



# EVALUATING THE PROFITABILITY OF BANKS ACCORDING TO ACCOUNTING INDICATORS AND THEIR FUTURE FORECASTS- APPLIED TO A SAMPLE OF BANKS LISTED IN THE IRAQ STOCK EXCHANGE

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<b>Article history:</b>	<b>Abstract:</b>
<b>Received:</b> 11 <sup>th</sup> June 2024	Achieving profit is one of the main goals that represent the success of banks and the continuation of competition with other banks in the competitive market. It is also one of the important aspects in making investment decisions by investors, as it represents the percentage of measuring the bank's performance in the market. The quality and efficiency of management are also measured through profitability, as it is considered one of the most important factors that indicate the success of management. Therefore, this research aims to measure and evaluate the profitability of banks according to accounting indicators (ROA) (ROE) for the period from (2014 to 2023) and measure their future predictions through quantitative and statistical methods for the period from (2024-2033) for a sample of banks listed on the Iraqi Stock Exchange, which were represented by five banks: (Bank of Baghdad, Gulf Commercial Bank, Investment Bank of Iraq, National Bank of Iraq, and Trans Iraq Bank)
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## INTRODUCTION

Profit making is the main objective of the existence of banks in the long term, it is the main objective of the owners and management, and the process of analyzing profitability is one of the important things that investors take into account when making investment decisions, as the bank must achieve a satisfactory level of profitability in the competitive market, as it represents the percentage of measuring the bank's performance in the market, as one of the basic conditions for the success of the bank and its survival in the long term is profitability, without it the bank will not be able to attract external capital and will not be able to remain in the market. (Margaretha and Supartika, 2016: 132) The bank can survive in the competitive market if its profits are good. Profits reassure the bank's stakeholders (managers, employees, lenders and investors), as profits are not just a result but rather a necessary and important condition for the bank's success and continuity in the market. (Abel, Roux, 2016: 845)

One of the main goals of any bank is to be sustainable in the competitive market, and to do so it is important for the bank to develop and implement plans and strategies that can improve and enhance its performance. The efficiency and quality of management depends on their ability to identify the elements that can lead to maximizing profitability, as it is considered one of the most important factors that indicate the success of management and the satisfaction of shareholders, and thus works to attract investors and contribute to the sustainability of the bank. (Alarussi and Alhaderi, 2017: 442)

The main objective of this research is to evaluate the profitability of banks and measure their future expectations for the coming years by applying it to a sample of commercial banks listed in the Iraqi Stock Exchange. Through knowing and understanding the current and future profitability index, it will give feedback to the bank where it can find the appropriate policy that should be taken to solve the problems related to profits and work to maximize profitability.

## Part One: Profitability Indicators:

Profitability is measured through several indicators, and the most common accounting indicators used by researchers and specialists are the return on assets (ROA) indicator and the return on equity (ROE) indicator.



**First: Return on assets index:**

Analysts and specialists prefer to use return on assets (ROA) as a measure of profitability as it shows the extent to which the bank is successful in using its resources to achieve profit. A high level of this indicator is considered a good thing as it indicates the bank's efficiency in managing its financial position. (Aydognmus and others, 2022: 122) This indicator is calculated as a percentage of dividing net profit by the bank's total assets and is considered an indicator of management efficiency. (Petriaa and others, 2015: 520) ROA measures the ability of the bank's assets to achieve profits. If the return on assets is high, this means that there is high efficiency in asset management, which means high efficiency in bank management (Kartikasari and Merianti, 2016: 410)

This indicator gives an indication of the effectiveness and efficiency of the management in managing the bank's assets to generate and achieve revenues, as it is used to evaluate the efficiency and operational performance of the bank, as it studies the profits resulting from the assets invested by the bank. (Rahman and others, 2015: 139)

ROA is calculated using the following formula: (Shahnia and others, 2020: 789)

$$(ROA) = \text{Net profit} / \text{Total assets}$$

**Second: Return on equity indicator :**

The second measure of profitability is the return on equity (ROE), which is calculated as a ratio of net profit divided by equity, and it expresses the net return on capital invested by shareholders (Petria and others, 2015: 520). It measures the bank's efficiency in achieving profits from each unit of shareholders' equity, and shows how well the bank uses investment funds to achieve growth in profits. (Gul and others, 2011: 71)

ROE is calculated using the following formula: (Supriyadi, 2021: 223)

$$ROE = \text{Net profit} / \text{Total Equity}$$

**Part Two: The Practical Side of the Research:**

**First: Measuring and analyzing profitability indicators**

According to the equations mentioned above, the results of the return on assets and return on equity were obtained for the research sample banks, which consisted of five banks, for the period from 2014 to 2023, as shown in the table below:

Profitability Indicators (ROA) (ROE)

bank year	Bank of Baghdad		Gulf Commercial Bank		Investment Bank of Iraq		National Bank of Iraq		Trans Iraq Bank	
	ROA	ROE	ROA	ROE	ROA	ROE	ROA	ROE	ROA	ROE
2014	1.797	11.232	4.205	9.925	5.169	10.177	1.475	3.445	1.910	2.889
2015	0.855	4.939	1.155	2.912	3.171	6.221	0.777	1.599	2.932	4.053
2016	1.686	7.158	0.731	1.847	1.761	3.512	4.060	8.164	3.620	5.443
2017	0.561	2.285	0.701	1.318	0.696	1.411	0.490	1.037	2.910	3.688
2018	0.372	1.556	0.102	0.188	0.055	0.119	-	-3.068	1.978	2.368
2019	0.644	2.667	-0.715	-1.281	0.003	0.006	1.448	3.570	0.381	0.495
2020	1.423	7.254	-	-	0.967	2.083	2.226	6.474	0.872	1.112
2021	1.947	9.698	-0.935	-1.655	0.172	0.427	1.434	8.270	-	-
2022	3.082	15.203	-0.927	-1.662	1.172	3.100	1.139	8.263	-	-
2023	5.667	32.884	0.961	1.712	4.030	12.182	4.770	37.996	-	-
arithmetic mean	1.803	9.487	0.527	1.330	1.719	3.923	1.631	7.575	1.120	1.476

**1. Return on Assets (ROA)**

As mentioned above, this indicator shows the extent of the bank's success in using its resources to achieve profit, as it measures the ability of the bank's assets to achieve profits. If the return on assets is high, this means high efficiency in asset management, which means high efficiency in bank management.

