

The Impact of Information and Communication Technology on Banks' Performance and Customer Service Delivery in the Banking Industry

Alhaji Abubakar Aliyu, Rosmaini Bin HJ Tasmin

Department of Technology Management

Faculty of Technology Management, Business and Entrepreneurships

Universiti Tun Hussein Onn Malaysia, 86400, Parit Raja, Batu Pahat, Darul Ta'zim, Johor, Malaysia

hp090012@siswa.uthm.edu.my

rosmaini@uthm.edu.my

Abstract - Information and communication technology (ICT) has become the heart of banking sector, while banking industry is the heart of every robust economy. If it collapses so will the economy. This is absolutely evident from current recession in European banks crises, and in turn. The effect of globalization, competition and innovation in the banking industry by its providers to offer their services makes essential the understanding of how various aspects of consumer behaviour affect the innovation and respond to customer service delivery. Within this context this paper has considered a critical literature review of previous researchers with the objective to examine the impact of Information and Communication Technology on banks performance and customer service delivery. This paper also makes of a critical review of peer reviewed, scholarly and organizational literature regarding the impact of ICT on banks' performance to examine if banks have successfully achieved effective customer's service delivery, by providing high level of customer service through online delivery channel, besides operating cost minimization and revenue maximization.

Keywords - Banking Industry, ICT, Online Banking, Customer Service delivery and Bank's performance.

1. Introduction

Information and communication technology (ICT) has in particular brought a complete paradigm shift on the bank's performance and on the customer service delivery in the banking industry. In a bid to catch up with global development, improve the quality of customer service delivery, and reduce transaction cost, banks have invested heavily in ICT,

and have widely adopted ICT networks for delivering a wide range of value added products and services. The ICT development has a significant effect on development of more flexible and user friendly banking services. In this context one of the objectives of this paper is to examine the relevant literature to assess to what previous researchers have found about the impact of Information Technology on bank's performance and customer service delivery after adoption of information technology.

Customer satisfaction and customer service delivery is a key parameter for banks to ascertain how effectively the web furthers their objectives of customer acquisition, retention and increased share of wallet. The research on the impact of ICT on bank's performance and customer service delivery in the banking industry have been broad. However, few areas, with consumer perspective, are left with less exploratory debate.

Today, information and communication technology has become the heart of banking sector, while banking industry is the heart of every robust economy. If it collapses so will the economy. It is absolutely evident from the current recession, in European banks' crises, and in turn. ICT has created a new infrastructure for the world economy to become truly global and also provided the users of new technology a competitive advantage over their rivals. Electronic banking system has become the main technology driven revolution in conducting financial transactions. However, banks have made huge investments in telecommunication and electronic systems, users have also been validated to accept electronic banking system as useful and easy to use (Adesina and Ayo, 2010).

Castells (2001) reveals that, now transactions worth billions of dollars can only take place in seconds in the electronic circuit throughout the globe by pressing a single button. Although, ICT has revolutionized the way of living as well as conducting businesses and study of Banking industry has received increased attention over the last decade, it continues to pose challenges for marketers and academic alike. According to Loonam *et al* (2008), ICT advancements, globalization, competition and changing social trends such as heightened customer proactiveness and increased preferences for convenience have caused intense restructuring of the banking industry.

2. Theoretical Background

Apparently, to identify and examine the impact of ICT on bank's performance and customer service delivery, the researcher explored various articles/journals, relevant literature and existing practice of Electronic banking. In today's business, competition, deregulation and globalization have compelled Banks to offer service 24 hours around the globe, whereas the significance drawback, on the other hand, lies in its inconvenience and security factors. However, both these factors have a significant and profound impact on banks' performance and customer service deliver. The relationship that revolves between ICT expenditures, bank's performance delivery is conditional upon the extent of network effects. If the networks are low, ICT is likely to:

- Reduce payroll expenses.
- Increase market share.
- Increase revenue and profit.

Furthermore, in a broader perspective, ICT, deregulation and globalization in the banking industry could reduce the income streams of banks and thus the strategic responses of the banks, particularly the trend towards internal cost cutting, mergers and acquisitions are likely to change the dynamics of the banking industry. This paper seeks to determine if banks have earned higher income and delivered a high quality service than in traditional way. The main issues that can prevent consumers positively include the convenience aspect of the service, ease of use and its compatibility with their lifestyle.

