

# La adopción de las aplicaciones de banca móvil desde una perspectiva dual \*

## The adoption of mobile banking applications from a dual perspective

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**Resumen:** El surgimiento de las Fintech provoca un incremento de la competencia para el sector bancario ya que, además de

**Abstract:** The rise of Fintech brought about an increase in competition for the banking sector given that, as well as offering services more

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ofrecer servicios más orientados a los clientes y optimizar el uso de las tecnologías, en muchas ocasiones centran su actividad en ofertar en productos que venía ofreciendo la banca tradicional. Por su parte, la banca tradicional encuentra en las apps una herramienta fundamental y una vía para contrarrestar la presión de los nuevos competidores. El presente trabajo se dirige a analizar, a través de un modelo de factor dual los favorecedores e inhibidores de la adopción de las apps de banca móvil. Basado en un trabajo de campo de 240 encuestas, y tras aplicar Modelos de Ecuaciones Estructurales, de acuerdo con los resultados, entre los facilitadores de la adopción de las apps de banca móvil juega un papel fundamental la expectativa de resultado, mientras que la satisfacción y los costes hundidos generan la inercia en el uso de la banca digital.

**Palabras clave:** app, banca móvil, modelo de factor dual, facilitadores, inhibidores.

oriented toward customers and optimizing the use of technologies, they often centered their activity on proposing products which traditional banking had offered. For its part, traditional banking finds in apps a fundamental tool and a way to counteract the pressure of the new competitors. This is why this work is aimed at analyzing, through a dual factor model, the facilitators and inhibitors of the adoption of mobile banking apps. Based on a field work of 240 surveys, and after applying Structural Equation Modeling, according to the results among the facilitators of the adoption of mobile banking the performance expectation plays a fundamental role, while satisfaction and sunk costs generate inertia in the use of digital banking.

**Keywords:** app, banca móvil, modelo de factor dual, facilitadores, inhibidores

## 1. INTRODUCTION

The advances in communication favor the consolidation of online banking, teeming with benefits for banks and their users (Al-Otaibi, Aljohani, Hoque & Alotaibi, 2018; Khan, Hameed & Khan, 2017; Susanto, Lee & Ciganek, 2013). Its development rests with the pledge of financial institutions for digitalization, which, in the case of Spain, has meant between 2010 and 2016 an increase in its number of users from 9.1 to 15 million (Arellano & García, 2017). Within online banking, mobile banking is fundamental in the growth strategies of the banking industry (Dapp, 2015; Goswami & Raghavendran, 2009). Mobile banking applications (apps) make it possible for financial institutions to increase the services offered, provide a greater knowledge of their clientele and also reinforce their competitive position (Dapp, 2017). Their success requires establishing a critical mass of users who modify their habits and integrate them into their daily routines (Goswami & Raghavendran, 2009; Laukkanen, Sinkkonen, Kivijärvi & Laukkanen, 2007).

In spite of this, banks experience problems in transferring their customers to electronic channels, as a significant number of them opt for offices or ATMs (Hoehle, Scornavacca & Huff, 2012; Kuisma, Laukkanen & Hiltunen, 2007; Susanto et al., 2013). In Spain, where 92% of bank customers are habitual users of Internet, the figure of online banking users is around 46% (Carbó, Cuadros & Rodríguez, 2017) and of Internet users 54.6% (Fundación Telefónica, 2017), of whom only 8% carry out financial activities by Internet (Arellano & García, 2017). The preferences of customers, the ICT innovations and the services offered by non-banking agents lead to a greater customer orientation by the financial industry, causing traditional banks to have less power to prevent competition (Alt & Puschmann, 2012).

In this scenario, the Fintech are beginning to transform the financial sector and its relation with its customers (Fundación Telefónica, 2017). In Spain, the adoption of the Fintech is 37% of the active digital population, the forecast being to reach 56% (EY, 2017). And what is more relevant, in Spain 50% of the Fintech are centered on services traditionally provided by financial institutions (KPMG, 2017). That is to say, the financial institutions, with the emergence of mobile technologies, find themselves in a scenario which means, as well as opportunities for the provision of services, the rise of a new competitor: the Fintech. In the light of this situation it is of special relevance for banks to know the factors that determine the adoption of the mobile apps of financial institutions.

