

INTERNET BANKING CAPABILITIES AND PERFORMANCE OF SMALL BUSINESS: THE IT BUSINESS VALUE FROM THE PERSPECTIVE OF EXTERNAL CAPABILITIES

CAPACIDADES DE INTERNET BANKING E DESEMPENHO DAS PEQUENAS EMPRESAS: O VALOR DE NEGÓCIO DA TI NA PERSPECTIVA DE CAPACIDADES EXTERNAS

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ABSTRACT

The purpose of this research is to identify the extent to which Internet Banking Capabilities are related to the performance of small business (bank customers) at the processes and firm levels. As a research method, a survey with small businesses which use internet banking has been conducted. For data analysis, we used Structural Equation Modeling estimated with Partial Least Squares (PLS). The results indicate the direct impact of Internet Banking Capabilities on process performance, which sequentially impacts the performance at the firm level. On the other hand, there is no direct impact of Internet Banking Capabilities on firm performance. Limitations and research opportunities are included in the conclusions.

Keywords: IT value, Internet Banking Capabilities, process performance, firm performance.

RESUMO

Esta pesquisa objetiva identificar em que medida as capacidades de *internet banking* estão associadas ao desempenho de pequenas empresas (clientes bancários) nos níveis de processos e de firma. Como método de pesquisa, realizou-se uma *survey* com pequenas empresas que utilizam *internet banking*. Para análise de dados, utilizou-se a Modelagem de Equações Estruturais, por estimativa *Partial Least Squares (PLS)*. Os resultados indicam o impacto direto das capacidades de *internet banking* no desempenho de processos, que, por sua vez, impacta o desempenho no nível de firma. Por outro lado, inexistente relação de impacto direto das Capacidades de *Internet Banking* no Desempenho de Firma. Limitações e oportunidades de pesquisa constam nas conclusões.

Palavras-chave: Valor da TI, capacidades de *internet banking*, desempenho de processos, desempenho da firma.

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INTRODUCTION

Is the investment in Information Technology (IT) contributing to improve the outcome of firms? To answer this question, a lot of effort has been done by researchers in the field of Information Systems (IS), with several studies in the last decades to measure the relationship between IT investments and productivity (Gartner *et al.*, 2009; Kim *et al.*, 2011; Maçada *et al.*, 2005; Rivard *et al.*, 2006; Voudouris *et al.*, 2012).

Among the various business segments, the banking sector is one of the major investors in IT, in order to implement strategies and gain competitive advantage (Maçada *et al.*, 2012). In addition, Brazilian banks are internationally recognized by the quality of products and services offered to their customers (Faria, 2010).

In this scenario of heavy investments and continuous technological changes, banks have developed new ways to relate to their customers, in particular through internet banking (Mello *et al.*, 2006). Internet Banking Capabilities – as a tool for access to online services – introduce new ways of communication between the customer and the bank, as well as to support and catalyze new ways of business and to reduce operating costs (Donner and Oliveira, 2008). The customers – more participative in the provision of banking services – select products and services, and run the processes for accomplishing his goal (Mello *et al.*, 2006).

Access to banking services for firms and individuals has been facilitated by various government initiatives in Brazil, such as the Post Office Savings Bank, established in inner cities (Pozzebon *et al.*, 2011), and the fostering in the accounts and credit openings. Similarly, companies have prioritized the adoption of online tools that reduce operating costs and improve the financial logistics. According to the Brazilian Federation of Banks (Febraban, 2009), internet banking accounts more than tripled in the 2000s, from 8.3 million in 2000 to 32.5 million in 2008.

Despite the growth in the use of internet banking, the literature of IS still needs more studies to define the construct "Internet Banking Capabilities" and its contribution to the performance of user organizations (bank customers). The small number of studies in the literature focuses on the value of internet banking as a strategic resource for financial institutions (e.g., Sumra *et al.*, 2011). In addition, studies on the value of IT have been predominant in the context of large companies (Chae *et al.*, 2014; Oliveira and Maçada, 2013); however, the amount of small businesses in the economies has fostered the research focus in this segment in recent years (e.g., Lunardi *et al.*, 2010).

Small businesses are the backbone of many economies, for example in Europe – where 99% of firms have less than 250 employees (Ruivo *et al.*, 2012). The contributions of these enterprises are related to both the number of jobs created as exports and economic outcomes (Mohamad and Said, 2012).

In Brazil, the micro and small enterprises (MSEs) in 2000 represented 4.2 millions of establishments. In 2010 the amount of enterprises reached 6.1 millions, employing thus far about 14.7 millions of people – on the contrary to the 13.8 millions of jobs in medium and large business. From the total jobs, about 6.1 millions were generated only in the decade of 2000 – 2010 – with an average annual growth of 5.5% in employment generation. In addition, the series of payment in micro and small enterprises reaches 40% of the total – i.e. every \$ 100 paid to employees in the 2000s, about \$ 40 were generated by MSEs. About 99% of the establishments in Brazil in 2010 were micro and small enterprises, which occupied 51.6% of private formal non-agricultural jobs (Dieese, 2011).

Taking into consideration the demand of the aforementioned research, the purpose of this article is to identify the extent to which Internet Banking Capabilities are related to the performance levels of processes and firms on small businesses.

This paper is organized in four sections besides the introduction. Section 2 shows the theoretical framework, the hypotheses and the research model. In section 3: the methodological procedures are addressed (data collection and analysis). Section 4 the results are shown. Section (5) brings the conclusions and research opportunities.

