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# The role of computerized accounting information systems in reducing financial risks according to the (COSO) framework (An analytical study of a sample of Iraqi banks listed in the Iraq Stock Exchange)

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**Abstract**

The research aims to know the role that computerized accounting systems play in reducing financial risks according to the COSO framework. As this was achieved by analyzing spending on computerized accounting tools such as electronic devices and information networks, as well as conducting an analysis to measure financial risks according to the matrix provided by the COSO committee in a sample of Iraqi banks listed on the stock market for the fiscal period (2018-2019 -2020) and through that analysis, the research hypothesis was tested and its objectives were achieved.

**Keywords:** computerized accounting information systems, financial risks, COSO framework.

## 1. Introduction

As a result of the progress made in information technology and the emergence of the calculator as one of the assets in the company, it has become necessary for the companies' systems to adapt to these changes in order to enable them to keep pace with the changes taking place in the world (AlAdham et al, 2015:61). It is known that the use of computer-based systems in developing Accounting information systems reduce routine work and reduce administrative errors that occur in the manual accounting system. The computer-based accounting system has made the process of registration, posting, and balance very quickly and with high accuracy. It has even become possible for the company to obtain information about previous activities quickly and at any time it sees. Appropriate and automated systems reduce the costs of registration and migration operations, which saves money for the company (Backus, 2011:25).

Therefore, most banks have recently resorted to the application of computerized accounting, which is one of the tools of electronic governance in order to achieve speed in work and complete it accurately in a manner that achieves harmony between (efficiency and speed) as well as reducing financial risks to confront the current crisis that most Arab countries suffer from (Acosta & Fernández,2015;43) in light of the current financial crisis and the spread of the Corona pandemic, and this research comes with a practical study in order to know the role that innovative accounting plays in reducing the financial risks of a sample of Iraqi banks (Wilhelm, 2009:55).

### 1- Conceptual framework of computerized accounting information systems

The computerized accounting system is defined as a set of financial and accounting operations that are processed by the computer in the company in an organized manner, and through this definition, it is possible to know the components of the computerized accounting system as shown in the following figure (Eric 2011:52):-



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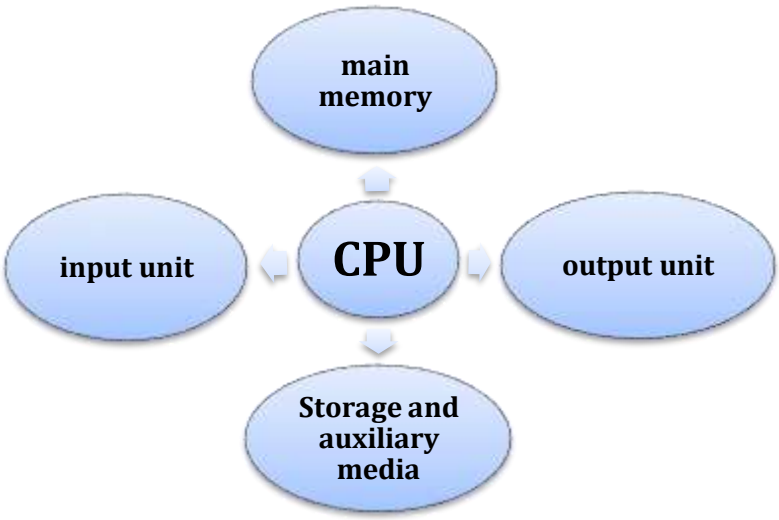


Figure (1) Components of the computerized accounting system

These components can be explained as follows :- (Kamath,2015:72)

a. Input units: These include a set of physical components that are used to enter data into the computerized system.

b. Central processing units: It is the internal part of the system that is responsible for all activities related to managing the system internally, which contain electronic circuits that are responsible for policies and software, and consists of the following (Janette & Dimitris, 2017:32):-

- Arithmetic and Logic Unit: It is a software that performs logical mathematical calculations.
- Control Unit: It is the unit responsible for the software for controlling the calculation operations, which supervises and directs the input, output, and storage media, and in turn resembles the human nervous system.

c. The main memory: In this section, the data and programs entered by the input media are stored. The results are also stored in this memory before being sent to the temporary memory or to the printer.

d. Auxiliary storage media: It includes all other storage media that work on storage other than the main memory unit.

e. Output units: It includes all the means through which the results are produced in the computerized system, including printers, speakers, and screens.