Traditional theories have centered, initially, on the facilitating elements of the adoption of innovations (Hoehle et al., 2012), supported by the bias in favor of change which supposes that any innovation should be adopted as if offers more value than the existing products (Kuisma et al., 2007; Ram, 1987). Given that many consumers

do not desire a change, research should be centered on identifying the inhibitors which prevent using a technology (Hoehle, et al., 2012), especially for those banking customers who, being able to use digital banking, opt for traditional channels (Kuisma et al., 2007). In spite of the advantages which it offers, the use of a mobile for banking activities is scant. This is why it is estimated that inhibitors must exist that slow down the use of mobile channels for banking transactions (Laukkanen, 2007)

As adopting mobile banking is influenced by external factors beyond facilitators (Sarfraz, 2017), there is a call to investigate the motivators (Benoit, Baker, Bolton, Gruber & Kandampully, 2017; Verissimo, 2016) and inhibitors of the adoption of mobile banking apps (Laukkanen, 2011; Maroofi, Kahrarian & Dehghani, 2013). The dual factor follows this proposal, offering a theoretical bridge that unites inhibitor factors and use in an integrated model (Hsie, 2016; Polites & Karahanna, 2012; Rey-Moreno, Felício, Medina-Molina & Rufin, 2018). This work's aim is therefore to analyze the functioning of an explanatory dual model of the intention of using mobile-banking apps which considers facilitator and inhibitor elements.

In the following section we set out the theoretical elements that are fundamental for this article. After, we present the dual models, the facilitator and inhibitor elements and the hypotheses to be verified. The next sections have the methodology and the results, after which comes the analysis of the results. The article concludes with the implications, conclusions and limitations.

#### MOBILE BANKING APPS AND THE RISE OF THE FINTECH

The increase of competitive intensity and of the sensitivity of banking customers to the cost and convenience is causing banks to reinforce their pledge for the use of technological solutions (Alalwan, Dwivedi, Rana & Algharabat, 2018), depending on the competitiveness of banks, such as the satisfaction and loyalty of their customers, and the speed and flexibility with which they respond to these challenges (Alalwan et al., 2018; Boonsiritomachai & Pitchayadejanant, 2017; Dapp, 2017). The financial sector has a broad history in the development of ways to interact with their customers using multi-channel strategies (Babat, 2017; Cortiñas, Chocarro & Villanueva, 2010). The growing availability of electronic self-service technologies in the banking industry has modified how banks serve customers (Hoehle et al., 2012).

Banks develop their mobile services with the objective of maintaining themselves competitive in the market and finding new formulas to serve their customers (Laukkanen et al., 2007). The evolution of banking services and the change of traditional banks to digital banks modifies how consumers control their

personal finances, and access banking services through different means and technologies (Prodanova, San-Martín & Jiménez, 2015). These have different names, Internet banking and mobile banking being the most frequent. Internet banking is a banking channel that enables consumers to develop a wide variety of financial and non-financial services in any place through the bank's webpage. Mobile banking is defined as the use of mobile devices to access banking networks and carry out both financial and non-financial transactions through apps (Al-Otaibi et al., 2018; Goswami & Raghavendran, 2009; Hoehle et al., 2012; Muñoz-Leiva, Climent-Climent & Liébana-Cabanillas, 2017; Prodanova et al., 2015; Veríssimo, 2016). It is seen as an extension of Internet banking with unique characteristics (Laukkanen & Passane, 2008).

The financial services of the future will not only replicate the existing banking channels but will bear in mind that mobile and social technologies mold and create new financial services (Alt & Puschmann, 2012). To transform smartphones into pocket bank offices and create an omnipresent bank will require intelligent businesses and solid alliances (Goswami & Raghavendran, 2009). To be competitive, banks must reconfigure their digital business model (Boonsiritomachai & Pitchayadejanant, 2017; Dapp, 2017).

Mobile banking means an innovative form of offering a broad range of financial services, embodied in banking apps which enable accessing services and carrying out transactions in the best conditions of time and place (Alalwan et al., 2018; Goswami & Raghavendran, 2009; Laukkanen & Lauronen, 2005). Banks, highly dynamic entities, convert the apps into the most effective channel to offer their products and services, as they allow the diversification of their offer via a broad range of functionalities (Ghazawneh & Henfridsson, 2013; Laukkanen & Lauronen, 2005; Muñoz-Leiva et al., 2017). Their use in mobile banking is supported by a continuous, comfortable and swift service; easy, having cover and quality, functional, intuitive and safe (Muñoz-Leiva et al., 2017; Prodanova et al., 2015). Those banking institutions that take advantage of the potential of the apps will be in a good competitive position (Goswami & Raghavendran, 2009; Laukkanen & Lauronen, 2005). Two options have been suggested to increase the diffusion of mobile banking: a pull strategy, fostering the benefits of banking innovations and a push strategy, increasing the commissions charged in other channels (Laukkanen, 2016).