INTERNET BANKING AND ORGANIZATIONAL PERFORMANCE

Over the past 20 years, significant innovations offered by information technology, especially new business patterns supported by internet and web systems (Donner and Oliveira, 2008) changed the way of communication between people and organizations.

Banking industry has created new channels of communication, new products and new banking services to their customers, all of them made possible by the dissemination of new technologies (Faria, 2010). Among the new products and services there are: internet banking, mobile banking, ATM, electronic funds transfer (EFT), online paying bills, online statements and credit card etc. (Sumra *et al.*, 2011).

In banks, automated transactions (performed without the intervention of employees) represent increasing share of total operations, especially because transactions can be performed in longer period of time than the banking hours of the agencies, and also in locations more comfortable and nearer to customers (Becker *et al.*, 2003).

INTERNET BANKING CAPABILITIES

According to the studies of Adachi and Diniz (2005), Nelson *et al.* (2005) and Cheung and Lee (2009), internet banking applications must provide details such as information security, information quality and system integration, in this

article defined as dimensions of Internet Banking Capabilities. These dimensions are taken from the IS literature in order to enable the measurement of the construct "Internet Banking Capabilities".

For the first dimension (security), the user's attention is focused on access to the World Wide Web (Internet), which is a two-way network. Even as the user has access to millions of published information, criminals also have access to the servers where data is hosted (Adachi and Diniz, 2005). Therefore, it became necessary to protect this new environment, which has broken the physical barrier of bank agencies.

The "trust", as an aspect of information security, has impact on the value perceived by bank customers who in turn reflect on their fidelity to the company (Brei and Rossi, 2005). In this sense, Donner and Oliveira (2008) emphasize that fraud and the identification of vulnerabilities in internet banking reduce the number of transactions and online operations.

Trust is the mainstay of any traditional or electronic business or enterprise, inside or outside the internet, linked to the "information security" dimension (Brei and Rossi, 2005). Security management in IT is a positive differentiation opportunity for companies that are adapting to this growing demand (Cernev and Leite, 2005) into an information society.

Investments in IT have increased the informational quantity available for organizations; however, much information is not always reflected in information quality (Lima and Maçada, 2007). According to Cheung and Lee (2009), high-quality information is updated in real time; reliable and posted in an appropriate place (in the website) in order to help the user in choosing the best decision (Cheung and Lee, 2009). In addition, this information should be readily understandable and interpretable by the user (Nelson *et al.*, 2005).

The "systems integration" dimension is the degree to which software or a process facilitates the combination/confrontation of data or information in order to give support to business decisions (Nelson *et al.*, 2005). Therefore, internet banking should facilitate the combination/confrontation of financial data between the bank and the customer company system supporting business decisions. There must be an "adjustment" between the technology offered to the customer by the bank and the technology that the market is demanding from the customer (Stoel and Muhanna, 2009). The provision of IT capabilities by banks should be sufficient to strengthen the financial processes, but should not overload the actual needs of each customer. In this case, it is expected that IT systems are able to share timely information for decision-making (Huang *et al.*, 2009).

According to Han *et al.* (2013), complementarity between the customer and vendor capabilities is critical to the successful use of the capabilities and external resources. The closer the customers and vendors capabilities levels are, the greater the synergy generated and the extracted value from IT will be.

INTERNET BANKING CAPABILITIES AND PERFORMANCE: RESEARCH MODEL AND HYPOTHESES

The resources and capabilities of the firm are seen, according to Resource-Based Theory (RBT), as potential for ensuring sustainable competitive advantage and performance or rents (Mahoney, 2001; Makadok, 2001). These resources and capabilities, however, require qualities that support those potentialities (Kraaijenbrink *et al.*, 2010), including the value, rarity, and the impossibility of substitution and the imitation by competitors (Barney, 1991). In essence, it is assumed that the resources and capabilities that explain differential performance among firms are peculiar and unique – singly or integrated with other resources and organizational capabilities (Ting-Peng *et al.*, 2010).

In the theoretical perspective, the Internet Banking Capabilities can be understood as third party resources made available to bank customers and that potentially contribute to the business of its users. The RBT seeks to explain the differential performance among firms, based on the accessed or controlled resources in their activities (Barney, 1991; Ray *et al.*, 2005). Studies that analyze IT value and other organizational resources using the RBT have been successful in confirming their premises and proving the hypotheses made in each case (Crook *et al.*, 2008; Oliveira and Oliveira, 2012b).

However, the RBT has been mainly used to support and understand the role of internal resources (produced or owned by the firm) on organizational performance (Nevo and Wade, 2011; Stoel and Muhanna, 2009). The role of external resources, available to firms, has rarely been the subject of investigation in the light of RBT, except for a few studies (Nevo *et al.*, 2007; Watjatrakul, 2005), which dealt with aspects of this phenomenon.

Internet Banking Capabilities are resources available to enterprises (bank customers) as an extension of financial services and contracted credit, designed to promote the speed of transactions and the agility of internal financial departments, among other impacts. Whereas such capabilities depend on the quality of specific factors (e.g., information, security, systems), the level of knowledge of users taking the application in organizations, the IT infrastructure available etc., potentially, such capabilities should be understood as singular resources to the organizational environment which adopts them (i.e., customers companies). In this case, in its way the Internet Banking Capabilities incorporate specific elements of firms, related to its history and culture, especially regarding the dynamics of use, which approaches them to the concept of IT capabilities addressed in the area of IS (Bharadwaj, 2000).