From the above table, we note that the Bank of Baghdad achieved the highest return on assets in 2023, which amounted to (5.667), which is the highest return among the banks in the research sample, while the lowest return was in 2018,



which amounted to (0.372), while the arithmetic mean for the period amounted to (1.803), which is the highest arithmetic mean for the banks in the research sample.

As for Gulf Bank, the highest return was in 2014 (4.205) and the lowest return was in 2020, reaching (-0.0002), which is the lowest return among the banks in the research sample. As for the arithmetic mean, it reached (0.527), which is the lowest arithmetic mean among the banks. As for the Investment Bank of Iraq, the highest return was in 2014, reaching (5.169), and the lowest return was in 2019, reaching (0.003), while the arithmetic mean for the period reached (1.719).

As for the National Bank of Iraq, the highest return was in 2023, reaching (4.770), and the lowest return was in 2018, reaching (-1.505), and the arithmetic mean for the period was (1.631).

As for the Trans-Iraq Bank, the highest return was in 2016, reaching (3.620), and the lowest return was in 2021, reaching (-0.579), and the arithmetic mean for the period was (1.120).

## 2. Return on equity :

As we mentioned, this indicator expresses the net return on capital invested by shareholders. It measures the bank's efficiency in achieving profits from each unit of shareholders' equity, and shows the extent to which the bank uses investment funds to achieve growth in profits.

We note from the table above that the Bank of Baghdad achieved the highest return on equity in 2023, which amounted to (32.844), while the lowest return was in 2018, which amounted to (1.556). As for the arithmetic mean for the period, it amounted to (9.487), which is the highest arithmetic mean for the banks in the research sample.

As for the Gulf Commercial Bank, the highest return was in 2014, reaching (9.925), while the lowest return was in 2020, reaching (-0.0004), which is the lowest return among the banks in the research sample. As for the arithmetic mean for the period, it reached (1.330), which is the lowest arithmetic mean for the banks in the research sample.

As for the Investment Bank of Iraq, the highest return was in 2023, reaching (12.182), while the lowest return was in 2019, reaching (0.006), while the arithmetic mean for the period reached (3.923).

As for the National Bank of Iraq, the highest return was in 2023, reaching (37.996), which is the highest return among the banks in the research sample. As for the lowest return, it was in 2018, reaching (-3.068), while the arithmetic mean for the period reached (7.575).

As for the Trans-Iraq Bank, the highest return was in 2016, reaching (5.443), while the lowest return was in 2022, reaching (-3.116), while the arithmetic mean for the period reached (1.476).

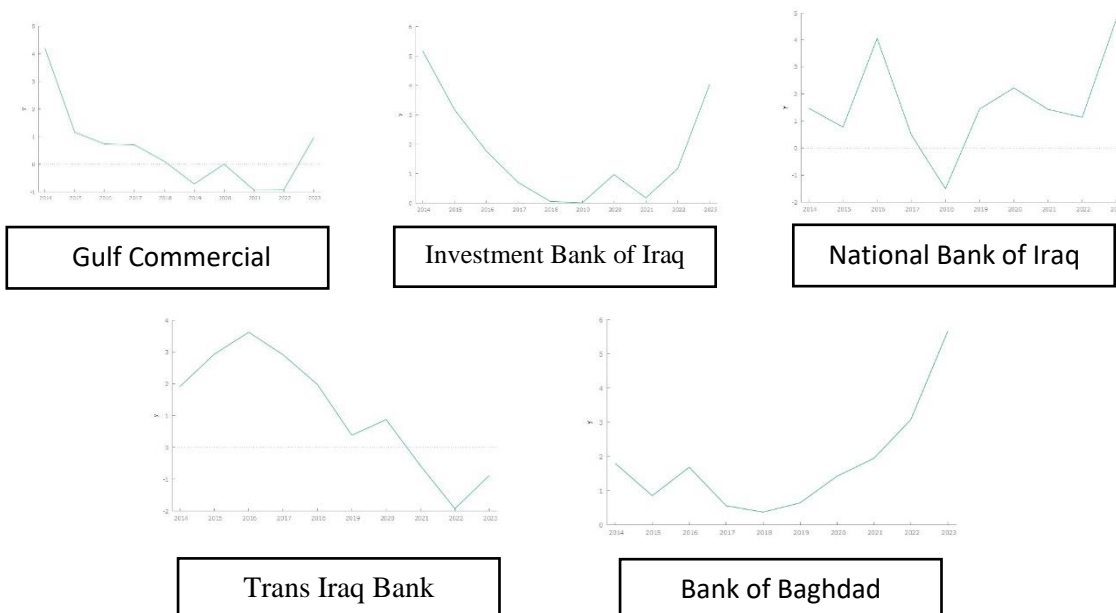
## Second: Measuring future profit forecasts:

After collecting data on five banks for a period of ten years and processing it using accounting indicators, work will be done to predict the data by using statistical quantitative methods, which were done through several steps explained in the following points for each accounting indicator:

