of studies on certain moderating variables, our study has limited power to reject null hypotheses.

Fourth, the relationships tested in this work, from the assumption of meta-analytic research, comprise at least three relations with the construct object of study (Moher et al. 2009). Thus, a limitation of the direct relationships assumed in the tested model concerns the failure to consider possible biases, either multicollinear or collinear. Thus, future work on different or understudied constructs, such as efficiency, privacy and satisfaction with problem recovery, is recommended.

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