In the literature concerning IT value, organizational performance has been discussed at the multilevel perspective. Usually, two common levels of analysis are: process level and firm level (Figure 1), since studies have confirmed that the IT impacts occur in the process measures and, indirectly, on

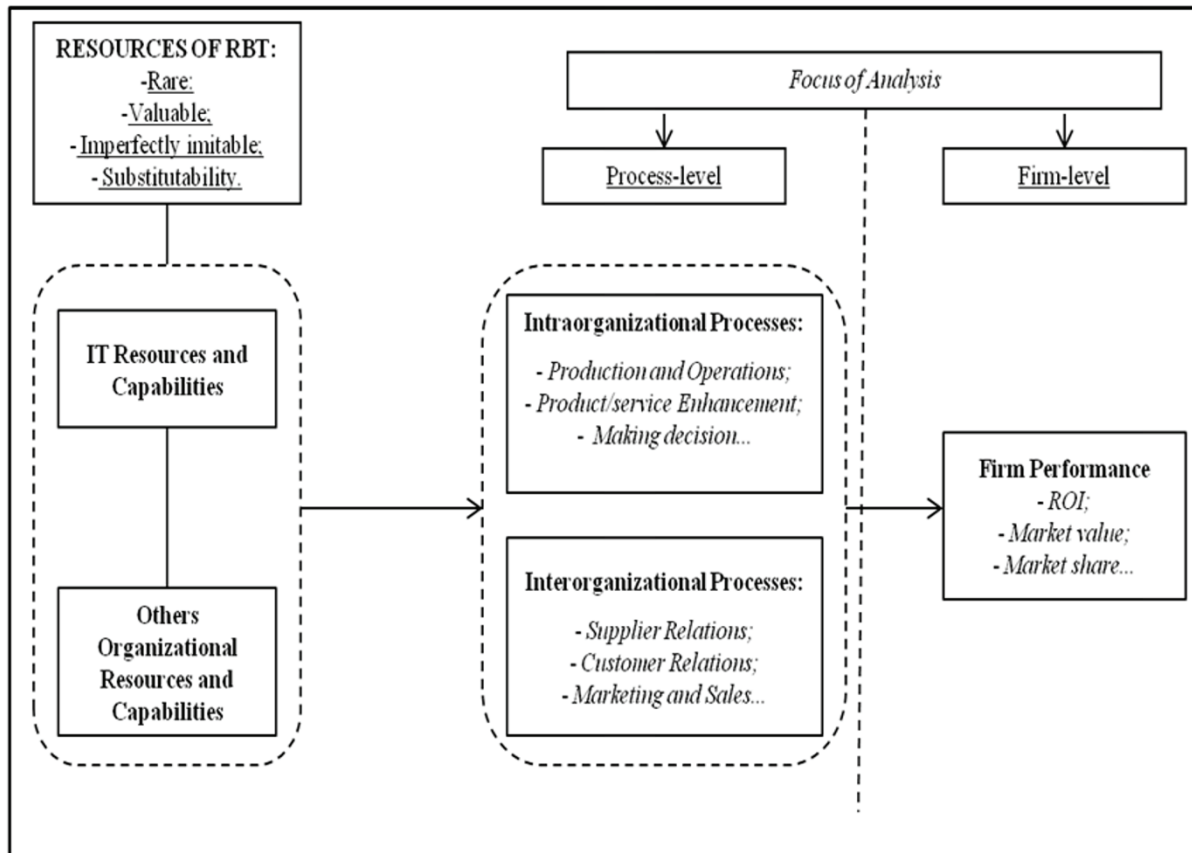


Figure 1. RBT: IT capabilities, resources and performance level.

Source: Adapted from the literature (Khallaf, 2012; Nevo and Wade, 2010; Ray et al., 2005; Tallon and Kraemer, 2007).

overall performance of the firm (Chen et al., 2014; Oliveira and Oliveira, 2012a; Rivard et al., 2006; Tallon, 2010).

PERFORMANCE AT THE PROCESS LEVEL

Firms use IT capabilities to monitor and improve processes (Lira and Candido, 2007). In this vein, studies have signaled to the impact of IT capabilities on the performance of processes, both in the specific processes (Chen and Tsou, 2012) and in those linked to the business operations, e.g., relationship with suppliers, sales and marketing, operations and production, product improvements or services (Chen et al., 2014; Tallon and Kraemer, 2007).

For Tallon (2010), business processes represent the first phase of the capture IT value, considering that they use directly and intensely the technological capabilities of the firm. In this case, the technologies offered by banks tend to improve customer's performance for achieving automation, standardization and efficiency to the financial process (Tallon, 2010).

In addition, the success for the adoption of IT in enterprises is based on the support of top management (Hartono et al., 2010) and the perceived need by users, who understand its importance for processes and working skills (Prates and

Ospina, 2004). So, for the successful implementation of internet banking in customer organizations, users and managers should understand the importance and the improvements achieved by the tool. Based on the RBT (Ray et al., 2005) and in the literature that discusses the value of IT capabilities for firms, and based on the impact of these capabilities at the level of business processes (Chen et al., 2014; Kim et al., 2011), we enounce the hypothesis on Figure 2.

H1 – In enterprises (bank customers), the Internet Banking Capabilities are positively associated with Performance at the Process level.

PERFORMANCE AT THE FIRM LEVEL

The use of the internet banking requires lower expenses with the infrastructure of the firm, such as buildings, files, safes and security, and this represents a cost reduction perspective (Malhotra and Singh, 2009). The online environment of internet banking stores vouchers, reduces the risk of theft, and reduces spending on the physical security of the firm.