### 1. Return on Assets (ROA) Index:

#### 1.1: Data stability:

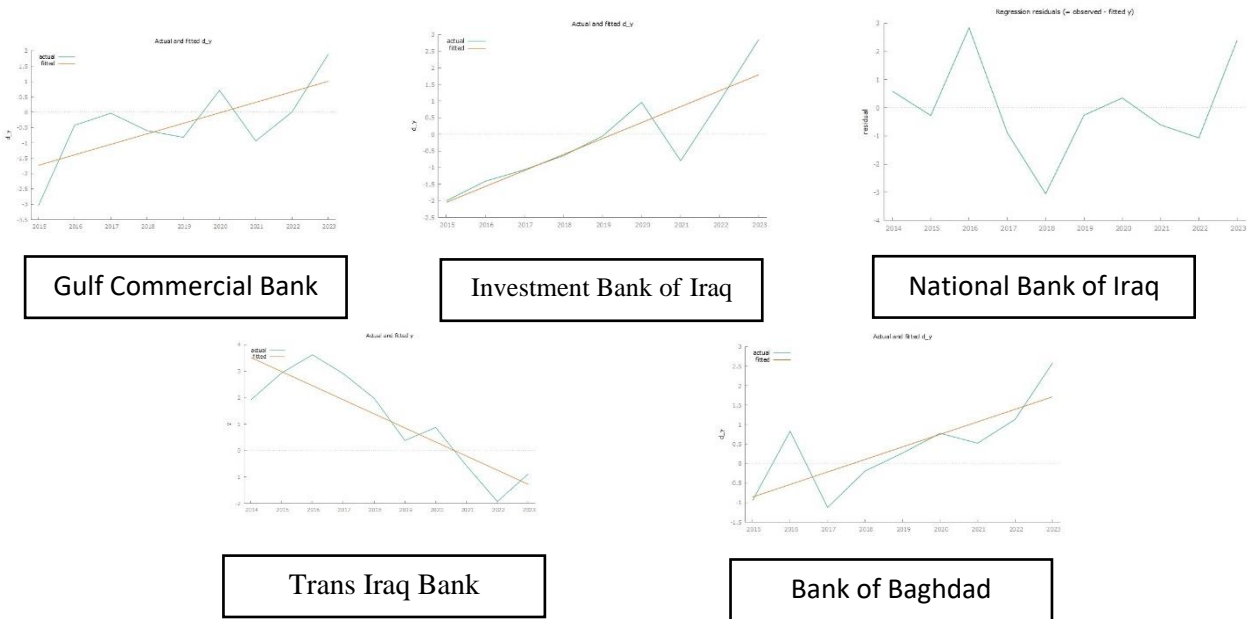
The data stability test was conducted through the chart shown below for the five banks :





The above figures show the instability of the data studied for the banks under study, and require processing in order to complete the testing process.

2.1 Data stability after processing:



After taking the differences for the data for the purpose of processing the data, which were in the above forms, and which noted the stability of the data in the presence of some data in which mutations occur as a result of external and internal changes and variables.

3.1 Least squares test:

The least squares test is performed on the data obtained from the banks under study, which are explained in the following tables:

<b>Investment Bank of Iraq</b>				
<b>Model 1: OLS, using observations 2014-2023 (T = 10)</b>				
<b>Dependent variable: y</b>				
	<b>Coefficient</b>	<b>Std . Error</b>	<b>t-ratio</b>	<b>p-value</b>
<b>Const</b>	<b>-3.00646</b>	<b>0.660175</b>	<b>-4.554</b>	<b>0.0026</b>
<b>time</b>	<b>0.479983</b>	<b>0.101068</b>	<b>4.749</b>	<b>0.0021</b>
<b>Mean Dependent Var</b>	<b>-0.126556</b>	<b>S. D . dependent var</b>	<b>1.504711</b>	
<b>Sum Squared Resid</b>	<b>4.290212</b>	<b>S .E . of regression</b>	<b>0.782871</b>	
<b>R - squared</b>	<b>0.763145</b>	<b>Adjusted R-squared</b>	<b>0.729309</b>	
<b>F (1, 8)</b>	<b>22.55396</b>	<b>P- value(F)</b>	<b>0.002086</b>	
<b>Log - likelihood</b>	<b>-9.436449</b>	<b>Akaike Criterion</b>	<b>22.87290</b>	
<b>Schwarz Criterion</b>	<b>23.26735</b>	<b>Hannan - Quinn</b>	<b>22.02168</b>	
<b>rho</b>	<b>-0.242147</b>	<b>Durbin -Watson</b>	<b>2.091614</b>	

<b>National Bank of Iraq</b>				
<b>Model 1: OLS, using observations 2014-2023 (T = 10)</b>				
<b>Dependent variable: y</b>				
	<b>Coefficient</b>	<b>Std. Error</b>	<b>t-ratio</b>	<b>p-value</b>



const	4.71576	1.35721	3.475	0.0084
time	0.480719	0.579104	0.8301	0.4306
Mean Dependent Var	5.500000	S. D . dependent var	3.027650	
Sum squared resid	75.95742	S .E . of regression	3.081343	
R- squared	0. 79304	Adjusted R-squared	-0.035783	
F (1, 8)	0.689079	P- value (F)	0.430551	
Log- likelihood	-24.32732	Akaike Criterion	52.65465	
Schwarz Criterion	53.25982	Hannan - Quinn	51.99078	
rho	0.788847	Durbin - Watson	0.232593	

<b>Gulf Commercial Bank</b>				
<b>Model 1: OLS, using observations 2014-2023 (T = 10)</b>				
<b>Dependent variable: y</b>				
	<i>Coefficient</i>	<i>Std. Error</i>	<i>t-ratio</i>	<i>p-value</i>
const	-2.41566	0.858183	-2.815	0.0260
time	0.342537	0.131382	2.607	0.0351
Mean Dependent Var	-0.360444	S .D. dependent var	1.336487	
Sum Squared Resid	7.249700	S.E . of regression	1.017679	
R- squared	0.492658	Adjusted R-squared	0.420181	
F (1, 8)	6.797409	P- value (F)	0.035057	
Log- likelihood	-11.79726	Akaike Criterion	27.59451	
Schwarz Criterion	27.98896	Hannan- Quinn	26.74329	
rho	-0.191552	Durbin- Watson	1.995809	