The financial sector finds itself in an accelerated process of digital transformation of traditional entities and of the disruption of new actors (Jun & Yeo, 2016; KPMG, 2017). These new actors, called Fintech, suppose a challenge for the financial institutions (Maier, 2016). The Fintech develop financial products and services which satisfy the customers' needs, making their life easier through the application of technology (Funcas, 2017), supported by mobile phones. The Fintech

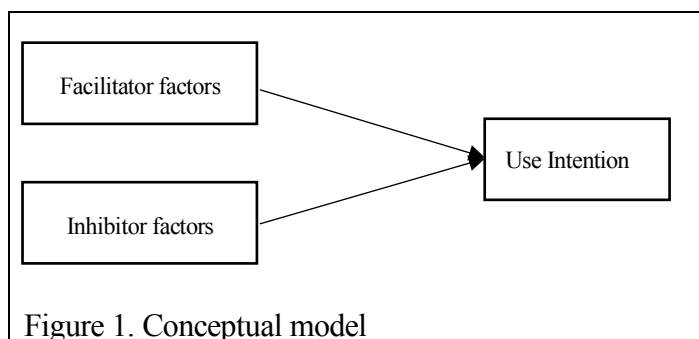
combine innovative business models and technology to facilitate, reinforce and create financial services, redefining a new way of understanding banking services (EY, 2017). The sector covers a wide range of activities from payments to financial information and analysis, digital processes and payment platforms (Barberis, 2014; Shim & Shin, 2016).

The Fintech cement their business model by offering alternative services to those of banks (EY, 2017; KPMG, 2017). In comparison with traditional banking, the Fintech focus on proposing more efficient low-cost customer-centered financial services (Funcas, 2017; Fundación Telefónica, 2017). They are established not only as significant actors in the market but as a reference for financial services. Their new value proposals are attractive for those consumers underserved by the existing offers of financial services (EY, 2017). Fruit of this movement, retail banks are losing market quota in the face of these agile competitors foreign to the banking sector (Fundación Telefónica, 2017).

## 2. MODEL

### 2.1. Dual models

There exists a gap in the knowledge of how users evaluate the option of changing or resisting online services that can be answered in theories such as the dual factor, which integrates acceptance and resistance to the Information System (IS). While adoption is produced by facilitators, rejection is due to inhibitors (Hsie, 2016). Facilitators are those beliefs which favor or brake the use of the IS, depending on their valence. Inhibitors are those factors which discourage the use of the IS when they are present, but do not necessarily favor it when absent. They are different and independent constructs that can coexist, differentiated by having different antecedents and consequences (Hsie, 2016; Rey-Moreno et al., 2018).



## 2.1. Main factors intervening in the model. Facilitators, inhibitors and Intention of Use

This work sets out from Hsie's (2016) model for facilitators and Khedhaouria, Thurik, Gurau & van Heck's (2016) for inhibitors. According to Hsie (2016), the intention of use is determined by performance expectation, effort expectation, social influence and facilitating conditions. For Khedhaouria et al., (2016) inertia has a direct effect on intention of use, the same as habit and satisfaction, at the same time as it mediates the impact on intention that satisfaction, switching costs, sunk costs and habit have.

Venkatesh, Morris, Davis, & Davis (2003) unify the facilitators identified in previous models through the UTAUT model. This proposes four key determinants in the acceptance and use of new technologies: performance expectation, the degree to which people consider that the use of the technology will help them to achieve their aims, improving the performance in an activity; effort expectation, the extent to which the possible user of a technology expects that its use will not involve effort; social influence, the perception that those who are important for people believe that they should use the technology; and facilitating conditions, the degree to which people consider that there exists a technical infrastructure that will help them in the case of need.

Among the inhibitors we consider satisfaction with the system in use, the sunk costs, the switching costs, habit and inertia. Satisfaction is conceptualized as a judgment that involves cognitive and affective evaluations after the consumer experience or use, and is the response to the congruence between the outcome and the comparison standard (Oliver, 1980). The users' satisfaction reflects the attitude toward an IS and the convenience and enjoyment that they obtain when using it (Bankole, Bankole & Brown, 2017). Satisfaction with a system in use can inhibit changing the system. The sunk costs are the psychological commitment that influences the intention of people to maintain their course of action, generated by the efforts of learning, experience and expertise with the current system. They could reduce the value of the new IS even when the value of a new option is sufficient to adopt it (Hsie, 2016; Lee & Joshi, 2017). Switching costs are those which one incurs when adapting to the new situation (Falk, Schepers, Hammerschmidt & Bauer, 2007). Habit is a sequence of automatic behaviors linked to the achievement of specific objectives according to the people repeating actions in stable circumstances (Polites & Karahanna, 2012). Habit is related with the typical human tendency to seek consistence and the status quo more than to look for constantly new behaviors. Inertia reflects the lack of a desire to abandon the status quo regardless of the existing alternatives, a tendency which leads to remaining with what was chosen before (Lucía-Palacios, Pérez-López & Polo-Redondo, 2016; Polites & Karahanna, 2012).