Internet Banking Capabilities also reduce human errors, costs of procedures, processes and services, and increase efficiency and profit (Sumra et al., 2011). Thus, the reinforcement

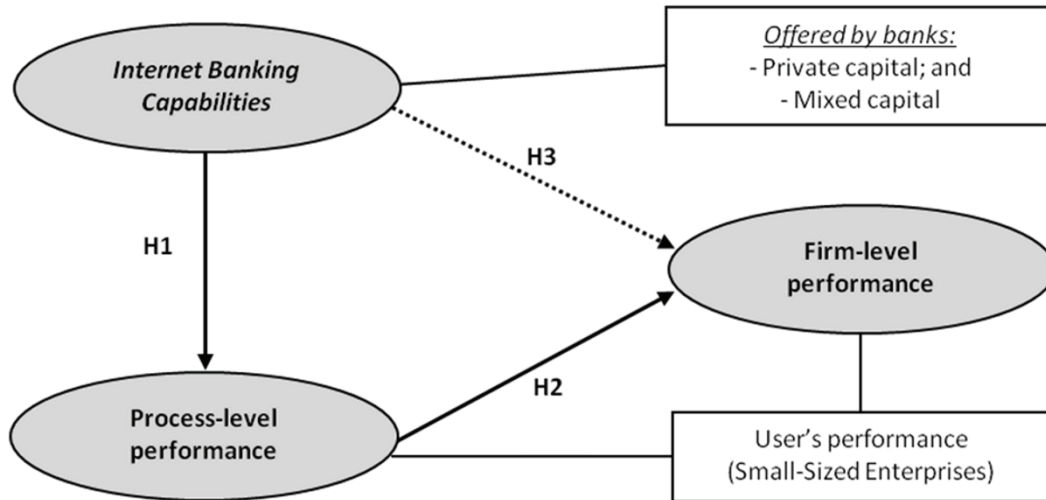


Figure 2. Research model and hypotheses.

accomplished by Internet Banking Capabilities to enterprise's processes tends to the improvement in financial performance and organizational efficiency (Ting-Peng *et al.*, 2010).

The relationship between business processes and financial returns at the corporate level is aligned to the four perspectives presented by Kaplan and Norton (2004) in the context of organizational strategy. The Internet Banking Capabilities can be in the learning and growth perspective, called information capital. The alignment of these technological resources to the strategy contributes to the improvements of operational processes (internal perspective) that lead to efficiency in customer management. Compliance with aspects related to the customer's perspective (product attributes, relationships and image) tends to attribute indirect financial value to the firm, such as ROI, sales growth, cost reduction, etc.

Based on this strategic approach, the value of IT to the company and shareholders is obtained indirectly from the information capital (resources and technological capabilities), linked with other organizational resources when applied to business processes and customer management (Chen and Tsou, 2012), since both are aligned in each strategic perspective.

Modern literature supports the direct association between advances in process and performances in the firm, rated for aggregated measures, such as profit increasing and higher market share (Chen and Tsou, 2012; Chen *et al.*, 2014; Kim *et al.*, 2011). Rivard *et al.* (2005) and Tallon (2010) specifically demonstrate that there is a relationship between the improvement of the production process and the results. Therefore:

H2 – In enterprises (bank customers), the Performance at the Process level is positively associated with Performance at the Firm level.

The direct relationship between IT and the firm performance lacks consensus in the literature, considering that

there are studies with different results (Ting-Peng *et al.*, 2010) and some more recent researches that defend the direct null impact (Kim *et al.*, 2011; Oliveira and Oliveira, 2012a; Chae *et al.*, 2014). The explanation for the inconclusive results regarding the IT impact directly at the firm level is the fact that this level of performance is explained by a larger set of variables (Goldoni and Oliveira, 2010; Ting-Peng *et al.*, 2010), and the IT is one of them.

Another good reason for the null direct association between IT capabilities and aggregated performance measures is in the standardization of information systems (e.g., Enterprise Resource Planning) and wide accessibility to the technological resources themselves, making them commodities, by making them available to all firms (Chae *et al.*, 2014). This reality is in line with the RBT, which explains the role of the peculiar resources (unique) in the performance differential among firms. In this case, IT is treated as commodities, given that it would be an ubiquitous resource.

Along with the studies that indicate null IT impacts directly on the performance of aggregated measures (Masli *et al.*, 2011; Oliveira and Maçada, 2013), the results from the literature have shown that the patterns that try the indirect impact of IT capabilities on firm performance have significant convergence. These studies use intermediate measures of performance [beyond the firm performance] that directly capture IT value, e.g., business processes (Chen *et al.*, 2014; Kim *et al.*, 2011).

Thus, IT tends to indirectly have an effect on the results of the firms, as their capabilities allow improvement of production processes and customer-company relationship (Chen and Tsou, 2012; Rivard *et al.*, 2006).

"Therefore, considering the results of indirect association between IT capabilities and performance at the firm level in literature (Chen *et al.*, 2014; Hartono *et al.*, 2010; Tallon and

Kraemer, 2007), and authors that point to null direct impacts at the firm level (Chae *et al.*, 2014; Kim *et al.*, 2011; Oliveira and Oliveira, 2012a), we test the following hypothesis:

H3 – In enterprises (bank customers), the Internet Banking Capabilities are associated positively and indirectly to the performance at the firm level, through the Performance at the Process level.

