



Marketing Intelligence & Planning

Drivers leading firm adoption of internet banking services

Danny P. Claro Ramon B. Rosa

Article information:

To cite this document:

Danny P. Claro Ramon B. Rosa , (2016), "Drivers leading firm adoption of internet banking services", Marketing Intelligence & Planning, Vol. 34 Iss 3 pp. 336 - 354

Permanent link to this document:

<http://dx.doi.org/10.1108/MIP-11-2015-0226>

Downloaded on: 02 December 2016, At: 15:38 (PT)

References: this document contains references to 64 other documents.

To copy this document: permissions@emeraldinsight.com

The fulltext of this document has been downloaded 283 times since 2016*

Users who downloaded this article also downloaded:

(2015), "Online banking adoption: A factor validation and satisfaction causation study in the context of Indian banking customers", International Journal of Bank Marketing, Vol. 33 Iss 6 pp. 760-785 <http://dx.doi.org/10.1108/IJBM-11-2014-0161>

(2015), "Challenges of adoption of internet banking service in Yemen", International Journal of Bank Marketing, Vol. 33 Iss 2 pp. 178-194 <http://dx.doi.org/10.1108/IJBM-01-2013-0001>

Access to this document was granted through an Emerald subscription provided by emerald-srm:556114 []

For Authors

If you would like to write for this, or any other Emerald publication, then please use our Emerald for Authors service information about how to choose which publication to write for and submission guidelines are available for all. Please visit www.emeraldinsight.com/authors for more information.

About Emerald www.emeraldinsight.com

Emerald is a global publisher linking research and practice to the benefit of society. The company manages a portfolio of more than 290 journals and over 2,350 books and book series volumes, as well as providing an extensive range of online products and additional customer resources and services.

Emerald is both COUNTER 4 and TRANSFER compliant. The organization is a partner of the Committee on Publication Ethics (COPE) and also works with Portico and the LOCKSS initiative for digital archive preservation.

*Related content and download information correct at time of download.

Drivers leading firm adoption of internet banking services

Danny P. Claro and Ramon B. Rosa

Insper Education and Research Institute, São Paulo, Brazil

336

Received 28 November 2015
Revised 8 January 2016
Accepted 19 January 2016

Abstract

Purpose – The purpose of this paper is to identify factors influencing firm adoption of internet banking services (IBS). While previous literature has primarily focussed on the individual consumers' adoption, the authors aim to shed light on the adoption of online banking by firms. The authors investigate the propensity and speed of IBS adoption and offer recommendations to providers of IBS and firm users.

Design/methodology/approach – To attain the above purpose a conceptual model was based on research about IBS adoption in the firm context that derives primarily from technology acceptance model and diffusion of innovation. The authors use data from 5,002 firms located in 239 counties, encompassing 52.1 percent of firms users of IBS of a financial service provider and 47.9 percent of non-user firms. All sampled firms received an offer to adopt IBS from the financial service provider. Such unique data set was analyzed using logistic regression to assess propensity and a survival analysis model to assess IBS adoption speed.

Findings – Results revealed that firms, with high propensity to adopt IBS, operate with a diverse management board, are large and young, and compete with a large number of firm users. The survival model showed that the diverse composition of management board also speeds up IBS adoption.

Practical implications – Several implications are drawn from the findings. For instance, managers in firms adopting IBS should invest in recruiting and retaining a diverse set of board members (e.g. internal and external with full decision power), which allows for thorough assessment of pros and cons of any relevant decision to be made. The authors also highlight implications for managers in financial service providers (e.g. bank) that offer IBS to automate the relationship with customer firms. Managers should consider the study as a template for the selection criteria of firms that are likely to accept the IBS offer.

Originality/value – This is one of few empirical studies to investigate the adoption of IBS in a firm context. Previous studies focussed on the individual consumer adoption of IBS. The authors show that adopting diverse set of board management, growing in size, young firms and facing the competitive environment positively influence firm's propensity to adopt IBS. The authors also analyze the time spent by firms from the IBS offering to the adoption, which shows that management decision context play a key role in adoption speed. The research contributions add to the scarce ongoing discussion about firm's adoption of IBS.

Keywords B2B relationship, Firm technology adoption, Internet banking service, Relationship automation

Paper type Research paper

1. Introduction

In today's competitive business environment, internet banking services (IBS) provide efficient and reliable online platform to automate relationships between firms. While in the past firms would make a trip to a bank branch or call the bank manager to make a transaction, the internet today provides an online channel for banking businesses to automate relationships with customer firms by offering IBS to manage for instance firms' cash flow, collectibles and receivables (Lai *et al.*, 2014). Some of the firm's in-house IT systems even integrate IBS to gain efficiency in the relationship with financial service providers by process automation and accountability. IBS provide prompt access to a wide scope of financial services to operate and deliver solutions revolutionizing the relationships between firms. These gains motivate our study to investigate drivers that foster the adoption of IBS by firms.



Previous studies on IBS adoption have concentrated on individual consumers who also gain advantages when adopting IBS. For example, IBS users purchase more banking products and generate more positive financial results for banks than those who are not IBS users (Durkin, 2007; Guerrero *et al.*, 2007; Hitt and Frei, 2002) as well as improve long-term relation with IBS providers (Campbell and Frei, 2010). In addition, consumers also benefit from reduced transaction costs when interacting with banks and improve management of financial resources because of IBS features (Barczak *et al.*, 1997; Mattila *et al.*, 2003; Kuisma *et al.*, 2007). The literature focussed on drivers that lead individual consumers to adopt IBS and developed different profiles of new technology adoption (Alsajjan and Dennis, 2010; Cheng *et al.*, 2006; Deb and Lomo-David, 2014; Harrison *et al.*, 2014; Yuen *et al.*, 2015; Yiu *et al.*, 2007). The drivers included the willingness to accept the perceived risk of operating on the internet (Bauer and Hein, 2006; Yuen *et al.*, 2015) and the perceived benefits and low costs for users (Hernandez and Mazzon, 2007; Xue *et al.*, 2007). However, the extant literature in IBS has primarily focussed on individual consumers (i.e. business to consumer setting) and neglected the relationship with firm customers (i.e. B2B setting).

Although critical for businesses, the study of influencing factors that lead firms to adopt IBS is scarce. Some questions remained unanswered in the business context: how does the management structure influence IBS adoption? Do maturity and size matter in influencing IBS adoption? The seminal conceptual work about firms technology adoption by Robertson and Gatignon (1986) and the recent empirical study about IBS value creation model of Lai *et al.* (2014) highlighted several drivers that affect the decision of firms to adopt IBS as a new technology. Firm management structure, firm's demographics and the nature of the competitive environment play a role in the IBS adoption. The two previous studies inspired us to develop a research framework that deepens our understanding of the drivers of firm's IBS adoption.