3. Role of ICT in the Banking Industry

Apparently, there are always potentials of crisis which make the bank endure an insufficiency; advanced ICT supported by a superior mechanism control is required to make certain that ICT has achieved the required processes insufficiency; thus, advanced information system supported by a superior mechanism control is required to make certain that ICT has achieved the required processes. A review of some related literatures reveals that ICT may essentially affect negatively banks efficiency and may reduce productivity. This notion was noted by Solow (1987), "you can see the computer age everywhere these days, but in the productivity statistics".

However, since 1970s to the time Solow was claiming that there was a huge decelerating in growth as the technologies were becoming ubiquitous. On the same vein, the paradox has been defined by Turban, et al. (2008) as the "discrepancy between measures of investment in ICT and measures of output at the national level". ICT has been one of the most essential dynamic factors relating all efforts; it cannot improve banks' earnings. This was revealed in an extensive survey conducted in USA for the period of 1989-1997 by Shu and Strassmann (2005)

Conversely, there are various literatures that debunk Solow's claiming in totality and approve the positive impacts of Information and Communication Technology expenses to business value. In a comprehensive research conducted by Saloner and Shpard (1995) in USA within the time frame of 1971-1979 reveals that the interest of network effect is significant in utilizing an Automated Teller Machines (ATMs). Milne (2006) also encourages and supported the notion of the above authors. Interestingly, Kozak (2005) investigates the influence of the ICT evolution on the profit and cost effectiveness of the banking industry within the stipulate period of 1992-2003. For this period, the study declares a significant relationship between the executed ICT, productivity and cost savings.

The modernization of ICT has set the stage for extraordinary improvement in banking procedures throughout the world. For instance the development of worldwide networks has considerably decreased the cost of global funds transfer. Berger (2003), reveals' banks that are using ICT related products such as online banking, electronic payments,

security investments, information exchanges, financial organizations can deliver high quality customer services delivery to customers with less effort.

Brynjolfsson and Hitt (2000) point out that "ICT contribute significantly to firm level output." They determine that Information Technology capital contributes an 81% marginal increase in output, whereas non Information Technology capital contributes 6%. Likewise they illustrate that Information System professionals are more than twice as productive as non-Information System professionals. Farrell and Saloner (1985) and Economides and Salop (1992), showed that the relationship concerning Information and Communication Technology and banks' performance have two encouraging outcomes.

1. ICT can bring down the operational costs of the banks (the cost advantage). For instance, internet technology facilitates and speeds up banks procedures to accomplish standardized and low value added transactions such as bill payments and balance inquiries processes via online network.
2. ICT can promote transactions between customers within the same network (the network effect).

ICT has completely reshaping the landscape and the dimension of competition in the banking industry. Following the introduction of online banking, ATMs and Mobile banking, which are the initial milestones of electronic banking, the diffusion of ICT and increased penetration of Internet has added a new challenges and distribution channel to retail banking: online banking for the delivery of services and products.

4. Information and Communication Technology and Banks' Performance

However, research on the impact of ICT on banks' performance is insufficient and the available studies are more of US, European and Australian banking industry. Carlson *et al* (2000) and Furst *et al* (2002) conducted and intensive research whether there is a positive relationship that exists

between offering electronic banking and bank's profitability. Furst *et al* (2002), reveals that federally chartered US banks had higher Return on Equity (ROE) by using the conventional business model, ICT was one of the major factors that affect bank's profitability within the period under study and they also observe that more profitable banks adopt ICT after 1998 but yet they are not the first movers. On the same note, Eglund *et al* (1998), conducted a study and found no evidence of major differences in performance of electronic banking in the US subject to two caveats:

1. This result may not be the case for all the banks.
2. Such results are open to change over time as banks become more severe in the use of innovation.

While in a similar study in Kansas USA, Sullivan (2000) also found no systematic evidence that multi-channel banks in the 10th Federal Reserve District were either helped or harmed by having transactional web sites. These finding were among the previous findings of Sathye (2005), for the credit unions in Australian banks for the period of 1997 to 2001, shows that electronic banking has not proved to be a yard stick for performance enhancing tool. According to Haq (2005) banks' existence depend on their ability to achieve economies of scale in minimizing asymmetry of information between savers and borrowers. Today, one of the major challenges facing the banking industry is how ICT has helped banks to sustain the economies of scale whilst shifting from bricks and mortar banking to online banking.

