The Impact of E-Banking Processes in Minimizing Risk Ratios of Commercial Banks in Jordan

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Abstract
The aim of this paper was to specify solutions and recommendations in order to provide an overview of the current developments in the e- banking sector of the commercial banks. The researches have investigated the effectiveness of e-banking processes relying in information gathered from 6 banks in Jordan, two Jordanian and four foreign banks. Five major processes of e-banking were chosen to identify their impact on risk ratio. Quantitative methods and qualitative information gathered from 9 interviews with bank managers of IT, IS and risk departments and the questionnaire was analyzed. Major results of the study are, there is lack of required documentation for the risk of E-banking and shortage of proper planning required to integrate the risk divisions of the banks with their IT and IS Divisions there is also a need to employ specialists on e-banking to gradually decrease banks reliance upon third parties.
Key words: E – banking, Ecommerce application, internet banking system, risk averages ratio, network administration, website design and hosting.

1- Introduction

The E- banking services have spread worldwide in recent years In Jordan the large number of commercial banks have realized the advantages of E- banking and started to transform their bank activities into electronic systems, while competition among existing bank organization has allowed a much wider array of banking products and services, it has also carried risks (brown, 2003: 381). Each E-banking process affects the risk average of a bank in a deferent way, and overall risk can jeopardize the e-banking effectiveness coming from upper management and while the Global risk technology expenditure is estimated to increase by 10% (Bank Technology Summit Egypt, 2011).

2-E-Banking: literature review:

Different researchers have used different ways in measuring e-banking as (Rooyen, 2004) study "The future effect of e-business on treasury and risk management systems and treasury management in South Africa" aimed to show the impact of using new technologies

on South Africa as a developing country as it may lead to a stronger economy, which in turn will make an important contribution to more rapid reform in the long run and the main outcomes is to recommend embracing technological change offers the potential for high growth and high returns due to progressive changes taking place in south Africa.

While, (Daghfous,N ,Toufaily., 2007) study titled "The adoption of e-banking by Lebanese banks : success and critical factor" aim to analyze the organizational structural and strategic factors which can accelerate or on the contrary slow the adoption of this electronic mode of distribution and communication by the banks and the main outcome of the study supports that the international profile of bank has a significant impact on the degree of adoption of e-banking. (Devinaga, Rasiah,2010) study titled ATM Risk Management and controls aim to investigate risk management security and controls in the context of automated teller machines (ATMs)and the main outcome of the study indicated that although comprehensive computer insurance cover is available to banks for losses relating to ATMs , it is important to note that they vary significantly by utilizing careful ATM analysis and the best prevention and reduction methods acceptable level of ATM risk can be maintained.

3-Research Problem and its Elements

The risk management procedures and disciplines have not evolved at the same speed among banks and many banks, especially the smaller ones, have not been able to incorporate internet banking risk controls within their existing risk management structures.

4-Research Hypotheses:

Main hypotheses:

There is no significant impact of the E-banking processes on the risk averages rate at (α = 0.05) level.

Sub-main hypothesis as follows:

H1-1: There is no significant impact or the planning process of E-commerce application in the E-banking system on the risk averages rate at (α = 0.05) level

H1-2: There is no significant impact of the process of Internet banking server in E- banking system on the risk averages rate at (α = 0.05) level**.**

H1-3: There is no significant impact of the planning process of network administration in the E-banking system on the risk averages rate at (α = 0.05) level.

H1-4: There is no significant impact of the planning process of website design and hosting in the E-banking system on the risk averages rate at (α = 0.05) level.

H1-5: There is no significant impact of the planning process of firewall configuration and management in the E-banking system on the risk averages rate at (α = 0.05) level.

5-Research Model:

