

The Effect of Inflation on Capital Adequacy in Iraqi Banking Sector with Statistical Analysis

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Abstract

The study investigates the correlation between specific economic variables (inflation) and the financial performance of government-owned banks in Iraq from 2000 to 2021. It aims to determine the impact and relationships of that variable on capital adequacy ratios. Where it was found that there is a statistically significant correlation and effect between inflation and capital adequacy. The research employs statistical tools like SPSS and MATLAB for data analysis and modeling to explore the logical connections between the variables. By focusing on these variables, the study aims to provide insights into the banking sector's performance.

Keywords: capital adequacy ratio, inflation, financial performance, correlation.

1. Introduction

The banking sector is considered one of the important sectors, it represents an important link in the development of the financial system in any country and a reflection of its economic and financial systems, it plays a great role in the various activities which distinguish from other sectors (Saleh, 2008). Banks are important in terms of providing financial services, credit facilities, and various social services, therefore, the performance achieved by these banks must be made clear to the dealers (shareholders, suppliers, customers, and others), so banking performance is one of the issues that have a great importance in terms of their management, shareholders and dealers, The banking performance measures what is actually achieved with what it was planned in advance so that the bank's management and others would know about the plan in place. The performance of the banking system, including its level of development and stability, depends on the national or regional economic conditions. The Iraqi economy is characterized by a challenging macroeconomic environment due to the rapid and continuous changes experienced by the overall economic variables. These changes in economic variables can lead to significant difficulties in the banking industry and banking stability. Consequently, an effective tool must be used to determine the expected future risk level of the variables and economic conditions to achieve banking stability. Inflation is considered one of the most critical factors that significantly affect the performance of banks and their financial performance (Anshu, 2019).

This research dealt with the role of inflation, which is considered one of the macroeconomic variables, and its impact on a financial performance indicator of Iraqi state-owned banks: capital adequacy.

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2. Research Problem

The research problem is defined by answering the following question: Does inflation, as one of the macroeconomic variables, have an impact on the adequacy of capital, as one of the financial performance indicators of the Iraqi banking sector?

3. Research Objective

The aim of this study is to diagnose and explain the relationship between inflation as an independent macroeconomic variable and capital adequacy as a financial performance indicator for the banking sector as a dependent variable during the period 2000-2021 through statistical analysis of the aforementioned variables and the impact of some on others.

4. Research Hypotheses

The hypotheses of the research are as follows:

- 1- The first hypothesis (H01): There is no statistically significant correlation between inflation and capital adequacy.
- 2- The second hypothesis (H02): There is no statistically significant effect relationship between inflation and capital adequacy.

5. Methodology

In order to achieve the objectives of this study, the researcher used the analytical method, which was based on integrating the theoretical side of the subject (measuring the relationship between capital adequacy, one of the indicators of the financial performance of government banks in Iraq, and inflation, one of the macroeconomic variables for the period (2000-2021)) and the side of analytical method is based on drawing conclusions after extrapolating the results of the statistical data.

5.1 Financial performance

Financial performance is one of the indicators used to measure the success of an institution in terms of financial returns. Financial performance is used as a tool for this measurement by the government through the government monitor, which works to monitor compliance with regulatory matters and the general safety of the financial sector (Al-Abody, 2022). The difference in the concept of banking performance stems from the different criteria and measures used in studying and measuring the performance of managers and banks (Hamdan & Edrees, 2009). Weston et al (2015) clarified that the term financial performance of a bank refers to quality-based issues such as competitiveness, efficiency, profitability, and stability. Therefore, banks are important institutions with a great role in providing financial services, credit facilities, various social services, and other banking services that benefit all members of society, projects and business enterprises (Abo-Mousa,2005),and there are numerous financial indicators used to evaluate bank performance. However, some of the most common indicators for measuring financial performance are (Fouad (2016):

- 1- Profitability index.
- 2- Liquidity index.
- 3- Capital adequacy index.
- 4- Asset quality index.

In this research, we will address the capital adequacy index.

5.2 Capital adequacy index:

This indicator is also known as the capital adequacy ratio, which refers to the ultimate capacity of a financial institution or bank to meet its financial obligations. Capital adequacy indicates robustness rather than efficiency, i.e. the strength of the capital. Capital adequacy ratios are international standards for measuring credit risks and show the extent to which capital is adequate in protecting the funds of depositors and shareholders, covering foreseeable and unforeseeable risks (Saigh, 2018).