METHOD

METHODOLOGICAL APPROACH AND RESEARCH VARIABLES

As a research method, we adopted the Survey in order to identify the relationship between the constructs of the research

	Internet Banking Capabilities	Adapted from:
Information Security	CSI1: The environment of the internet banking is secure (low risk, low vulnerability); CSI2: Internet banking is reliable (provides security to the user to use all features); CSI3: The occurrence of fraud reduces the use of internet banking.	(Adachi and Diniz, 2005; Brei and Rossi, 2005; Cernev and Leite, 2005; Donner and Oliveira, 2008)
Information Quality	CQI1: The information of internet banking is accessible (it is easy access, it is logic); CQI2: The information generated is reliable (restricted to certain persons, updated for our work); CQI3: The information is accurate and free from error (it is timely, consistent); CQI4: The amount of information is adjusted as needed (it is sufficient, it is not too much).	(Lima and Maçada, 2007; Calazans and Costa, 2009; Stoel and Muhanna, 2009)
System's Integration	CIS1: The distribution of access in the net banking occurs appropriately (allows the same delegations of functions, and access the internal system of financial management); CIS2: The internet banking has databases compatible with the internal financial management system of the company (the return of the files occur without error); CIS3: The internet banking does not increase the idle time in the system (the system does not become slower, heavy loading).	(Calazans and Costa, 2009; Nelson <i>et al.</i> , 2005; Gable <i>et al.</i> , 2008)
Process-level Performance		
Internal Processes	CRI1: Internet Banking Capabilities improve the implementation of the financial process (resolves more inside the firm, without the need to go to the bank); CRI2: Internet banking is a change agent (it changed the processes, changed products, changed the focus of security); CRI3: Enhances monitoring of financial transactions (allows real-time monitoring, allows managers monitor/authorize operations of subordinates); CRI4: Standardizes the runtime (always takes the same time to have an operation, namely, transfer, discount, loan); CRI5: The internet banking improves automation (processes become more agile, easy, less expensive).	(Lira and Cândido, 2007; Tallon, 2008; Yongmei <i>et al.</i> , 2008)
External Processes	CRE1: The customer appreciates technological innovation; CRE2: The interpretation of events can be influenced by other individuals (the views of other managers about the internet banking influencing its adoption); CRE3: The internet banking brings changes to business processes (it allows the discount of trade notes, it reduces the time taken to check cashing).	(Tallon and Kraemer, 2007; Möwes <i>et al.</i> , 2011)
Firm-level Performance		
Cost Reduction	CRC1: Internet banking is a utility for the finance department of low cost; CRC2: The internet banking Capabilities reduce the cost of bank transactions; CRC3: Internet banking reduces spending on physical infrastructure (with files, safes, security).	(Donner and Oliveira, 2008; Malhotra and Singh, 2009; Sumra <i>et al.</i> , 2011)
Results	CAML1: The internet banking supports new forms of business (profit opportunity for more practical bank movement); CAML2: The internet banking positively impacts the operating profit of the company; CAML3: Internet banking provides financial process improvement and increased profits.	(Tallon and Kraemer, 2007; Faria, 2010; Gartner <i>et al.</i> , 2009)

Figure 3. Research constructs and items.

model, using the questionnaire and phone as data collection strategies. Research about the IT value has identified that the use of perceptive measures presents similar results in the use of objective measures, so a survey with managers could be a suitable substitute for objective measures (Tallon and Kraemer, 2007). This is due to the difficulty of access to performance data in enterprises, something already stated in the literature (Chen and Tsou, 2012), mainly, in small businesses, considering the lack of mandatory publication of financial statements for this segment. The manifest variables of the constructs were extracted from the related literature (as Figure 3) and were measured by Likert 7-point scale, with 1 being strongly disagreed and 7 strongly agreed.

RESEARCH SAMPLE

The population consists of 623 enterprises (MSEs), from the portfolio of a commercial multiple bank selected by evidence of the use of internet banking application. The enterprises are localized in South Cone of the state of Rondônia (Brazil). The customer fidelity with the bank was not considered, but it took into account the use of applications (internet banking) from other organizations (private and mixed capital). The demographic data of the sample are shown in Table 1.

The sample was obtained through a random selection interval (e.g. 1, 4, 7, ...) from the portfolio of 201 companies, so that their characteristics and perceptions represent the entire target population (Pinsonneault and Kraemer, 1993).

From the 201 contacted enterprises, 93 were not using internet banking at the time or had no interest in participating in the research. Other 32 companies were not considered, due lack of response of some item. Finally, 76 small businesses presented complete data for testing the hypotheses.

DATA ANALYSIS

For data analysis, the Structural Equation Modeling was applied, considering that there is a relationship between independent and dependent constructs in the research model (Hair *et al.*, 2005). The estimation method used was the Partial Least Squares (PLS) through a specific software, the Smart PLS v. 3.2.1 (Ringle *et al.*, 2005).

The PLS assessment is indicated in studies that focus on the development of theories and when the research topic is in the exploratory stage. The PLS is less sensitive to sample size than other approaches (Lee *et al.*, 2011; Ringle *et al.*, 2012), which is considered in this article.

Table 1. Sample characteristics.