Our study aims to develop a research framework that comprises of nine hypotheses on key drivers of firms' IBS adoption. The drivers encompass three high-level antecedents of adoption. Firm management structure refers to the composition and diversity of managing board members, while firm demographics refers to firm size and maturity. In addition, the nature of the competitive environment encompasses the intensity and the extent to which competitors adopted IBS. We develop specific hypotheses about the impact of each dimension of the antecedents on firm's propensity to adopt IBS and the speed with which the adoption occurs. The hypotheses are tested with empirical evidence of 5,002 firms that were offered IBS automation for the relationship with the financial service provider.

The contribution of this paper is threefold. First, we focus on firm's IBS adoption, as opposed to previous studies that have tackled individual consumers' adoption (e.g. Deb and Lomo-David, 2014; Mattila *et al.*, 2003; Kuisma *et al.*, 2007), and identify the drivers of propensity and speed of adoption. Our empirical evidence enabled a detailed investigation of firms that have already adopted IBS compared to those firms that have declined IBS offering. We also analyzed the time spent by firms from the offering to the adoption, which showed the importance of management structure as powerful driver of firm IBS adoption. Second, we argue and show that young firms and high competitive environment are key for firm's propensity to adopt IBS. Third, firm management play a critical role in speeding up IBS adoption. Our contributions add to the scarce ongoing discussion about firm's adoption of IBS. Managerial implications addresses critical issues to IBS adoption for decision makers in firms and IBS providers.

In the next section, we review the literature about the adoption of IBS based on established models of technology acceptance and diffusion of innovation. Next, we develop our conceptual framework to study firm's IBS adoption. The method section presents the sample and instruments used to collect evidence used to test our hypotheses. We finally unveil the results and conclusions.

2. Firm adoption of IBS

Firms essentially innovate to obtain competitive advantages, and in turn incremental profits and revenues on the available alternatives (Webster, 1969). In an industrial marketing setting, adopting online platforms eases the way firms can manage the various types of buyer-supplier interactions. The study of the adoption drivers of innovative online technology by businesses is recent (Lai *et al.*, 2014) and was the result of a convergence of two rather different research streams proposed long ago (Robertson and Gatignon, 1986). The first is organizational buying behavior, which is based on the differences between individuals and firms as buying agents. The purchase decisions in firms are complex, involve several individuals at different hierarchical levels with different interests, and decisions are made in the context of budgets, costs and profits, and require negotiation that take time to reach an agreement (Karjaluoto *et al.*, 2015). Therefore, any firm's decision to adopt innovations rely on purchase objectives, risk perception and access of information (Kelliher and Reinl, 2009).

The second stream of firms' innovation adoption research is based on the diffusion of innovations theory (Rogers, 1962). Robertson and Gatignon (1986) put forward an extensive conceptual framework of firms' innovation adoption. This study highlighted structure (e.g. competitiveness, reputation, standardization and vertical coordination with consumers); sufficient resources (e.g. guaranteed funding for research and development and marketing support); competitive environment (e.g. heterogeneity of the industry, the intensity of inter-industry competition and demand uncertainty) and corporate communication; and firm demographic characteristics. A later study then empirically tested this conceptual framework (Gatignon and Robertson, 1989) showing the importance of management structure, firm characteristics and the competitive environment.

The work of innovative technology adoption by Robertson and Gatignon (1986) inspired the formulation of our hypotheses that accounts for IBS as a relatively recent technological innovation for firms. In the following section, we develop our central concepts and elaborate the hypotheses of our study about firm's adoption of IBS.

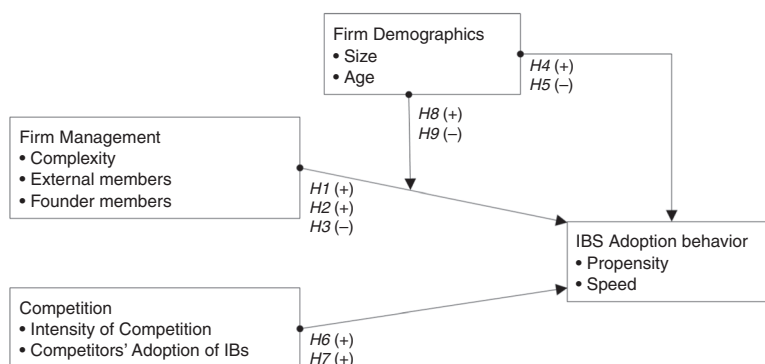
3. Research framework and hypotheses development

Previous studies have identified issues related to firm adoption of IBS meriting further research, such as how firms management structure fosters IBS adoption and how firm maturity affect the adoption. Of particular interest is the nine hypotheses, which contains three drivers of firm's IBS adoption (Figure 1). The drivers encompass firm management, firm demographics and competition. We look at IBS adoption by firm's probability to adopt as well as the speed with which the adoption occurs.

3.1 Firm management structure

In the process of firms' adoption of any new technology, especially when provided by a third party, firms go through the steps of identification, evaluation and acquisition of the new technology. To deal with such a buying process, some firms set up buying center with formal structure that brings together individuals involved in the buying

Figure 1.
Research framework
for the firm's IBS
adoption



decision-making process (Järvi and Munnukka, 2009). In some firms, the buying process is often informal and done directly by the owners, managing partners or by a board member. Studies found different results when large number of people with different background and function are involved in the buying process. One stream of thought predicted conflicts in the decision-making process when there was a high diversity in management board composition (Goodstein *et al.*, 1994). Other studies show that diverse board members are important to avoid complacency with mistakes that can drain resources (Bourgeois and Eisenhardt, 1988) and the top management involved in the buying process is prone to exhaustively discuss pros and cons of a technology adoption (Eisenhardt and Schoonhoven, 1990). The diversity, in terms of different roles and background of members, of boards involved in the IBS adoption is expected to affect positively the way a technology is chosen and implemented (Kelliher and Reinl, 2009). In addition, this diversity allows for having different opinions and new ideas in the decision process (Pearce and Zahra, 1992) and so we put the first hypothesis forward:

H1. Firms with greater diversity in their board are more likely to adopt IBS.

Over time, the process of constant growth leads firms to use information technology to implement IT systems that permit them to control for instance inventory, finance, sales and order fulfillment. The adoption of such systems allows firms to increase reliability and influence the roles individual play within the firm. The systems expand control of board members who acquire more and more decision-making power by virtue of their specialized knowledge (Freeman and Engel, 2007; Kelliher and Reinl, 2009). These boards may also include external members that are individuals outside the firm who have been appointed to support the decision process. External members are prone to implement innovations in firms (Hoskisson *et al.*, 2002), and favor of third party systems as opposed to the ones developed in-house (Baysinger and Hoskisson, 1990). Therefore, we argue that external members in boards with influence power on management action positively affect the adoption of innovations and the speed with which these innovations are adopted. Our hypothesis is as follows:

H2. Firms with large number of external members in their board are more likely to adopt IBS.

The concentration of decision-making power in the hands of founding partners often suggests the rejection of new ideas and perspectives. Founders who are majority

shareholders tend to be conservative in their decisions, particularly about innovation provided by third party, because they prefer ideas that come from within the firm (Hoskisson *et al.*, 2002). There is evidence to believe that innovations such as IBS, which are offered by a third party (i.e. banks) tend to suffer more resistance to adopt when the decision-making power is concentrated in the hands of the majority shareholders. We then posit:

- H3. The predominance of founders with full power on the board hinders the decision to adopt of IBS.

