Investments in Internet-Based Innovations for Financial Services: Strategic Advantage or Strategic Necessity?

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Abstract: As information technology (IT) becomes more accessible, sustaining any competitive advantage from it becomes challenging. We argue that, in addition to perceiving IT as a strategic choice for competitive advantage in the financial services industry, IT should also be viewed as a strategic necessity that prevents competitive disadvantage in rapidly changing business environments. We present a set of propositions on strategic advantage and strategic necessity in the context of Internet banking technology innovations. Our empirical work covers investments among the entire population of banks that were members of the United States Federal Deposit Insurance Corporation (FDIC) during the 2003 to 2005 period. We seek to understand whether their IT investments were made as a strategic choice, or as a result of strategic necessity; and more importantly, what were their business value outcomes. We offer the methods and the context as an exemplar for the assessment of different forms of return-on-investment (ROI) for technology innovations.

Keywords: Financial services, innovation, Internet banking, IT investments, strategic advantage, strategic necessity, technology innovations

Biographical notes:

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1 Financial IS and Technology Innovations: Choice Versus Necessity

Advances in information technology (IT) have enabled banks to extend their business models and improve their business processes. Senior managers have hoped to gain strategic advantage by investing in IT, but as technology has become pervasive and more accessible, sustaining any strategic advantage has become a real challenge. Some authors have dismissed IT as a non-essential asset, based on their belief that it has not and cannot yield sustainable competitive advantage (Carr 2003, Quan et al. 2005).

In this article, we will argue differently. Although IT is increasingly common across banks, its importance should not be underestimated, and there are more current and far more insightful ways to think about the value it creates. Our view builds on past thinking, for example, from the research of Eric K. Clemons and Steven O. Kimbrough, faculty at the Wharton School of the University of Pennsylvania. Nearly three decades ago, they wrote that IT “may be strategically important, not because it gives you strategic advantage, but because failing to attend to it results in strategic disadvantage” (Clemons and Kimbrough 1986).

This is especially true in a fast-moving industry like financial services. By not investing in the innovations made possible by IT, banks will face sustained disadvantage in the changing environments in which they operate, while their competitors move rapidly to invest in accessible, potentially high return-on-investment (ROI) technologies that can be integrated into their increasingly flexible IT architectures. Our view is that IT has become a strategic necessity for most banks. The minimum required investment in technology-based competition is constantly rising though, making IT investments essential for firms to do business.

Studies in the early to mid 1980s challenged senior managers to think about strategic choice for their IT investments. Later, university researchers and industry consultants argued that IT investments were important to a firm because they afforded strategic advantage. Over the past decade though, others have noted that IT investments have to be made because all players in the market may adopt technology-based solutions. The outcome is an “arms race” of technology-based competition that is unattractive to all firms. This strategic necessity perspective for IT investments argues that they are essential for doing business – what Clemons and McFarlan (1986) called a “hook up or lose out” value proposition in strategy. Both perspectives point toward the benefits of IT. Distinguishing between the effects of IT value as supporting competitive strategy or addressing a strategic necessity is a more difficult and thought-provoking issue. Senior management’s perspective on value appropriation will influence the IT investment strategy that the firm can justify implementing. For example, IT for strategic advantage requires a forward-looking IT investment portfolio that has the capacity to pre-empt other competitors, while IT for competitive necessity calls for a more reactive, wait-and-see investment strategy.
In an investigation of the purposes for making IT investments in financial services, the natural questions to ask next include: Have IT investments paid off? How has ROI arisen? How can it be measured? Allen Berger, Economist at the Board of Governors of the U.S Federal Reserve System has offered some hints about the complexity of the business problem that underlies these seemingly simple questions. He has written that, in 2001, banks “offering transactional Internet sites were more profitable than those that did not. This reflects the choice of profitable banks to adopt the technology, rather than profitability from Internet services” (2003). An essential problem here in statistical estimation terms is endogeneity due to simultaneity. So understanding how to answer these questions requires knowledge of data analytics that can probe endogeneity and simultaneity in order to achieve a clear reading on causality.

We conducted this study to address these issues in the context of Internet banking investments by American commercial and retail banks covering the period from 2003 to 2005. We analyzed Internet banking-related IT investments made by all of the banks in the United States that were insured by the Federal Insurance Deposit Corporation (FDIC) during the period of observation. At that time, Internet banking was viewed industry-wide as a high-tech that would transform the customer experience in retail banking and redefine the service focus of that segment of the industry.

