Al-Qadisiyah Journal for Administrative and Economic Sciences ISSN$_{Online}$: 2312-9883
QJAE, Volume 27, Issue 3 (2025) ISSN$_{Print}$: 1816-9171
DOI: https:// doi.org/ 10.33916/ qjae.2025 .033446

The Fragility of the Banking Sector and Its Impact on Financing the Public Budget in Iraq (2004–2022)

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Article history:
Received: 13/7/2025
Accepted: 3/8/2025
Available online: 15 /9 /2025

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Abstract : The objective of this research is to analyze the impact of banking sector fragility on the financing of the public budget in Iraq during the period 2004–2022, within an unstable financial environment characterized by weak economic diversification and excessive reliance on oil revenues. These factors have led to a widening budget deficit, prompting the government to increasingly depend on the banking sector as a primary tool for financing this deficit. The study employs analytical and econometric methods, including time series stationarity tests and Error Correction Models (ECM), to measure the nature of the relationship between indicators of banking fragility—such as weak liquidity and inefficient credit allocation—and the sector's capacity to finance fiscal deficits. The results indicate a statistically significant relationship, both in the short and long term, between the fragility of the banking sector and the financing of the public budget deficit. The research recommends the need to reform the banking infrastructure and enhance its efficiency, in addition to restructuring public finance and diversifying non-oil revenues, in order to reduce reliance on deficit financing and achieve fiscal sustainability.

Keywords: banking sector fragility, general budget, Iraqi economy, ARDL, 2004–2022

INTRODUCTION: The banking sector in Iraq is among the most fragile components of the post-2003 economic environment, due to its weak infrastructure, low levels of financial inclusion, and poor credit allocation efficiency. This fragility has been exacerbated by successive crises, such as the war on terrorism and the COVID-19 pandemic, amid increasing pressure to finance the country's persistent fiscal deficit. Given Iraq's heavy reliance on oil revenues, the public budget has become highly vulnerable to external shocks, heightening the need to utilize the banking system as a tool for deficit financing. However, the structural weakness of this sector raises concerns about its ability to meet such financial demands. Accordingly, this research aims to analyze the impact of banking sector fragility on the financing of Iraq's public budget during the period 2004–2022, by examining the relationship between fragility indicators—particularly banking liquidity and credit efficiency—and deficit financing mechanisms, while proposing structural reforms to enhance the banking sector's role in achieving financial stability.

1. Significance of the Study

The importance of this research stems from the growing need to understand the impact of banking sector fragility on the financing of Iraq's public budget, particularly within an economically and financially unstable environment characterized by a lack of funding diversification. The banking sector serves as a primary tool for financing fiscal deficits; however, its weak infrastructure, low liquidity, and limited risk management capabilities have contributed to deepening the funding gap. This issue gains further importance amid rising fiscal deficits and increasing reliance on state-owned banks as the main domestic source of financing.

2. Research Objectives

This study aims to achieve the following objectives:

1. Analyze the indicators of banking sector fragility in Iraq during the period 2004–2022 and identify their structural and economic causes.
2. Measure the impact of banking fragility on the financing of the public budget, focusing on the deficit, revenues, and financing sources.
3. Evaluate the efficiency of the fiscal policies adopted by the Iraqi government during the study period, particularly the reliance on the banking sector.

4. Provide practical recommendations to enhance the stability of the banking sector and improve its effectiveness in supporting public finance.
5. Contribute to formulating a comprehensive vision for banking system reform within the framework of achieving fiscal sustainability.

3. Research Problem

Iraq faces complex challenges in financing its public budget due to its heavy dependence on oil revenues, limited non-oil income, and high levels of public spending—particularly in the security and reconstruction sectors. These challenges have been exacerbated by the fragility of the banking sector, which is expected to play a role in deficit financing but suffers from low liquidity, weak public trust, and inefficient lending practices. Therefore, the research problem emerges from the following central question:

To what extent does the fragility of the banking sector affect the financing of the public budget in Iraq during the period 2004–2022, and what policies could enhance its role in achieving fiscal balance?

4. Research Hypothesis

The study is based on the following primary hypothesis:

There is a direct (positive) relationship between banking sector fragility and the increase in Iraq's public budget deficit.

5. Research Methodology

To achieve its objectives, the research adopts the following methodologies:

- **Descriptive-analytical method**: to examine the fragility of Iraq's banking sector, its sources, and the dimensions and implications of this fragility on public finance.
- **Quantitative econometric method**: to estimate the relationship between banking variables (such as liquidity, credit, and bank assets) and public budget indicators, using official financial data from government and international institutions.