Claessens *et al* (2001) buttress that, "Role of ICT in the banking industry can allow global economies to setup a financial system before first establishing a fully functioning financial infrastructure instead. Virtually, since electronic banking is much cheaper, it involves reduced processing costs for providers and less search and switching costs for consumers, banks can promote their services and products involving smaller transactions to lower income borrowers, even in remote areas.

Similarly, a research conducted by DeYoung (2005) analyzes the performance of the conventional banking versus the modern banking in the US market and find strong evidence of general

experience effects available to all start-ups. However, in a recent study, DeYoung *et al* (2007) invoke and find that, for US community banks and traditional community banks, those multi-channel banks are somewhat more profitable, mainly via increased noninterest income from deposit service charges. Movements of deposits from checking accounts to money market deposit accounts, increased use of brokered deposits, and higher average wage rates for bank employees were also observed for click and mortar banks. Whereas no change was explored in loan portfolio mix, these findings confirm Hernando and Nieto (2007) that internet banking is seen as a complementary channel.

Centeno (2004) in his study of analyzing the acceding and candidate countries' (ACCs) adoption of e-banking, classified e-banking adoption factors in two categories:

1. ICT factors: These factors involve internet penetration rates, skill of consumers in using internet and related technologies, attitude towards technology, security and privacy concerns.
2. Banking factors: This category includes trust in banking sector, banking culture, Electronic banking culture and Internet banking push.

In a similar research, conducted by Centeno (2004), he also stated that lack of PC and internet penetration is still an entry barrier for internet banking development both in EU15 and ACCs. The cost of access services is a main issue for the PC and Internet penetration especially in Central and Eastern Europe countries. On the other hand, there has been a lack of confidence in the banking sector in ACCs due to past turbulent periods. These concerns are further aggravated with privacy concerns. Magnitude of banking service usage and electronic banking culture are also weaker in ACCs compared to EU 15. A similar research with Centeno (2004), conducted by Gurau (2002), reveals that successful implementation and development of online banking is upon many interrelated factors. Today these aspects as in the current age in UK these factors have been dealt and overcome by the people. Now a day's skills of using internet and cost of accessing the technology, being at home, do not seem to be a stumbling block towards the adoption of innovation from the consumer

perspective.

Simpson, (2002) reveals that electronic banking is motivated largely by the prospects of operating costs minimization and operating revenues maximization. An evaluation of online banking in developed and emerging markets reveals that in developed substitute for physical branches for delivering banking services.

5. Customer Service Deliver In The Banking Industry

Bloemer *et al* (1998) were on the view that most models in the banking industry of customer evaluations of services focus on the comparative judgment of expectations versus perceived performance resulting in the two major evaluative judgments of perceived service quality and customer satisfaction. For example:

1. Customers access service delivery by comparing their expectations prior to their service encounter with a bank (employee).
2. Customers also, develop perceptions during the service delivery process and then compare their perceptions with the actual service received from the bank's employee.

Thus, customer expectations are unique prior to a service. They influence customer's evaluation of service performance and customer satisfaction. Customer services, by definition, are intangible and easily duplicated. They can be divided into high-touch or high-tech services.

1. High-touch services are mostly dependent on people in the service process producing the service.
2. Whereas high-tech services are predominantly based on the use of automated systems, information technology and other types of physical resources.

However, one should always remember that high-touch also includes physical resources and technology based systems that have to be managed and integrated into the service process in a customer oriented fashion (Gronroos, 2001). Consequently, electronic banking services include both high-tech and high-touch services. For example, high-tech services include online banking, Mobile Banking, ATM machines, etc whereas high-touch services consist of instructions and personnel assistance in using the services.

Customer service delivery is differentiable and stem from the expectations of customers. Hence, it is necessary to identify and prioritize expectations for customer service and incorporate these expectations into a process for improving customer service delivery (Kassim and Bojei, 2001). Implementing and evaluating customer service is a very complex process. Zeithaml and Bitner (1996) reported that two aspects need to be taken into consideration when evaluating customer service:

1. Content
2. Delivery

Customers may be in the best position to evaluate the quality of service delivery, while the service providers are the best judges of the content of the message. Though there is a number of different aspect of services involved.

According to Parasuraman *et al* (1985), the study of customer service delivery has gained interest just after the concern on improving the quality of products appeared, and services are increasingly important in the global economy (regarding the participation in the GNP and job creation figures, for instance). Like machines transformed the agricultural economy into an industrial one, the information technology nowadays changes the industrial economy in such a way that it becomes characterized as based on services (Fitzsimmons, 2000).