Characteristics	Number	Percentage (%)
Most used internet banking (Banks)	-	-
Public	2	2.63
Private capital	54	71.05
Mixed capital	20	26.31
Function	-	-
CEO or shareholder	16	21.05
Financial manager	35	46.05
Others	25	32.89
Firm size (employees)	-	-
From 1 to 5	15	19.74
6 to 10	26	34.21
11 to 15	10	13.16
16 to 20	11	14.47
More than 20 employees	14	18.42
Time of use the internet banking	-	-
From 6 months to 1 year	4	5.26
1 to 2 years	17	22.37
2 to 4 years	25	32.89
More than 4 years	30	39.47
Sum	76	100.00

Reliability indicators, convergent and discriminate validity of the measurement model are analyzed before the hypothesis tests, according to the literature recommendations (Bido *et al.*, 2010; Bradley *et al.*, 2012).

RESULTS AND DISCUSSION

In this section, the measurement model is adjusted toward the testing of hypotheses and the results are discussed according to the reviewed literature.

MEASUREMENT MODEL

The recommended minimum loadings were fitted with the demands of validity and reliability of the measurement model, in order to ensure the steadiness of the structural model to test the hypotheses.

According to Hair *et al.* (2005), the factor loadings need to be analyzed in terms of practical and statistical significance. The practical significance regards the absolute value of the load. By this criterion, loadings above 0.50 have this

significance. Another aspect considered in the analysis of significance (statistical) takes into account the sample size. For this research, the minimum loading for the statistical significance would be between 0.60 and 0.65. The analysis of factor loadings should consider the full model, e.g. number of variables, exploratory/confirmatory research, among others (Hair *et al.*, 2005), including the confirmation of the constructs to the detriment of single items (Bido *et al.*, 2010). To meet two aspects of significance, we removed items with loading below 0.60. The factor loadings are presented in Table 2.

Note that all factor loadings are greater than 0.60 (Table 2) – complying with the recommendation of the literature. Therefore, the explained variance for each item exceeds the minimum 0.25 (Hair *et al.*, 2005). In addition, we present the items and factor loadings removed from the model (Table 3), based in practical, statistical significance and model analysis as a whole.

In studies with latent variables, the measurement model usually is analyzed in terms of convergent and discriminant validity (Bradley *et al.*, 2012), before the structural model to be tested. The convergent validity of the constructs (Table 4) was

Table 2. Measurement model (cross-loadings).

Items	Constructs		
	Internet Bank Cap	Process Perf	Firm Perf
CQI1 – The information of <i>internet banking</i> is accessible (it is easy to access, it is logic).	0.74	0.49	0.39
CQI2 – The information generated is reliable (restricted to certain persons, updated for our work).	0.63	0.34	0.07
CQI3 – The information is accurate and free from error (it is timely, consistent).	0.63	0.31	0.23
CSI1 – The environment of the internet banking is secure (low risk, low vulnerability).	0.88	0.45	0.35
CSI2 – Internet banking is reliable (provides security to the user to use all features).	0.85	0.46	0.29
CRE1 – The customer appreciates technological innovation.	0.40	0.78	0.65
CRI1: Internet Banking Capabilities improve the implementation of the financial process (resolves more inside the firm, without the need to go to the bank).	0.49	0.64	0.43
CRI3 – Enhances monitoring of financial transactions (allows real-time monitoring, allows managers monitor/authorize operations of subordinates).	0.46	0.78	0.39
CRI4 – Standardizes the runtime (always takes the same time to have an operation, namely, transfer, discount, loan).	0.33	0.69	0.42
CRI5 – The internet banking improves automation (processes become more agile, easy, less expensive).	0.36	0.77	0.46
CAML1 – The internet banking supports new forms of business (profit opportunity for more practical bank movement).	0.33	0.59	0.86
CAML2 – The internet banking positively impacts the operating profit of the company.	0.26	0.50	0.80
CRC2: The Internet Banking Capabilities reduce the cost of bank transactions.	0.30	0.40	0.63

calculated considering the Average Variance Explained (AVE>0.50), as described in literature (Fornell and Larcker, 1981; Tallon, 2010).

Discriminant validity is the extent to which a latent variable is different from other latent variables (Farrell, 2010). As an alternative to measure the extension of the differences between constructs, it is also recommended that the square root of the VME in each factor exceeds the correlation between each pair of factors (Gorla *et al.*, 2010; Tallon, 2010) – as shown in Table 4.

Regarding the internal consistency of the scale, the values of composite reliability (0.81 to 0.87) for the constructs of the research meet the recommendations of 0.70 in positive analysis (Hair *et al.*, 2005).

Thus, considering the indicators of reliability and validity of the measurement model, the structural model is shown in subsection 4.3 seeking to the test of the hypotheses.

STRUCTURAL MODEL: HYPOTHESES TESTING

The structural model refers to a set of one or more dependency relations, which connect the hypothesized latent variables in the model (Hair *et al.*, 2005). In this case, the structural model proves the relationships (Figure 4) between Internet Banking Capabilities, Performance at the Process level and Performance at the Firm level.

Table 3. *Removed items and loadings by construct.*

Removed items	Constructs		
	Internet Bank Cap	ProcessPerf	FirmPerf
CSI3: The occurrence of fraud reduces the use of internet banking.	0.31	-	-
CQI4: The amount of information is adjusted as needed (it is sufficient, it is not too much).	0.43	-	-
CIS1: The distribution of access in the net banking occurs appropriately (allows the same delegations of functions, and access the internal system of financial management);	0.54	-	-
CIS2: The internet banking has databases compatible with the internal financial management system of the company (the return of the files occur without error).	0.49	-	-
CIS3: The internet banking does not increase the idle time in the system (the system does not becomes lower, heavy loading).	-0.18	-	-
CRE3 – The internet banking brings changes to business processes (it allows the discount of trade notes, it reduces the time taken to check cashing).	-	0.56	-
CRI2: The internet banking is a change agent (it changed the processes, changed products, changed the focus of security);	-	0.47	-
CRE2: The interpretation of events can be influenced by other individuals (the views of other managers about the internet banking influenced its adoption).	-	0.30	-
CRC1: The internet banking is a utility for the finance department of low cost.	-	-	0.21
CRC3: The internet banking reduces spending on physical infrastructure (with files, safes, security).	-	-	0.58
CAML3 – The internet banking provides the improvement of financial process and increased profits.	-	-	0.60