Chapter One: Conceptual Framework

1. Fragility of the Banking Sector

Before explaining the concept of financial fragility, the concept of fragility in general will be explained. The concept of fragility, which has several definitions in the literature and has been a subject of research for a long time, increased in importance with the new economic trends that the world witnessed in the 1980s. With the achievement of global economic integration, the economic influence of countries on each other increased, and an event occurring in one country can easily affect other countries or economies. This situation brought the fragility of economies to the agenda, and this concept began to be a subject of research (Abash, 2012: 8). The concept of fragility, through its economic and common definition, means the negative impact resulting from unexpected events and is defined as the risk of harm (Patrick, 1990: 4). The definition of fragility was updated by the Organization for Economic Co-operation and Development in 2015. According to the updated definition, fragility is expressed as exposure to high risks coupled with low capabilities and is defined as a phenomenon that brings about violence, conflict, underdevelopment, and long-term political crises. In this context, various scientific disciplines emphasized the concept of fragility and risk, focusing on the various components of risks and conducting Fragility is defined as a negative change in the system due to anxiety caused by risks. The definition of fragility varies depending on the viewpoint of scholars of the concept and the different economic units, but the most common definition is the risk of negative exposure or harm through unexpected events and situations (Guillaumont, 2001:21).

2. Banking Performance Indicators

Capital Adequacy

Capital adequacy is the most representative indicator of a bank's financial solvency. Maintaining a certain level of capital plays a significant role in increasing customer confidence in the bank's provision of all services. The capital adequacy ratio also takes into account the financial and non-financial risks that a bank may face (Al-Afandy, 2020: 253). Capital adequacy has been interpreted as an indicator of capital strength. This indicator is widely accepted, as banks with high levels of capital are likely to indicate the strength and solidity of their financial position. This indicator represents the basis for Basel III capital considerations. The capital adequacy ratio is calculated according to the requirements of the Basel III Committee using the following equation (Aspal, 2019: 174).

$$CAR = TC / RWA\ (CE + MR + OR) \times 100\% \geq \%8$$

:Where
CAR: Capital Adequacy Ratio
TC: Total Capital
RWA: Risk-Weighted Assets

MR: Market Risk
CR: Credit Risk
OR: Operational Risk

Asset Quality

Asset quality is associated with the left side of a bank's balance sheet. Senior management typically focuses on the quality of loans provided to customers, as it contributes to the bank's profits. The terms "asset quality" and "loan quality" are often used interchangeably, although they reflect the same concept. Asset quality impacts banks' costs and balance sheets, as lower-quality assets are more likely to become non-performing loans. Non-performing loans are often bad debts, past due, or close to default. There is no universally agreed-upon standard for determining which assets should be considered non-performing (Hseeb, 2011: 54). Asset quality is particularly important in the rating system, as it represents an essential part of a bank's operational activity. Furthermore, a bank's acquisition of high-quality assets will contribute to increased income generation and improved liquidity and capital adequacy. Asset quality depends on a number of factors (Ali, 2019: 26).

-The size and density of non-performing assets relative to total capital.
-The size and trends of delinquent loan repayments, as well as the measures taken to reschedule them.
-Large credit concentrations and risks associated with individual debtors or related debtors.
-The size and management of employee loans.

There are several measures of asset quality, the most important of which are:

A. Non-performing loans to total loans ratio

$$\mathbf{NPLLR} = \frac{\text{NPL}}{\text{L}} \times \mathbf{100}$$

Liquidity Ratio

Liquidity, in its general sense, means cash, while in its technical sense, it refers to the ability of an asset to be converted into cash quickly and without incurring losses. The goal is to maintain liquid assets to meet obligations due now or within a short period. Liquidity is therefore a relative concept that reflects the relationship between cash, assets that can be converted into cash quickly and without losses, and obligations that must be met. Therefore, the liquidity of any bank or individual can only be assessed in the context of the maturity of its obligations (Siddiqi, Sayyid, 2023: 95).

Profitability

- A bank's profitability can generally be defined as the difference between the profit earned from assets and the total cost of liabilities and legal obligations. A bank's profitability is expressed as a function of internal (micro) and external (macro) determinants. Internal factors consist of accounts on the balance sheet and income statements and are therefore called micro or bank-specific variables. External factors are factors not related to bank management but that affect the performance of financial institutions (47:1997, Freixas).