The banking sector has already been depicted (e.g., in Parasuraman *et al*, 1993, and Mukherjee *et al*, 2003) as exhibiting little market orientation and fulfilling services with little regard to customer needs, as well as including branches dissimilar in efficiency (Berger and Mester, 1997). According to Mattos, (1999) the most frequent problems in using banking services are:

- Long lines.
- Limited time for customer servicing.
- Transaction errors due to the banks personnel.
- Excessive bureaucracy.

However, contemporary factors like more demanding and informed customers, the emergence of new technologies, and the competition increase (Cooke, 1997) modified the relationship between banks and customers, and strategies for survival and business expansion started to approach this seriously (Global Finance, 2000). In fact, customers determine the frequency of their contacts with banks based on

the experiences they have with the services, and this exerts substantial impact on the profitability of banks in the long run (Bhat, 2005). Although, customers who are satisfied with service delivery are less likely to shift to other banks, therefore increasing such things as loyalty and retention (Al-Hawari *et al*, 2005).

Moreover, in as much as the customers want to be sure that they choose a bank perceived as being the best manager for their money, equally they also want a polite servicing and a trustworthy process. Barnes (1997) already said that no any service industry seems to be more interested in setting up relations with customers than the banking industry; however, the increasing deployment of ICT in financial transactions reduced the contact between bank and customers, modifying quite remarkably the general aspect of the relationship in fact, with the ICT having lowered information costs, customers were able to compare portfolios of investments between banks, or even invest directly (Cooke, 1997).

Interestingly, ICT in particular play an important role in the financial industry and this is one reason why the banking sector is among the most intensive in deploying ICT (Shoebridge, 2005). With the increase of Internet services and cash machines available in various locations, the most recurring problems have been mitigated and, in some cases, solved; as an effect, the volume of customer services increased became easier, and the customer experience turned out to be more comfortable. It is noticeable that the new technologies, particularly in ICT, enabled banks to service customers not only in branches and other dedicated servicing sites, but also in domiciles, work places and stop and shop stores, as well as in a myriad of other channels (Al-Hawari *et al*, 2005).

Thus, various issues related to the branches are another concern when dealing with the customer service delivery in the banking industry. For instance, access to the facilities (e.g., parking lot attributes and the mobility of people inside the branches), safety and convenience of location make customers access service delivery on a tangible basis (Castro, 1997); the branches external and internal architecture may mediate the perception of service delivery; while ATMs inside the branches simplify the customers procedures and lowers personnel costs, the number of human attendants is also important and vary according to demand, especially for reducing waiting times for certain services, providing human

interaction and servicing elder and less informed customers, who still seem to prefer people instead of machines as interfaces for their transactions (Dick, 2003).

Advertising practices and the banks institutionalized reputation within the community may be related to customer service delivery as well (Dick, 2003). Compton (1990) points out that another strategy for developing a good image within the market is to diversify the portfolio of services. As much as who uses many banking services is not likely to move to another bank, sponsoring social activities should also be considered.

6. Significance of ICT in the Banking Industry

ICT revolution has distorted the conventional banking business model by making it possible for banks to break their comfort zones and value creation chain so as to allow customer service delivery to be separated into different businesses. Thus, for example, primarily Internet banks distribute insurance and securities as well as banking products, but not all the products they distribute are produced by their group (Delgado and Nieto, 2004).

However, the main economic argument for diffusion of adopting the Internet as a delivery channel is based on the expected reduction in overhead expenses made possible by reducing and ultimately eliminating physical branches and their associated costs. This specifically applies to and relevant in the Spanish banking system, which is one of the most "over branched" in Europe. As stated by DeYoung (2005) and Delgado *et al* (2006), the Internet delivery channel may generate scale economies in excess of those available to traditional distribution channels.