Through in-depth analysis of the data, we found that FDIC-insured banks made IT investments for reasons of both strategic advantage and strategic necessity. The motivation for strategic necessity-based IT investments appears to have been increasing over time as well, while the motivation for IT investments for strategic advantage appears to have been decreasing. IT investments also were associated with bank transaction cost savings and higher levels of customer deposits in bank accounts. Finally, we found evidence for the presence of a strong circular relationship: better performing banks indeed were more likely to invest in Internet banking-related IT investments; and these investments, in turn, resulted in better financial performance.

2 Internet Banking and American Financial Services

2.1 Industry Background

The commercial and retail banking industry has been the most IT-intensive industry in the U.S. for at least thirty years (Triplett and Bosworth 2004). IT supports a range of bank operations, from customer-oriented front-office services, to financial risk management-focused middle office functions, to efficiency-driven back-office processes that have become essential capabilities (Davamanirajan et al. 2006). The introduction of Internet banking technology to support online transactions has provided banks with new ways to reduce transaction costs, and multiple new channels for reaching out to new and younger customers (Berger 2003, Corrocher 2006).

The banking industry is highly competitive and banks that are market leaders often adopt new technologies to be able to participate effectively in the sector. Various studies in the banking and financial services literature have suggested that banks adopted Internet banking to retain their customers, and that Internet-capable banks have been more profitable as a result (Berger 2003, DeYoung 2005). Critics, meanwhile, have argued for the presence of a circular or simultaneous relationship. Profitable banks have more financial and human resources to invest successfully in IT. They also have been more likely to implement Internet banking out of strategic necessity in competitive
environments. The circular relationship between Internet banking and performance has remained an empirical question though, since rigorous evidence has yet to be reported, despite the earlier research of Berger (2003) and Furst et al. (2001, 2002). Some earlier research has shown that Internet-only banks may underperform compared to other new banks operating in multiple channels (DeYoung 2005). However, when Internet-only banks accumulate sufficient experience, the technologies they use create scale effects for firm expansion, supporting profitability and growth. These benefits are built on the alignment between their IT capabilities and their corporate strategy.

A brief review of prior studies on our part suggested a number of issues related to bank IT investments. One specific issue stood out among the rest though: their ROI still needs to be addressed within the industry for senior managers to obtain deeper insights into how the appropriation of business value works.

2.2 Strategic Advantage Versus Strategic Necessity

We begin examining the reasons behind IT investments in organizations by distinguishing strategic advantage from strategic necessity. A firm’s investment in IT achieves strategic advantage if it brings about better than normal ROI. To gain strategic advantage from IT, the firm has to operate in an environment in which there are barriers to the replication of value from the IT investment. Competitors should not be able to duplicate the investment quickly and achieve the same ROI impacts. ITs that become readily accessible within the market may create benefits for a firm that adopts them early; however, such benefits are likely to be gained industry-wide and not afford strategic advantage for any individual firm.

To establish strategic advantage when IT is involved, the firm’s strategy also has to be aligned with its IT investments. In order to gauge the impacts of IT for strategic advantage, it is necessary to be able to observe and quantify the outcomes associated with the firm’s execution of its strategy. Firm strategy is the positioning of an organization in the market, reflected by its product, service and market choices, and the competitive advantage it is able to achieve. Porter (1980) defined firm strategy another way: as a deliberate plan to choose a set of value activities that will deliver a unique mix of value. IT is widely believed to facilitate the design of value-driven firm strategy. Investments in IT also provide real options for the firm in the formulation of new strategic opportunities for sustainable advantage (Benaroch and Kauffman 2000). Other studies have suggested that, in order to gain strategic advantage, firms must also consider the strategic role of complementary non-IT resources (Melville et al. 2004).

Unlike strategic advantage, strategic necessity has been studied much less. Clemons and Kimbrough (1986) defined strategic necessity as an essential condition or action required by a firm to remain viable in the environment in which it operates. Strategic necessity is influenced by external factors, and the environment in which the firm operates determines the extent of possible IT impacts. This external pressure gives the firm limited flexibility in investment decision-making though.

Figure 1 depicts the circular relationship between strategic necessity and its effects. Firms exhibit interdependence in a competitive industry and maintain their competitive positions through self-regulation. The pressures experienced by firms in the business environment signal their need to remain competitive, and the kinds of actions that are warranted. The figure suggests that strategic necessity drives the firm’s IT investments,
and such investments reduce the pressure the firm is experiencing, by enhancing its capabilities.