Table 4. *Convergent and discriminant validity.*

Construc	VME	1	2	3
1. Internet Banking Capabilities	0.57	0.75		
2. Process Performance	0.54	0.56	0.73	
3. Firm Performance	0.60	0.38	0.65	0.77

Note: The values in the principal diagonal are square roots of the Average Variance Explained (AVE). Values below of the principal diagonal are correlations among constructs.

The model (Figure 4) confirms the hypothesis H1, therefore, there is a positive association between Internet Banking Capabilities and Performance at the Processes-level ($\beta = 0.558$, $p < 0.001$). The hypothesis H2 is also confirmed, considering there is a significant relationship between the Performance at the Processes-level and the Performance at the Firm level ($\beta = 0.639$, $p < 0.001$).

Given the non-significant relationship between Internet Banking Capabilities and Performance at the Firm level ($\beta=0.026$, $p>0.05$), as well as confirmation of H1 and H2, the third hypothesis (H3) is also confirmed.

The analysis demonstrated that there is full mediation by construct "Performance at the Processes-level". According to Baron and Kenny (1986) and Chen and Tsou (2012), mediation exists when the following conditions are confirmed, jointly:

(1) the independent variable (Internet Bank Cap) significantly impacts the mediator (Process Perf); (2) the mediating variable (Process Perf) significantly impacts the dependent variable (Firm Perf); (3) the independent variable (Internet Bank Cap) significantly impacts the dependent variable (Firm Perf); (4) the impact of the independent variable (Internet Bank Cap) on the dependent (Firm Perf) is reduced or not significant when inserting the mediator (Process Perf) in the model. The results of these conditions are presented in Table 5 models.

Then, the impact of Internet Banking Capabilities over Performance at the Firm-level is completely mediated by performance at the processes-level, which characterizes the total indirect impact of 0.36 ($t = 4.07$, $p < 0.001$). The statistical significance of the estimates was checked by Bootstrap procedure, based on 500 subsamples.

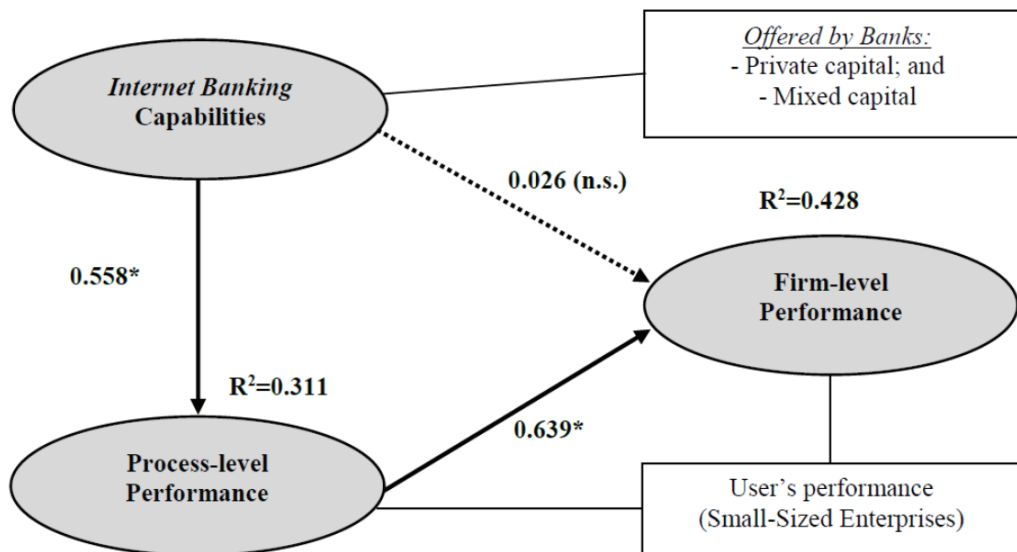


Figure 4. Results of structural model.

Notes: * $p < 0.001$; n.s. – not significant at $p < 0.05$.

Table 5. Mediation tests.

Relationship (paths)	Model (1)	Model (2)	Model (3)	Model (4)
Impact of Internet Bank Cap on FirmPerf, mediated by Process Perf				
<i>Internet Bank Cap</i> → <i>Process Perf</i>	0.57**	-	-	0.558**
<i>Process Perf</i> → <i>Firm Perf</i>	-	0.66**	-	0.639**
<i>Internet Bank Cap</i> → <i>Firm Perf</i>	-	-	0.41*	0.026 ^{n.s.}
R^2				
Process Perf	0.32			0.311
Firm Perf		0.44	0.17	0.428

Notes: * $p < 0.01$; ** $p < 0.001$; n.s. Non-significant ($p > 0.05$).

The variance explained for the dependent constructs is significant: 31.1% for Process Performance and 42.8% for Firm Performance (Figure 4).

DISCUSSION

The hypotheses test demonstrates that there is a direct relation between the Internet Banking Capabilities and Process-level Performance. It also shows that improvement in business processes impacts the aggregated performance of the firm, corroborating the studies by Rivard *et al.* (2005), Liu *et al.* (2008) and Tallon and Kraemer (2007).