<b>Trans Iraq Bank</b>				
<b>Model 1: OLS, using observations 2014-2023 (T = 10)</b>				
<b>Dependent variable: y</b>				
	<i>Coefficient</i>	<i>Std. Error</i>	<i>t-ratio</i>	<i>p-value</i>
const	4.05080	0.661464	6.124	0.0003
time	-0.532709	0.106605	-4.997	0.0011
Mean Dependent Var	1.120900	S. D. dependent var	1.853296	
Sum Squared Resid	7.500597	S.E . of regression	0.968284	
R - squared	0.757359	Adjusted R-squared	0.727029	
F (1, 8)	24.97056	P -value (F)	0.001057	
Log- likelihood	-12.75137	Akaike Criterion	29.50275	
Schwarz Criterion	30.10792	Hannan - Quinn	28.83888	
rho	0.135407	Durbin - Watson	1.369610	

<b>Bank of Baghdad</b>				
<b>Model 1: OLS, using observations 2014-2023 (T = 10)</b>				
<b>Dependent variable: y</b>				
	<i>Coefficient</i>	<i>Std. Error</i>	<i>t-ratio</i>	<i>p-value</i>
const	-1.49860	0.632805	-2.368	0.0497
time	0.321433	0.0968782	3.318	0.0128
Mean Dependent Var	0.430000	S.D . dependent var	1.125890	
Sum Squared Resid	3.941859	S. E. of regression	0.750415	
R- squared	0.611296	Adjusted R-squared	0.555767	
F (1, 8)	11.00855	P- value (F)	0.012802	
Log- likelihood	-9.055372	Akaike Criterion	22.11074	
Schwarz Criterion	22.50519	Hannan -Quinn	21.25952	
rho	-0.360063	Durbin- Watson	2.388503	



For the above tables, the data was analyzed and for the National Bank of Iraq, the calculated F value was (0.689079) with a significance of (0.0084) which is less than the significance degree of 0.05. The analysis results also showed that the value of the coefficient of determination was (0.79304), which explains 79% of the returns variable. As for the parameters of the linear regression model, they showed that the value of the marginal slope reached (4.71576) with a significance of (0.0084), while the fixed limit reached 0.480719 with a significance of 0.4306. As for the Investment Bank of Iraq, the calculated F value was (22.55396) with a significance of (0.002086), which is less than the significance degree of 0.05. The analysis results also showed that the value of the coefficient of determination was (0.763145), which explains 76% of the returns variable. The linear regression model parameters showed that the marginal slope value reached (-3.00646) with a significance of (0.0026) while the fixed limit reached 0.479983 with a significance of 0.0021. As for the Gulf Commercial Bank, the calculated F value was (6.797409) with a significance of (0.035057), which is less than the significance degree of 0.05. The analysis results also showed that the value of the coefficient of determination was (0.492658), which explains 49% of the returns variable. As for the linear regression model parameters, they showed that the marginal slope value reached (-2.41566) with a significance of (0.0260) while the fixed limit reached 0.342537 with a significance of 0.0351. The results of the Baghdad Bank calculated F value were (11.00855) with a significance of ( 0.012802) which is less than the significance degree of 0.05. The analysis results also showed that the value of the coefficient of determination (0.611296) which explains 61% of the returns variable. As for the parameters of the linear regression model, they showed that the value of the marginal slope reached (-1.49860) with a significance of (0.0497). As for the fixed limit, it reached -0.532709 with a significance of 0.0128. As for the Trans-Iraq Bank, the calculated F value is (24.97056) with a significance of (0.001057), which is less than the significance level of 0.05. The analysis results also showed that the value of the coefficient of determination is (0.757359), which explains 75% of the returns variable. As for the parameters of the linear regression model, they showed that the value of the marginal slope reached (4.05080) with a significance of (0.0003). The constant limit was -0.532709 with a significance of 0.0011.

**4.1 Profitability forecasting:**

<b>National Bank of Iraq</b>				
<b>For 95% confidence intervals, <math>t(8, 0.025) = 2.306</math></b>				
<b>Obs</b>	<b>y</b>	<b>prediction</b>	<b>std. error</b>	<b>95% interval</b>
2024	undefined	2.53873	2.18606	(-2.50233, 7.57980)
2025	undefined	2.70370	2.29190	(-2.58143, 7.98883)
2026	undefined	2.86867	2.40951	(-2.68766, 8.42501)
2027	undefined	3.03364	2.53725	(-2.81727, 8.88455)
2028	undefined	3.19861	2.67368	(-2.96690, 9.36412)
2029	undefined	3.36358	2.81752	(-3.13364, 9.86081)
2030	undefined	3.52855	2.96771	(-3.31501, 10.3721)
2031	undefined	3.69352	3.12333	(-3.50890, 10.8959)
2032	undefined	3.85849	3.28361	(-3.71352, 11.4305)
2033	undefined	4.02346	3.44789	(-3.92738, 11.9743)

<b>Investment Bank of Iraq</b>				
<b>For 95% confidence intervals, <math>t(7, 0.025) = 2.365</math></b>				
<b>Obs</b>	<b>d_y</b>	<b>prediction</b>	<b>std. error</b>	<b>95% interval</b>
2024	undefined	2.27336	0.967655	(-0.0147789, 4.56150)
2025	undefined	2.75334	1.02407	(0.331805, 5.17488)
2026	undefined	3.23333	1.08697	(0.663044, 5.80361)
2027	undefined	3.71331	1.15531	(0.981446, 6.44518)
2028	undefined	4.19329	1.22816	(1.28915, 7.09744)
2029	undefined	4.67328	1.30479	(1.58795, 7.75861)
2030	undefined	5.15326	1.38455	(1.87932, 8.42720)
2031	undefined	5.63324	1.46694	(2.16448, 9.10201)
2032	undefined	6.11323	1.55154	(2.44441, 9.78204)