Figure 1 Strategic necessity as a circular relationship

<table>
<thead>
<tr>
<th>Necessity Pressures</th>
<th>IT Investments</th>
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<tr>
<td>Increased demands from</td>
<td>IT infrastructure,</td>
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<td>business environment</td>
<td>processes, applications</td>
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<td></td>
<td>Strategic Necessity</td>
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3 Value Propositions For Internet Banking Investments

We now discuss some of our observations and offer some value propositions related to the motivation for Internet investments and their associated impacts in the banking sector.

3.1 Strategic Advantage, Firm Strategy and IT

The strategy of a firm can be viewed as the combination of its value propositions with a set of value activities that facilitate their achievement. A close fit between the firm’s value propositions and its value activities is essential to achieve strategic advantage. This matching can be observed in the banking industry. We will describe how a bank’s loan distribution strategy – as a basis for delivering its value proposition to the marketplace – is matched with its Internet banking investment – is an expression of its capacity to support its value activities.

Internet banking augments operations by providing an additional channel to serve customers. It is suited to commoditized services, including funds transfer, credit card applications, balance inquiries and bill payments, more so than differentiated services. Internet banking alleviates the transactional load from branches, reducing the bank’s overhead expenses. Internet banking also is well suited to support transactional lending (DeYoung 2005). Transactional loans are made to borrowers with the aid of objective metrics from electronic credit scoring models and risk assessment tools. The risk of the bank is managed by diversifying and securitizing relatively homogenous loans, such as personal lines of credit, and auto, mortgage and credit card loans. Services that transactional lending customers require can often be provided through Internet banking. It acts as a substitute for more costly face-to-face interactions with banking staff members. This aspect of Internet banking provides greater scale benefits and is an enabler of bank growth.

Internet banking services, however, are ill-suited for handling relationship lending, in which the borrowers’ risk is assessed by subjective metrics, such as personal knowledge and the monitoring of idiosyncratic borrowers (DeYoung 2005). Examples of relationship lending include small business loans and farm loans. With the exception of providing generic bank information for advertising on the banks’ websites, Internet banking provides limited support for relationship lending activities. There is not a good substitute for a customer’s personal interactions with branch banking staff for such services.

A bank’s loan distribution strategy, based on its choices of products or its domain of market operations, has to be matched with its corporate IT strategy. Banks that mainly focus on transactional lending, like credit card loans, should consider providing extensive Internet banking services as opposed to banks that focus more on relationship lending, like agricultural and community banks. Based on this argument, a bank’s conscious
choice to adopt Internet banking to match its loan distribution approach is a classic way to implement IT for strategic advantage. This suggests:

- **Value Proposition 1 (Strategy-IT Alignment).** Internet banking investment is impacted by a bank loan’s distribution strategy: more transactional lending increases its likelihood of Internet banking investment compared to relationship lending.

### 3.2 Strategic Necessity in Commercial Banking

There are a variety of strategic necessity pressures that may affect investment decision-making for Internet banking services. Two pressures seem paramount: the need to compete for customer deposits to increase a bank’s access to capital, and the need to manage high transaction costs.

Banking is transaction-intensive and a significant portion of the industry's operational costs involve handling information and processing transactions. The costs of maintaining a relationship between a customer and the bank are high, so managing these costs is essential for higher profitability. Transaction cost economics recognizes the importance of transaction costs in market exchanges, including the time, effort and other direct costs associated with searching, negotiating, monitoring and completing transactions (Williamson 1975). In addition to the market coordination costs, operational risks and opportunism risks are associated with the transaction costs and the reduction in control in moving from a hierarchical activity within the firm to a market activity. The IS literature provides strong evidence to suggest that IT is facilitating and promoting more market transaction activity due to the lower associated transaction costs.