### 2.3. Justification of the hypotheses

Perceived usefulness refers to the evaluation of mobile transactions as convenient and efficient and is related with the use of mobile banking being advantageous and facilitating operations. When consumers perceive that using mobile banking allows them to carry out their tasks more quickly and that it is an advantage, they develop a positive attitude toward mobile banking (Maroofi et al., 2013), performance expectation having been verified as being among the determinants of the adoption of mobile banking (Bankole et al., 2017; Sarfaraz, 2017; Khan et al., 2017; Silva, Muñoz-Leiva & Liébana-Cabanillas, 2013), or even of its apps (Verissimo, 2016). Thus, we propose:

H<sub>1</sub>: the perceived performance expectation is directly related with the intention of use of mobile banking apps.

The perceived ease of use refers to the expectation that the use of mobile banking will take place without effort. When the consumers perceive that learning and using mobile banking is easy, they increase their positive perception of usefulness (Maroofi et al., 2013), effort expectation being establishing as related with the intention of use of mobile banking (Bankole et al., 2017; Sarfaraz, 2017), or even of its apps (Verissimo, 2016). So, we put forward:

H<sub>2</sub>: the perceived effort expectation is directly related with the intention of use of mobile banking apps.

It is considered that the facilitating conditions have a great influence on the perception and attitude of the users towards mobile banking services, affecting the intention of use of mobile banking (Bankole et al., 2017; Khan et al., 2017). Therefore, we postulate:

H<sub>3</sub>: the facilitating conditions are directly related with the adoption of mobile banking apps.

There is a controversy about the impact of social influence on the intention of adoption of mobile banking. Thus, while at times it is considered to be the factor which most influences the adoption of mobile banking, other cases establish the inexistence of this (Sarfaraz, 2017). So, the next hypothesis is:

H<sub>4</sub>: social influence is not significantly related with the adoption of mobile banking apps.

Status quo bias (SQB) is a theory that is useful to explain how the use of a system impacts the perceptions and intentions of a new system. This proposes that when consumers are faced with multiple options, they usually opt for the alternative linked to the status quo (Polites & Karahanna, 2012). Cost is considered to be among



the inhibitor factors of the adoption of electronic banking (Hoehle et al., 2012). Two conscious sources of inertia are identified through SQB: sunk costs and switching costs, people's tendency being to justify their previous commitments (Kim & Gupta, 2012; Ng & Kwakh, 2010, Lucía-Palacios et al., 2016; Polites & Karahanna, 2012). Hence, we propose:

H<sub>5</sub>: sunk costs are directly related with inertia in the use of digital banking.

H<sub>6</sub>: switching costs are directly related with inertia in the use of digital banking.

One of the dimensions of resistance is the incompatibility of innovation with the consumers' practices and habits (Kuisma et al., 2007; Ram & Sheth, 1989). Though inertia implies a rational choice to maintain oneself with the current supplier, its antecedents can include unconscious factors such as habit. It is accepted that habit concerning a current system is among the determinants of inertia (Ng & Kwakh, 2010; Polites & Karahanna, 2012). The users of different banking channels do not appreciate novelty, but rather prefer their existing habits regarding the interaction channel with the bank (Kuisma et al., 2007). Satisfied consumers develop an affective commitment that increases their inertia (Kim & Gupta, 2012; Ng & Kwakh, 2010). We therefore put forward:

H<sub>7</sub>: habit is directly related with inertia concerning banking.

H<sub>8</sub>: satisfaction with digital banking is directly related with inertia concerning digital banking.

The incorporation of additional variables in the explanation of the intention of use is supported, indicating habit (Khan et al., 2017). When people acquire habits, they develop automatic behaviors that at times serve to maintain the status quo (Ng & Kwakh, 2010). Habit is a significant antecedent of the intention of adopting mobile banking (Khan et al., 2017), or a barrier to its use emerges when the innovation is incongruent with the habits (Laukkanen, 2016). We hence propose:

H<sub>9</sub>: habit is directly related with the intention of use of mobile banking apps.