The Model prepared in order to give a preliminary comprehensive insight into the research variables and the relations among them and provides a quantitative perception of all the variables relevant to this research.
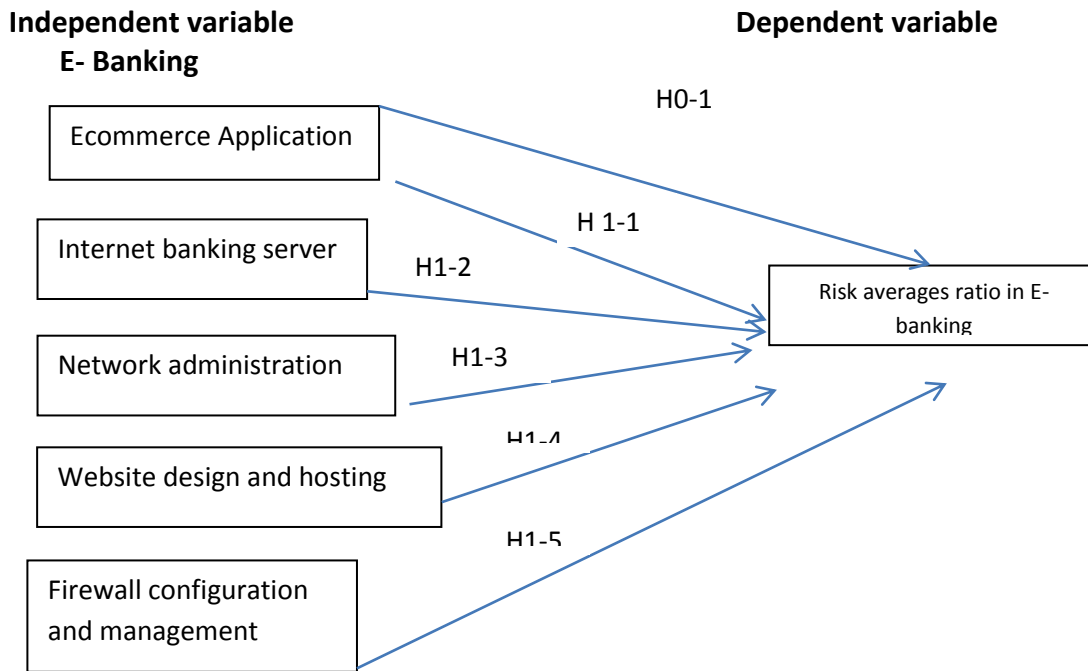
**Independent variable
E- Banking**

Dependent variable

**Figure No.1 Model of the Research
Sources: This model has been prepared by the researchers.**

6- The Data, Methodology and Statistical Treatment:

The population of this research includes the total number of employees in the sections of risk management IT staff and IS staff at the six banks chosen for this study. These banks were. The Cairo, Amman Bank, Audi Bank, Bloom Bank, capital Bank, Al Ahli Bank and housing Bank for Trade and finance) .The sample size 55 IT (32), Risk Management staff (14) is staff (9).

The reliability analysis applied to the level of cronbach Alpha (α), the minimum acceptable level (α ≥ 0.65)

Reliability Questionnaire Dimensions Cronbach Alpha

No.	Dimension	Alpha Value α	
1	E-commerce Application	0.731	All Questioner 0.884
2	Internet Banking Server	0.847	
3	Website Design and Hosting	0.687	
4	Network Administration	0.713	
5	Fire wall configuration and Management	0.748	

The table shown the arithmetic mean, SD

		Mean	SD
1	E-commerce application	3.42	0.94
2	Website design and hosting	3.34	1.02
3	Internet banking server	3.41	0.91
4	Firewall configuration and management	3.53	0.92
5	Net work administration	3.25	0.99

Where the arithmetic mean range for all independent variable's between (3.25 → 3.53) that is meant median level for cmportance, and the standard deviation (0.91 →1.02) that mean the staff or the bank have clear understanding of the required actions that should be taken in order.

Risk Average in banking

The researchers use the Risk Average in percent as shown in Table

No.	Bank	RISK					
		e-commerce application	Website design and hosting	Internet banking server	Firewall configuration and management	Network administration and management	total
1	Cairo Amman	0.34	0.35	0.42	0.52	0.41	0.41
2	Capital	0.50	0.36	0.96	0.47	0.54	0.57
3	Housing	0.41	0.31	038	0.55	0.51	0.43
4	Bloom	0.32	0.41	0.74	0.67	0.66	0.56
5	Ahli	0.44	0.27	0.46	0.34	0.25	0.35
6	Audi	0.45	0.43	0.58	0.54	0.55	0.51
	Risk average	0.41	0.47	0.49	0.52	0.59	0.36

Done by the researchers

Risk= SD for Process/ SD for all SD banks

From the above table we observe that lower risk is (0.25) for Al Ahli Bank. And the higher is (0.96) for the Capital Bank from the researcher point of view, this indicates that Al Ahli Bank is one of the oldest banks in Jordan with a large number of bank branches, giving it the ability for adequate and precise control over their own e- banking processes unlike the Capital Bank which is new in the field with less experience concerning be e-banking transactions and less bank branches.