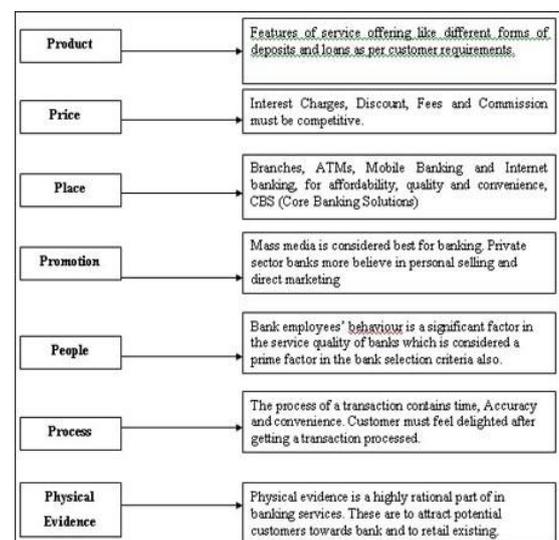
Besides them, Haq (2005) also states that bank exists because of their ability to achieve economies of scale in minimizing asymmetry of information between savers and borrowers. The unit costs of Internet banking fall more rapidly than those of traditional banks as output increases as a result of balance sheet growth. In this context, DeYoung *et al* (2007) refer to the Internet banking as a "process of innovation that functions mainly as a substitute for physical branches for delivering banking services". In the case of the Spanish banks, there is some undependable evidence that shows that the Internet distribution channel has lower unit

transaction costs than the two other distribution channels (branch and telephone) for a given type of transaction (money transfer, mortgage loan, brokerage or demand deposits).

7. Consumers' Behaviour in The Banking industry

Consumer behaviour is dynamic and to be studied regularly. Increasing awareness, globalisation, deregulation, living standards and urbanization has led to increase in the changing preferences and the same has forced the Banking industry to change their product features and customer service delivery. The study of consumer behaviour is compulsory to the banking industry, so as to know about likes and dislikes of consumers from time to time so that the products and customer services can be offered accordingly. Customers have their own unique needs, demands and preferences in a particular segment. Also, banks have to study customers in particular segment. Interestingly, the study of consumer behaviour can make it possible that after observing and examining the behaviour of consumer a Bank can present its product in such a way that the product can capture the market. Consumer behaviour indeed gives every possible answer to the complex questions concerned with consumer's buying reasons.

The following diagram will be elaborated considering all marketing decisions taken in the banking industry. All of them are essential decisions and are concerned with essential ingredients of services marketing mix.



Source: Mittal (2008), p. 225.

When customers are treated as the king of the Bank, the study of consumer behaviour becomes more important for marketing decisions. There is no doubt that the behaviour is the base of management decisions.

Birch and Young (1997) show that consumers seek convenience, transactional efficiency, a choice of core banking products and non-core products, and access to competitive returns and prices. The concept of internet has raised customer's sensitivity to fast and efficient customer service delivery. Cox and Dale (2001) categorise four factors in delivering customer service delivery through web site that are:

1. Ease of use
2. Customer's confidence
3. Online resources
4. Relationship services.

Each class relates to a different part of the website experience and serves to improve and exceed customer satisfaction. Ease of use is associated with all factors relating to the design of website. The key site seeks to, during the course of customer navigation, reduce customers' frustration. The fundamental nature of website means that communication with the customer has to be enabled through the use of text, graphics and animation.

All these factors relate to design of the web site and if the design is poor and not user friendly it cannot then achieve customers' expectation. The spread of electronic banking should also benefit consumers by reducing the time and inconvenience of banking transactions and, in very small communities, by providing access to banking services that might otherwise be unavailable. (Keeton, 2001).

Apparently, ICT creates unprecedented opportunities for the bank sector in the ways they organize financial product development, delivery, and marketing via the Internet. While it offers new opportunities to bank sector, it also brings many challenges such as the innovation of ICT applications, the blurring of market boundaries, the breaching of industrial barriers, the entrance of new competitors, and the appearance of new business models Cheung, *et al* (2003) and Saatcioglu *et al* (2001). Basically, ICT is associated with a lot of benefits, risks and new challenges for human governance of the developments (Hamelink, 2000). Today, the challenges are rapidly increasing with the pervasiveness of the Internet and the extension of

information economy (Holland and Westwood, 2001).

However, to successfully cope with the challenge of the ICT, the bank sector must understand the nature of the changes that revolves around them, changes in terms of ICT, Innovation and Demography. Without this understanding, attempts to migrate to ICT may be doomed to failure. Today, banks that are well equipped with a good grasp of the electronic banking phenomenon will be more able to make informed decisions on how to transform ICT and to exploit the opportunity in electronic banking. (Southard *et al*, 2004). In today's competitive market, establishing core capabilities can help the banking industry reorganize their product and customer service delivery, so as to sustain competitive advantages and to achieve congruence whilst shifting from the conventional banking to electronic banking.