The labor and infrastructure required to execute transactions result in high transaction costs and profit pressures. The industry also is highly competitive, and banks strive to be cost-effective, through outsourcing and business process re-engineering, among other remedies. Internet banking is a potential cost-savings tool. Banks that implement it can channel standardized, high-volume low-value transactions to the Internet to reduce their expenses. This permits them to operate with narrower spreads, by offering higher deposit rates and lower loan rates. An *interest rate spread* is the difference between the rate at which money is deposited in a financial institution and the higher rate at which the bank loans the funds. The relationship between the rates determines a bank’s earning ability. Low interest costs allow banks to be profitable and grow in competitive environments, since they can price their loans more aggressively than their competitors, resulting in higher profits. This is typically called a *price recovery* advantage. It describes a firm’s ability to achieve a low cost of funds and a high willingness-to-pay on the part of customers for the price of the money lending services it offers. In a competitive environment, such cost management is crucial. As a result, banks will invest in Internet banking out of strategic necessity. We assert:

- **Value Proposition 2 (Transaction Costs-Based IT Investment Necessity).** Banks facing high transaction costs are more likely to invest in Internet banking out of strategic necessity to reduce costs and remain competitive.

Banks finance illiquid investments by using short-term liabilities, such as interbank loans and customer deposits. They also compete for deposits to establish a stable source of capital to fund their lending and deal portfolios. When capital is in short supply, banks must supplement deposit-taking by borrowing short-term funds from large institutions that are perpetually rolled over, a practice known as *liability management banking*. This
practice is risky and poor management may lead to bank failure, if the bank loses its creditworthiness and is unable to roll over its borrowings. The scale of debt recall by institutional creditors can cause significant liquidity risk as well. (See Textbox 1.)

<table>
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<tr>
<th>Textbox 1</th>
<th>The risks associated with interbank liability management</th>
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<tr>
<td>The riskiness of interbank liability management was demonstrated by the sudden bankruptcy of Lehman Brothers Holdings in 2008. Lehman Brothers alleged that its bankruptcy was caused by a massive liquidity shortfall, when J.P. Morgan demanded US$8.6 billion of additional collateral the weekend prior to Lehman’s collapse. The additional collateral was called to guarantee interbank liability positions, and left Lehman powerless, since it had no access to low-cost capital.</td>
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One way of mitigating this risk is to capture more deposits, reducing the bank’s need to borrow money in the higher cost short-term market. Deposits provide a lower risk alternative for obtaining funds, and the risks are indemnified in the U.S. by federal deposit insurance. This diminishes banking customers’ uncertainty discount on the deposit interest rate they will accept. (Without deposit insurance, depositors would demand higher interest earnings on the funds they loan to the banks.) Internet banking also reduces customer search costs, so potential customers are able find banks that otherwise would be unavailable due to geographical constraints. In addition, Internet banking lowers the coordination costs for the bank customer. Some banking transactions can be performed with greater convenience through this channel. To attract deposits in a competitive banking environment, banks are compelled to adopt Internet banking out of strategic necessity to extend their reach to potential depositors. On this basis, we propose:

- **Value Proposition 3 (Deposit-Based Funding IT Investment Necessity).**
  Banks that face pressure in obtaining funding from consumer deposits are more likely to invest in Internet banking out of strategic necessity.

We hypothesized that higher transaction costs and a lower level of deposits have positive effects on a bank’s decision to invest and implement Internet banking. By adopting Internet banking, banks expect the technology to decrease their transaction costs through streamlined operations. Similarly, Internet banking will cause an increase in deposits through better sourcing capabilities and scope. Adopting Internet banking thus creates countervailing effects on the strategic necessity pressures driving the adoption decision. To test these relationships, we assert:

- **Value Proposition 4a (Transaction Costs Simultaneity).** Internet banking services decrease transaction costs for the bank, thus reducing the pressure of cost competition.
- **Value Proposition 4b (Deposits Simultaneity).** Internet banking services increase customer deposits, thus reducing the pressure associated with the overall cost of funding.

### 3.3 IT and Bank Performance

There are many prior studies that investigated the relationship between IT and firm performance. Using different units of analysis and separate measures for IT and performance, these studies have confirmed the role that IT typically plays in value creation. The studies have indicated that firm structure, business characteristics such as workforce composition, risk profile, scale of operations and organizational knowledge
establish the conditions that make or break the value creation process.

