Impact of IT investment on financial performance in Saudi banks

أثر الاستثمار في تكنولوجيا المعلومات على الأداء المالي في البنوك السعودية

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Received: 19/01/2024 *Accepted: 25/10/2024* *Published: 11/11/2024*

Abstract:

The research aims to analyze the impact of investment in Technology information on financial performance, and the investment in information technology consists of three components: investing in the number of ATMs, investing in software and technological systems, investing in technological banking devices, By applying to a sample of banks listed on the Saudi Market, the data were collected from the annual reports and published by these banks and statistics of the Central Bank of Saudi Arabia during the period 2016-2020, and based on time series data, and adopted a study mainly on the use of Program (E-views), the research found an impact of investment in Technology information on financial performance, where there is a weak inverse relationship between both software investment and technology systems with return on assets, , and there is a strong correlation between both investment in ATMs and return on assets…

Key words: : IT, IT investment, financial performance, Number of ATMs

ملخص:

يهدف البحث إلى تحليل أثر الاستثمار في تكنولوجيا المعلومات على الأداء المالي، ويتكون الاستثمار في تكنولوجيا المعلومات من ثلاث مكونات وهي الاستثمار في عدد أجهزة الصراف الآلي، الاستثمار في البرمجيات والأنظمة التكنولوجية، الاستثمار في الأجهزة المصرفية التكنولوجية، وقد كان المتغير التابع هو الأداء المالي مقاسًا بالعائد على الأصول، وذلك بالتطبيق على عينة من البنوك المدرجة في السوق السعودية (تداول)، وقد تم جمع البيانات من التقارير السنوية والمنشورة لهذه البنوك واحصائيات البنك المركزي السعودي وذلك خلال الفترة 2016-2020م، واعتمدت الدراسة بشكل أساسي على استخدام برنامج (E-views))، وتوصل البحث إلى وجود تأثير للاستثمار في تكنولوجيا المعلومات على الأداء المالي، حيث توجد علاقة عكسية ضعيفة بين كلٍ من الاستثمار في البرمجيات والأنظمة التكنولوجية مع العائد على الأصول، في حين كان هناك علاقة طردية ضعيفة بين كلٍ من الاستثمار في الأجهزة المصرفية التكنولوجية مع العائد على الأصول، ويوجد علاقة طردية قوية بين كلٍ من الاستثمار في عدد أجهزة الصراف الآلي مع العائد على الأصول.

الكلمات المفتاحية: تكنولوجيا المعلومات، الاستثمار في تكنولوجيا المعلومات، الأداء المالي، عدد أجهزة الصراف الآلي.

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1. INTRODUCTION:

1.1 The importance of the topic:

The importance of the subject is theoretical:

The importance of the research, in theory, lies in the fact that it highlights it in banks listed on the Saudi market (trading) and financial performance is an important strategy in determining the overall level of performance of banks where banks that perform well are more able to develop progress and compete.

Learn about the importance of investing in software and technological systems on financial performance in Saudi Arabian banks.

Learn about the importance of investing in technology banking devices on financial performance in Saudi Arabian banks.

Learn about the importance of investing in counting A.L. ATMs on financial performance in Saudi Arabian banks.

The importance of the topic is applied:

This study derives its importance from a practical point of view in increasing scientific knowledge between investment in information technology and financial performance in Saudi banks, where Saudi Arabia's banks have been experiencing significant investment in the recent period and the banking sector is an important and major in the economies of most countries.

1.2 The question of research and its scope:

Based on the importance of the topic, several questions have been formulated for the research:

How do investments in software and technology systems affect financial performance in Saudi Arabian banks?

How does investing in technology banking affect financial performance in Saudi Arabian banks?

How does investing in ATMs affect financial performance in Saudi Arabian banks?

1.3 Search goals:

Find out the impact of investment in software and technological systems on financial performance in Saudi Arabian banks.

Find out the impact of investing in technology banking devices on financial performance in Saudi Arabian banks.

Find out the impact of investment in the number of ATMs on financial performance in Saudi banks.

1.4 hypothesis:

Key hypothesis: There is a statistically significant impact between IT investment and financial performance in Saudi banks.

Sub hypotheses:

There is a statistically significant impact between investment in software, technological systems, and financial performance in Saudi banks.

There is a statistically significant impact between investment in technological banking and financial performance in Saudi banks.

There is a statistically significant impact between investment in ATM numbers and financial performance in Saudi banks.

