The Effect Of Mobile Banking, Security Systems And Information Systems Among Customers’ Preference Of Banks In Bahrain

Sawsan Abdullatif, Vikneswaran S/o Manual

School of Accounting, Finance and Quantitative studies, Asia Pacific University, House: 2031, Block: 732, Road: 3246, A’ali, Bahrain, PH-973 34182114
Sawsan7475@gmail.com
School of Accounting, Finance and Quantitative studies, Asia Pacific University, Jalan Teknologi 5, Kuala Lumpur, Malaysia, PH-0102404005
Vikneswaran.manual@apu.edu.my

Abstract: Technology plays an important role in enhancing the performance of banks, by contributing to the reduction of operational risk and enhancing the operational efficiency. This study was aimed at developing a better understanding on the influence of security systems, information systems and mobile banking among customers’ preference for banks in Bahrain. Even though there are many past researchers that studied the factors effecting customer choice of banks, there has not been any study that focused on examining the influence of technology variables on customers’ preference of banks, specifically in Bahrain. The data collection was conducted by distribution of questionnaires and the total valid respondents were 204, while the data analysis method included t-test and ANOVA. The findings from this study were interesting, as both security systems and information systems impacted the choice of bank for customers in Bahrain, but mobile banking had no influence on customers’ preference. This could be justified with the lack of awareness and resistance to change from traditional banking to mobile banking among Bahraini customers. Finally, the study suggested a few implications for local banks, Government of Bahrain, Central Bank of Bahrain and regulators to further improve bank customers’ satisfaction based on the study’s findings.

Keywords: Customer’s preference, Information systems, Mobile banking, Operational risk, Security systems.

1. Background of the study
The most important part that any business must consider is the customer satisfaction and striving to achieve it in any possible way (Gustafsson, Johnson & Roos, 2005). Therefore, this research will be more concern with the banking industry customer’s preference on the different technology factors including those relating to security, information systems and online/mobile banking when approaching to choose their own banks. When banks have a better overview of the different technology tools that could impact their customer’s choices, it will help them understand and apply changes to their systems all in aim of attracting and sustaining their customer base (Joseph and Stone, 2003). According to Kamel (2005), technology is considered a major contributor in reshaping and enhancing the banking industry the usage of it can be directly or indirectly visible in banks as they are seen inform of an Auto Teller Machine, Cash Deposit Machine and Online/Mobile banking, or it can be inform of the bank’s security system, transaction processing information system, loan credit scoring system and many more which might not be directly seen by their customers. This study is focusing on providing a better understanding of the different technologies and the emerging technology advances that the banking sector is currently using globally and the many ways that these technologies can have an effect on the banks. According to Oliner & Sichel (2000), as emphasized by Ho & Mallick (2010) such technologies are rising concerns in regards to how effective and beneficial they actually are to the banks and whether they are deserving cost that the banks undergo to obtain them due to the banks believe of the major role information technology and technology tools play in enhancing their field of work. It became an important tool for banks to also have a competitive advantage over the other banks operating in the same industry, this is because having advanced technology can help banks in retaining their loyal customers and attract new customers to increase the bank’s market share (Kamel, 2005). Furthermore, the usage of technology in the banking sector helped banks in maintaining their customer’s loyalty with the existing bank users as well as playing an important role in increasing the banks market base by attracting new customers (Ganguli & Roy, 2011). Technology advances applied in banks have also resulted in a more efficient and effective conduct of performance of the bank’s services, by enabling a better delivery of the services to the end user which is the bank’s customers (Ho and Ko, 2008). Subsequently, as technology increased the level of efficiency of services delivery it has reduces the costs of operations required to make the services available for the bank’s customer that was previously done using the bank’s employees which can now be replaces with technological advances to do so which have also reduced the time of conducting operations. This research paper will be focusing on the case of Kingdom of Bahrain, which is a small country located in the gulf region in the Middle East that is well known to be a financial hub for investors and institutions from all over the world (Dew, 2003). The banking industry in Bahrain is one of the key factors which the country’s economy depends on alongside crude oil and tourism (Central Bank of Bahrain, 2015). Therefore, the banking industry is a critical player in the financial growth of Bahrain and it has been noticed that the local and international banks operating in there are striving to succeed with the adoption of different technologies and information systems including the recent trend of mobile and electronic banking as well as...
specific knowledge, transaction and decision support system (Shubita, Harris &Felaifel, 2014). The continuous increase in number of banks in Bahrain over the years, with 79 conventional bank licensees and 24 Islamic bank licensees currently have raised the level of competition and subsequently motivated banks to implement more advanced technology into their systems.