From prior studies, we also recognize the critical importance of establishing an accurate representation of the relationship between IT and its outcomes. With the exception of a handful of studies (see Aral et al. 2006 for a review), the issue of a circular relationship between IT and its outcomes – the relationship that we described as *endogeneity due to simultaneity* early in this article – has most often been understated. Although the empirical evidence on the impact of Internet banking on bank performance is far from conclusive, many have recognized an inherent circular relationship between Internet banking and bank performance (Berger 2003). Internet banking seems to have a positive impact on bank performance, and it is widely accepted that high performance banks are more likely to invest in Internet banking, since they have slack resources. In addition, some studies have suggested that, due to their greater flexibility, high performance banks are more likely to adopt Internet banking to retain their customer bases and remain competitive. So we assert:

- **Proposition 5 (IT and Performance Simultaneity).** Internet banking investments positively influence bank performance, and high bank performance positively and simultaneously influences the decision to invest in Internet banking.

We next will discuss the data and the overall approach that we used to obtain our results in this study.

4 CONTEXT AND METHOD

4.1 Data on the Federal Deposit Insurance Corporation (FDIC) Banks

The data for this study consist of the entire population of American banks that were insured by the FDIC over a three-year period from 2003 to 2005. The population contains only banks that engaged in commercial and retail banking activities, excluding investment banking, asset management and trading activities, which would confound the information in our findings. As we noted earlier, Internet banking was viewed as an interesting technological innovation for the industry.

We collected a total of 23,250 observations. The annual panel data from the FDIC uniquely identify each bank by its Federal Reserve Identification Number across overall operations of the banks. A bank was recorded as having Internet banking technology if its website was able to support financial transactions between the bank and its retail consumers. A bank with a website that only provides information to consumers was not recorded as having implemented Internet banking technology.

We chose *financial transactional capability* as the selection criterion: it captures both demand-side and supply-side impacts. Transactional capabilities increase deposits, as they enhance the reach of the bank by supporting depositors from different geographical locations. These consumers are able to transact with the bank by depositing funds into or transferring funds from accounts held by the bank. On the supply side, Internet technologies reduce the operational load for physical bank branches, so fewer tellers can handle a larger customer base.

4.2 Empirical Models and Estimation Approach

We next will present a managerial version of our findings. Additional technical details of
our estimations can be found in Goh and Kauffman (2013). Nevertheless, it is important to highlight that we took various steps to ensure that our statistical analysis work was performed in a way that achieved robust results. First, we specified an appropriate research model by including all necessary controls to ensure that our results would not be confounded by other extraneous factors. Second, we considered alternative estimation methods to triangulate the findings for consistency. Abridged details of the controls and main effects variables used are discussed in Textbox 2.

**Textbox 2  Estimation model controls and main effects variables**

**Controls.** For all of our estimations, we use a variety of firm-level control variables to account for variations across banks, as well as environmental variables to control for macro-socioeconomic fluctuations. We adopted firm-level control variables suggested in prior studies to examine Internet Banking Use and Bank Performance. We also used the natural log of Total Bank Assets to control for the effects of different operating scale on bank performance. The Number of Bank Branches accounts for the size of the branch network, which also affects a firm’s propensity to adopt Internet banking. Since differences in bank risks also may influence the likelihood that a firm will make Internet investments, and that, in turn, may affect the bank’s performance. We controlled for this by using the Percentage of Non-Current Loans to Total Loans. Non-current loans are those whose payments are in arrears. This is a common proxy used in other bank performance studies. A larger ratio suggests that the bank is in a higher risk condition, which may lead to greater uncertainty about the bank’s future performance. We use Percentage of Real Estate Owned to control for the effects of loan portfolio mix on bank input mix requirements, earnings, growth and other performance measures. We further controlled for bank experience, proxied by the Bank’s Age. This affects bank profitability and a firm's ability to utilize advanced technology, especially for start-ups. And, the natural logs of Total Bank Loans and the Number of Employees served as control variables for bank transaction costs.

We further controlled for the Bank’s Home State to account for socioeconomic differences. This enabled us to remove the effects of differences among bank customers by their geographic location, which may affect the banks’ business opportunities and operations. To control for possible environmental impacts, such as interest rate fluctuations, economic cycles and regulatory changes that might bias the results, we applied fixed-effects estimation with Time as a panel variable. We also included the Number of Employees Laid Off from the Banking Sector Due to Outsourcing at the state level to control for outsourcing activities as a proxy for other structural changes the banks could be experiencing in the business environment.