3.2 Firm demographics

As firms grow, processes become complex and the need to adopt automated technology solutions increases to meet control and reliability requirements (Freeman and Engel, 2007). Large firms take more advantage of opportunities to enter new markets than small firms (Haveman, 1993). A meta-analysis that evaluated 20 studies on this subject shows that there is a positive relationship between firm size and innovation (Damanpour, 1992). Therefore, we hypothesize that:

- H4. The larger the firm, the greater the firm's adoption of IBS.

Studies of firm ecology (Baum and Amburgey, 1996; Freeman and Hannan, 1975) focus on the factors that affect the firm survival. The ecology literature views firms as living beings that are born, grow and die. Some argue that with time firms become slow, heavy and are less likely to make changes. For example, the theory of structural inertia (Amburgey *et al.*, 1993; Hannan and Freeman, 1984) states that over time the process of institutionalizing routines, which is so important to incorporate rational behavior in firm's decision making, creates resistance to change and diminishes the possibilities for evolution. This happens because shareholders and board members tend to prioritize short-term performance and end up exaggerating risks in change (Amburgey *et al.*, 1993). In addition, the theory of obsolescence (Barron *et al.*, 1994; Henderson, 1999; Ranger-Moore, 1997) posits the existence of a path-dependence linked to the firm's age that makes it difficult to cope to environmental changes. These studies sustain the following hypothesis:

- H5. The more mature the firm, the lesser the firm's adoption of IBS.

3.3 Competitive environment

In competitive markets, firms are stimulated to constantly improve themselves to keep up with their competitors and increase their chances of success. Competition leads to innovation (Lai *et al.*, 2014) to the extent that a firm's propensity to adopt innovation and the speed of this adoption will be greater in competitive industries and in those in which competitors already possess or are looking for the same types of innovation, in a process of imitation (Van den Bulte and Joshi, 2007). Therefore, we expect that:

- H6. The more competitive the firm's industry, the greater firm's adoption of IBS.

- H7. The more competitors adopt IBS, the more likely the firm will adopt IBS.

3.4 Moderating impact of firm's maturity

We also evaluate separately the moderating effects of firm's maturity on the influence of external and internal board members on the adoption of IBS. Over time, external

board members acquire more influence over the decision-making process. Freeman and Engel (2007) states that board members acquire more decision-making power over time by virtue of their specialized knowledge. This allows us to speculate that the firm's age increases the impact of external members on the adoption of IBS, whereas age increases the negative impact of founders in the board on the IBS adoption. Therefore, we put forward:

- H8. The more mature the firm, the higher the positive effect of external members on the IBS adoption.
- H9. The more mature the firm, the higher the negative effect of founders in the board on the IBS adoption.

4. Method

To test the hypotheses, the empirical part of our study comprises of firms that have been offered IBS from a leading bank in Brazil. In this country, banks are not obliged to offer such online services so firms may go to branches to do business with the bank and/or use IBS. Online services includes cash flow management, payment process, money transfer, currency exchange, bank credit and debt management, and a receivables and collectibles management platform. The criteria to select the sample included firms with a maximum of a two-year time window from bank account opening to the day of IBS adoption as well as firms that actively purchased banking services and placed transactions in multiple channels (e.g. branch and telephone). We then collected data from 5,002 firms located in 239 counties, in which 52.1 percent of these firms adopted IBS from the focal bank and the rest 47.9 percent did not adopt IBS after the bank offer. With such data set, we avoid common method bias that is usual in survey data and avoid the trap of measuring intentions that is exposed to response bias.

The research measures fall into three high-level drivers. For firm management structure, we looked into the board composition of every firm to compute three variables. The variable diversity refers to the total number of different board member profiles that exist in the firm (Bourgeois and Eisenhardt, 1988). The profiles are: members with full formal power, external board member with full formal power, both (external and internal) with full power and both with no full power. The external influence variable measures the proportion of external board members that have full power, as compared to the total number of board members (Hoskisson *et al.*, 2002). The other variable is founder influence that is calculated by the proportion of founders with full power on the board divided by the total number of board members (Hoskisson *et al.*, 2002). The other high-level driver refers to firm demographics. The variable firm size refers to an index that accounts for the firm's revenue and number of employees relative to the other firms in the sample (Haveman, 1993). To test the effect of the age of each firm, we used the natural logarithm of the variable firm age, calculated by the number of months between the firm's start up day to the day of IBS adoption (Ranger-Moore, 1997).

Finally, competition drivers capture the effects of competitive environment. The number of firms operating in the same industry measures the degree of market competition. We used the variable competition intensity, which expresses the total number of competitors by the total number of firms in the same industry operating in the municipality where the firm is headquartered (Porter, 1998). We used the seven digit ID of CNAE (The National Registry of Economic Activity) to classify the sample firms according

to their industry. To determine each firm's portion of the national market, we considered the customer base of the bank providing IBS to create a proxy of the competitive market for each sample firm. The Experian Activity Code (Serasa Experian, 2012) categorizes the customer database. Using these categories, we calculated the competitor adoption variable that measures the proportion of IBS users among competitors on a national level. A set of control variables were used to capture regional effects, technological infrastructure, the use of bank credit and credit rating, and the industry with the greatest propensity for adopting technological innovations (Porter, 1998).

Table I shows the descriptive statistics of the main and control variables. We followed Tabachnick and Fidell (2006) to assess multicollinearity between pairs of independent variables and identify correlation coefficients larger than 0.701 that may suggest problem in the estimation. The significant ($p < 0.05$) correlation between variables is very low ($r_{\text{mean}} = -0.00$; $\sigma_r = 0.16$; $r_{\text{minimum}} = -0.48$; $r_{\text{maximum}} = 0.67$). In addition, the variance inflation factor falls below the suggested threshold score and so indicates no problem with multicollinearity. For the interaction variables, the indicators were calculated by mean centering them, as suggested by Aiken and West (1991) and Tabachnick and Fidell (2006).

To estimate the equations that the adoption of IBS is the dependent variable, we use a model that assumes a dichotomous variable. The independent variable assumes the value 1 (one) if the firm is an IBS user or 0 (zero) if otherwise. For this case, Logistic Regression is the suitable statistical method (Hosmer and Lemeshow, 2000). Our objective is to determine the probability P that the firm will use IBS, given that P expresses the conditional probability that Y , the response variable will be equal to 1, given the model's explanatory variables:

$$P = E(IBM_USER = 1/x) = \frac{e^z}{1 + e^z} \quad (1)$$

in which Z is a polynomial that represents the overall model's response variable as a function of the explanatory variables (indicated by vector x) and their respective parameters (described by vector β for the betas) that we wish to estimate.