2. THEORETICAL FRAMEWORK AND PREVIOUS STUDIES:

2.1 THEORETICAL FRAMEWORK FOR RESEARCH:

IT concept:

Information technology is defined as the tools, techniques ,and systems that can be used to obtain information, process it, store and publish it. These technologies include computers of all kinds, methods of storage, printing ,and reading, methods of receiving and transferring, work and

fax networks, and software systems and their application. The concept of information technology also refers to processing, and sending retrieval. Information by computers and software (Lrady, 2019).

There has been increased talk about the importance of information technology in the banking sector in recent years, and it has been noted that information technology has contributed to the development of the economies of some countries, making this issue a mere concern for many countries.

Invest in IT:

Interest in information technology investments in the banking sector has increased due to the nature of the banks' activity, which is to process information and work to manage and make good use of it. This is because banks are among the most important sectors that use information technology, where traditional banking services have been developed and new services have been introduced such as ATM Self-service devices and banking phone applications that contributed to increasing customer satisfaction and thus reducing the cost and effort incurred by banks and customers. Hence, it is noted that information technology contributes to the development of culture, production, and economic prosperity for societies, as it is of great importance in industry, design, and wealth production (Al-Khoury, 1998 AD: 212).

The concept of financial performance:

Financial performance is one of the indicators used to measure the success of the institution is a quantitative measure of the quality of the company's use of its commercial assets and revenue generation and the degree of achievement of the company's financial objectives, and the measurement of the bank's performance is a complex subject where many researchers in their studies resorted to using different methods to evaluate the performance of banks, yet some measures are considered more reliable and have been used intensively in studies published in the past, Return on equity, Return on Assets.

Controversy has spread among many researchers, whichever is better at assessing banks' performance. In the light of the above, this study adopted the use of return on assets to measure the financial performance of Saudi banks.

The rate of return on assets can be expressed in the following relationship:

$$Return\ of\ assets = \frac{net\ income}{total\ assets}$$

2.2 PREVIOUS STUDIES:

Study title: (Impact of ICT on the financial performance of private commercial banks in Syria),Author:Hanna Ibrahim and Mona Bitar. Year of publication (October 21, 2019). Search goal: This research aims to examine the impact of ICT on the financial performance of commercial banks in Syria. Data and methodology : Sample: All 7 private commercial banks in Syria. Sector: Banking, Duration: 2010-2017, Methodology: Panel Data through E-views 9.5 , Child variable: financial performance,

Independent variables:

1. Annual amounts spent on the purchase of hardware, software, and services (IT)
2. Inflation
3. Concentration of the financial market
4. Staff efficiency

Top results: No impact of the amounts invested in the devices on the rate of return on assets (ROA) . The impact of the amounts invested in the programs on the rate of return on assets (ROA) .An impact on the efficiency of ICT use in the rate of return on assets (ROA).

Study title: (Impact of IT investment on the performance of Saudi banks, Arab Journal of Management). Author: Dr. Oqlah Mohammed Irsheed. Year of publication (Mar 2017) . Search goal: he study aimed to identify the impact of IT investment (hardware investment, SW software investment, and atm number) on the performance of Saudi banks listed on the financial market, by performance measures, including ROA, and ROE. Data and mand methodology. Sample: All Saudi banks listed on the Saudi financial market. Sector: Banking . Duration: 2006-2012. Methodology: Common regression (aggregated data model) . Child variable: return on assets Return on equity
Independent variables: Log SW), Log HW, Log ATM, Log Size, Deposit)
Top results: An impact on IT investment (hardware investment, SW software investment, ATM d promise) on the performance of Saudi banks measured by return on assets. There is an impact of the controlled variable (volume) on the performance of Saudi banks measured by the return on assets, while there is no impact o the controlled variable (deposit-to-asset ratio) on the performance of banks measured by return on assets. The impact of IT investment (hardware investment, Sw investment, number of ATMs) on the performance of Saudi banks is measured by return on equity. The impact of controlled variables (size, deposit-to-asset ratio) on the performance of Saudi banks is measured by return on property rights.

Study title: (The impact of the use of information technology in improving banking performance "Field Study on Yemeni banks operating in the Hadramaut Valley")
Author: Dr. Salem delivers lardhi. Year of publication (December 2019)
Search goal: Learn about the impact of the use of information technology in improving banking performance in Yemeni banks operating in the Hadramout Valley.
Data and methodology Data: Sample: 7 Yemeni banks operating in the Hadramaut Valley. Sector: Banking . Duration: 2019. Methodology: Descriptive analytical approach. Child variable: banking performance
Independent variables:
1. Electronic payment methods
2. Electronic distribution channels
Top results: There is a statistically significant moral relationship between the use of information technology (electronic payment methods and electronic distribution channels) and improved banking performance in Yemeni banks operating in hadramaut valley.