2033	undefined	6.59321	1.63801	(2.71993, 10.4665)
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<b>Bank of Baghdad</b>				
For 95% confidence intervals, $t(7, 0.025) = 2.365$				
Obs	d_y	prediction	std. error	95% interval
2024	undefined	2.03717	0.927538	(-0.156112, 4.23044)
2025	undefined	2.35860	0.981614	(0.0374524, 4.67975)
2026	undefined	2.68003	1.04191	(0.216309, 5.14376)
2027	undefined	3.00147	1.10741	(0.382859, 5.62007)
2028	undefined	3.32290	1.17725	(0.539156, 6.10664)
2029	undefined	3.64433	1.25069	(0.686917, 6.60175)
2030	undefined	3.96577	1.32715	(0.827560, 7.10397)
2031	undefined	4.28720	1.40612	(0.962244, 7.61216)
2032	undefined	4.60863	1.48722	(1.09192, 8.12535)
2033	undefined	4.93007	1.57010	(1.21736, 8.64277)

<b>Gulf Commercial Bank</b>				
For 95% confidence intervals, $t(7, 0.025) = 2.365$				
Obs	d_y	prediction	std. error	95% interval
2024	undefined	1.35224	1.25789	(-1.62219, 4.32667)
2025	undefined	1.69478	1.33122	(-1.45306, 4.84261)
2026	undefined	2.03731	1.41299	(-1.30388, 5.37851)
2027	undefined	2.37985	1.50182	(-1.17139, 5.93109)
2028	undefined	2.72239	1.59653	(-1.05280, 6.49758)
2029	undefined	3.06492	1.69613	(-0.945794, 7.07564)
2030	undefined	3.40746	1.79982	(-0.848438, 7.66336)
2031	undefined	3.75000	1.90692	(-0.759162, 8.25915)
2032	undefined	4.09253	2.01690	(-0.676679, 8.86174)
2033	undefined	4.43507	2.12930	(-0.599937, 9.47007)

<b>Trans Iraq Bank</b>				
For 95% confidence intervals, $t(8, 0.025) = 2.306$				
Obs	y	prediction	std. error	95% interval
2024	undefined	-1.80900	1.17265	(-4.51314, 0.895137)
2025	undefined	-2.34171	1.22942	(-5.17677, 0.493348)
2026	undefined	-2.87442	1.29251	(-5.85496, 0.106120)
2027	undefined	-3.40713	1.36104	(-6.54568, -0.268572)
2028	undefined	-3.93984	1.43422	(-7.24715, -0.632523)
2029	undefined	-4.47255	1.51138	(-7.95780, -0.987294)
2030	undefined	-5.00525	1.59195	(-8.67629, -1.33422)
2031	undefined	-5.53796	1.67542	(-9.40150, -1.67443)
2032	undefined	-6.07067	1.76140	(-10.1325, -2.00888)
2033	undefined	-6.60338	1.84952	(-10.8684, -2.33838)

After conducting the tests for the time series, the prediction stage was reached, as the National Bank of Iraq had prediction results starting from 2.53873 for the year 2024 to 4.02346 for the year 2033 and an increase of 1.43616, meaning there is an increase in returns. As for the Investment Bank of Iraq, the prediction results were 2.27336 for the

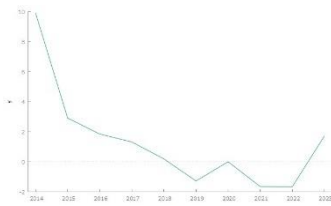


year 2024 to 6.59321 for the year 2033 and an increase of 4.31985. As for the Gulf Commercial Bank, the prediction results were 1.35224 for the year 2024 to 4.43507 for the year 2033 and an increase of 3.08283. As for the Baghdad Bank, the prediction results were 2.03717 for the year 2024 to 4.93007 for the year 2033 and an increase of 2.8929. As for the Trans-Iraq Bank, the prediction results were -1.80900 for the year 2024 to -6.60338 to the year 2033, which indicates that the Trans-Iraq Bank is exposed to losses that may reach an amount of 4.79438.-

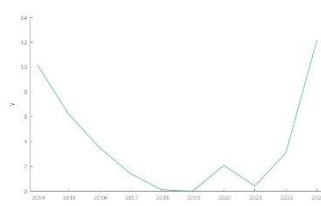
**2. Return on Equity (ROE) Index:**

**2.1 Data Stability:**

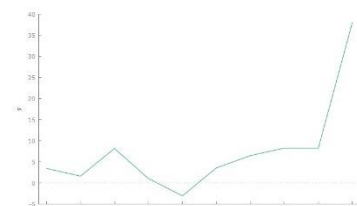
The data stability test was conducted through the chart shown below for the five banks.



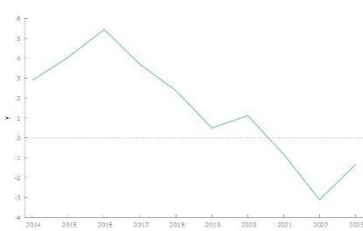
**Gulf Commercial Bank**



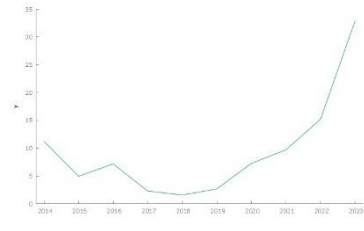
**Investment Bank of Iraq**



**National Bank of Iraq**



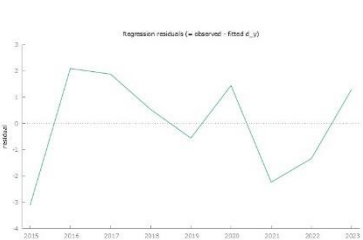
**Trans Iraq Bank**



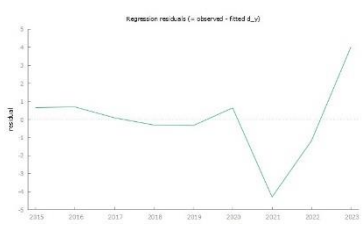
**Bank of Baghdad**

The above figures show the stability of the data studied for the banks under study. The data was unstable and required processing in order to complete the testing process.