**Main effects variables.** We utilized various measures to represent main effects variables in our study. We measured transaction costs by the natural logarithm of Premise and Equipment Costs, which represent all costs related to maintaining the physical presence of bank branches, excluding employee costs. Customer deposits were measured by the natural logarithm of Total Interest-Bearing Bank Deposits. We used the natural logarithms of Transactional Lending and Relationship Lending to represent the banks’ loan distribution strategies. Transactional lending includes credit card loans, personal overdrafts, auto loans and home mortgages, and relationship lending includes small business and farm loans. Finally, we used the natural logarithms of Gross Revenue and Net Income to represent the firm-level impacts of Internet banking investments.

**5 Findings for the Managerial Audience**

We next discuss our findings about the factors that motivate Internet banking investments. Our results show that transactional lending increases the probability of implementing Internet banking by at least twice compared to relationship lending. In Figure 2, each column represents the estimation of a different model that measures the
relative difference in magnitude between transactional lending and relationship lending in impacting the decision to invest in Internet banking. For every dollar increase in transactional lending, banks were at least two times more likely to adopt Internet banking compared to the same dollar increase in relationship lending. This result suggests that the bank’s loan distribution strategy, as a proportion of transactional lending compared to relationship lending, affected its propensity to invest in Internet banking. The consistency exhibited by the estimates from the four models provides strong support for this finding.

**Figure 2** Relative probabilities between transactional and relationship lending

![Figure 2](image)

*Note:* The ratio of probabilities values represent the number of times transaction lending is more likely to result in the investment in Internet banking compared to the same amount of relationship lending. We present the estimates from the four different estimation models.

Moving on to the possible competitive necessity factors that motivate Internet banking, we found that both transaction costs and customer deposits level have an influence on Internet banking investment decisions. (See Figure 3.)

**Figure 3** Impact of transaction costs and deposits on Internet banking investments

![Figure 3](image)

*Note:* An index score is a criterion at which transaction costs or deposits begin to have an influence on Internet banking investments. A positive score suggests that higher transaction costs positively motivated Internet banking investment. A negative score suggests that the lack of deposits had a larger positive impact on Internet banking investment.
Higher levels of transaction costs were associated with a greater propensity for banks to have invested in Internet banking during the period we studied. Specifically, we found that banks that experienced high levels of transaction costs from brick-and-mortar operations experienced pressure to control costs. Investing in Internet banking for them became a strategic necessity so they could streamline the operations of their physical bank branches; Internet banking provided another channel for them to move various banking activities into.

Further, we found that banks that had fewer deposits were more likely to invest in Internet banking. They did this to increase the reach of the bank, bring in more customers and gain more deposits. Similarly, banks with larger deposits bases probably felt less pressure to invest in Internet banking, as they did not face the risk levels experienced by their counterparts that required more interbank liability management to meet their deposit shortfalls.

Our final set of estimations of the data involved measuring the outcomes of Internet banking. (See Table 1.)

Table 1  Impacts of Internet banking

<table>
<thead>
<tr>
<th>Impacts of Internet banking on:</th>
<th>Transaction Costs</th>
<th>Customer Deposits</th>
<th>Bank Revenue</th>
<th>Bank Net Operating Income</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>↓ 7.3%</td>
<td>↑ 29.3%</td>
<td>↑ 14.5%</td>
<td>↑ 18.1%</td>
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Note: All of the impact estimates are statistically significant.

We found the implementation of Internet banking to be effective in reducing the transaction costs for the banks in our study’s sample. Based on our results, all else equal, banks that invested in Internet banking incurred on average 7.3% lower transaction costs than those that did not. We further found that Internet banking was positively associated with higher levels of bank deposits. This enabled us to estimate an interesting outcome: that banks which invested in Internet banking gathered 29.3% more deposits than those that did not. Since banks facing a shortage of customer deposits were more likely to implement Internet banking out of strategic necessity, it is clear that their investments paid off through increased bank deposits. This had the added benefit of reducing the pressure on the bank’s funding costs. These findings led us to conclude that Internet banking was effective in diminishing strategic necessity pressures through process-level benefits. This helped the firms to maintain a consistent level of competitiveness in spite of other disadvantageous changes that were occurring in the changing business environment.

Finally, our results also showed that Internet banking was positively associated with bank revenue and net operating income. Based on our estimation results, Internet banking investment was associated with an increase of 14.5% in bank revenue and an increase of 18.1% in net operating income. This matches some of the findings in the prior IT and banking literature (Dedrick et al. 2003, DeYoung 2006). However, all of our findings consider and more effectively account for the circular relationship between Internet banking investment and bank performance.