However, consumer behaviour affect person's usage of electronic banking, obviously a person should have an access to a computer with an Internet connection either at home or in the office. It is possible to use computers with Internet connection also in some of the self-service branches. Apparently, the research of online shopping reveals that prior web experience has positive impact on the persons' beliefs about ICT in general (Crisp *et al*, 1997, p 4) and it is quite obvious to draw a conclusion that the same applies also for electronic banking. Consumers who are on ease with ICT and use them also for other purposes find it convenient to start using electronic banking.

In addition, personal characteristics have been identified as significant predictors of consumers' adoption of an innovation various researchers have shown that it is the perceived attributes of the innovation itself rather than the characteristics of the innovators that are stronger predictors of the adoption decision (Black *et al*, 2001, p 391, Polatoglu, Ekin 2001, p.157)

Clients demand a minimum relative advantage in order to switch channels. It means that the new innovative service should be perceived to be better than its predecessor. In the case of electronic banking this is achieved via two strategies: added convenience and price incentives. The branch banking venue is characterized by long waiting lines and slow service and it is quite logical that those who have the possibilities try to use electronic banking. Also, the negative motivation of pricing has been successfully

used by the banks. Electronic banking transactions are either considerably lower priced or without any fee at all but for the transactions in branches the fees are very high according to the Banks standard. That is definitely one of the main reasons why the branch transactions are quickly losing their popularity.

8. Conclusions

The banking industry which is the back bone of every economy is confronted with various challenges such as globalisation, deregulation, competition, significant high cost of installing ICT and maintenance. The usage of ICT can lead to lower costs, but the effect on profitability remains inconclusive, owing to the possibility of ICT effects that arise as a result of consistence high demand of skilled work force, issues of increasing demand to meet customer's expectation for customer service delivery, trustworthiness of the information system and competition in financial services.

However, from the discussion whilst reviewing literature many researchers did not find ICT, for the delivery of customer service and profitable for bank's financial performance. So there has been an arrow head among these findings on perspective of profitability and customer service delivery. While, on the same vein, other researchers found ICT channel making profitable impact on the banks that are only internet start-ups than the conventional banks transforming into click and mortar.

In addition, there are other studies that proclaim due to perceived security risk, lack of comfort with computer technology, either due to lack of awareness or age factor, and a host of other reasons that ICT did not appear to be significantly viable or accepted warmly or quickly by consumers. Other researchers also found that despite all these factors banks, themselves, have been unable to have provided efficient customer service delivery because of which the clients who were even ready to adopt this delivery channel did not turn up again to innovation, and banks couldn't successfully build the required contents of electronic banking environment for consumers. More research need to be carrying out in different location and different time frame may confirmed or refute the previous findings by collecting the primary data to come up to a conclusion for the impact of ICT on customer service delivery and banks performance.

It is quite evident from our study that enhancing ICT in the banking industry is a must in a rapidly changing market place, as the ICT revolution has set the stage for exceptional increase in financial activity across the globe.

References

- [1] Adesina, A. A. and Ayo, C.K. (2010), An Empirical Investigation of the Level of Users' Acceptance of Ebanking in Nigeria, *Journal of Internet Banking and Commerce*, Vol. 15, No. 1.
- [2] Al-Hawari, M., Hartley, N. and Ward, T. (2005), Measuring banks automated service quality: a confirmatory factor analysis approach, *Marketing Bulletin*, 16,
- [3] Barnes, J. G. (1997), Closeness, strength and satisfaction: examining the nature of relationships between providers of financial services and their retail customers. *Journal of Psychology & Marketing*, 14(8), 765-790.
- [4] Berger, A. N. and Mester, L. J. (1997), *Inside the black box: what explains differences in the efficiencies of financial institutions?* Wharton School, Center for Financial Institutions Working Paper Series 97-04
- [5] Berger A. N. (2003), The economic effects of technological progress: evidence from the banking industry. *Journal of Money, Credit, Banking*, 35 (2): 141-176.
- [6] Birch, D. and Young, M.A., (1997), Financial Services and the Internet - What does Cyberspace mean for the Financial Services Industry? *Internet Research: Electronic Networking Applications and Policy*, Vol. 7, No. 2, pp. 120-128.
- [7] Bhat, M.A. (2005), Correlates of service quality in banks: an empirical investigation. *Journal of Services Research* 5(1), 2005, 77-99.
- [8] Black, N. J., Lockett, A., H. Winklhofer and Ennew, C. (2001), The adoption of Internet financial services: a qualitative study. *International Journal of Retail and Distribution Management*, 29(8): 390-398.
- [9] Bloemer, J., de Ruyter, K. and Peeters, P. (1998), Investigating drivers of bank loyalty: the complex relationship between image, service quality and satisfaction,