Our results are in line with those ones presented in the literature regarding the value of IT capabilities at the process level. Chen *et al.* (2014) identified the positive impact of these capabilities in various processes (relationships with suppliers, customers, production and operations, marketing and sales), also confirming the indirect impact of IT on firm performance. This mediating role of process performance is also found in studies by Kim *et al.* (2011) and Tsou and Chen (2012).

The internet banking contributes to the improvement the financial monitoring process; it takes automation and determines the task execution times, that is, causes changes in the ways of business, as claimed by the literature (Lira and Cândido, 2007). Additionally, according to Sumra *et al.* (2011), the online environment of the internet banking allows paying bills, conducting transfer services that until recent years were carried out only inside a bank.

Thus, the Internet Banking Capabilities improve the organization's operational processes (bank customer). This improvement, which converges with the results of Kim *et al.* (2011) and Tallon and Kraemer (2007), contributes to the result of the firm. These capabilities impact the operating result by improving key processes – e.g. customers and suppliers relationship (incomes control and online payments), as the model of Liu *et al.* (2008).

The structural model does not confirm the direct impact between Internet Banking Capabilities and Firm Performance, unlike the studies of Malhotra and Singh (2009). However, the results converge with studies that identified null direct impacts (Oliveira and Oliveira, 2012a; Quan, 2008). The result is also converging with the premise that the performance of the firm is the result of a wide number of variables (Goldoni and Oliveira, 2010; Ting-Peng *et al.*, 2010), where IT is a part.

The null direct association between Internet Banking Capabilities and Firm Performance is supported by recent results (Chae *et al.*, 2014; Oliveira and Maçada, 2013). These studies found that higher IT capabilities are dissociated from improvements in aggregated performance indicators of the firm. For Chae *et al.* (2014) this finding is explained by the trend towards homogenization of IT products and services, and the wide accessibility to information technologies, due to the low

cost. The ubiquity of these resources in firms – as a result of search to incorporate best practices in the industry – reduces the heterogeneity of resources for competitiveness among firms. In this case, the RBT assumes similar performance among firms considering that resources could lose the strategic nature, i.e., they are homogeneous (Barney, 1991).

Sumra's *et al.* (2011) research – as well as Malhotra and Singh (2009) – identifies the direct relationship between Internet Banking Capabilities and Performance at the firm level, however, our structural model did not confirm this relationship. In order for the Internet Banking Capabilities to improve firm-level performance it is necessary to consider the effect of business processes which, according to Tallon (2010), is the first level to capture IT value.

The distinction of this model tested in relation to other studies mentioned that analyzed the impact of the Internet Banking Capabilities on Firm Performance is in the analysis focus. Those papers (e.g., Sumra *et al.*, 2011) analyzed the benefits of Internet Banking Capabilities in the banking industry itself, the supplier of resources. However, this research has analyzed the impact on the customer organizations (users) that adopt the Internet Banking Capabilities offered by the banking industry. This is a differential, considering that the role of external capabilities to companies is rarely addressed in studies about the IT value, when analyzed the relevant resources to the organizational performance.

In this regard, our results are in line with those presented by Nevo *et al.* (2007), who declare that the use of consultants and IT experts by firms is associated with the IT productivity. We also emphasize that the positive impact on performance could be explained by the complementarity between Internet Banking Capabilities (external resources) and capabilities kept by firms (internal resources), such as corroborated by Han *et al.* (2013).

CONCLUSIONS

The objective of this research was to identify the extent to which Internet Banking Capabilities are associated with the Performance Levels of Processes and Firm. It is concluded that there is a direct and positive association between Internet Banking Capabilities and Process Performance, which also impacts the Performance at the Firm level. Under the proposed and tested model, it was found that there is no direct association between Internet Banking Capabilities and the aggregate Performance of the Firm.

The direct impact of Internet Banking Capabilities on the Process Performance and impact of this level on measures of Firm Performance – combined with absence of a direct relationship between Internet Banking Capabilities and Firm Performance – allow to conclude by the total mediation of the construct "Process Performance". Therefore, it supports the premise that the IT business value is captured primarily

in the lower level, and not in one of the firm – in this case, organizational processes (Tallon, 2010).

This study contributes to the literature insofar as the value of Internet Banking Capabilities is tested from the perspective of firms outside the banking industry (users). It confirms the advantages of using the internet banking, both at the process level and at the firm level. In addition, we propose a measurement model for internet banking and performance constructs – with adequate validity and reliability indicators according to the literature, which can be used to foster research around the external capabilities.

As a limitation of the research, the use of measures (manifest variables) of the literature related, adapted to the context of internet banking – considering the limited research in the area using the construct – is highlighted. However, analysis of reliability and validity of the measurement model revealed adequacy for testing of the structural model. Another limitation involves the sample size and the application of our model. As for the model, the data reflect the reality of users (banks customers) in the private sector and the mixed capital, being absent of the model the public institutions. For the sample size ($n = 76$), it is emphasized that the use of PLS estimation is indicated, considering that this method has lower requirements than the estimation by "Maximum Likelihood", either in sample size or distribution of the data (Lee *et al.*, 2011; Ringle *et al.*, 2012).

From this research, opportunities for future research are:

(i) analysis of the impact of Internet Banking Capabilities on the performance of financial institutions at the process and firm levels, and (ii) the analysis of the value of Internet Banking Capabilities offered by public institutions.

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