For the model of adoption speed, we considered the time between the bank account opening day and the first day the firm operated the IBS. When the time until occurrence of the event is a dependent variable, the most appropriate method is survival analysis model (Hosmer *et al.*, 2008; Kalbfleisch and Prentice, 1980). The most used survival analysis model is Cox's proportional hazards model. The model assumes that the risk of an event occurring in the long run is a function of a group of independent variables denoted by:

$$h(t) = h_0(t) \exp(\beta' x) \quad (2)$$

in which t is time, x is a vector of independent variables whose betas, indicated by vector β , we wish to estimate, and $h_0(t)$ indicates the baseline hazard. The component $h_0(t)$ accounts for the probability that an event occurs if all independent variables are equal to zero. The factor $h_0(t)$ is not estimated directly, as long as we can assume the proportionality of hazards.

5. Results and discussion

5.1 Adoption propensity

Table II presents the results of the logistic regression to evaluate the IBS adoption propensity. Model 0 is the baseline one and shows the estimation of control variables.

Variables	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20
1. Business municipalities	1																			
2. Local municipal centers		1																		
3. Rural municipalities		-0.14*																		
4. Broadband internet		-0.05*	-0.02	1																
5. Branches density		-0.05*	-0.10*	-0.06*	1															
6. Distance (home branch)		-0.15*	-0.07*	-0.01	0.38*	1														
7. Distance (nearest branch)		-0.03*	0.25*	0.14*	-0.11*	-0.13*	1													
8. IBS adoption (main branch)		0.11*	0.10*	0.08*	-0.13*	-0.06*	0.47*	1												
9. Manufacture sector		-0.19*	-0.14*	-0.04*	0.57*	0.39*	-0.06*	-0.17*	1											
10. Retail sector		0.03*	0.01	0.02	-0.02	-0.04*	0.02	0.08*	-0.04*	1										
11. Industry innovation rate		0.06*	0.04*	0.01	-0.05*	-0.03*	0.01	0.05*	-0.13*	-0.27*	1									
12. Credit use		0.01	-0.01	0.01	0.03	-0.01	0.00	0.03*	0.03*	0.67*	-0.38*	1								
13. Credit score		0.05*	0.03*	0.03*	-0.07*	-0.01	0.01	0.05*	-0.04*	0.02	0.08*	-0.01	1							
14. Management diversity		-0.03*	-0.03*	-0.02	0.04*	0.04*	-0.07*	-0.06*	0.02*	-0.02	-0.04*	0.01	-0.26*	1						
15. External members		0.00	0.02	-0.02	0.07*	0.08*	-0.02	-0.06*	0.10*	0.00	-0.07*	0.03*	0.06*	-0.01	1					
		0.05*	0.01	0.03*	-0.09*	-0.07*	0.07*	0.16*	-0.14*	-0.01	0.11*	-0.05*	-0.02	-0.05*	-0.49*	1				

(continued)

Firm adoption
of internet
banking
services

Table I.
Descriptive statistics

Table I.

Variables	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20
16. Founder members	0.06*	0.03*	0.04*	-0.03*	-0.02	0.06*	0.13*	-0.08*	0.02	0.13*	0.00	0.09*	-0.14*	-0.45*	0.63*	1				
17. Size	-0.02	-0.02	0.01	0.05*	0.05*	-0.08*	-0.10*	0.07*	0.06*	-0.05*	0.05*	0.23*	0.01	0.14*	-0.17*	-0.06*	1			
18. Age	0.00	-0.03*	-0.01	0.05*	0.01	-0.08*	-0.07*	0.01*	0.04*	-0.04*	0.02	-0.13*	0.17*	-0.01	-0.10*	-0.25*	0.00	1		
19. Intensity of competition	-0.41*	-0.30*	-0.13*	0.19*	0.17*	-0.15*	-0.18*	0.28*	-0.13*	0.03*	-0.10*	-0.07*	0.02	-0.02	0.03*	-0.01	-0.02	0.00	1	
20. Competitors' adoption of IBS	-0.02	-0.02	-0.02	0.06*	0.00	0.01	-0.04*	0.09*	-0.03*	-0.30*	0.17*	-0.09*	0.05*	0.09*	-0.16*	-0.16*	0.07*	0.05*	-0.19*	1
Mean	0.23	0.06	0.00	1.29	2.90	1.08	-0.52	-0.28	0.05	0.57	0.09	0.45	0.74	1.50	-0.54	-0.10	0.35	2.22	6.11	-1.14
SD	0.42	0.24	0.09	0.93	0.27	1.78	1.29	0.14	0.21	0.49	0.29	0.49	0.43	0.60	0.47	0.63	0.46	0.80	2.17	0.31
Median	0.00	0.00	0.00	1.18	2.94	1.06	-0.45	-0.26	0.00	1	0.00	0.00	1	1	-0.69	0.00	0.18	2.31	6.20	-1.10
Minimum	0.00	0.00	0.00	-0.76	1.87	-4.39	-5.04	-0.69	0.00	0.00	0.00	0.00	0.00	1	-2.40	-3.40	0.00	-2.43	0.00	-1.61
Maximum	1	1	1	2.50	3.59	11.34	4.83	0.023	1	1	1	1	1	5.00	0.69	0.69	7.38	4.71	10.79	0.07

Note: *Significant at 5 percent (two-tailed tests for correlation)

Note: *Significant at 5 percent (two-tailed tests for correlation)

						Firm adoption of internet banking services
Variables	Model 0 Baseline	Model 1 Management	Model 2 Demographic	Model 3 Competition	Model 4 Moderation	
<i>Main effects</i>						
Management diversity	<i>H1</i>	0.20***	0.12*	0.12*	0.11	
External members	<i>H2</i>	−0.34***	−0.19*	−0.13	−0.16	
Founder members	<i>H3</i>	−0.07	−0.21***	−0.18**	−0.17*	
Size	<i>H4</i>		0.89***	0.84***	0.85***	
Age	<i>H5</i>		−0.24***	−0.25***	−0.24***	
Intensity of competition	<i>H6</i>			0.01	0.01	
Competitors' adoption of IBS	<i>H7</i>			1.47***	1.47***	
<i>Moderating effects</i>						
Age × external members	<i>H8</i>				0.01*	
Age × internal members	<i>H9</i>				−0.05	
<i>Control variables</i>						
Business municipalities ^a		0.15*	0.15*	0.19**	0.22**	
Local municipal centers ^a		0.10	0.07	0.09	0.15	
Rural municipalities ^a		0.39	0.44	0.34	0.52	
Broadband internet		0.08*	0.09*	0.11**	0.10*	
Branches density		0.34**	0.31**	0.34**	0.43***	
Distance to the main branch		−0.02	−0.03	−0.03	−0.03	
Distance to the nearest branch		−0.03	−0.01	−0.01	−0.01	
IBS adoption on main branch		1.99***	1.79***	1.70***	1.63***	
Manufacture sector ^b		−0.65***	−0.63***	−0.71***	−0.13	
Trade sector ^b		−0.40***	−0.35***	−0.33***	−0.12	
Industry innovation rate		0.68***	0.67***	0.68***	0.33*	
Credit use		0.43***	0.42***	0.25***	0.31***	
Credit score		0.29***	0.27***	0.29***	0.29***	
Intercept		1.00*	−1.36***	−1.01*	0.19	
LR χ^2 (log likelihood ratio)		340.05***	425.12***	606.58***	799.99***	
$\Delta\%$ LR χ^2		—	25.02	53.36	2.12	
Hosmer-Lemeshow index		10.40	9.95	4.64	3.39	
Pseudo R^2		0.08	0.10	0.15	0.19	
Notes: The table shows parameters estimates. Logistic regression model, dependent variable: (1) firm uses IBS, (0) otherwise ($n = 5,002$). ^a Compared to leading municipalities; ^b compared to trade sector +others. * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$ (Wald statistics)						