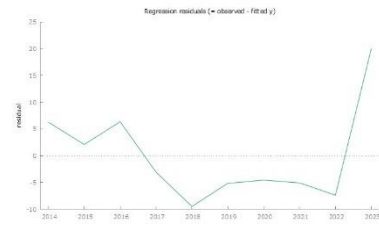
**2.2 Data stability after processing:**



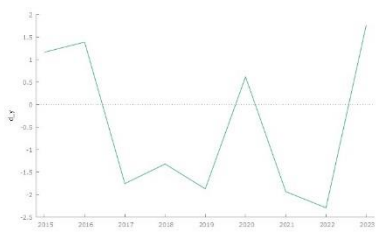
**Gulf Commercial Bank**



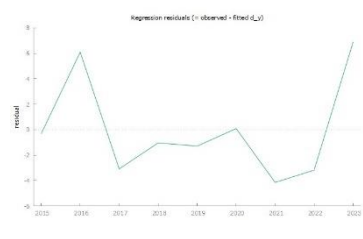
**Investment Bank of Iraq**



**National Bank of Iraq**



**Trans Iraq Bank**



**Bank of Baghdad**





After taking the differences for the data for the purpose of processing the data, which were in the above forms, and which noted the stability of the data in the presence of some data in which mutations occur as a result of external and internal changes and variables.

### 2.3 Least squares test:

The least squares test is performed on the data obtained from the banks under study, which are explained in the following tables:

<b>National Bank of Iraq</b>				
<b>Model 1: OLS, using observations 2014-2023 (T = 10)</b>				
<b>Dependent variable: y</b>				
	<i>Coefficient</i>	<i>Std. Error</i>	<i>t-ratio</i>	<i>p-value</i>
const	-5.12787	6.44781	-0.7953	0.4494
time	2.30961	1.03916	2.223	0.0570
Mean Dependent Var	7.575000	S.D . dependent var	11.31754	
Sum Squared Resid	712.7007	S.E . of regression	9.438622	
R- squared	0.381755	Adjusted R-squared	0.304475	
F (1, 8)	4.939862	P- value(F)	0.056952	
Log- likelihood	-35.52177	Akaike Criterion	75.04354	
Schwarz Criterion	75.64871	Hannan -Quinn	74.37967	
rho	0.068563	Durbin- Watson	1.322203	
<b>Investment Bank of Iraq</b>				
<b>Model 1: OLS, using observations 2014-2023 (T = 10)</b>				
<b>Dependent variable: y</b>				
	<i>Coefficient</i>	<i>Std. Error</i>	<i>t-ratio</i>	<i>p-value</i>
const	-7.03292	1.95388	-3.599	0.0087
time	1.20928	0.299126	4.043	0.0049
Mean Dependent Var	0.222778	S.D . dependent var	3.957937	
Sum Squared Resid	37.58013	S.E . of Regression	2.317022	
R- squared	0.700132	Adjusted R-squared	0.657293	
F (1, 8)	16.34358	P- value(F)	0.004916	
Log-likelihood	-19.20208	Akaike Criterion	42.40415	
Schwarz Criterion	42.79860	Hannan -Quinn	41.55293	
rho	-0.096532	Durbin- Watson	1.667950	
<b>Bank of Baghdad</b>				
<b>Model 1: OLS, using observations 2014-2023 (T = 10)</b>				
<b>Dependent variable: y</b>				
	<i>Coefficient</i>	<i>Std. Error</i>	<i>t-ratio</i>	<i>p-value</i>
const	-10.1646	3.55672	-2.858	0.0244
time	2.09507	0.544509	3.848	0.0063
Mean Dependent Var	2.405778	S.D . dependent var	6.963156	
Sum Squared Resid	124.5260	S. E. of regression	4.217752	
R- squared	0.678961	Adjusted R-squared	0.633098	
F (1, 8)	14.80420	P- value(F)	0.006312	
Log- likelihood	-24.59325	Akaike Criterion	53.18651	
Schwarz Criterion	53.58095	Hannan -Quinn	52.33529	
rho	-0.330313	Durbin- Watson	2.025832	



<b>Gulf Commercial Bank</b>				
<b>Model 1: OLS, using observations 2014-2023 (T = 10)</b>				
<b>Dependent variable: y</b>				
	<i>Coefficient</i>	<i>Std. Error</i>	<i>t-ratio</i>	<i>p-value</i>
<b>const</b>	<b>-5.40070</b>	<b>1.70826</b>	<b>-3.162</b>	<b>0.0159</b>
<b>time</b>	<b>0.748023</b>	<b>0.261523</b>	<b>2.860</b>	<b>0.0243</b>
<b>Mean Dependent Var</b>	<b>-0.912556</b>	<b>S.D . dependent var</b>	<b>2.790561</b>	
<b>Sum Squared Resid</b>	<b>28.72551</b>	<b>S.E . of regression</b>	<b>2.025745</b>	
<b>R- squared</b>	<b>0.538900</b>	<b>Adjusted R-squared</b>	<b>0.473029</b>	
<b>F (1, 8)</b>	<b>8.181104</b>	<b>P- value(F)</b>	<b>0.024328</b>	
<b>Log- likelihood</b>	<b>-17.99297</b>	<b>Akaike Criterion</b>	<b>39.98594</b>	
<b>Schwarz Criterion</b>	<b>40.38039</b>	<b>Hannan -Quinn</b>	<b>39.13472</b>	
<b>rho</b>	<b>-0.171663</b>	<b>Durbin -Watson</b>	<b>1.928615</b>	