- International Journal of Bank Marketing*, Vol. 16, No. 7, pp. 276-286.
- [10] Brynjolfsson, E. and Hitt, L.M. (2000), Beyond computation: information technology, organizational transformation and business performance. *Journal of Economic Perspectives*, 14(4): 23-48.
- [11] Carlson, J. et al. (2000), *Internet Banking: Markets Developments and Issues. Economic and Policy Analysis, Working Papers*, 2000-9, Office of the Comptroller of the Currency.
- [12] Castells, M. (2001), *The Internet Galaxy: Reflections on the Internet, Business and Society*, Oxford; New York: Oxford University Press.
- [13] Castro, I. R. (1997), Determinação dos atributos mais valorizados pelos clientes (pessoa física) de instituições bancárias, como base de auxílio para sua segmentação. M.Sc. dissertation. Porto Alegre: UFRGS, 1997.
- [14] Centeno, C., (2004), Adoption of Internet Services in the Acceding and Candidate Countries, Lessons from the Internet Banking Case. *Telematics and Informatics*, pp. 293-315.
- [15] Cheung, M.T. and Liao, Z. (2003), Challenges to Internet E-banking. *Communications of the ACM*, Vol. 46, No. 12, pp. 248-250.
- [16] Claessens, S., Glaessner, T. and Klingebiel, D. (2001), E-finance Emerging Markets: Is Leap frogging Possible? *Financial Sector*, Discussion Paper, The World Bank, Vol. 7.
- [17] Compton, E. (1990) *Princípios das atividades bancárias*. São Paulo. Instituto Brasileiro de Ciência Bancária, 1990.
- [18] Cooke, S. D. (1997), Structural change in the US banking industry: the role of information technology. Washington: US Department of Commerce. Retrieved August 29, 2003,
- [19] Cox, J. and Dale, B. J. (2001), Key Quality Factors in Website Design and Use: An Examination, *International Journal of Quality and Reliability Management*, Vol. 19, No. 7, pp. 862-888.
- [20] Crisp, B., Järvenpää, S. and Todd, P. (1997), Individual Differences and Internet Shopping.
- [21] Delgado, J. and Nieto, M. J. (2004), Internet Banking in Spain. Some stylized facts: Monetary Integration.
- [22] Delgado, J., Hernando, I. and Nieto, M. J. (2006). Do European Primarily Internet Banks Show Scale and Experience Efficiencies, *European Financial Management*
- [23] DeYoung, R. (2005), The Performance Internet-based Business Models: Evidence from the Banking Industry. *Journal of Business*, Vol. 78, No. 3, pp. 893-947.
- [24] DeYoung, R., Lang, W. W. and Nolle, D. L. (2007), How the Internet affects Output and Performance at Community Banks, *Journal of Banking & Finance*, Vol. 31, pp. 1033-1060.
- [25] Dick, A. A. (2003), Nationwide branching and its impact on market structure, quality and bank performance. *Journal of Business*, April.
- [26] Economides, N. and Salop, S. (1992), Competition and integration among complements, and network market structure. *The Journal of Industrial Economics*, XL (1): 105-123.
- [27] Eglund, K., Furst K., Nolle D., and Robertson D. (1998), Banking Over the Internet, *Office of the Comptroller of the Currency Quarterly Journal*, Vol. 17, No. 4.
- [28] Farrell J. and Saloner G. (1985), Standardization, compatibility and innovation. *RAND Journal of Economics*, 16 (1): 70-83.
- [29] Fitzsimmons, J. (2000), *Administração de serviços: operações, estratégia e tecnologia de informação*. Porto Alegre: Bookman, 2000.
- [30] Furst, K., Lang, W. and Nolle, D., (2002), Internet Banking, *Journal of Financial Services Research*, Vol. 22, pp. 95-117.
- [31] Gronroos, C. (2001), *Service Management and Marketing: a customer relationship management approach*, 2nd edition, Wiley