The most widely used profitability indicators are:

- **Return on Assets (ROA)**:

ROA=(Net Profit /Total Assets)×

- **Return on Equity (ROE)**:

ROE=(Net Profit / Equity)×100

3. The Concept of the General Budget

The state's general budget is the primary tool for achieving public performance and one of the most important tools used by the legislative authority to assess the efficiency of its legislative, executive, and oversight bodies by examining the budget's inputs and outputs in achieving economic and social development (Saloum, Al-Muhtabni, 2007: 95). It is defined as the process of planning revenues and expenditures for a future financial period, taking into account the circumstances surrounding the economic unit and the expected conditions during that period. The actual implementation of the plan is then compared to achieve the objectives. If actual implementation deviates from the established plan, the administration must make the right decisions to address it (Ibrahimm, 1997: 9). The general budget is defined as a technical accounting method for estimating the state's revenues and expenditures for the coming year. A law is issued regulating the spending and collection process annually at the state level during the year. It is also defined as a tool. The general budget is defined as a plan that includes an estimate of the state's revenues and expenditures for a subsequent period of time, usually a year. This estimate is made in accordance with the economic and social objectives that the government seeks to achieve. According to this definition, the general budget is not an accounting tool for clarifying the state's public expenditures and revenues, but rather a means for the state to achieve its goals (Al-Janabim, 2002: 102).

4. Characteristics of the General Budget

Based on its definition, the general budget possesses the following key characteristics:

1. The general budget is a forecast or estimate of revenues and expenditures.

The budget is a future plan that includes probable estimates of expenditures and revenues. Given the element of probability, these estimates and forecasts must be as accurate and objective as possible. The value of the budget depends on the accuracy and success of the estimation criteria, as well as their connection to changes in the country's economic activity. Since these estimates include all of the state's revenues and expenditures, it is essential that they be completed within a sufficient period of time. Therefore, most countries set a one-year period for the preparation, discussion, approval, and ratification of the general budget (Al-Omari, 1988: 208)

2. The budget is a parliamentary approval.

The legislative authority's approval of the general budget is one of its most prominent characteristics. Its existence as a document aimed at collecting revenues and disbursing expenditures does not make it binding on the executive authority. This document only acquires legitimacy after its ratification by the legislative authority, which enables it to be implemented in accordance with the law. If this approval is not obtained, the budget will remain mere proposals and ideas that cannot be implemented on the ground (Dhanibat: 2003, 49).

4. Legal Obligation Through Parliamentary Approval

A general budget document does not become binding on the executive branch unless it is granted legal legitimacy through parliamentary approval. Without this, the document remains merely a conceptual outline. Once ratified, revenue collection becomes a legal obligation for the government, particularly because it imposes a financial burden on the citizens. Therefore, the government cannot alter this burden—by increasing or decreasing it—without prior approval from the people, as represented by their elected officials.

As for expenditures, the executive is granted some flexibility to respond to emerging needs and circumstances, including the reallocation of funds within different sections of the budget. Nevertheless, all such actions remain subject to post-implementation oversight by the legislature. In other words, parliamentary approval is constitutive in the case of revenues and declaratory in the case of expenditures.

Section Two: Analysis of Banking Sector Fragility Indicators in Iraq

1. Deposit-to-GDP Ratio Indicator

Table (1): Evolution of the Deposit-to-GDP Ratio for Iraqi Banks During the Period (2004–2022)

Year	Total Deposits (Billion IQD)	Annual Growth Rate (%)	GDP (Billion IQD)	Annual Growth Rate (%)	Deposits-to-GDP Ratio (%)
2004	3396.7	-	53235.4	-	6.38
2005	8489.9	149.95	73533.6	38.13	11.55
2006	16928.2	99.39	95587.9	29.99	17.71
2007	26188.9	54.71	111455.8	16.60	23.50
2008	34524.9	31.83	157026.0	40.89	21.99
2009	38582.4	11.75	130642.1	-16.80	29.53
2010	47947.2	24.27	162064.5	24.05	29.59
2011	56150.0	17.11	217327.1	34.10	25.84
2012	62005.9	10.43	254225.4	16.98	24.39
2013	68855.4	11.05	273587.5	7.62	25.17
2014	74073.3	7.58	266420.3	-2.62	27.80
2015	64344.0	-13.13	194680.9	-26.93	33.05
2016	62398.7	-3.02	196924.1	1.15%	31.69
2017	67048.6	7.45	225722.3	14.62	29.70
2018	76893.9	14.68	251064.4	11.23	30.63
2019	82106.4	6.78	276157.9	9.99	29.73
2020	84924.1	3.43	215661.5	-21.90	39.37
2021	96071.4	13.13	301158.8	39.64	31.90
2022	129083.3	34.36	383064.1	27.19	33.69