2. Research questions and objectives
Starting with the research questions:
1. Do security systems have an effect on the customer choice of banks in Bahrain?
2. Does mobile banking have an effect on the customer preference of banks in Bahrain?
3. Does information systems implemented in banks have an impact on customer’s bank preference in Bahrain?

While the research specific objectives are:
1. To examine whether security systems adopted within banks affect customers’ choice of banks in Bahrain.
2. To clearly describe the influence of mobile banking towards customers’ preference of banks in Bahrain.
3. To investigate the impact of the information systems in banks on customers’ bank preference in Bahrain.

3. Theoretical framework
3.1 Theory of reasoned action
As cited in Southey (2011), Fishbein and Ajzen have developed the theory of reasoned action which is model about the human behavior and the influences behind such behavior. This theory describes the motives that impact the human’s intentions to execute an action and make a decision. The theory is basically used to illustrate how a person attitude will lead to a certain behavior depending on his beliefs that such behavior will result him a desired and of benefit outcome (Jasaragic, 2014). Therefore, a person’s choice of selecting a certain behavior will be based upon whether he thinks it can bring him an advantage or a disadvantage once selected.

3.2 Diffusion of innovation theory
This theory is founded by Rogers (1995) which describes the different levels of acceptance and willingness to adopt technology innovations depending on distinguishing characteristics that separates individuals. Therefore, this theory explains the process of adoption towards a new technology product, service, system and practice (Sahin, 2006). The normally distributed levels for individuals depends on the time and channel of communication, in which the levels of acceptance for innovations are innovators, followed by the early adopters, then the early majority, the late majority and finally the laggards starting with those which are most willing to implement technologies to the least as time passes.

3.3 Task technology fit
The TTF is a theory based from a research by Goodhue &Thompson (1995), they suggested that the organizations will be implementing and using a specific technology if it can be effectively utilized to fit the tasks required by the organization by conducting them as needed. Therefore, this theory will focus on assessing the effectiveness degree of a technology in assisting an employee or an individual in completing tasks. The more help a technology provides, the more fitting it is to be adopted in an organization. The theory is based upon a comprehensive understanding by the organization of the both the technology and task characteristics in order for the performance level of the organization to be maximized (Zigurs and Buckland, 1998).

4. Methodology
The research method is considered quantitative as it uses statistics, and is based on quantifying measures to provide an explanation behind the research results. The research approach is deductive, as it refers to the constructing and examining the research theory and hypothesis for each newly developed research.

Figure (1): Research framework.

4.1 Pre-tests
Since this is a primary research, the data collection will be done using a five point Likert-scale questionnaire. As the questionnaire was self-developed, a pre-test, pilot test and reliability test were conducted to ensure that the data collection instrument is reliable and valid for testing. Pre-testing of the survey before distributing it to the sample respondents is critical to ensure that the instruction given in the survey are clear, precision and easy to understand. Pre-testing was done to validate the questionnaire by disturbing it to 10 knowledgeable people in this field such as academic experts and working people in banks to obtain their review on the survey and apply changes to it accordingly. After pre-testing is carried out, it is necessary to conduct further testing to ensure that the questions within the survey are appropriate, relevant and well-constructed. The main purpose of pilot testing is to be certain that all the survey questions are understood the same way by the entire sample. Also, it is important to do this as it helps measure the time it takes to complete answering. Pilot test is tested by 30 respondents chosen randomly from the sample size. Reliability test is to be conducted using Cronbach’s Alpha Coefficient; to allow the research to know the degree of consistency in preparing and performing the research data collection, in this study the questionnaire.