Study title:(IT role in improving banking performance "Research in a sample of Iraqi private banks"). Author Ihsan Ali Mubarak Al, Jubouri. Year of publication (2016).
Search goal: The research aims to study the impact of information technology on banking performance through its dimensions of hardware. Equipment, software, network and base, individual skills between banking performance in its dimensions, financial dimension, after customers, after internal operations, after learning and growth, social dimension.
Data and methodology: Sample: The 5 Iraqi private banks listed on the Iraqi Stock Exchange were relied upon. Sector: Banking. Duration: 2016.Methodology: Descriptive analytical approach
Child variable: Bank performance: financial dimension, after customers, after internal operations, after learning and growth
The social dimension.
Independent variables:
IT: physical components, software, database, individual skills
Networks.
Top result :there is a morally significant statistical relationship between information technology and banking performance.
There is a statistically significant relationship between hardware and equipment and banking performance.

There is a statistically significant relationship between software and banking performance.
There is a statistically significant relationship between networks and banking performance.
There is a statistically significant relationship between the database and banking performance.
There is a statistically significant relationship between individuals and banking performance.
There is a morally significant statistical relationship between Technology information and banking performance.
There is a morally significant statistical relationship between information technology and the financial dimension.
There is a morally significant statistical relationship between information technology and customer dimensions.
There is a statistical relationship of moral significance between information technology and internal processes.
There is a morally significant statistical relationship between information technology and learning and growth.

Study title: (Information technology and its role in raising the efficiency of the performance of the banking system, Kirkuk University Journal of Administrative and Economic Sciences) . Author: M.M. Hassan Hadi Jahel, M.M. Abbas Mohammed Alou, and M. Amer Rajab Dhiab. Year of publication (October 8, 2019).

Search goal: The current research addresses both information technology and its role in increasing the efficiency of the banking system by identifying the role of information technology (hardware and equipment, software, human resources skills) in increasing the performance of the banking system in a sample of banks operating in Kirkuk city.

Data and methodology

Sample: Commercial banks operating in Kirkuk province, represented by the branches of Rafidain and Rashid Banks. Sector: Banker . Duration: 2019

Methodology: descriptive and analytical approaches.

Child variable: banking performance

Independent variables: technology (technology), physical components (hardware and equipment) Software, human skills.

Top results: The results showed that the technology (technology a) information with all its components dr. important in the performance of the banking system, that the physical components represented by all the devices and equipment used in commercial banks suffer from deficiencies in one aspect, which may relate to the age of these devices and equipment and not keep up with the development of rat that has affected the technological field worldwide, which may affect banking performance in one way or another, Banking professionals are based on their skills and experience gained using different technologies and software in providing different banking services in high quality and more efficient. The lack of a database of accurate information on which Iraqi banks build strategies and develop appropriate plans for competition in the banking field internationally may, therefore, lead to poor performance efficiency of the agency.

Study title: (Impact of IT investment on financial performance: applied study to banks listed on the Palestine Stock Exchange) Author: Mohamed Amin Hassan

Year of publication (December 18, 2021).

Search goal: This study aims to analyze the impact of IT investment on financial performance, where investment consists of three components: investment in technological devices, investment in software and technological systems, and vestment in the number of ATMs.

Data and methodology

Sample: All 6 banks listed on the Palestinian Stock Exchange. Sector: Banking

Duration: 2015-2020. Methodology: The inference approach.

Child variable: financial performance
Independent variables:
1. Investing in ATMs
2. Investing in software and technological systems
3. Investing in technological devices
Top results: There is a statistically significant impact at the level ($\alpha \leq 0.05$) between investment in technological devices and financial performance in banks listed on the Palestine Stock Exchange.
There is a statistically significant impact at the level ($\alpha \leq 0.05$) between software investment and financial performance in banks listed on the Palestine Stock Exchange.
There is a statistically significant impact at the level ($\alpha \leq 0.05$) between investment in the number of ATMs and financial performance in banks listed on the Palestine Stock Exchange.
Study title : The role of information communication technology (ICT) in the development of banking services in Libya" Case Study: The commercial banks in Libya" . Author A. Aza Youssef Al-Hasadi .Year of publication (December 2019)
Search goal: The Libyan economy, like other the economies of developing countries, seeks to improve the level of the banking services sector as the main engine of economic development in the country, especially after the emergence of the knowledge economy, commercial banks are seeking to develop their services in line with the new economy.
Data and methodology: Sample: The 6 commercial banks operating in the eastern region of Libya. Sector: Banking. Research Period: 2019
Methodology: Descriptive analytical method.
Dependent Variable:
Banking services development
Independent Variable:
Information and Communication Technology
Top results: There is a statistically significant impact of information and communication technology on the development of banking services.
Source: Search team setup.