345

Table II.
Influencing factors of
firms IBS adoption

The likelihood ratio and the Hosmer-Lemeshow index indicate that the estimated models (0-4) are acceptable, and thus reject the null hypothesis that all the estimated parameters are equal to zero. We checked also the adjusted statistics and all models display a significant evolution when compared with the baseline model (1) ($p < 0.01$). The coefficients were not standardized.

Firm management structure. Model 1 shows support to *H1* that predicts a positive effect of large number of firm's board members with different types on the firm's propensity to adopt innovation in the form of IBS ($\beta = 0.20$; $p < 0.001$). There is further support to *H1* in the main variables estimations of Models 2 and 3. We argued that complex board composition tend to carefully evaluate alternative new technologies and support the implementation. This care affects positively the propensity to adopt IBS. For *H2*, the coefficient was significant and negative ($\beta = -0.34$; $p < 0.001$), the opposite hypothesized direction. A great number of external members in firm's board reduce the propensity to adopt IBS. We speculate that when boards are overpopulated with external members, firms may lose focus on central issues of the business. This effect becomes not significant in the model with all main variables (Model 3). Interestingly, external members in the interaction effect with firm's age turns out to be significant and positive on IBS adoption, as discussed in *H8* below. In addition, we found support to *H3* that predicts a negative impact of the number of founders in the board on the adoption of IBS. The coefficient is significant in the full main models (2 and 3) ($\beta = -0.21$; $p < 0.001$; $\beta = -0.18$; $p < 0.05$). In a *post-hoc* analysis, we did not find a U-shape effect of external and founder members, which support the linear negative effect of high numbers of such a kind of members. Overall, we found support to two dimensions of high-level driver of firm management and model 1 performs better than the baseline model, as can be seen by the increase in the likelihood ratio (Δ percent LR $\chi^2 = 25.02$ percent).

Firm demographics. *H4* was supported by the results in models 2 and 3, which has a positive and significant coefficient of firm size ($\beta = 0.89$; $p < 0.001$; $\beta = 0.84$; $p < 0.001$). As a firm grows, there is a need to automated systems to gain control and reliability of processes. This then leads to a high propensity to adopt IBS. The results for *H5* were also significant and negative as expected in model 2 ($\beta = -0.24$; $p < 0.001$) and model 3 ($\beta = -0.26$; $p < 0.001$), which indicates that mature firms tend to do not adopt IBS. The conservative and short-term focus affect the decision of old firms to avoid new automation technology. The support to *H4* and *H5* indicates that firm demographics adds great explanatory power to the model (Δ percent LR $\chi^2 = 53.36$ percent), and is important in predicting whether technological innovations will be adopted by firms.

Competition. We tested the competitive environment effect on the firm's adoption propensity of IBS. The results for the variable competition intensity were not significant, which leads us to do not support *H6*. We hypothesized that as competitors make pressure in the market, firms will be prone to engage in projects with innovative tone. IBS could be an initiative to cope with high intense competitive markets, which the results of our estimation showed no direct effect on the propensity of adopting IBS. However, the results for the competitor adoption in model 3 show a positive and significant effect on the propensity of IBS adoption ($\beta = 1.47$; $p < 0.001$), which is also significant in model 4 ($\beta = 1.47$; $p < 0.001$). This result is in line with our *H7* that argues the more competitors adopt the IBS technology, more firms in the same industry as competitors are prone to adopt. With these results, we see that competition adds strong explanatory power to the model (Δ percent LR $\chi^2 = 56.88$ percent).

By looking at all three high-level drivers together, the effect of management diversity effect (*H1*) disappeared when introducing the firm demographics drivers (*H4* and *H5*) and competitor adoption (*H7*). Greater diversity appears to have a significant effect on a firm's propensity to adopt new technology in the form of IBS only in markets that competitors in the same industry do not adopt IBS and firm demographics less homogeneous among firms.

Moderating effects. In model 4, we introduced interaction variables to verify whether firm demographics moderate the effect of firm management on the propensity of IBS adoption. The interactions capture the combined effects of the firm's age and external board members as well as founder board members, because the management board composition has influence on the firms' decision making. This is relevant to the decision to adopt or acquire a new technological solution, namely IBS, for the firm. First, we found support to *H8* that argues about the firm age increases the impact of external board members on the IBS adoption ($\beta = 0.01$; $p < 0.05$). Analyzing the effect of external members on adoption, we find $\beta_{\text{under high age}} = -0.22$ and $\beta_{\text{under low age}} = -0.22$. The older the firm the lower the external members positive effect on adoption. The number of external members in firm's management board reduces in young firms. Interestingly, such an external influence has no direct effect on the adoption, which suggests that external influence works on the adoption for young firms. We also hypothesized (*H9*) the moderating effect of firm age on the founders influence. There is no significant effect for such a coefficient. We expected that age would increase the negative impact of founders influence on the propensity of IBS adoption. As firms mature, our result show that founders have no blocking effect on the IBS adoption and so there is no support for *H9*.

Several control variables affect the propensity of IBS adoption. We included variables to control for the kind of municipality the firm operates. The business municipalities' firms are likely to adopt IBS, which reflects the entrepreneurial and dynamic nature of such municipal environment ($\beta = 0.22$; $p < 0.01$). We also included a control for physical distance and density of branches. The distance variable was not significant neither for the main branch nor for the nearest branch, which suggests that physical distance does not influence firm's decision to adopt IBS. The density of branches, in the area firms operate, affects the propensity to adopt IBS ($\beta = 0.42$; $p < 0.001$), which enforces the importance of business activity in the surroundings. Another control variable in the estimation showed the impact of IBS adoption by firms in the main branch ($\beta = 1.62$; $p < 0.001$). The more other firms in the main branch adopt IBS in the main branch, the more the firm tend to adopt IBS. This contextual effect was also found in previous study Xue *et al.* (2011). In the complete models (3 and 4), the industry dummy showed not effect on the propensity to adopt IBS. Finally, credit use and credit score were also controlled and showed positive effects on the propensity to adopt IBS ($\beta = 0.31$; $p < 0.001$; $\beta = 0.28$; $p < 0.001$). Firms with credit clearance reflect effective financial management, which consequently affects positively the adoption of tools like IBS.