4.2 Statistical tests
In regards to the data analysis methods, it will be based on one sample T-test; to analyze if the independent variables (security systems, information systems and mobile banking) have an impact on customer’s choice of banks in Bahrain. The other data analysis applied is one-way ANOVA, to
examine if different age groups have different perception towards the independent variables. The analysis will be conducted using SPSS. The models used for T-test and ANOVA are as following:

\[ t = \frac{X - \mu}{\sigma \sqrt{n}} \text{ with d.f.} = (n - 1) \]
\[ \sigma^2 = \frac{\sum (X_i - \bar{X})^2}{(n - 1)} \]
\[ y_j = \mu_j + \epsilon_j, \]
where \( \mu_j \) = mean of the jth population = \( \mu + \tau_j \)

\[ (1) \]
\[ (2) \]

5. Data Analysis

Data analysis will be conducted in order to reject or fail to reject the null hypotheses for the variables, which are as following:

<table>
<thead>
<tr>
<th>Variables</th>
<th>Hypothesis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Security</td>
<td>H0: Security systems in banks have no significant effect on the customer’s preference of banks in Bahrain.</td>
</tr>
<tr>
<td></td>
<td>H1: Security systems in banks have a significant effect on the customer’s preference of banks in Bahrain.</td>
</tr>
<tr>
<td>Mobile Banking</td>
<td>H0: Mobile banking adoption in banks has no significant effect on the customer’s preference of banks in Bahrain.</td>
</tr>
<tr>
<td></td>
<td>H1: Mobile banking adoption in banks has a significant effect on the customer’s preference of banks in Bahrain.</td>
</tr>
<tr>
<td>Information systems</td>
<td>H0: Information systems in banks have no significant effect on the customer’s preference of banks in Bahrain.</td>
</tr>
<tr>
<td></td>
<td>H1: Information systems in banks have a significant effect on the customer’s preference of banks in Bahrain.</td>
</tr>
</tbody>
</table>

Table (1): hypotheses for the study.

5.1 Security systems tests

<table>
<thead>
<tr>
<th>One-Sample Statistics</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Std. Error Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Security systems</td>
<td>204</td>
<td>3.3480</td>
<td>1.04432</td>
<td>.07312</td>
</tr>
</tbody>
</table>

Table (2): One-sample T-test for security systems.

The P-value (significance 2-tailed) is 0.0001, less than 0.05. Initially, it is noticed that the generated mean score for security systems (3.348 ± 1.04432) was higher than test value of 3.0, a statistically significant difference of 0.348 (95% CI, 0.2039 to 0.4911), \( t(203) = 4.760, p = .0001 \). Subsequently, the null hypothesis is rejected in favor of the alternative hypothesis, and it can be concluded that the security systems in banks have a significant effect on the customer’s preference of banks in Bahrain.

ANOVA

<table>
<thead>
<tr>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>1.124</td>
<td>4</td>
<td>0.281</td>
<td>.258</td>
</tr>
<tr>
<td>Within Groups</td>
<td>215.381</td>
<td>198</td>
<td>1.088</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>216.504</td>
<td>202</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table (3): One-way ANOVA for security systems.

For security systems, the P-value is 0.904 > 0.05. Subsequently, it can be concluded that there is no significant effect of age over the security systems variable. In other word, there is no statistical significance difference between the various age groups’ means.

5.2 Mobile banking tests

<table>
<thead>
<tr>
<th>One-Sample Statistics</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Std. Error Mean</th>
</tr>
</thead>
</table>

Table (4): One-sample T-test for mobile banking.
Mobile banking | 204 | 3.1148 | .84617 | .05924

One-Sample Test

<table>
<thead>
<tr>
<th>Test Value = 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>t</td>
</tr>
<tr>
<td>----------------</td>
</tr>
<tr>
<td>Mobile banking</td>
</tr>
</tbody>
</table>

Table (4): One-sample T-test for mobile banking.