3- Data and methodology

3-1 Data:

The sample of the study was (6) sucking in Saudi Arabia, and the study data were collected through the reports of published banks, the Saudi market (trading), and the annual statistics of the Central Bank of Saudi Arabia, where the study was limited to the period 2016-2020.

The following variables were also relied upon: -

Independent variables:

- Number of ATMs: Total investments in the number of ATMs owned by the bank are measured during the year.
- Investment in software and technological systems: Measured by total software investments in the Bank during the year.
- Investment in technology banking: Measured by total investments in the bank's technological devices during the year.

Child variable:

- Financial performance: Expressed by return on assets at the bank during the year
-

Table (2) Data metadata

Variable	Number of ATMs (independent variable)	Investment in software and technological systems (independent variable)	Investment in technology banking (independent variable)	Financial performance: return on assets (child variable)
Average	7.1525	291298	1.7782	0.0169
Standard deviation	0.8511	255563	1.3629	0.0055
The greatest value	8.5592	758276	14.8497	0.0282
Smallest value	6.0137	788.00	9.5662	0.0024
Flattening	1.7726	1.8319	3.2768	3.5396
Convolution	0.3230	0.5859	0.9264	-0.1282
Jarque Bera	2.4048	3.4219	4.3869	0.4461
Prob probability value	0.3004	0.1806	0.1115	0.8000

Source: Search team setup

From the previous table, it can be noted that: -

The table above shows that the probability value of Jarque-bera testing is greater than the indicated level of 0.05, indicating that the variables used in the estimated model do not have a problem of natural non-distribution, and some data were treated in the analysis process using natural logarithm in a strong relationship between variables when natural logarithm was used.

The table of metadata for study variables during the period (2016-2020) also shows that the average return on assets is (0.016) the highest value (0.028), and the average number of ATMs taking logarithm Natural (7.152) and the highest value (8.55), the average natural logarithm for investment in technological banking devices was (11.77) and the highest value (14.84), while for the variable investment in software technological systems averaged (291298.3) and the highest value (758276).

The standard deviation also measures the extent to which data are dispersed from the computational medium and how much the broker is separated from the average in variables, and it is clear from the table that the standard deviation values are low, indicating that the data dispersion from the computational medium is low, and both the broker and medium values are close to each other.

Flattening measures, the degree to which the probability distribution function of a real random variable is curved and it is clear from the table above that the flattening is almost moderate and thin.

The twist measures the degree of asymmetry or deviation from symmetry, we have almost positive twisting values except for the twisting of the return on the assets then the distribution curve has a party on the right longer than the left end the distribution is twisted to the rift or it is positive twisting.

3-2 Methodology:

The descriptive statistical analysis approach was used, relying on the statistical model of multiple regression in the manner of micro-squares, and statistically analyzing and processing data through the E-views program to extract results by testing the theories of the study and thereby achieving its objectives.

4-Analysis and discussion

4-1 Analysis:

Pearson's correlation coefficient between variables was used to determine the strength and direction of the relationship between the child variable and the independent variables.

Table (3) Correlation Coefficient Matrix

Variables	Financial performance: return on assets	Investing in software and technological systems	Number of ATMs	Investing in technology banking
Financial performance: return on assets	1			
Investing in software and technological systems	-0.0302 0.8738	1		
Number of ATMs	0.7639 0.0000	0.3225 0.0821	1	
Investing in technology banking	0.4399 0.0150	-0.5284 0.0027	0.3836 0.0364	1

Source: Search team setup

Through Table 3, which shows the degree of correlation between the study variables, the results indicated a correlation between the study variables, where the correlation factor between investment in software and technological systems and financial performance was equal to (-0.0302) and this indicates that there is a weak inverse relationship, so increased investment in software and technological systems have reduced financial performance in Saudi banks, and the correlation factor between the number of ATMs and financial performance was equal to (0.7639) as evidenced by the fact that there is a strong expulsion relationship as increased investment in the number of ATMs has contributed to positive returns in Saudi banks, and the correlation between investment in technological banking devices and financial performance (0.4399) indicates a weak expulsion relationship, i.e. investment in technological banking devices has improved the financial performance of Saudi banks well**.**

Table (4) Results of model transaction estimate

Variables **Variable**	**Transactions** **Coefficient**	**Standard error** **Std Error**	**t-statistic**	**Probability value** **P-Value**
Fixed limit	-0.0177	0.0068	-2.6105	0.0148
Investing in software and technological systems	-8.94E-09	3.82E-09	-2.3412	0.0272
Number of ATMs	0.0061	0.0010	5.8616	0.0000
Investing in technology banking	-0.0005	0.0007	-0.7970	0.4327
F=18.1684, Prob=0.00001, R2=0.6770, Adj.R. Squared=0.6397				

Source: Search team setup

Table 4 shows the results of the statistical estimate of the study model, where the adjusted selection factor (0.6397) indicates that investment in information technology affects 64% of the financial performance of Saudi banks and the rest is due to other factors.