7-   Study Hypotheses Test

The researcher in this part tested the main hypotheses and studied sub hypotheses, through Multiple, Simple linear Regression analysis with (F) test using ANOVA table as follows:

HO: There is no significant effect of the E-banking processes (E-commerce application, Internet banking server, network administration, website design and hosting, firewall configuration and management) on the risk averages rate at level$(\propto \leq 0.05)$. To test this hypothesis, the researcher uses the multiple regression analysis to ensure the effect of E-banking processes (E-commerce application, Internet banking serve, network administration, website design and hosting, firewall configuration and management) on the risk averages rate over the years (2006-2009) As shown in Table (4-7). Table (4-7) multiple regression analysis test results of the effect of E banking processes on the risk averages rate

	(R)	(R^2)	F Calculate	F Tabulated	β		Degree of freedom	Sig*
E- banking processes on the risk averages rate	0.675	0.455	8.190	2.404	ECA	0.606	5	0.000
					WBH	0.849		
					IBS	0.129	49	
					FCM	0.228	54	
					NA	0.319		

*The impact is significant at level $(\propto \leq 0.05)$

Table shows that there is a significant effect of E-banking processes on the risk averages rate. The R was (06.75) at level$(\propto \leq 0.05)$. Whereas the R2 was (0.455). This means the (0.455) of risk averages rate changeability's results from the changeability in E-banking processes variables. As β was (E-commerce application: 0.606; website design and hosting: 0.849; Internet banking server: 0.129; firewall configuration and management: 0.228; network administration: 0.319). This means that an increase of one unit in E-banking processes variables concerned will increase risk averages rate (E-commerce application: 0.606; website design and hosting: 0.849; internet banking server: 0.129; firewall configuration and management: 0.228; network administration: 0.319). Assuring significant impact F calculate was (8.190) and it's significance at level $(\propto \leq 0.05)$ compared with F Tabled was (2.404). This indicates the invalidity of the main hypothesis. Thus the null hypothesis is rejected and accepts the alternative hypothesis that states:

There is a significant effect of the E-banking processes (E-commerce application, internet banking server, network administration, website design and hosing, firewall configuration and management) on the risk averages rate at level $(\alpha \leq 0.05)$

To ensure the effect of E-banking processes (E-commerce application, internet banking server, network administration, website design and hosting, firewall configuration and management) on the risk averages rate, the researcher divides the first main hypothesis to three sub hypotheses, and uses the simple regression analysis to test each sub-hypothesis, as a follows:

HO1: There is no significant effect of E-commerce application on risk averages rate at level $(\alpha \leq 0.05)$.

To test this hypothesis, the researcher uses the Simple regression analysis to verify the effect of E-commerce application on risk averages rate, as shown in Table (4-8). Table (4-8) Simple regression analysis test results of the effect of E-commerce application on risk averages rate

	(R)	(R^2)	F Calculate	F Tabulated	β	Degree of freedom	Sig*
risk averages rate	0.555	0.308	23.644	4.019	0.605	1	0.000
						53	
						54	

*The impact is significant at level $(\alpha \leq 0.05)$

Table (4-8) shows that there is a significant effect of E- commerce application on risk averages rate. The *R* was (0.555) at level $(\alpha \leq 0.05)$. Whereas the R^2 was (0.308). This means the (0.308) of risk averages rate changeabilities result from the changeability in E-commerce application. As β was (0.605) this means the increase of one unit in E-commerce application will increase risk averages rate value (0.605). Assuring significant impact *F* $_{calculate}$ was (23.644) and it's significant at level $(\alpha \leq 0.05)$. comparing with *F* $_{tabled}$ was (4.019), and that assuring invalid first sup- hypotheses. Unaccepted null hypothesis and accepted alternative hypothesis: There is a significant effect of E-commerce application on risk averages rate at level $(\alpha \leq 0.05)$

HO2: There is no significant effect of E-internet banking server on risk averages rate at level $(\alpha \leq 0.05)$. to test this hypothesis; the researcher uses the Simple regression analysis to verify the effect of E-commerce application on risk averages rate, as shown in Table (4-9).