The P-value (significance 2-tailed) is 0.054, more than 0.05. Initially, it is notices that the generated is mean score for mobile banking (3.1148 ± 0.84617) was slightly higher than test value of 3.0, a statistically significant difference of 0.11485 (95% CI, -0.0020 to 0.2317), t(203) = 1.939, p = 0.054. Subsequently, the null hypothesis is accepted, and it can be concluded that existence of mobile banking in banks have no significant effect on the customer’s preference of banks in Bahrain.

### ANOVA

<table>
<thead>
<tr>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mobile banking</td>
<td>Between Groups</td>
<td>2.474</td>
<td>4</td>
<td>.618</td>
</tr>
<tr>
<td>Within Groups</td>
<td>141.927</td>
<td>198</td>
<td>.717</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>144.401</td>
<td>202</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table (5): One-way ANOVA for mobile banking.

The one-way ANOVA results for mobile banking variable show a P-value of 0.487 > 0.05, therefore, it can be concluded that there is no statistical significance effect of age over the mobile banking variable. As such, age has no contribution over the generated analysis results for this variable.

### Information systems tests

#### One-Sample Statistics

<table>
<thead>
<tr>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Std. Error Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information systems</td>
<td>204</td>
<td>3.3368</td>
<td>.87472</td>
</tr>
</tbody>
</table>

One-Sample Test

<table>
<thead>
<tr>
<th>Test Value = 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>t</td>
</tr>
<tr>
<td>----------------</td>
</tr>
<tr>
<td>Information systems</td>
</tr>
</tbody>
</table>

Table (6): One-sample T-test ANOVA for information systems.

The P-value (significance 2-tailed) is 0.0001, less than 0.05. Initially, it is notices that the generated is mean score for security systems (3.3368 ± 0.87472) was higher than test value of 3.0, a statistically significant difference of 0.33683 (95% CI, 0.2161 to 0.4576), t(203)= 5.500, p = 0.0001. Subsequently, the null hypothesis is rejected in favor of the alternative hypothesis, and it can be concluded that the information systems in banks have a significant effect on the customer’s preference of banks in Bahrain.

### ANOVA

<table>
<thead>
<tr>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information systems</td>
<td>Between Groups</td>
<td>1.327</td>
<td>4</td>
<td>.332</td>
</tr>
<tr>
<td>Within Groups</td>
<td>152.201</td>
<td>198</td>
<td>.769</td>
<td></td>
</tr>
</tbody>
</table>
Last but not least is the one-way ANOVA result for information systems variable. The above results reflect a P-value of 0.786 > 0.05 which means that age has no significant effect over the analysis results for information systems as there is no statistical significance difference between the various age groups’ means.