<b>Trans Iraq Bank</b>				
<b>Model 1: OLS, using observations 2014-2023 (T = 10)</b>				
<b>Dependent variable: y</b>				
	<i>Coefficient</i>	<i>Std. Error</i>	<i>t-ratio</i>	<i>p-value</i>
<b>const</b>	<b>5.78447</b>	<b>0.931735</b>	<b>6.208</b>	<b>0.0003</b>
<b>time</b>	<b>-0.783339</b>	<b>0.150163</b>	<b>-5.217</b>	<b>0.0008</b>
<b>Mean Dependent Var</b>	<b>1.476100</b>	<b>S.D . dependent var</b>	<b>2.697858</b>	
<b>Sum Squared Resid</b>	<b>14.88224</b>	<b>S.E . of regression</b>	<b>1.363921</b>	
<b>R- squared</b>	<b>0.772811</b>	<b>Adjusted R-squared</b>	<b>0.744412</b>	
<b>F (1, 8)</b>	<b>27.21294</b>	<b>P- value(F)</b>	<b>0.000806</b>	
<b>Log -likelihood</b>	<b>-16.17730</b>	<b>Akaike Criterion</b>	<b>36.35461</b>	
<b>Schwarz Criterion</b>	<b>36.95978</b>	<b>Hannan -Quinn</b>	<b>35.69074</b>	
<b>rho</b>	<b>0.062783</b>	<b>Durbin -Watson</b>	<b>1.545890</b>	

For the above tables, the data was analyzed and for the National Bank of Iraq, the calculated F value was (0.689079) with a significance of (0.0084) which is less than the significance degree of 0.05. The analysis results also showed that the value of the coefficient of determination was (0.79304), which explains 79% of the returns variable. As for the parameters of the linear regression model, they showed that the value of the marginal slope reached (4.71576) with a significance of (0.0084), while the fixed limit reached 0.480719 with a significance of 0.4306. As for the Investment Bank of Iraq, the calculated F value was (22.55396) with a significance of (0.002086), which is less than the significance degree of 0.05. The analysis results also showed that the value of the coefficient of determination was (0.763145), which explains 76% of the returns variable. The linear regression model parameters showed that the marginal slope value reached (-3.00646) with a significance of (0.0026) while the fixed limit reached 0.479983 with a significance of 0.0021. As for the Gulf Commercial Bank, the calculated F value was (6.797409) with a significance of (0.035057), which is less than the significance degree of 0.05. The analysis results also showed that the value of the coefficient of determination was (0.492658), which explains 49% of the returns variable. As for the linear regression model parameters, they showed that the marginal slope value reached (-2.41566) with a significance of (0.0260) while the fixed limit reached 0.342537 with a significance of 0.0351. The results of the Baghdad Bank calculated F value were (11.00855) with a significance of ( 0.012802) which is less than the significance degree of 0.05. The analysis results also showed that the value of the coefficient of determination (0.611296) which explains 61% of the returns variable. As for the parameters of the linear regression model, they showed that the value of the marginal slope reached (-1.49860) with a significance of (0.0497). As for the fixed limit, it reached -0.532709 with a significance of 0.0128. As for the Trans-Iraq Bank, the calculated F value is (24.97056) with a significance of (0.001057), which is less than the significance degree of 0.05. The analysis results also showed that the value of the coefficient of determination is (0.757359), which explains 75% of the returns variable. As for the parameters of the linear regression model, they showed that the value of the marginal slope reached (4.05080) with a significance of (0.0003). The constant limit was -0.532709 with a significance of 0.0011.



**2.4 Profitability forecasting:**

<b>National Bank of Iraq</b>				
<b>For 95% confidence intervals, <math>t(8, 0.025) = 2.306</math></b>				
<b>Obs</b>	<b>y</b>	<b>prediction</b>	<b>std. error</b>	<b>95% interval</b>
2024	undefined	20.2779	11.4307	(-6.08146, 46.6372)
2025	undefined	22.5875	11.9842	(-5.04803, 50.2230)
2026	undefined	24.8971	12.5991	(-4.15654, 53.9507)
2027	undefined	27.2067	13.2671	(-3.38724, 57.8007)
2028	undefined	29.5163	13.9804	(-2.72264, 61.7553)
2029	undefined	31.8259	14.7326	(-2.14753, 65.7994)
2030	undefined	34.1355	15.5179	(-1.64889, 69.9200)
2031	undefined	36.4452	16.3317	(-1.21570, 74.1060)
2032	undefined	38.7548	17.1697	(-0.838658, 78.3482)
2033	undefined	41.0644	18.0287	(-0.509925, 82.6387)

<b>Investment Bank of Iraq</b>				
<b>For 95% confidence intervals, <math>t(7, 0.025) = 2.365</math></b>				
<b>Obs</b>	<b>d_y</b>	<b>prediction</b>	<b>std. error</b>	<b>95% interval</b>
2024	undefined	6.26919	2.86392	(-0.502890, 13.0413)
2025	undefined	7.47848	3.03088	(0.311578, 14.6454)
2026	undefined	8.68776	3.21706	(1.08063, 16.2949)
2027	undefined	9.89704	3.41930	(1.81169, 17.9824)
2028	undefined	11.1063	3.63493	(2.51109, 19.7016)
2029	undefined	12.3156	3.86170	(3.18413, 21.4471)
2030	undefined	13.5249	4.09777	(3.83520, 23.2146)
2031	undefined	14.7342	4.34163	(4.46786, 25.0005)
2032	undefined	15.9435	4.59202	(5.08506, 26.8019)
2033	undefined	17.1527	4.84794	(5.68920, 28.6163)