5.2 Speed of adoption

We additionally checked the impact of our hypotheses on a different dependent variable of IBS adoption that captures the speed with which firms adopt the technology. Table III shows the results of the Cox's proportional hazards model for the speed of adopting IBS, expressed as the time lag from bank account opening to IBS activation. The full model was estimated and the assumption of proportional

MIP
34,3

348

Table III.
Speed of IBS
adoption

Variables	Model 5 speed
Management diversity	-0.10*
Intensity of competition	0.03
Business municipalities ^a	0.15
Local municipal centers ^a	0.10
Rural municipalities ^a	-0.01
Broadband internet	0.02
Distance from main branch	-0.02
Distance to the nearest branch	0.08**
Branches density	0.03
IBS adoption on main branch	-0.86**
Credit use	0.32***
Credit score	-0.14*
Failures ^b	1,261
LR χ^2 (log likelihood ratio)	87.20***
Log likelihood	-9,496.20

Notes: Cox's proportional hazards coefficients ($n=2,395$). ^aCompared to leading municipalities; ^bindicates the number of firms adhering to the IBS during the 15 months-follow. * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

hazards of the model showed non-conclusive results. While the numerical tests pointed to a violation of the hypotheses by several variables, there was no graphical evidence that it was a problem. After several attempts to eliminate these inconsistencies with no success, we followed Hosmer *et al.* (2008) to drop violating variables from the model in order not to compromise the results of the other variables. The adjusted restricted model meets the proportionality test that is underlying assumption of Cox regression and is statistically acceptable as sustained by magnitude and significance of the likelihood ratio.

The results show that firm management by its board diversity hypothesis (*H1*) is statistically significant ($\beta = -0.10$; $p < 0.05$). There is evidence that more complex firm's board leads to a short time of IBS adoption. This result reinforces the support of *H1* in the propensity model presented in the previous section. The diversity of a firm's board is key to increase the propensity to adopt IBS as well as to accelerate the adoption. Once the firm adopts IBS, the existence of various profiles in its board of directors makes the activation process faster compared to firms with more homogeneous management. This finding supports the argument that firms with a diverse set of members in the board are able to perceive the benefits of adopting innovations. Especially in terms of automation tools like IBS that allow remote control and operation of firm finances and provide gains in efficiency. Firms with complex boards adopt IBS in a short window of time from the bank account.

The control variables showed significant effects on the speed of adoption. Firms located far distant from the nearest branch tend to adopt IBS more promptly ($\beta = 0.07$; $p < 0.01$). The distance may cause difficulties to establish a face-to-face interaction in the branch, which encourage firms to adopt IBS. In addition, firms in main branch that has more firms that adopted IBS tend to take more time to adopt ($\beta = -0.86$; $p < 0.01$). One might suggest that branches with a large number of IBS users tend to focus on existing customer firms and lack quality response to new customers, which in turn result in lower speed of adoption by firms. Finally, credit

use and score also affect the speed of adoption in different ways. Firms that use more credit tend to promptly adopt IBS ($\beta = 0.31$; $p < 0.001$), whereas firms that have high credit score take more time to adopt IBS ($\beta = -0.13$; $p < 0.05$). This suggests that firms with better credit clearance and less-leveraged business operation speed up the IBS adoption.

6. Concluding remarks

In our study, we aimed to study factors that drive IBS adoption by firms as few previous research focussed on firms' IBS adoption and developed frameworks to understand drivers of diffusion and adoption (Lai *et al.*, 2014; Robertson and Gatignon, 1986). The seminal studies of Bass (1969) and Rogers (1962) about technology diffusion and adoption supported a vast stream of research. The technology acceptance model followed this stream, which was extensively used to investigate IBS adoption by individual consumers (Davis, 1989; Davis *et al.*, 1989; and more recently Venkatesh *et al.*, 2003). However, research about IBS adoption by firms is rare. Drawing from previous evidence on firm technology adoption, our study develops a framework to analyze drivers of propensity and speed of IBS adoption by firms (Gatignon and Robertson, 1989). The findings shed light on the importance of management board diversity to increase adoption propensity. Firms with complex management boards are capable of stressing the issue and reaching a solution that supports IBS adoption. External members in the management board require a cautionary tale because they have a direct negative impact on adoption propensity. Nonetheless, external members in old firms affect positively adoption propensity. Old firms benefit from the experience of external members who assist firms to adopt IBS. Firm size and firm age also increase propensity of adoption. Such demographic drivers of adoption offer the decision to invest in new technology.

We also found evidence that competitive environment influence firm's propensity to adopt IBS. The direct overall competition does not influence firm's propensity to adopt IBS, nevertheless the adoption by competitors influence the firm's decision to also adopt IBS. The influence has three implications for management. First, competitors may have invested in financial process automation to gain efficiency in the business overall. Firms experience the competition pressure and felt compelled to also gain efficiency by adopting IBS. Second, firms may benchmark competitors and learn how competitors are coping with the implementation of the new technology. As imitators, firms study competitors experience with the implementation and take the risk of adopting as well (Van Den Bulte and Joshi, 2007). Finally, the IBS providers may proactively spread the experience of firm users with others by for instance showcases, visit presentations and best practice sharing meetings. Showing business cases with testimony of other firms in similar businesses allow providers to support the IBS diffusion.

6.1 Managerial implications

The managerial implications based on our results can be addressed to managers in firms and IBS providers. First, firm managers should invest in diversity of board composition, which allows for thorough assessment of pros and cons of any decision to be made. Adopting firms gain from board members with different decision power such as board member with full formal power, both external and internal with full power. Stimulating the debate of different opinions among board members support diligent and early adoption of IBS. By early adopting, firms can beat competition and

be the first to gain the advantages of automation and accountability. When inviting external members to participate in the management board, young firms (under two years) must carefully consider members to support the decision to adopt IBS because impact may be minor. Firms should also be careful with founder members in the management board. Founders may hamper the adoption of IBS by bringing emotion to the table and influencing negatively the risk assessment of the adoption. In addition, managers in firms should closely monitor competition and learn the ways to successfully adopt IBS. Managers may inquire customers and suppliers to get updated information about competitors, as well as attend meetings at industry association that create positive environment for information exchange. Competitors that adopted IBS have experienced the mistakes and determined the best practices of adoption. A benchmark approach is advisable to avoid wasting precious time and resources.

Second, we address implications for managers in banks who provide IBS. Manager should consider our study as a template for the selection criteria of firms that are likely to accept the IBS offer. The success of IBS offering and implementation is dependent on firm management board, firm demographics and competitive environment. Managers should gather relevant data and develop propensity models to accurately predict firms who will successfully adopt IBS. Marketing campaign should target the selected firms and provide necessary support to implement IBS. Users testimony, best practice book and meeting with adopter firms provide the necessary detailed information about adoption process and benefits of use that encourage firms to adopt IBS.