Satisfaction is an antecedent of the intention of behavior (Kim & Gupta, 2012; Ng & Kwakh, 2010), a relevant factor in the success of Internet banking (Susanto et al., 2013). Banks must make improvements in the quality of their mobile banking apps to achieve the satisfaction of their customers as a way of encouraging their loyalty. In spite of the satisfaction of the user being among the factors which have a greater influence on the adoption of mobile banking services (Bankole et al., 2017), there is no significant relation between satisfaction and loyalty toward mobile banking. We therefore postulate:

H<sub>10</sub>: satisfaction with digital banking is inversely related with the intention of use of mobile banking apps.

Inertia negatively influences the disposition to interact with innovative technologies and is conceptualized as a characteristic which affects the disposition of consumers to try out new technologies (Falk et al., 2007). Among these new technologies we can include e-services. Inertia is an unconscious determinant of intention (Lucía-Palacios et al., 2016; Kim & Gupta, 2012). So, we establish:

H<sub>11</sub>: inertia in the use of digital banking is related with the intention of use of mobile banking apps.

### 3. METHODOLOGY

#### 3.1. Constructs and variables

The scales used have already been validated in previous works, assuming their validity of content. The sources of the scales are: effort expectation, performance expectation, facilitating conditions, social influence (Venkatesh et al., 2003); inertia (Khedhaouria et al., 2016; Polites & Karahanna, 2012); habit (Khedhaouria et al., 2016); satisfaction (Venkatesh, Thong, Chan, Hu & Brown, 2011); intention of use (Taylor and Todd, 1995); switching costs and sunk costs (Kim & Kankanhalli, 2009; Polites & Karahanna, 2012).

In the field work we gathered 240 valid questionnaires between April 12th. and May 30th. 2018. 95% of the respondents use digital banking. In the case of interacting with the bank, 20% of the respondents state that they exclusively use digital banking; 5% exclusively the bank office; 12% the bank office mainly and digital banking at times; 64% digital banking mainly and the bank office at times. The statistical analysis was carried out via structural equation modelling (SEM), applying the Partial Least Squares (PLS) technique with SmartPLS 3.2.7.

### 4. RESULTS

#### 4.1. Analysis of the measurement model

We eliminated those indicators which had a loading less than 0.707. Those shown in Table 1 remained. We used the composite reliability index as a measurement of the internal composite reliability (Table 1). 0.7 is suggested as an acceptable value of reliability in the initial stages of research, and stricter levels of 0.8 for advanced stages. As we can note in Table 1, all the constructs surpassed the strict criterion. The convergent validity is established through the analysis of the Average Variance Extracted (AVE), proposing that the AVE values must be over 0.5. Having surpassed this value, the convergent validity of the constructs used is accepted. Likewise, the criterion linked to the VIF is met.

Table 1. Measurement model
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Construct <sup>1</sup>	Composite reliability	AVE	Indicator	Loading	VIF
FCon	1.000	1.000	CFac1	1.000	1.000
SuCo	1.000	1.000	CHun1	1.000	1.000
SwCo	1.000	1.000	CTran2	1.000	1.000
EffE	0.851	0.657	EffE 1	0.762	1.405
			EffE 2	0.800	1.529
			EffE 3	0.866	1.521
PerE	0.842	0.643	PerE 1	0.901	1.748
			PerE 2	0.783	1.526
			PerE 3	0.709	1.299
Hab	0.861	0.674	Hab1	0.844	1.721
			Hab2	0.866	1.834
			Hab3	0.749	1.330
SInf	1.000	1.000	SInf1	1.000	1.000
IUse	0.902	0.754	IUse1	0.865	2.168
			IUse2	0.889	2.415
			IUse3	0.851	1.688
Ine	1.000	1.000	Ine2	1.000	1.000
Sat	0.904	0.760	Sat1	0.907	1.927
			Sat2	0.870	2.286
			Sat3	0.836	2.022

To confirm the discriminant value, the AVE must be higher than the variance shared between the construct and the other constructs represented. The constructs analyzed surpass this criterion as well as that linked to the VIF, which is exceeded for the five models developed. Likewise, we employed the hetero-trait-monotrait (HTMT) ratio of correlations (Henseler, Ringle & Sarsted, 2015). The constructs pass the HTMT criterion.90, except for the relation of PerE with IUse.