Table (4-9) Simple regression analysis test results of the effect of E- internet banking server on risk averages rate

	(R)	(R^2)	F Calculate	F Tabulated	β	Degree of freedom	Sig*
risk averages rate	0.586	0.343	29.753	4.019	0.308	1 / 53 / 54	0.000

*The impact is significant at level $(\propto \le 0.05)$

Table (4-9) shows that there is a significant effect of E- internet banking server on risk averages rate. The *R* was (0.586) at level $(\propto \le 0.05)$. Where as the R^2 was (0.343). This means the (0.343) of risk averages rate change abilities result from the changeability in E-internet banking server. As β was (0.308) this means the increase of one unit in internet banking server will increase risk averages rate value (0.308). Assuring significant impact *F* calculate was (29,753) and it's significant at level $(\propto \le 0.05)$. comparing with *F* tabled was (4.019), and that assuring invalid second sup- hypotheses. Unaccepted null hypothesis and accepted alternative hypothesis:

There is a significant effect of E-internet banking server on risk averages rate at level$(\propto \le 0.05)$

HO_3: There is no significant effect of website design and hosting

On risk averages rate at level $(\propto \le 0.05)$.to test this hypothesis, the researcher uses the Simple regression analysis to ensure the effect of website design and hosting on risk averages rate, as shown in Table (4-10).

Table (4-10) Simple regression analysis test results of the effect of website design and hosting on risk averages rate

	(R)	(R^2)	F Calculate	F Tabulated	β	Degree of freedom	Sig*
risk averages rate	0.640	0.410	39.550	4.019	0.361	1 / 53 / 54	0.000

*The impact is significant at level $(\propto \le 0.05)$

Table (4-10) shows that there is a significant effect of website design and hosting on risk averages rate. The *R* was (0. 640) at level $(\propto \le 0.05)$. Where as the R^2 was (0.410). This means the (0.410) of risk averages rate change abilities result from the changeability in website

design and hosting. As β was (0.361) this means the increase of one unit in website design and hosting will increase risk averages rate value (0.361). Assuring significant impact $F_{calculate}$ was (39.550) and it's significant at level $(\propto\leq 0.05).$ comparing with F_{tabled} was (4.019), and that assuring invalid third sup- hypotheses. Unaccepted null hypothesis and accepted alternative hypothesis:

There is a significant effect of website design and hosting on risk averages rate at level$(\propto\leq0.05)$

HO4: There is no significant effect of network administration on risk averages rate at level $(\propto\leq 0.05).$ to test this hypothesis; the researcher uses the Simple regression analysis to ensure the effect of network administration on risk averages rate, as shown in Table (4-11).

Table (4-11) Simple regression analysis test results of the effect of network administration on risk averages rate

	(R)	(R^2)	F Calculate	F Tabulated	β	Degree of freedom	Sig*
risk averages rate	0.745	0.555	71.155	4.019	0.472	1	0.000
						53	
						54	

*The impact is significant at level $(\propto\leq 0.05)$

Table (4-11) shows that there is a significant effect of network administration on risk averages rate. The R was (0.745) at level $(\propto\leq 0.05).$

Where as the R^2 was (0.555). This means the (0.555) of risk averages rate change abilities result from the changeability in network administration. As β was (0.361) this means the increase of one unit in network administration will increase risk averages rate value (0.472). Assuring significant impact $F_{calculate}$ was (71.155) and it's significant at level $(\propto\leq 0.05).$ comparing with F_{tabled} was (4.019), and that assuring invalid Fourth sup- hypotheses. Unaccepted null hypothesis and accepted alternative hypothesis:

There is a significant effect of network administration on risk averages rate at level$(\propto\leq0.05)$

HO5: There is no significant effect firewall configuration and management on risk averages rate at level $(\propto\leq 0.05).$ To test this hypothesis, the researcher uses the Simple regression analysis to ensure the effect firewall configuration and management on risk averages rate, as shown in Table (4-12).

Table (4-12) Simple regression analysis test results of the effect of firewall configuration and management on risk averages rate

	(R)	(R^2)	F Calculate	F Tabulated	β	Degree of freedom	Sig*
risk averages rate	0.592	0.351	30.834	4.019	0.294	1	0.000
						53	
						54	

*The impact is significant at level $(\alpha \leq 0.05)$

Table (4-12) shows that there is a significant effect of firewall configuration and management on risk averages rate. The *R* was (0.592) at level $(\alpha \leq 0.05)$.