6. Findings

Security systems results reflect a significant effect towards customer’s choice of banks in Bahrain. This indicates that the banks individual customers’ are aware of the importance of implementing various security systems and technologies because of the benefits it provides. Security systems are crucial especially in banks as it is the entity where customers place their money with the utmost trust and expect the bank to be providing protection and safety in return. Therefore, the more assured customers’ feel towards the security of the bank’s location, facilities and systems the higher the preference towards the bank would be. This could be clearly seen by the continually upgraded security systems at banks as they are aware of its importance and subsequently work on improving it to satisfy customers’ expectations. Further, banks are always seen addressing the public and making customer announcements providing them with security warnings and guidance when using the bank’s facilities. On the hand, because banks are realizing that security systems advances are also critical to the banks, they try to enhance its systems as much as possible to avoid being in losses due to operation risk. Therefore, any security breaches or robbery incidents scenarios are taken very seriously to firstly prevent them from actually happening by providing the necessary protection to do so. Consequently, is could be seen that the results regarding security systems are justifiable due to the security element becoming a priority for most bank customers, specifically in Bahrain. Moving on to mobile banking and findings that showed that in Bahrain, customers find the implementation and adoption of mobile banking to have no significant effect towards their preference for banks. The trend of using mobile banking to complete financial transaction might have started many years back, however only recently did banks in Bahrain started to provide such service to their customers. As such, it could be seen that there is not much appetite for customers in Bahrain to start switching from the traditional banking which is what they are used and adjusted to towards mobile banking which is this new concept that many may not be aware of yet. Therefore, there is a resistance to change observes not only in Bahrain but also in many surrounding countries in the Gulf. The reason behind this could be due to the security concerned and low trust by customers when it comes to conducting financial transaction using personal information through a mobile device. As a result, it is obvious why mobile banking did not prove to have an effect on customers’ choice of bank, as many are still leaning towards traditional banking. In regards to information systems, it is noticed that banks customer’s in Bahrain do agree in the significant role it plays when selecting banks. This is mainly due to the importance of implementing advances information systems in all of the bank’s functions and departments, as it facilitates the flow of information within the bank. Further, the respondents showcased a high level of knowledge regarding the implementation of different information systems and the benefits they provide, which is exactly why the results showed it to have a significant effect on customer’s choice of banks. The more information systems that are available in a bank, the better the abilities of the bank will be in conducting its operations and functions. Therefore, banks will be able to improve customers’ satisfaction as it is the primary goal for any bank. It is also important to note that even banks are aware of the benefits of information systems because they help in reducing operational losses and facilitate the growth of the bank. Information systems enable a better communication channels between the banks and its customers by enabling a rapid response to any requests for products or information as well as positively impacting banks by providing bank-wide information to support decision making. There are many other benefits of using information systems by banks as it could be utilized as an analytic tool for evaluation purposes, maximize the bank’s operational efficiency and increase the bank’s knowledge of their customers. Therefore, since bank customers in Bahrain have high awareness levels, the results are considered accurate representation of their needs.

7. Implications

7.2 Recommendations to local banks

Operational risk has proven to be detrimental to the bank’s profitability and sustainability and therefore enhancing the bank’s technologies to control such risk is critical. Banks are continuously competing with each other to withhold larger market share, but this can only happen if they step up their technology advances to keep up with today’s demanding world. By focusing their attention on improving what customers prioritize as important, which in this case it is highly advances security and information systems, banks will be able to retain existing customers and attract new customer base. Further, banks need to be aware of the changing need and wants of each generation of customers, with the new generation pressuring and demanding for technology advances. As such, by fulfilling their request banks will be able to build a stronger customer relationship with them.Besides that, since security systems were proved to impact customer’s preference for bank; banks should also use their advanced security measures as a marketing tool to attract and retain customers by spreading the word regarding any new addition to their security systems. By doing so, it will enhance the customers’ prospective about the banks and provide them with higher trust and confidence when choosing the bank as their preference. In addition, banks should focus their attention in utilizing customer knowledge management system (CKM) to build a strong database about their customers as it will enable them to connect better and understand the individual unique needs of each individual client. The benefits from implementing such detailed information system is to enable a better capturing of
customers information in order to improve relationship marketing with the bank clients. Therefore, it will improve the customization of products and services based on data extracted from the information system to achieve higher customers’ satisfaction. Adding to that, banks should raise awareness about the benefits of using mobile banking over traditional banking such as saves time, more convenient and ability to conduct transaction beyond the bank’s operational hours. As recommended by Tran and Cornor (2016), banks should establish communication channels to understand area of concerns and therefore facilitate the process of customers’ decision to shift toward mobile banking. This will enable a better flow of information and feedback between the two parties which will eventually allow banks to raise awareness, address any security concerns and assure customer’s when it comes to mobile banking adoption.