Table 2. Discriminant validity (Fornell & Larcker/HTMT criterion)

	FCon	SuCo	SwCo	EffE	PerE	Hab	SInf	IUse	Ine	Sat
FCon	1.000	0.174	0.330	0.477	0.435	0.492	0.151	0.339	0.180	0.379
SuCo	0.174	1.000	0.214	0.337	0.436	0.360	0.036	0.236	0.296	0.249

<sup>1</sup> Intention of Use (IUse); Performance Expectation (PerE); Effort Expectation (EffE); Facilitating Conditions (FCon); Social Influence (SInf); Inertia (Ine); Satisfaction (Sat); Sunk Costs (SuCo); Switching Costs (SwCo); Habit (Hab)

SwCo	-0.330	-0.214	1.000	0.592	0.459	0.570	0.341	0.434	0.308	0.584
EffE	0.424	0.284	-0.513	0.811	0.787	0.787	0.173	0.654	0.375	0.589
PerE	0.387	0.358	-0.394	0.586	0.802	0.752	0.249	0.967	0.311	0.562
Hab	0.429	0.315	-0.498	0.598	0.562	0.821	0.129	0.652	0.447	0.764
SInf	-0.151	-0.036	0.341	-0.151	-0.215	-0.112	1.000	0.149	0.067	0.199
IUse	0.313	0.220	-0.398	0.535	0.778	0.527	-0.137	0.868	0.212	0.539
Ine	0.180	0.296	-0.308	0.320	0.254	0.385	-0.067	0.200	1.000	0.431
Sat	0.360	0.236	-0.560	0.499	0.469	0.637	-0.195	0.477	0.421	0.872

Note: inferior diagonal Fornell & Larcker criterion; inferior diagonal HTMT criterion.

#### 4.2. Analysis of the structural model

The first criterion to use is the coefficient of determination of the endogenous constructs (R<sup>2</sup>), measured from the predictive power and indicator of the quantity of variance of the construct explained by its antecedent variables in the model. An R<sup>2</sup> value above 0.10 is recommended. This criterion is surpassed by IUse (R<sup>2</sup>=0.633) and by Ine (R<sup>2</sup>=0.232). According to the SRMR, it can be considered that the model has a good fit as it has a value less than 0.08 (SRMR=0.073).

Next, we analyze the paths, or estimated standardized regression coefficients, bearing in mind the sign, magnitude and significance (Table 3). Those significant paths (p) whose sign follows the direction marked in the hypotheses support the proposed relations.

	Path	t-statistic	P-value	2.5%	97.5%	Result
FCon ->IUse	-0.037	0.891	0.373	-0.121	0.043	Non-significant
SuCo ->Ine	0.180	2.680**	0.007	0.053	0.319	Significant
SwCo ->Ine	-0.057	0.785	0.433	-0.188	0.089	Non-significant
EffE ->IUse	0.079	1.327	0.185	-0.036	0.204	Non-significant
PerE ->IUse	0.675	11.831***	0.000	0.560	0.782	Significant
Hab ->IUse	0.064	1.120	0.263	-0.040	0.175	Non-significant
Hab ->Ine	0.133	1.415	0.157	-0.054	0.326	Non-significant
SInf ->IUse	0.042	1.095	0.274	-0.028	0.123	Non-significant
Ine ->IUse	-0.067	1.425	0.155	-0.155	0.023	Non-significant
Sat ->IUse	0.130	2.158*	0.031	0.012	0.246	Significant
Sat ->Ine	0.262	2.695**	0.007	0.062	0.441	Significant

\*p, 0.05; \*\*p, 0.01; \*\*\*p, 0.001 based on a one-tailed Student t distribution (499), t (0.05; 499)=1.6479; t (0.01; 499)=2.3338; t (0.001; 499)=3.1066

If we begin by the antecedents of inertia, the impact of SuCo (path=0.180, t=2.680) and that of Sat (path=0.262, t=2.695) are significant but not that of SwCo (path=-0.057, t=0.785), or that of Hab (path=0.133, t=1.415). Among the favored antecedents of the intention of use, the impact of PerE (path=0.675, t=11.831) is significant, but not that of EffE (path=0.079, t=1.327), that of SInf (path=0.042, t=1.095), or that of FCon (path=-0.037, t=0.891). Finally, among the inhibitors of IUse only the relation with Sat (path=0.130, t=2.158) is significant, not the relation with Hab (path=0.064, t=1.120) or with Ine (path=0.064, t=1.120).

Table 4. Relations measured

	Path	t-statistic	P-value	2.5%	97.5%	Result
SuCo -> Ine -> IUse	-0.012	1.134	0.257	-0.043	0.001	Non-significant
SwCo -> Ine -> IUse	0.004	0.584	0.559	-0.005	0.024	Non-significant
Hab -> Ine -> IUse	-0.009	0.983	0.326	-0.040	0.002	Non-significant
Sat -> Ine -> IUse	-0.018	1.189	0.235	-0.058	0.004	Non-significant

As we can note in the table above, none of the relations measured contained in the model is significant. That is to say, the relations of SuCos (t-statistic=1.134), SwCo (t-statistic=0.584), Hab (t-statistic=0.983) and Sat (t-statistic=1.189) are not significant.