3-The mechanism of work in the computerized accounting system

There is no difference in the work performed by the computerized system in terms of the people in charge of it. The accountant is the one who gives orders to the computer to enter the financial data related to economic events, and the computer takes care of following the other steps. Also, the accountant who enters the data must coordinate with the computer programmer who follows The following steps (Fathi et al, 2014:21):

- The mechanism is suitable for encoding the elements of the computerized system, as is the case with the manual system, for the purpose of distinguishing the system from others.
- Create programmed daily records to record daily events.
- Creating programmed monthly ledgers and balances that work automatically.
- Establishing a mechanism for the programmed posting of accounts and financial operations.
- Create programmed final financial statements that give accurate financial results.

**4-** Framework and Hypotheses



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The research mainly aims to determine the role of innovative information technology provided by human knowledge on the financial performance of Iraqi banks, but the research contains other sub-goals represented as follows:

**a**. Knowing the procedures that can be used for the purpose of knowing the role of computerized accounting systems in reducing financial risks in Iraqi banks.

**b.** It helps to provide accurate accounting information for the purpose of conducting periodic assessments of the inherent and remaining financial risks that affect the company's objectives.

**c .** The research helps to determine the relative importance of the financial risks that have the highest priority in treatment and reduction in Iraqi banks.

5-The concept of financial risk

The financial risk is defined as the disturbance of a process, and its departure from its natural path outside the target or expected path, and the most common meaning is the company's inability to pay obligations, and defaulting is defined from a banking point of view as the project that does not pay interest on time and does not pay installments on time due (Zouari, 2013;98). The effects of the financial risk on banks are represented by depriving the bank of the benefits of non-performing loans, as well as the formation of a provision for non-performing loans (Altman et al, 2016:32), since the formation of the provision requires that the bank's profits be reduced in the year during which this provision was taken, and the risk leads to The financial burden leads to an increase in the financial burden on the administration by reducing the market value (Chieng, 2013; 67).

**Financial risk measurement model**

For the purpose of measuring financial risks in banks, the researcher used the following model**:**

$$\mathbf{Z = 1.042X_1 + 0.42X_2 - 0.461X_3 - 0.463X_4 + 0.271X_5}$$

X1: net profits before taxes on total assets.

X2: shareholders' equity over total liabilities.

X3: current assets to current liabilities.

X4: net sales to net assets

X5: cash assets to total assets

As a result of the great ease in applying the above model, it will be used to find out the size of the financial stumbling block that the research sample banks are exposed to, in addition to knowing the reasons that lead to financial stumbling in that sample.




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Figure (2) Research Scheme

6- Assessment and management of financial risks in accordance with the COSO framework

In 2004, the COSO Committee published the main concepts of the integrated framework in corporate risk management, which indicates that the risk management process deals with risks and opportunities that affect value creation or preservation, which is defined as follows: "It is a process implemented by the board of directors of the facility and management And individuals to apply the strategy developed across the organization with the aim of identifying potential events that may affect its performance to be within the accepted risks.

Risk assessment is also the core of the facility's process in view of potential events that may affect the achievement of its objectives. Risks are evaluated after identifying and defining them, and the risk assessment includes measuring the potential size of the loss and the possibility of its occurrence, then prioritizing the work. By dividing the risks into the following:

a- Inherent risks: represented in the fact that the risk exists before management takes any steps to control the possibility or impact of the risk.

b- Residual risk: It is represented as the risk that remains after the administration has applied internal control or any other form of risk response.