4-2 Discussion

4.2.1 Search hypotheses:

Hypothesis 1: There is a statistically significant impact between investing in software and technological systems and financial performance in Saudi banks. The correlation coefficient was found to be equal to (-0.0302). This indicates a weak inverse relationship between investment in software, technological systems and financial performance in Saudi banks. The hypothesis is accepted to reach the probability value (0.0272) 5% between investment in software, technology systems, and financial performance.

Hypothesis 2: There is a statistically significant impact between investment in technological banking and financial performance in Saudi banks.

The correlation between investment in technology banking and financial performance was 0.4399

This indicates a weak expulsion relationship, and it is clear from the table above that the hypothesis is unacceptable to achieve the probable value .4327) of 10% < i.e. there is no statistical indication between investment in technological banking devices and financial performance.

Hypothesis 3: There is a statistically significant impact between investment in atm number and financial performance in Saudi banks.

The correlation factor between atm number and financial performance was equal to (0.7639) indicating a strong ejection relationship, and it is clear from the table above that the hypothesis is acceptable to achieve the probability value (0.0000)

1% > i.e. there is a statistical indication of a moral level of 1% between the number of ATMs and financial performance**.**

Research issues:

How do investment in software and technology systems affect financial performance in Saudi Arabian banks?

It has become clear categorically that it is a negative impact, the more banks invest in software and technological systems, the more negative affecting financial performance.

How does investing in technology banking affect financial performance in Saudi Arabian banks?

It has turned out to be a positive impact, i.e. the more banks spend on technological banking devices, the more positive financial performance.

How does investing in ATMs affect financial performance in Saudi Arabian banks?

It has become clear categorically that it is a positive and strong impact, the more banks invest in the number of ATMs, the higher the return on financial performance.

4.2.3 Comparison with previous studies:

The search results are consistent with:

(Mohamed Amin Hassan, 2021; Aqua Nawash Arshid, 2017; Ihsan Ali al-Jubouri, 2016) in the existence of a statistical indication between both investment in software and technological systems, investment in the number of ATMs, and financial performance, the reason for the agreement in the hypotheses is that these banks have already had a positive impact in terms of independent variable and invested in it to improve the use of information technology, which made the degree of agreement between them high thee agrees with Hanna Ibrahim & Mona Bitar, 2019, that there is no statistically significant impact between investment in technological banking devices and financial performance, because both studies (team research and study) agreed that there is no statistical indication of investment in technological banking devices but there is a correlation between the two variables.

It differed with:

(Mohamed Amin Hassan, 2021; Aqua Noash Arshid, 2017) in the absence of a statistically significant impact between both investment in technological banking devices and financial performance, because the infusion of funds in research banks differed from the structure of what was studied in this research, which affected statistical indications and differences.

4.2.4 Evaluating the achievement of research objectives:

- Find out the impact of investment in software and technological systems on financial performance in Saudi Arabian banks.
- Find out the impact of investing in technology banking devices on financial performance in Saudi Arabian banks.
- Find out the impact of investment in the number of ATMs on financial performance in Saudi banks.

All research objectives have been achieved as the impact of investing in the above variables has been reached and identified and clarified in relation to the dependent variable, as well as the importance of investing in information technology on financial performance, which is important in raising the efficiency of banks.

5. **CONCLUSION**

The study aimed to analyze the impact of IT investment on financial performance as measured by return on assets in Saudi banks in a total of 6 banks, from 2016 to 2020, and was one of the first in the Saudi scale to contribute to the analysis of the impact of IT investment on financial performance, and after the practical analysis using the descriptive statistical analytical approach using the multiple regression model in the manner of micro-squares using the micro-squared program

(E-views) The study found that there is a statistically significant impact between it investment and financial performance in Saudi banks, which is heterogeneous, as there is a statistically significant impact between investment in ATMs and financial performance in Saudi banks, as well as a statistically significant impact between investment in software, technological systems and financial performance in Saudi banks, but no statistically significant impact between investment in technological banking devices and financial performance in Saudi banks. Saudi banks.

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