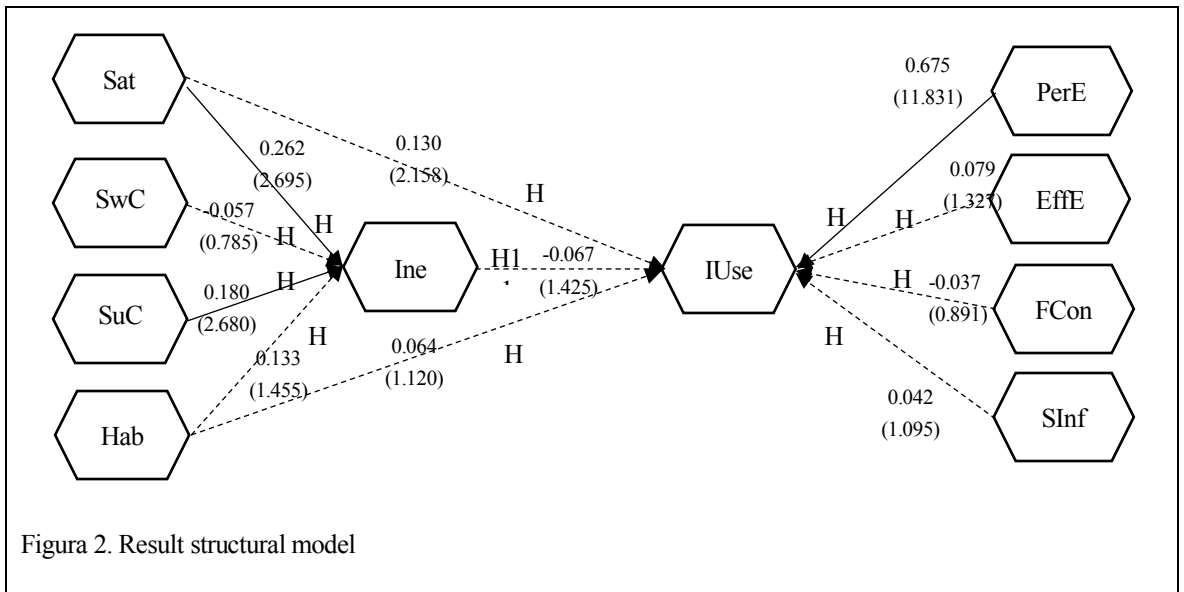


Figura 2. Result structural model

## 5. ANALYSIS OF THE RESULTS

According to the results, among the facilitators of the intention of use of mobile banking apps, only the performance expectation has a significant result, so  $H_1$  is accepted but not the effort expectation, facilitating conditions or social influence, so  $H_2$ ,  $H_3$  and  $H_4$  are not accepted.

This work is therefore in line with those which present an effect of the performance expectation on the intention of use of mobile banking (Bankole et al., 2017; Khan et al., 2017; Lin & Shiquan, 2018; Silva et al., 2013). This is in spite of the large number of functionalities that users recognize in mobile banking (Ghazawneh & Henfridsson, 2013; Laukkanen & Lauronen, 2005; Muñoz-Leiva et al., 2017). On the other hand, the effort expectation is not significant. In this case, it appears that the users consider the mobile banking service to be sufficiently convenient, easy and intuitive (Muñoz-Leiva et al., 2017; Prodanova et al., 2017). This situation is reproduced for the facilitating conditions, as they are penalized by mobile banking services being sufficiently convenient. Finally, the lack of impact of social influence had already been proposed (Sarfaraz, 2017).

If we analyze the antecedents of inertia, this is determined significantly by satisfaction,  $H_8$  being accepted, and by sunk costs, not accepting  $H_6$  and  $H_7$ . Hence, it is again verified how satisfied consumers develop an affective commitment which increases their inertia (Kim & Gupta, 2012; Ng & Kwakh, 2010). Nevertheless, habit and switching costs not being linked with inertia goes against previous proposals in line with the SQB (Ng & Kwakh; Polites & Karahanna, 2012).

It seems that consumers experience, as determinants of their habit, the costs that they have incurred in learning the current system more than those linked to adapting to a new situation. That is to say, although the effort expectation is not linked with the intention of use, the sunk costs, close to risk, end up determining the users' habits.