Where as the R^2 was (0.351). This means the (0.351) of risk averages rate changeabilities result from the changeability in firewall configuration and management. As β was (0.294) this means the increase of one unit in firewall configuration and management will increase risk averages rate value (0.294). Assuring significant impact *F* calculate was (30.834) and it's significant at level $(\alpha \leq 0.05)$. comparing with *F* tabled was (4.019), and that assuring invalid fifth sup-hypotheses. Unaccepted null hypothesis and accepted alternative hypothesis:

There is a significant effect of firewall configuration and management on risk averages rate at level $(\alpha \leq 0.05)$

8-   Results

The current study posed a set of questions, placing the hypotheses and their relation to the impact within the study variables.

The main results are:

1. The importance level of E-commerce application was Median with mean (3.42).
2. The importance level of Internet banking server was median with mean (3.34).
3. The importance level of Website design and hosting was Median with mean (3.41).
4. The importance level of Website and hosting was Median with mean (3.53).
5. The importance level of Network Administration was Median with mean (3.25).
6. There is a significant effect of the E-banking processes (E-commerce application, Internet banking server, network administration, website design and hosting, firewall configuration and management)on the risk averages rate in the years 2006-2009 at level $(\alpha \leq 0.05)$.
7. There is a significant effect of E-commerce application on risk average rate at level $(\alpha \leq 0.05)$.
8. There is a significant effect of Internet banking server on risk averages rate at level $(\alpha \leq 0.05)$
9. There is a significant effect of website design and hosting on risk average rate at level $(\alpha \leq 0.05)$

10. There is a significant effect of network administration on risk averages rate at level $(\propto \leq 0.05)$

11. There is a significant effect of firewall configuration and management on risk averages rate at level $(\propto \leq 0.05)$

9-   Conclusions

On the basis of the study results, the researcher concludes with the following points.

- There is a lack of the required documentation for the risks of E- banking, and there is no dedicated framework responsible for recording and calculating the risk averages of e-banking processes followed by the banks, independent and dedicated communications among the various divisions of the bank concerning e-banking activities and processes are lacking or nonexistent.
- Plans to educate bank staff and clients on e-banking processes, activities and services are insufficient.
- The banks in Jordan in general are in the early steps in the field of e-banking and they mostly depend upon third parties, concerning the e-banking infrastructure, securities, policies and support services.
- There is s strong rivalry among banks in Jordan. As a result, we find many differences between banks and gaps regarding ways the banks gradually adopt various stages of e-banking Another result is that banks are adopting more efforts enhance their reputations as early adapters, and as reliable and secure banks.
- In the near future there will be huge transformation in the banking
  Sector where a few banks that are out raced in the competition will be left behind and only the well-known, state-of- the- art banks will survive and flourish.
- Proper plans required to integrate the Risk Division of the bank with its IT and IS Division are lacking.
- Rules and regulations concerning e-banking are not sufficient

10-   Recommendations: On the basis of study results and researcher conclusions, we suggest the following recommendations to meet the study objectives:

- Over the coming years the growing risk will raise concerns and become more crucial. Banks in Jordan need to be aware of this dilemma and fortify themselves against it. Risk Divisions especially, require substantial integration and preparation for the next generation of bank transformations and the adoption of e-banking.
- An extensive framework for documentation processes is required, with dedicated communication methods that would serve e b-banking processes and activities.
- Banks should take immediate steps towards the adoption of e-banking, modeled after successful methods already developed.
- There should be extensive efforts to provide the required levels of knowledge and understanding of e-banking for the bank staffs and clients using multiple dedicated methods and channels.

- Integration channels between bank divisions and communications for the purpose of efficient and effective e-banking should be reinforced.
- Banks need to start developing in house support systems and technical systems, and they need to employ specialists on e-banking to gradually decrease their reliance upon third parties. This step is important for the following reasons: e-banking will continue to evolve worldwide, and a strong reliance on third parties will increase. As this occurs the power will shift toward parties that already have expertise in banking.. It is not sufficient for Jordanian banks to meet the standards of large international banks, but they need to keep up with continuing change. Alternately, mergers and very strong long-term alliances should be recommended.
- Urgent need for revising and produce proper and state of the art rules and regulations concerning e-banking.

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