There are models that are used in capital adequacy index, divided into (Balazouz, et al, 2013):

- 1- Regulatory capital to risk weighted assets.
- 2- Basic regulatory capital to risk weighted assets.
- 3- Capital to assets or financial leverage

5.3 Macroeconomic Variables

There is a set of macroeconomic variables that constitute monetary policy, including exchange rate, interest rate, and inflation. This research will focus on inflation and its impact on the financial performance of banks as a longstanding variable that has dominated Iraq for a long time, at least since the 1990s until now.

5.3.1 The impact of inflation on the financial performance of banks

Inflation is one of the factors that affects the performance of the financial sector. An increase in the inflation rate has a negative impact on the performance of banks (Mohammed, 2014).

The developed financial sector plays an important role in achieving a fast and more sustainable economic growth rate. A more advanced financial sector promotes economic growth through reducing information and transaction costs, mobilising savings and financing investments, conducting settlement and payment transactions, and diversifying risks. Inflation is one of the factors affecting the performance of the financial sector. Empirical economic literature has confirmed a negative relationship between inflation and the development of the financial sector and economic growth. Increased inflation rates have a negative impact on the performance of the financial sector before affecting economic growth. In this regard, Al-Shorbagy (2006) highlighted the importance of the critical or threshold level of inflation in the relationship between inflation and financial sector performance. He explained that the negative impact of inflation on financial sector performance will be greater if the prevailing inflation rate exceeds the critical rate of inflation. If the results demonstrate a negative impact of inflation on the performance of the financial sector, then the development of the financial sector will have a negative impact on economic growth (Al-Shorbagy, 2006).

6. Data Collection and Analysis

6.1 Description and diagnosis of research variables

In this paragraph, the research variables will be described by illustrating them through graphic forms, and some statistical measures will be presented for these variables.

The research sample comprises seven Iraqi government banks, as shown in Table (1):

Table (1): Iraqi government banks

No.	Name of the bank	Number of branches	Date of Establishment
1	Rafidain Bank	155	1941
2	Rasheed Bank	151	1988
3	Agricultural Cooperative Bank	19	1935
4	Industrial Bank	19	1946
5	Real Estate Bank	16	1948
6	Iraqi Trade Bank	27	2004
7	Al-Nahrain Islamic Bank	1	2015
	Total government banks	388	

Source: Annual Statistical Bulletin - Central Bank of Iraq - Department of Statistics and Research - 2021

The sample covers the period (2000 - 2021) and consists of two aspects: the independent variable and the dependent variable. The independent variable is inflation, while the dependent variable includes the capital adequacy ratio.

Figure (1) represents the graphical representation of the variables used:

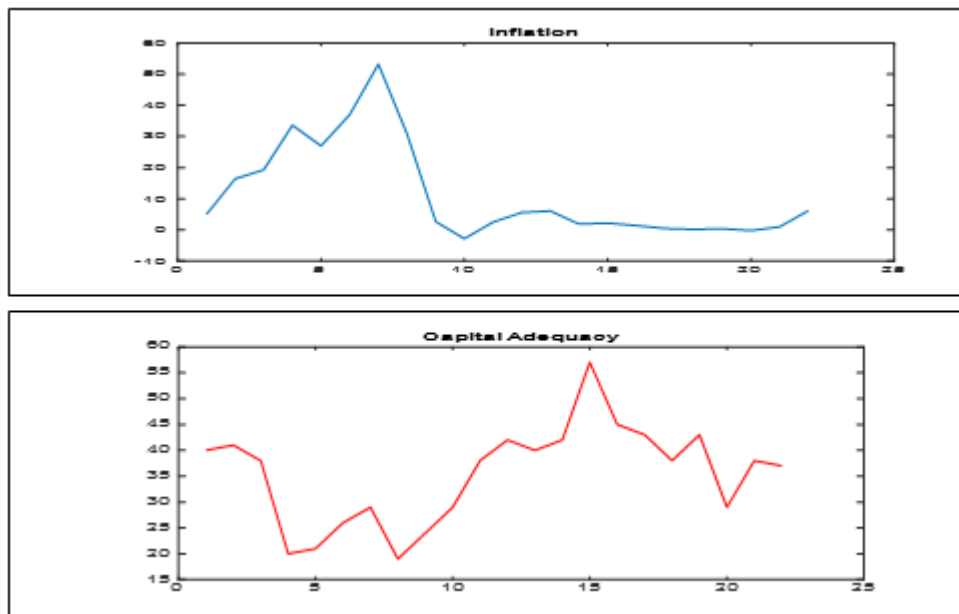


Figure (3): Charts for the independent and dependent variables

Source: From the researcher's work based on the outputs of the Matlab program (2020a)

The graphical representations of inflation and capital adequacy variable in Figure (3) indicate a mutual oscillation between the two variables during the initial period, which can be referred to as the 90s. We can observe the oscillation of the inflation rate from the figure, which coincides with the oscillation of the capital adequacy variable. This was a result of the economic sanctions imposed on Iraq during that time causing fluctuations in economic indicators to rise.