<b>Bank of Baghdad</b>				
<b>For 95% confidence intervals, <math>t(7, 0.025) = 2.365</math></b>				
<b>Obs</b>	<b>d_y</b>	<b>prediction</b>	<b>std. error</b>	<b>95% interval</b>
2024	undefined	12.8811	5.21328	(0.553660, 25.2086)
2025	undefined	14.9762	5.51722	(1.93003, 28.0223)
2026	undefined	17.0712	5.85611	(3.22373, 30.9188)
2027	undefined	19.1663	6.22426	(4.44827, 33.8844)
2028	undefined	21.2614	6.61678	(5.61518, 36.9076)
2029	undefined	23.3564	7.02959	(6.73411, 39.9788)
2030	undefined	25.4515	7.45932	(7.81303, 43.0900)
2031	undefined	27.5466	7.90321	(8.85846, 46.2347)
2032	undefined	29.6416	8.35900	(9.87574, 49.4075)
2033	undefined	31.7367	8.82486	(10.8692, 52.6042)



<b>Gulf Commercial Bank</b>				
<b>For 95% confidence intervals, <math>t(7, 0.025) = 2.365</math></b>				
<b>Obs</b>	<b>d_y</b>	<b>prediction</b>	<b>std. error</b>	<b>95% interval</b>
2024	undefined	2.82756	2.50389	(-3.09319, 8.74832)
2025	undefined	3.57558	2.64987	(-2.69035, 9.84152)
2026	undefined	4.32361	2.81263	(-2.32722, 10.9744)
2027	undefined	5.07163	2.98945	(-1.99730, 12.1406)
2028	undefined	5.81965	3.17797	(-1.69506, 13.3344)
2029	undefined	6.56768	3.37624	(-1.41587, 14.5512)
2030	undefined	7.31570	3.58264	(-1.15589, 15.7873)
2031	undefined	8.06372	3.79583	(-0.911994, 17.0394)
2032	undefined	8.81175	4.01475	(-0.681622, 18.3051)
2033	undefined	9.55977	4.23849	(-0.462677, 19.5822)
<b>Trans Iraq Bank</b>				
<b>For 95% confidence intervals, <math>t(8, 0.025) = 2.306</math></b>				
<b>Obs</b>	<b>y</b>	<b>prediction</b>	<b>std. error</b>	<b>95% interval</b>
2024	undefined	-2.83227	1.65179	(-6.64130, 0.976769)
2025	undefined	-3.61561	1.73176	(-7.60906, 0.377843)
2026	undefined	-4.39895	1.82063	(-8.59732, -0.200573)
2027	undefined	-5.18228	1.91715	(-9.60324, -0.761329)
2028	undefined	-5.96562	2.02023	(-10.6243, -1.30696)
2029	undefined	-6.74896	2.12892	(-11.6583, -1.83965)
2030	undefined	-7.53230	2.24241	(-12.7033, -2.36130)
2031	undefined	-8.31564	2.35999	(-13.7578, -2.87349)
2032	undefined	-9.09898	2.48110	(-14.8204, -3.37756)
2033	undefined	-9.88232	2.60523	(-15.8900, -3.87466)

After conducting the tests for the time series, the prediction stage was reached and shown for each bank, as the National Bank of Iraq had prediction results starting from 20.2779 for the year 2024 to 41.0644 for the year 2033 and an increase of 20.7865, meaning there is an increase in the index. As for the Investment Bank of Iraq, the prediction results were 6.26919 for the year 2024 to 17.1527 for the year 2033 and an increase of 10.8835. As for the Gulf Commercial Bank, the prediction results were 2.82756 for the year 2024 to 9.55977 for the year 2033 and an increase of 6.7322. As for the Baghdad Bank, the prediction results were 12.8811 for the year 2024 to 31.7367 for the year 2033 and an increase of 18.8556. As for the Trans-Iraq Bank, the prediction results were -2.83227 for the year 2024 to -9.88232 to the year 2033, which shows that the Trans-Iraq Bank is exposed to losses that may reach an amount of -7.05005.

### **CONCLUSION :**

The results of measuring the profitability of banks according to accounting indicators (ROA) (ROE) for the research sample banks for the period from (2014 to 2023) showed that the Bank of Baghdad achieved the highest return on assets (ROA) in 2023, which amounted to (5.667), which is the highest return among the research sample banks, and with an arithmetic mean for the period of (1.803), which is the highest arithmetic mean for the research sample banks. As for the lowest return, it was for the Gulf Bank in 2020, which amounted to (-0.0002), which is the lowest return among the research sample banks, while the arithmetic mean amounted to (0.527), which is the lowest arithmetic mean among the banks.

As for the (ROE) indicator, the results showed that the National Bank of Iraq achieved the highest return in 2023, as it reached (37.996), which is the highest return among the banks in the research sample. As for the lowest return, it was for the Gulf Commercial Bank in 2020, as it reached (-0.0004), which is the lowest return among the banks in the research sample. As for the arithmetic mean for the period, it reached (1.330), which is the lowest arithmetic mean for



the banks in the research sample. The Bank of Baghdad achieved the highest arithmetic mean for the period, as it reached (9.487), which is the highest arithmetic mean for the banks in the research sample.

After that, several operations were conducted to test the time series, which included four stages (stability, processing, testing and prediction). The data under study were forecasted for a period of ten years from (2024 to 2033). It was found that all banks in the research sample will achieve profits, except for the Trans-Iraq Bank, which showed through the data that the indicators are decreasing over the next ten years. Therefore, the bank must develop and implement appropriate strategies and policies that can enhance the bank's performance and achieve the required profitability. Therefore, we recommend that banks adopt these indicators to measure and analyze profitability. By measuring and analyzing current and future profitability indicators, it will enable banks to take appropriate measures and work on developing policies and strategies to solve problems related to profitability and work to maximize it.

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