With respect to the impact of the inhibitors on the intention of use, satisfaction with the current system is significantly related.  $H_{10}$  is not accepted, in spite of its being significantly related, because the relation is direct and not the opposite. It is worth remembering in this respect that in this work we set out from the possibility of satisfaction with the IS in use acting as an inhibitor of the adoption of a new IS. Despite habit being considered one of the main reasons for the behavior of the consumption of services (Chiu & Huang, 2015), in the present work this lacks a significant relation with the intention of use,  $H_9$  not being accepted. Finally, the relation of inertia with intention of use is not significant,  $H_{11}$  not being accepted.

Causal independence between facilitators and inhibitors in the dual factor models is consistent with previous works which show that different motivations lead to the adoption of and resistance to a technology (Hsie, 2016).

Table 5. Summary of hypotheses	
Hypothesis	Result
H <sub>1</sub>	Accepted
H <sub>2</sub>	Not accepted
H <sub>3</sub>	Not accepted
H <sub>4</sub>	Not accepted
H <sub>5</sub>	Accepted
H <sub>6</sub>	Not accepted
H <sub>7</sub>	Not accepted
H <sub>8</sub>	Accepted
H <sub>9</sub>	Not accepted
H <sub>10</sub>	Not accepted
H <sub>11</sub>	Not accepted

## 6. IMPLICATIONS, CONCLUSIONS AND LIMITATIONS

### 6.1. Implications for banking

In 2020 mobiles will surpass computers as a means of carrying out activities of balance enquiries and other banking information (Carbó et al., 2017). The applications which enable the use of mobiles in this area play a fundamental role in the growth strategy of traditional banks. In Spain, the suitability of mobile banking as a channel for the distribution of banking services is based on the preferences of citizens with respect to the access channel for banking operations. Thus, in 2016, 15.5% of Internet users used a Tablet, 56.7% a smartphone and 59.8% a computer (Fundación Telefónica, 2017).

The pressure to operate with lower margins increases the need to identify profitable and diverse services, there being highly efficient banks along with others in niches that will end up eliminating those which, having an undefined strategy, are trapped “halfway” (Alt & Puschmann, 2012). In the implementation of these new services, apps play a bridging role as a way of adoption for users. That is, the greater the adoption of the apps, the greater will be the possibility of bank achieving a cross-sell of new services

The downloading figures of banking apps show that the two traditional banks (BBVA and Caixabank) have the highest rates, surpassing 5,000,000. In the next block appear the apps of other traditional banks such as BSCH, Bankia, and ING, and the first Fintech (Fintonic). This latter is ahead of the apps linked to traditional

banks such as Abanca, EVO and Openbank. It is striking that the first bank with an exclusive online license (N26) is at the same level of downloads (threshold of 500,000) as the exclusively online initiative of Caixabank (Imaginabank). The improved valuation of the users in Play Store (Imaginabank) and in Apple Store (N26) corresponds to these two experiences.

The analysis of the evolution of the downloading of banking apps shows how, in Spain, two of the three major banks maintain their position (BCSH appears to distance itself from this strategy with its Digilosofia), while the Fintech climb positions with regards to banks of a smaller size.

If the app is going to be, in line with Dapp (2015, 2017), the bridge for the offer of additional services, many medium-sized and small entities can see their competitive position in danger in the market compared to large banks and the Fintech. That is why the traditional banks will have to work to effectively manage the impact of satisfaction with the channels of service provisions as, though it determines the intention of use of banking apps, its impact on inertia is greater. Likewise, if they show the apps as a “natural evolution” of the traditional channels, this can manage to mitigate the impact that it has on that inertia.

With respect to the facilitators, the ease of use and convenience of Internet banking, together with privacy in the use of the apps, causes only the performance expectation to significantly determine the intention of use of banking apps. In this way, the conditions are established for the application of the diffusion strategies presented by Laukkanen (2016).

## **6.2. Conclusions**

The services of mobile banking apps are linked with the carrying out of financial activities by Internet, only used by 8% of the population in the case of Spain (Arellano & García, 2017). If we add the need for the platform to attain a critical mass (Goswami & Raghavendran, 2009), all this endows with special relevance the study of the factors which determine the adoption of mobile banking apps.

Setting out from a dual model, we establish that the intention of use of mobile banking apps is determined by facilitator and inhibitor elements. Among the former, the performance expectation and among the latter the satisfaction with system in use. Likewise, inertia is determined by satisfaction and by sunk costs.

## **6.3. Limitations**

To go more deeply into the knowledge of the factors that determine the adoption of mobile banking apps, it would be interesting to carry out a comparison



between users and non-users of these apps, as a way to identify the elements which determine this adoption.

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