7.2 Recommendations to government, central bank and regulators
To begin with, government favor the growth of the banking industry in Bahrain due to the various benefits it provides them with, since rapid growth indicates better country’s economy and therefore improve the GDP of Bahrain. This is based on the research findings of Jokipii and Monnin (2013) as it concluded that there is a link between banking sector stability and an increase in real output growth in the economy. When examining the CBB rulebook, the operational risk management requirements for banks focus seems to be limited to the Payment Card Industry Data Security Standards (PCI-DSS) certification requirement set by CBB to prevent credit card frauds. Therefore, it is recommended that the regulatory authorities in Bahrain alongside the central bank of Bahrain (CBB) and the related government entities should work together in promoting the growth of the banking sectors by providing the necessary support and collaboration, especially when banks are implementing new security systems and technologies whereby they require the authorities’ approval. Subsequently, having enhanced the security and safety of the banks in Bahrain, this will have a positive impact on the stability of the financial sector in Bahrain, which is a core revenue stream for the country. To be more specific, the government though the central bank of Bahrain should have a direct supervision on the efficiency of security and information systems used in banks. For example, the government should create a supervisory board as part of the existing Banking Supervision Directorate of CBB, to ensure that banks are adhering to the security standards set by the central bank. The supervisory board should impose a new rule on banks which is; to regularly conduct a test on the safety and efficiency of the implemented security measures in banks, by reporting the results to the board every six months. The test should be a real stimulation of possible hacking into the information systems of bank to evaluate the security systems used to protect the financial data of customers, or test the efficiency of security alarms when a robbery takes place in a bank. Consequently, the results of those tests will be available to the supervisory board which will then provide a rating on the efficiency of the bank’s security and information systems, and suggest area for improvements. The government and regulatory authorities in Bahrain should also educated Bahrain bank customers on the importance of selecting banks that have a strong security infrastructure and technologies. As concluded by Khan and Barua (2010), customers with high knowledge on the importance of security systems and information systems will be raising the standards of perceptions towards banks. Therefore, the government role should be focused on creating awareness among customers, by opening a conversation discussing the different ways that customers can contribute to creating a safer and more secured banking environment. Many customers lack the basic knowledge about this topic; therefore the government should conduct public campaigns to highlight key instructions in order to protect the financial and personal information of bank customers. A nation-wide awareness program is considered a must at this point, especially with a fast-pacing world. In addition, the government should encourage further innovation in implementing new and advanced information systems within banks. This could be done through rewarding banks with that shows a high level of operational efficiency due to the functionality and innovativeness of its information systems. This could be measured using specific measurement standards such as speed of conducting transactions, efficiency in responding to customers’ complaints and feedback, ability to solve client dissatisfaction, and efficiency of linking the various bank departments through a central communication channel. Based on the results, the central bank of Bahrain will reward the banks showcasing the highest achievement, which will improve the bank’s reputation in return. Subsequently, since bank customers in Bahrain concluded that information systems have a significant effect on their choice of banks; this will provide them with a better overview on the banks with the best information systems in Bahrain. In regards to the adoption of mobile banking, based on the findings from this study, customers do not seem to fully understand the benefits of shifting from traditional banking to mobile banking, and appear to have trust issues with it. Therefore, the government role is to assure customers on the safety of using mobile banking to conduct financial transactions by motivating private banks to invest more in improving the infrastructure of mobile banking in Bahrain. When more banks begin to provide financial services through mobile banking, customers will be encouraged to try it. Further, with the support of the government entities, banks will be able to convince customers’ on the legitimacy of mobile banks and build confidence within customers to use it. Also, in order for bank customer’s to change their perception towards mobile banking and have trust in using it, the regulatory bodies in Bahrain should begin to implement laws and regulation in order to fully secure it and eliminate any legal issues. Such regulations should not be aimed at restricting or limiting banks from further innovating in mobile banking, but rather to protect both banks customers’ and the financial system. This will consequently take away the customers risk concerns and motivate them to move towards using mobile banking more frequently.

8. Conclusion
Overall, the study managed to achieve its main objectives and answer key questions regarding the specific technology factors that have an impact on customer’s perception towards banks in Bahrain. Throughout the research, the research hypotheses were appropriately tested by analyzing data and reaching to decisions on whether to reject or accept the
hypotheses. At the end, it focused on providing implications for local banks in Bahrain as well as the government, central bank and regulators to implement based on the study’s key findings.

References