6.2 *Limitations and future research*

Our study opens interesting opportunities for future research. We included a unique set of control variables, though future studies may look into others. For instance, the management profile of willingness to take risks may improve the understanding of IBS adoption – some firms yet worry about placing transactions on the internet. Firms may also work with other banks with the possible consequences that these firms have a different relationship and incentives to adopt IBS. A qualitative study to further investigate such profiles among business leaders can also complement the results of our study. Future research may look into other issues as pointed out by Frambach and Schillewaert (2002) to explore other drivers of IBS adoption. In their ten-year review of the extant literature, the issues were related to innovation provider marketing effort and the social network that could be included in future studies. Additionally, future study may also examine the possible impact of alternative channels for gaining efficiency on bank transactions, since IBS adoption offers such benefit. These channels could be in the form of customer service desk at the branch and customer service by phone or ATM (Mattila *et al.*, 2003).

To expand our research framework, future study may deepen the analysis about management controls and incentives. We found that the greater presence of external board members with decision power in firm management play an important role in firm's propensity to adopt innovation in the form of IBS. In particular, for external influence to matter the firm has to be old. Future studies may investigate micro-management decision processes and individual profile of members (Kelliher and Reinl, 2009). Finally, the results we obtained for the direct effect of external influence had the opposite hypothesized direction, which invites future examination in great depth.

References

- Aiken, L.S. and West, S.G. (1991), *Multiple Regression: Testing and Interpreting Interactions*, Sage, Newbury Park, CA.
- Alsajjan, B. and Dennis, C. (2010), "Internet Banking acceptance model: cross-market examination", *Journal of Business Research*, Vol. 63 No. 9, pp. 957-996.
- Amburgey, T.L., Kelly, D. and Barnett, W.P. (1993), "Resetting the clock the dynamics of organizational change and failure", *Administrative Science Quarterly*, Vol. 38 No. 1, pp. 51-73.
- Barczak, G., Ellen, P.S. and Pilling, B.K. (1997), "Developing typologies of consumer motives for use of technologically based banking services", *Journal of Business Research*, Vol. 38 No. 2, pp. 131-139.
- Barron, D.N., West, E. and Hannan, M.T. (1994), "A time to grow and a time to die: growth and mortality of credit unions in New York city, 1914-1990", *American Journal of Sociology*, Vol. 100 No. 2, pp. 381-421.
- Bass, F.M. (1969), "A new product growth model for consumer durables", *Management Science*, Vol. 15 No. 5, pp. 215-227.
- Bauer, K. and Hein, S.E. (2006), "The effect of heterogeneous risk on the early adoption of Internet Banking technologies", *Journal of Banking & Finance*, Vol. 30 No. 6, pp. 1713-1725.
- Baum, J.A.C. and Amburgey, T.L. (1996), "Organizational ecology", in Clegg, S.R., Hardy, C. and Nord, W.R. (Eds), *Handbook of Organization Studies*, 2nd ed., SAGE, London, pp. 243-260.
- Baysinger, B.D. and Hoskisson, R.E. (1990), "The composition of boards of directors and strategic control: effects on corporate strategy", *Academy of Management Review*, Vol. 15 No. 1, pp. 72-87.
- Bourgeois, L.J. and Eisenhardt, K.M. (1988), "Strategic decision processes in high velocity environments: four cases in the microcomputer industry", *Management Science*, Vol. 34 No. 7, pp. 816-835.
- Campbell, D. and Frei, F. (2010), "Cost structure, customer profitability, and retention implications of self-service distribution channels: evidence from customer behavior in an online banking channel", *Management Science*, Vol. 56 No. 1, pp. 1-21.
- Cheng, T.C.E., Lam, D.Y.C. and Yeung, A.C.L. (2006), "Adoption of Internet Banking: an empirical study in Hong Kong", *Decision Support Systems*, Vol. 42 No. 3, pp. 1558-1572.
- Damanpour, F. (1992), "Organizational size and innovation", *Organization Studies*, Vol. 13 No. 3, pp. 375.
- Davis, F.D. (1989), "Perceived usefulness, perceived ease of use, and user acceptance of information technology", *MIS Quarterly*, Vol. 13 No. 3, pp. 319-340.
- Davis, F.D., Bagozzi, R.P. and Warshaw, P.R. (1989), "User acceptance of computer technology: a comparison of two theoretical models", *Management Science*, Vol. 35 No. 8, pp. 982-1003.
- Deb, M. and Lomo-David, E. (2014), "An empirical examination of customers' adoption of m-banking in India", *Marketing Intelligence & Planning*, Vol. 32 No. 4, pp. 475-494.
- Durkin, M.G. (2007), "On the role of bank staff in online customer purchase", *Marketing Intelligence & Planning*, Vol. 25 No. 1, pp. 82-97.
- Eisenhardt, K.M. and Schoonhoven, C.B. (1990), "Organizational growth: linking founding team, strategy, environment, and growth among US semiconductor ventures, 1978-1988", *Administrative Science Quarterly*, Vol. 35 No. 3, pp. 504-529.
- Frambach, R.T. and Schillewaert, N. (2002), "Organizational innovation adoption: a multi-level framework of determinants and opportunities for future research", *Journal of Business Research*, Vol. 55 No. 2, pp. 163-176.

- Freeman, J. and Engel, J.S. (2007), "Models of innovation: startups and mature corporations", *California Management Review*, Vol. 50 No. 1, pp. 94-120.
- Freeman, J. and Hannan, M.T. (1975), "Growth and decline processes in organizations", *American Sociological Review*, Vol. 40 No. 2, pp. 215-228.
- Gatignon, H. and Robertson, T.S. (1989), "Technology diffusion: an empirical test of competitive effects", *Journal of Marketing*, Vol. 53 No. 1, pp. 35-49.
- Goodstein, J., Gautam, K. and Boeker, W. (1994), "The effects of board size and diversity on strategic change", *Strategic Management Journal*, Vol. 15 No. 3, pp. 241-250.
- Guerrero, M.M., Egea, J.M.O. and González, M.V.R. (2007), "Application of the latent class regression methodology to the analysis of internet use for banking transactions in the European Union", *Journal of Business Research*, Vol. 60 No. 2, pp. 137-145.
- Hannan, M.T. and Freeman, J. (1984), "Structural inertia and organizational change", *American Sociological Review*, Vol. 49 No. 2, pp. 149-164.
- Harrison, T.S., Onyia, O.P. and Tagg, S. (2014), "Towards a universal model of internet banking adoption: initial conceptualization", *International Journal of Bank Marketing*, Vol. 32 No. 7, pp. 647-687.
- Haveman, H.A. (1993), "Organizational size and change: diversification in the savings and loan industry after deregulation", *Administrative Science Quarterly*, Vol. 38 No. 1, pp. 20-50.
- Henderson, A.D. (1999), "Firm strategy and age dependence: a contingent view of the liabilities of newness, adolescence, and obsolescence", *Administrative Science Quarterly*, Vol. 44 No. 2, pp. 281-314.
- Hernandez, J.M.C. and Mazzon, J.A. (2007), "Adoption of internet banking: proposition and implementation of an integrated methodology approach", *International Journal of Bank Marketing*, Vol. 25 No. 2, pp. 72-88.
- Hitt, L.M. and Frei, F.X. (2002), "Do better customers utilize electronic distribution channels? The case of PC banking", *Management Science*, Vol. 48 No. 6, pp. 732-748.
- Hoskisson, R.E., Hitt, M.A., Johnson, R.A. and Grossman, W. (2002), "Conflicting voices: the effects of institutional ownership heterogeneity and internal governance on corporate innovation strategies", *The Academy of Management Journal*, Vol. 45 No. 4, pp. 697-716.
- Hosmer, D.W. and Lemeshow, S. (2000), *Applied Logistic Regression*, 2nd ed., John Wiley & Sons Inc., New York, NY.
- Hosmer, D.W., Lemeshow, S. and May, S. (2008), *Applied Survival Analysis – Regression Modeling of Time-to-Event-Data*, 2nd ed., John Wiley & Sons Inc., New York, NY.
- Järvi, P. and Munnukka, J. (2009), "The dynamics and characteristics of buying centre networks: a qualitative study on Finnish firms", *Marketing Intelligence & Planning*, Vol. 27 No. 3, pp. 439-457.
- Kalbfleisch, J.D. and Prentice, R.L. (1980), *The Statistical Analysis of Failure Data*, John Wiley and Sons, New York, NY.
- Karjaluoto, H., Mustonen, N. and Ulkuniemi, P. (2015), "The role of digital channels in industrial marketing communications", *Journal of Business & Industrial Marketing*, Vol. 30 No. 6, pp. 703-710.
- Kelliher, F. and Reinl, L. (2009), "A resource-based view of micro-firm management practice", *Journal of Small Business and Enterprise Development*, Vol. 16 No. 3, pp. 521-532.
- Kuisma, T., Laukkanen, T. and Hiltunen, M. (2007), "Mapping the reasons for resistance to internet banking: a means-end approach", *International Journal of Information Management*, Vol. 27 No. 2, pp. 75-85.