**7- Research Methodology**

For the purpose of achieving the objectives of the research, an analytical study will be conducted to find out the role of computerized accounting information systems in reducing financial risks according to the (COSO) framework in assessing financial risks by Iraqi banks, as well as conducting statistical analysis according to the statistical program (spss) in order to find relationships between indicators Applying computerized accounting and reducing or reducing risks. In order to achieve this, it is necessary to identify the characteristics of the sample of banks that facilitate credit, as follows:-

***Description of the research sample.***

Table (1) Description of the sample

| | Bank | Date of Establishment | nominal capital | capital at the date of listing | percentage of the private sector |
|---|---|---|---|---|---|
| 1 | Al Ahly | 1962 | 2.5 m | 90 m | 96.56% |
| 2 | Assyria | 1985 | 8 m | 240 m | 66.4% |
| 3 | The Middle East | 1989 | 5 m | 500 m | 90.7% |

(Source: Banks Published Data)

**First:** the level of application of computerized accounting tools in banks, the research sample

The percentage of applying computerized accounting tools will be extracted by knowing the volume of spending on these tools compared to other expenditures in the same bank, and these tools will be analyzed separately and according to the years, as shown in the following tables:-

Table (2) The level of spending on electronic and information systems in the research sample (amounts in thousands)

| bank | volume of spending on electronic governance tools | | | average | level of spending on electronic governance tools | | | average |
|---|---|---|---|---|---|---|---|---|
| | 2018 | 2019 | 2020 | | 2018 | 2019 | 2020 | |
| Al Ahly | 48 | 45 | 90 | 47 | 9% | 10% | 11 % | 10% |
| Assyria | 121 | 120 | 102 | 115 | 7% | 8% | 9 % | 8% |



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| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| The Middle East | 96 | 95 | 85 | 90 | 4% | 6% | 8 % | 6% |

(Source: Banks Published Data)

It is noted from Table (2) above the size and level of spending on electronic governance tools in the Iraqi banks, the research sample, as it is noted that the spending varies between banks, as the Assyrian Bank formed the highest percentage of spending in (2020) with an average of (115) thousand dinars and an average rate of (8%) Compared to expenditures in other fields and a growth rate of (2%) for each year, which indicates an increase in the bank's desire to shift towards computerized and electronic systems in a way that reduces the cost of administrative and manufacturing operations and achieves speed, accuracy, and efficiency of work.

Table (3) The level of spending on website systems in the research sample (amounts in thousands)

| bank | amount of spending on systems and websites | | | average | level of spending on systems and websites | | | average |
|---|---|---|---|---|---|---|---|---|
| | 2018 | 2019 | 2020 | | 2018 | 2019 | 2020 | |
| Al Ahly | 10 | 9 | 5 | 7.9 | 3% | 1% | 2% | 2% |
| Assyria | 9 | 4 | 4 | 8 | 2% | 2% | 3% | 2% |
| The Middle East | 3 | 8 | 9 | 6.8 | 6% | 6% | 4% | 5% |

(Source: Banks Published Data)

It is noted from Table (3) that the percentage of spending on designing electronic systems, informational websites, and internet networks was very small compared to other expenditures in the research sample banks, as it is noted that there is a fluctuation in spending between banks, in the year (2020) there was a decrease from the year (2018,2019) While the National Bank and the Ashur Bank recorded a relative increase in expenditures, as the value of expenditures on websites reached their highest levels by (7.9) thousand or (2%) in the year (2018). And protecting them and protecting their privacy of customers and customers, meaning that banks have not yet been able to establish strong electronic networks on the Internet to spread their information and protect them from penetration and tampering.