Table (3) displays the statistical measures of independent and dependent variables.

Table (3): The statistical measures of independent and dependent variables

Variables	Mean	Standard deviation
Inflation rate	11.36	15.38
capital adequacy ratio	35.36	9.60

Source: The researcher's work, based on the outputs of the SPSS program (22).

Table (3) shows the arithmetic mean of the independent variable, the inflation rate, which is (11.36), and the arithmetic mean of the dependent variable, the capital adequacy ratio, which is (35.36). while the standard deviation values for the independent and dependent variable as shown in the table were (15.38 and 9.60), respectively.

6.2. Testing of research variables

This paragraph deals with testing the data for the dependent variable (capital adequacy) to see if it follows a normal distribution, according to the Shapiro-Wilk test, which is used in small samples (less than 30) (Abu Daher, 2018) and according to the following hypotheses:

Null hypothesis: The data follow a normal distribution

Alternative hypothesis: The data do not follow a normal distribution

Table (4) Test of the normal distribution of capital adequacy

Variable	Shapiro-Wilk	Sig.
Capital Adequacy	0.929	0.115

Source: The researcher's work, based on the outputs of the SPSS program (22)

From Table (4), we find that the value of Sig. capital adequacy is greater than (0.05), so the data are distributed normally.

6.3. Analysis of the correlation between the inflation variable and the banking financial performance variable (capital adequacy)

This research includes testing the first hypothesis related to the correlation between the variables of the study represented by (No significant correlation between inflation and the variable of banking financial performance (capital adequacy)).

Table (6) shows the value of the Pearson correlation coefficient between the two variables (inflation and capital adequacy), as follows:

Table (6): Pearson correlation coefficient and its significant value

Dependent \ Independent	Inflation	Indicator
Capital Adequacy	-0.58*	r
	0.004	p-value

Source: The researcher's work, based on the outputs of the SPSS program (22)

Table (6) shows the value of the correlation coefficient between inflation and capital adequacy is (-0.58) with significant value (0.004), the relationship between inflation and capital adequacy is inverse.

6.4. Analysis of the effect relationship between the variable of banking financial performance (capital adequacy) and the macroeconomic variable (inflation).

This paragraph includes testing the second hypothesis H02, which states (there is no effect relationship between the banking financial performance variable (capital adequacy) and the macroeconomic variable (inflation)).

Table (7) shows the parameters of the linear regression model and the measurements of the model, as follows:

Table (7): Capital adequacy regression model with independent variable

Dep. Var. Indep.	Capital adequacy							
	Sig.	R ²	t		β_0	β_1	F	
			Cal.	Tab.			Cal.	Tab.
Inflation	0.04	0.35	2.21	0.000	41.87 (0.00)	-0.318	5.098 (0.017)	3.15

$n = 22$, $df = (3,18)$

It can be seen from the table (7) that β_0 , value of the constant limit in the regression equation, reflects the capital adequacy ratio in the absence of inflation. The value of the parameter was (41.87) and the significance of its value was (0.000).

The value of β_1 , which is the inflation parameter, reflected the inverse relationship between capital adequacy and inflation, this is evident from the negative sign of β_1 , as an increase in the inflation rate leads to a decrease in the capital adequacy ratio, the value of β_1 is (-0.318), with a significant value of (0.04).

The value of F is (5.098) with a significant probability value (0.017), and R² is (35%), which represents the changes that occurred in the dependent variable (capital adequacy ratio) caused by the independent variables (inflation), and the remaining percentage (64%), it is caused by other factors that cannot be controlled or other variables that did not enter the model.

From here, there is an effect relationship between part of the economic variables (inflation) and the variable of financial performance (capital adequacy).

7. Results and Conclusion:

Through the statistical analysis of the macroeconomic variable (inflation) and the financial performance index of Iraqi government banks (capital adequacy), we can summarize what has been reached with some conclusions as follows:

- 1- There is a statistically significant correlation between the capital adequacy variable on the one hand, and inflation on the other hand.
- 2- In general, there is a significant effect of the inflation variable on the capital adequacy variable, with a significance of 0.04.
- 3- We conclude from the significant effect of the inflation variable on the capital adequacy variable that inflation greatly affects the ability of banks to bear losses.
- 4- The existence of a statistically significant effect of the inflation variable on the capital adequacy variable indicates that inflation is an important factor that banks must take into account when managing their capital.

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