- Lai, J.Y., Lin, C.T., Ulhas, K.R. and Ong, C.S. (2014), "Factors driving value creation in online B2B banking", in Information Resources Management Association USA (Ed.), *Banking, Finance, and Accounting: Concepts, Methodologies, Tools and Applications*, Business Science Reference, Hershey, PA, pp. 159-179.
- Mattila, M., Karjaluoto, H. and Pento, T. (2003), "Internet banking adoption among mature customers: early majority or laggards?", *Journal of Services Marketing*, Vol. 17 No. 5, pp. 514-528.
- Pearce, J.A. II and Zahra, S.A. (1992), "Board composition from a strategic contingency perspective", *Journal of Management Studies*, Vol. 29 No. 4, pp. 411-438.
- Porter, M. (1998), *On Competition*, Vol. 32, Harvard Business School, Boston, MA.
- Robertson, T.S. and Gatignon, H. (1986), "Competitive effects on technology diffusion", *Journal of Marketing*, Vol. 50 No. 3, pp. 1-12.
- Ranger-Moore, J. (1997), "Bigger may be better, but is older wiser? Organizational age and size in the New York life insurance industry", *American Sociological Review*, Vol. 62 No. 6, pp. 903-920.
- Rogers, E.M. (1962), *Diffusion of Innovations*, Free Press, New York, NY.
- Serasa Experian (2012), "Tabela de Descrição dos Códigos de Atividade Serasa", available at: www.serasaexperian.com.br/ftp2/Codigo_Atividade_Serasa.pdf (accessed May 19).
- Tabachnick, B.G. and Fidell, L.S. (2006), *Using Multivariate Statistics*, 5th ed., Pearson, New York, NY.
- Van Den Bulte, C. and Joshi, Y.V. (2007), "New product diffusion with influentials and imitators", *Marketing Science*, Vol. 26 No. 3, pp. 400-421.
- Venkatesh, V., Morris, M.G., Davis, G.B. and Davis, F.D. (2003), "User acceptance of information technology: toward a unified view", *MIS Quarterly*, Vol. 27 No. 3, pp. 425-478.
- Webster, J.R.F.E. (1969), "New product adoption in industrial markets: a framework for analysis", *Journal of Marketing*, Vol. 33 No. 3, pp. 35-39.
- Xue, M., Hitt, L.M. and Chen, P.Y. (2011), "Determinants and outcomes of Internet Banking adoption", *Management Science*, Vol. 57 No. 2, pp. 291-307.
- Xue, M., Hitt, L.M. and Harker, P.T. (2007), "Customer efficiency, channel usage, and firm performance in retail banking", *Manufacturing & Service Operations Management*, Vol. 9 No. 4, pp. 535-558.
- Yiu, C.S., Grant, K. and Edgar, D. (2007), "Factors affecting the adoption of Internet Banking in Hong Kong – implications for the banking sector", *International Journal of Information Management*, Vol. 27 No. 5, pp. 336-351.
- Yuen, Y.Y., Yeow, P.H.P. and Lim, N. (2015), "Internet banking acceptance in the United States and Malaysia: a cross-cultural examination", *Marketing Intelligence & Planning*, Vol. 33 No. 3, pp. 292-308.

Further reading

- Calisir, F. and Gumussoy, C.A. (2008), "Internet Banking versus other banking channels: young consumers view", *International Journal of Information Management*, Vol. 28 No. 3, pp. 215-221.
- Chau, P.Y.K. and Lai, V.S.K. (2003), "An empirical investigation of the determinants of user acceptance of Internet Banking", *Journal of Organizational Computing and Electronic Commerce*, Vol. 13 No. 2, pp. 123-145.
- Chircu, A.M. and Kauffman, R.J. (2000), "Limits to value in electronic commerce-related IT investments", *Journal of Management Information Systems*, Vol. 17 No. 2, pp. 59-80.

- Cortiñas, M., Chocarro, R. and Villanueva, M.L. (2010), "Understanding multi-channel banking customers", *Journal of Business Research*, Vol. 63 No. 11, pp. 1215-1221.
- Hauser, J., Tellis, G.J. and Griffin, A. (2006), "Research on innovation: a review and agenda for marketing science", *Marketing Science*, Vol. 25 No. 6, pp. 687-717.
- Liao, Z. and Cheung, M.T. (2002), "Internet-based e-banking and consumer attitudes: an empirical study", *Information & Management*, Vol. 39 No. 4, pp. 283-295.
- Mahajan, V., Muller, E. and Bass, F.M. (1990), "New diffusion models in marketing: a review and directions for research", *Journal of Marketing*, Vol. 54 No. 1, pp. 1-26.
- Tan, M. and Teo, T.S.H. (2000), "Factors influencing the adoption of Internet Banking", *Journal of the Association for Information Systems*, Vol. 1 No. 1, pp. 98-112.
- Webster, J.R.F.E. and Wind, Y. (1972), "A general model for understanding organizational buying behavior", *Journal of Marketing*, Vol. 36 No. 2, pp. 12-19.
- Wind, Y. and Webster, J.R.F.E. (1972), "On the study of industrial buying behavior: current practices and future trends", *Industrial Marketing Management*, Vol. 4 No. 4, pp. 411-416.

Corresponding author

Danny P. Claro can be contacted at: danny@insper.edu.br