**Second:** extracting financial risk indicators

The kida model will be relied upon to measure the size of the financial risks in the research sample banks, according to the following equation:

$$\mathbf{Z = 1.042X_1 + 0.42X_2 - 0.461X_3 - 0.463X_4 + 0.271X_5}$$

Table (4) Indicators of (kida) model for measuring financial risks

| Financial risk indicators | National Bank | | | Assyria Bank | | | Middle East Bank | | |
|---|---|---|---|---|---|---|---|---|---|
| | 2018 | 2019 | 2020 | 2018 | 2019 | 2020 | 2018 | 2019 | 2020 |
| net profit before tax ÷ total assets (X1) | 0.14 | 0.06 | 0.04 | 2.22 | 0.23 | 0.43 | 0.52 | 0.80 | 0.56 |
| Total Equity ÷ Total Liabilities(X2) | 0.70 | 0.76 | 0.85 | 1.35 | 1.37 | 0.52 | 0.96 | 0.57 | 0.69 |
| Current assets ÷ Current liabilities (X3) | 1.70 | 1.80 | 1.93 | 2.20 | 2.32 | 0.48 | 1.56 | 1.45 | 0.87 |
| Sales ÷ Total Assets (X4) | 0.60 | 0.35 | 0.21 | 0.74 | 0.72 | 1.48 | 0.51 | 0.64 | 1.04 |



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| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Cash Assets ÷ Total Assets (X5) | 0.97 | 0.86 | 0.88 | 0.93 | 0.93 | 0.94 | 0.86 | 0.85 | 0.46 |

It is noted from Table (4) above the application of the (Kadi) model according to the above indicators for the purpose of knowing the size of the financial risks that the research sample banks may be exposed to, as the above table represents an application of the model equations, as the above percentages will be multiplied by coefficients of the value of (X) According to the following table:-

Table (5) Extracting the value of (Z)

| financial risk indicators | National Bank | | | Assyria Bank | | | Middle East Bank | | |
|---|---|---|---|---|---|---|---|---|---|
| | 2018 | 2019 | 2020 | 2018 | 2019 | 2020 | 2018 | 2019 | 2020 |
| 1.042(x1) | 0.14588 | 0.06252 | 0.04168 | 0.0567 | 0.05754 | 0.02184 | 0.54184 | 0.8336 | 0.58352 |
| 0.420(X2) | 0.0294 | 0.03192 | 0.0357 | 1.0142 | 1.06952 | 0.22128 | 0.04032 | 0.02394 | 0.02898 |
| 0.461(X3) | 0.7837 | 0.8298 | 0.88973 | 0.34262 | 0.33336 | 0.68524 | 0.71916 | 0.66845 | 0.40107 |
| 0.463(X4) | 0.2778 | 0.16205 | 0.09723 | 0.25296 | 0.25296 | 0.25568 | 0.23613 | 0.29632 | 0.48152 |
| 0.272(X5) | 0.26384 | 0.23392 | 0.23936 | 2.31324 | 0.23966 | 0.44806 | 0.23392 | 0.2312 | 0.12512 |

It is noted from Table (5) above that the (Kadi) model indicates that the value of (Z) has occupied its highest value in the Ashur Bank for the year (2018) with a value of (3.97972), and it has replaced its lowest percentage with the National Bank with a value of (1.3037) for the year (2020). ), as the table above indicates that the process of applying the model requires extracting the value of (Z) by collecting ratio indicators in the previous table that were multiplied by the coefficient (X) shown above.

**8- Using the (COSO) framework to assess financial risks**

For the purpose of assessing the financial risk, the (Kadi) model and the value of (Z) extracted from Table (5) will be employed with the matrix provided by the (COSO) committee and shown in Table (6) below to assess the financial risks and find out the potential for their impact on the company's objectives, so the levels of risk probability and its impact are determined According to the extracted values if the value of (Z) is positive, then it indicates a low level of risk probability and its impact. If the value of (Z) is negative, this indicates a high level of financial risk and its impact. If the value of (Z) is close to or equal to (0), then it is It expresses the average level of probability of occurrence and impact of financial risks, as shown in the following tables:

Table (6) Matrix framework (COSO) for assessing financial risks

| Possibility influence | High | Medium | Low |
|---|---|---|---|
| High | very high | High | Medium |
| Medium | High | Medium | Low |
| Low | Medium | Low | very low |

Table (6) shows the matrix provided by the (COSO) committee to evaluate financial risks and find out the possibility of their occurrence and their impact on the company's objectives, which will be employed with the value of (Z) shown in the following table:-