6 CONCLUSION

In this article, we highlighted the importance of understanding the factors that drive IT
investments in the banking industry, as well as measuring the payoffs of such investments after they were made. Overall, we found that Internet banking investments were made for strategic advantage as well as for strategic necessity reasons. Banks invested in Internet banking while being mindful of their loan distribution strategies. Banks with loan distribution strategies that benefited the most from Internet banking were more likely to invest in these technologies compared to their counterparts that had loan distribution strategies within which Internet banking acted as a complementarity. This suggests that IT investments were made as a strategic choice to best fit the banks’ overall business strategies. On the other hand, we observed banks that invested in Internet banking as a result of the competitive pressures they face relative to their competitors. The race to minimize costs and maximize customer deposits within the competitive banking environment led to banks investing in Internet banking technologies so as not to be left behind the pack.

Regardless of the reasons that motivated the investments in Internet banking, we found that these investments paid off in multiple ways. After controlling for various internal and external factors, we found that Internet banking investments minimized the competitive pressures faced by the banks. They reduced the high transaction costs and attracted more customer deposits as a result too. Further, we found that bank revenue and net operating income were positively associated with investments in Internet banking after accounting for the fact that more profitable banks were more likely to invest in these technologies in the first place. (See Table 2 for a summary of our key research findings.)

Table 2  Key findings

<table>
<thead>
<tr>
<th>Finding</th>
<th>Description</th>
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<tbody>
<tr>
<td>1</td>
<td><strong>Investing for strategic advantage reasons</strong>: Internet banking investment is impacted by the bank loan’s distribution strategy. Banks that have more transactional lending are more likely to invest in Internet banking investment compared to those with more relationship lending.</td>
</tr>
<tr>
<td>2</td>
<td><strong>For strategic necessity reasons</strong>: Banks facing high transaction costs are more likely to invest in Internet banking out of strategic necessity to reduce costs and remain competitive.</td>
</tr>
<tr>
<td>3</td>
<td><strong>For strategic necessity reasons</strong>: Banks that face pressure in obtaining funding from consumer deposits are more likely to invest in Internet banking out of strategic necessity.</td>
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<tr>
<td>4a</td>
<td><strong>Reducing strategic necessity pressures</strong>: Internet banking services decrease transaction costs for the bank, thus reducing the pressure of cost competition.</td>
</tr>
<tr>
<td>4b</td>
<td><strong>Reducing strategic necessity pressures</strong>: Internet banking services increase customer deposits, thus reducing the pressure associated with the overall cost of funding.</td>
</tr>
<tr>
<td>5</td>
<td><strong>Improving financial performance</strong>: Internet banking investments positively influence bank performance in terms of revenue and net operating income. This is after accounting for the fact that more profitable banks are more likely to invest in these technologies in the first place.</td>
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</table>
Our study highlights the importance of viewing IT as a source of strategic advantage, as well as the importance of simultaneously viewing it as a strategic necessity. We supported our value propositions for Internet banking by providing the first empirical evidence to understand strategic necessity for this kind of IT investment. We hope that our results will influence business policy-makers to develop a more realistic view of how IT investments work in financial services and other industries. The strategic necessity perspective provides an additional important rationale for IT investment. This is essential to prevent underinvestment in IT by decision-makers who are proponents of IT investments for the sole purpose of strategic advantage.

This study has contributed new knowledge to practice. First, it offers insights about the overall effects of Internet banking on the commercial banking industry. By examining the entire population of FDIC-insured commercial banks in the United States in the mid-2000s, we have been able to draw conclusions about the strategic and operational benefits of Internet banking when it was initially diffusing. Second, our empirical evidence has implications for Internet banking investments related to loan distribution and banking operations. This gives bank managers broader justification for investing in Internet banking and a better appreciation of its impacts. Other new technologies, such as mobile banking and mobile payments are also likely to engender similar beneficial effects.

Third, our analysis also provides senior managers with new knowledge on the payoffs of investment in Internet banking. Such investments have diminished the pressures that banks have faced on the margin. These include the need to compete for more deposits to improve a bank's liquidity, and to reduce transactional costs to remain efficient. These process-level benefits are instrumental for high performance.

Although the process of answering all of the questions about the payoffs of IT investments is far from over, this article represents a new step toward establishing a stronger understanding of the underpinnings of IT value within the financial services industry. It also provides an exemplar for how to think about assessing value when the focal technology is an emerging IT innovation.

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