- and Sons, England.
- [32] Gurau, C. (2002), Online Banking in Transition Economies: The Implementation and Development of Online Banking Systems in Romania. *International Journal of Bank Marketing*, Vol. 20, No. 6, pp. 285- 296.
- [33] Hamelink, C. (2000), *The Ethics of Cyberspace*, Sage, London.
- [34] Haq, M. F. (2005), *The Role of Information Systems in Islamic Banking: An Ethnographic Study*, University of London.
- [35] Hernando, I. and Nieto, M. J., (2007), Is the Internet Delivery Channel changing Banks' Performance?: The Case of Spanish Banks, *Journal of Banking & Finance*.
- [36] Kassim, N. M. and Bojei, J. (2001), Service Quality: gaps in the Malaysian telemarketing industry, *Journal of Business Research*, Vol.55, No.10, pp. 845-852.
- [37] Keeton, W. R. (2001), The Transformation of Banking and its Impact on Consumer and Small Business. *Economic Review*, Vol. 86, No. 1, pp. 25-29.
- [38] Kozak S. (2005), The role of information technology in the profit and cost efficiency improvements of the banking sector. *Journal of Academy of Business and Economics*, February 2005.
- [39] Loonam, M. and O'Loughlin, D. (2008), An Observation Analysis of e-service quality in Online Banking. *Journal of Financial Services Marketing*, Vol. 13, No. 2, pp. 164-178.
- [40] Mattos, A. (1999), Empregos e empresas que mudaram com a Internet. *Revista de Administração de Empresas* 39(3), 1999, 73-108.
- [41] Milne, A. (2006), What is in it for us? Network effects and bank payment innovation'. *Journal of Banking & Finance*, 30 (6): 1613-1630.
- [42] Mittal, A. (2008), *Advertising and Sales Promotion*, Wisdom Publication, New Delhi
- [43] Mukherjee, A., Nath, P., Pal, M. (2003), Resource, service quality and performance triad: a framework for measuring efficiency of banking services. *Journal of the Operational Research Society* 54(7), 2003, 723-735.
- [44] Parasuraman, A., Zeithaml, V. A. and Berry, L. L. (1985), A conceptual Model of Service Quality and Its implications for Future Research. *Journal of Marketing*, 49 (Fall), 41-50.
- [45] Parasuraman, A., Berry, L. and Zeithaml, V.A. (1993), More on improving service quality measurement. *Journal of Retailing* 69(1), 1993, 140-147.
- [46] Polatoglu, V. N. and Ekin, S. (2001), An empirical investigation of the Turkish consumers. Acceptance of Internet banking services. *International Journal of Bank Marketing*, 19(4): 156-165.
- [47] Saatcioglu, K., Stallaert, J. and Whinston, A. B., (2001), Design of a Financial Portal, *Communications of the ACM*, Vol. 44, No. 5, pp. 33-38.
- [48] Saloner, G. and Shepard, S. (1995), Adoption of technologies with network effects: an empirical examination of the adoption of automated teller machines. *RAND Journal of Economics*, 26(3): 479-501.
- [49] Saythe, M. (2005), The Impact of Internet Banking on Performance and Risk Profile: Evidence from Australian Credit Unions. *Journal of Banking Regulation*, Vol. 6, pp. 163-174.
- [50] Shu, W. and Strassmann, P. A. (2005), Does information technology provide banks with profit? *Information & Management*, 42: 781-787.
- [51] Simpson, J. (2002), The Impact of the Internet in Banking: Observations and Evidence from Developed and Emerging Markets. *Telematics and Informatics*, Vol. 19, No. 4, pp. 315-330.
- [52] Shoebridge, M. (2005), Banking on six sigma to improve service quality a case study: major Australian financial institution. *Australian Banking & Finance*, 14(9-10).
- [53] Southard, P. B. and Siau, K. (2004), A Survey of Online E-banking Retail Initiatives, *Communications of the ACM*, Vol. 47, No. 10, pp. 99-102.

- [54] Sullivan, R. J. (2000), How has the adoption of Internet Banking affected Performance and Risk at Banks? A look at Internet Banking in the 10th Federal Reserve District, *Federal Reserve Bank of Kansas City Financial Industry Perspective*, pp. 1-16.
- [55] Zeithaml, V. A. and Bitner, M. J. (1996), *Services Marketing*, McGraw-Hill, New York.