Table (7): The level of probability and impact of financial risks according to the COSO framework and the Z value

| National Bank | | Assyria Bank | | Middle East Bank | |
|---|---|---|---|---|---|
| year | 2018 | year | 2018 | Year | 2018 |
| Z | 1.50062 | Z | 1.32021 | Z | 1.3037 |



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| | | | | | |
|---|---|---|---|---|---|
| possibility and impact | low | possibility and impact | Low | possibility and impact | low |
| | | | | | |
| year | 2019 | year | 2019 | Year | 2019 |
| Z | 3.97972 | Z | 1.95304 | Z | 1.6321 |
| possibility and impact | very low | possibility and impact | Low | possibility and impact | low |
| | | | | | |
| year | 2020 | year | 2020 | Year | 2020 |
| Z | 1.77137 | Z | 2.05351 | Z | 1.62021 |
| possibility and impact | low | possibility and impact | very low | possibility and impact | low |

Table (7) shows the financial risk assessment process according to the COSO framework and the value of Z, which were employed together. It was concluded that increasing the value of Z to the positive value reflects a significant decrease in financial risk for the banks of the research sample, as well as a decrease in the probability and impact of the financial risk, which is expressed in the matrix provided by Before the COSO Committee, as it was found that the Z value increased for Al-Ahly Bank by (3.979) and for the Ashur Bank by (2.053), which is the highest percentage with the calculated Z value, which indicates a low level of probability of financial risk and its impact on the company's objectives according to the COSO framework. The research sample, applying computerized accounting systems, had a clear impact on the process of reducing financial risk through the speed of discovering misleading data and reducing manipulation, which were extracted from the above tables and whose effects are shown according to the following:-

Table (8): The effect of computerized accounting systems on reducing financial risks

| bank | The average volume of spending on electronic governance tools | The average level of spending on electronic governance tools | amount of spending on systems and websites | level of spending on systems and websites | average value Z | average probability and effect |
|---|---|---|---|---|---|---|
| Al Ahly | 47 | 10% | 7.9 | 2% | 1.37 | low |
| Assyria | 115 | 8% | 8 | 2% | 2.49 | low |
| The Middle East | 90 | 6% | 6.8 | 5% | 1.81 | low |

Table (8) shows a comparison of the role played by computerized accounting systems in helping to reduce financial risk by providing accurate information that reduces the risks of tampering with electronic accounting data. Increasing spending on networked and information systems by (5%, 2%), which was associated with an increase in the value of (Z) and a decrease in financial risk, which will be inferred through the statistical analysis shown in the following table:-

Table (9): Statistical analysis of the research variables

| Statistical indicators | Statistical ratios |
|---|---|
| N | 3 |
| link size | 0.941 |
| F | 0.074 |
| T | 11.514 |
| P-Value | 4.880 |
| Moral level sig | 0.002 |



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**9- Results**

It is noted from Table (9) above that there is a strong direct correlation between computerized accounting information systems and the reduction of financial risks in Iraqi banks, as the value of the correlation reached (0.941) at a significant level (0.002), which is less than the size of the significance (5%). One leads to an increase in the value of (Z), and thus a decrease in financial risk by (5.212).

**10-Conclusion**

Through meticulous analysis of data from Iraqi banks, the researcher's findings unveil a significant correlation between the implementation of computerized accounting tools and the mitigation of financial risks. These tools provide Iraqi banks with efficient mechanisms to expedite and execute tasks with utmost precision. However, it is worth noting that there exists a noticeable disparity in the adoption rates of computerized accounting mechanisms among Iraqi banks due to varying resource availability and application capabilities. To address this issue, the research proposes a solution for Iraqi banks by advocating the activation of computerized accounting foundations. This can be achieved through the establishment of governance rules, whereby banks form a governance committee consisting of multiple stakeholders from ministries and oversight bodies. Additionally, the involvement of a professional council dedicated to control and auditing is recommended to streamline and regulate the operations of the banks.

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