The data presented in Table (1) indicate that the ratio of total deposits to Gross Domestic Product (GDP) followed an upward trend during the study period (2004–2022), with some exceptions in certain years. It is observed that total deposits in Iraqi banks reached their lowest level in 2004, amounting to approximately 3,396.7 billion IQD, representing only 6.38% of GDP. This low percentage is attributed to the lack of political and security stability following 2003, as Iraq experienced a period of instability that eroded public trust in the financial and banking system. As a result, individuals and businesses preferred to keep their funds outside the banking sector to avoid potential risks. Additionally, the local currency was negatively affected by inflation and instability, reducing the attractiveness of bank deposits, which often failed to yield returns that matched inflation rates.

Subsequently, deposits began to rise steadily, reaching their peak in 2014 at approximately 74,073.3 billion IQD, accounting for 27.81% of GDP. This increase was mainly due to monetary policy efforts to stabilize the Iraqi dinar exchange rate, which stood at 1,214 IQD/USD in 2014, down from 1,936 IQD/USD in 2003. Furthermore, rising oil prices contributed to increased public confidence in commercial banks, leading to higher deposit volumes. However,

total deposits declined in 2015 and 2016, reaching 62,398.7 and 64,344.0 billion IQD, respectively, with relative contributions of 31.69% and 33.05% of GDP. This decline was due to increased war-related expenditures during the fight against terrorism, a global drop in oil prices, and reduced government spending post-2014. These factors negatively impacted the growth rate of deposits in both public and private banks, as well as household incomes, which in turn led to a decline in deposit volumes. In 2017, bank deposits resumed growth with a positive growth rate of 7.45%, reaching 67,048.6 billion IQD and contributing 29.70% to GDP. Although this deposit volume was higher than in 2014, its share of GDP was lower, as GDP growth outpaced deposit growth. The increase was attributed to a relative improvement in the economic situation, which positively impacted household income and, consequently, private sector deposits. The years 2018 to 2020 witnessed a noticeable increase, with the deposit-to-GDP ratio rising from 30.63% and 33.05% in 2018 to 39.37% in 2020—the highest in the series. This was due to a sharp contraction in GDP as a result of the COVID-19 crisis, while deposit levels remained relatively stable compared to GDP, which declined by 26.93%. In 2021 and 2022, a gradual recovery was observed. In 2021, economic improvement led to a 39.64% growth in GDP, but the deposit-to-GDP ratio declined to 31.9%. In 2022, deposits grew significantly by approximately 34.36%, raising the ratio to 33.69%.

Second: Banking Credit to GDP Ratio (Public and Private)

Table (2)

Banking Credit Ratio (Public and Private) to GDP in Iraq for the Period (2004–2022)

Year	Total Bank Credit (billion IQD)	Private Sector Credit (billion IQD)	Public Sector Credit (billion IQD)	GDP (billion IQD)	Private Sector Credit / GDP (%)	| Public Sector Credit / GDP (%)
2004	744.6	389.1	355.5	53235.4	0.73	0.67
2005	850.7	622.5	228.2	73533.6	0.85	0.31
2006	2664.9	1881.0	783.9	95587.9	1.97	0.82
2007	3459.0	2387.4	1071.6	111455.8	2.14	0.96
2008	4587.4	3978.3	609.1	157026.0	2.53	0.39
2009	5690.0	4646.2	1043.8	130642.1	3.56	0.80
2010	11721.5	8257.1	3464.4	162064.5	5.09	2.14
2011	20344.1	11356.2	8987.9	217327.1	5.23	4.14
2012	28438.7	14650.1	13788.6	254225.4	5.76	5.42
2013	29952.0	16947.5	13004.5	273587.5	6.19	4.75
2014	34123.1	17745.1	16378	266420.3	6.66	6.15
2015	36752.7	18070.1	18682.6	194680.9	9.28	9.60
2016	37180.1	18180.9	18999.2	196924.1	9.23	9.65
2017	37952.8	19450.3	18502.5	225722.3	8.62	8.20
2018	38486.9	20216.1	18270.8	251064.4	8.05	7.28
2019	42052.5	21042.2	21010.3	276157.9	7.62	7.61
2020	49817.7	25866.6	23951.1	215661.5	11.99	11.11
2021	52971.5	29578.3	23393.2	301158.8	9.82	7.77
2022	60576.0	35016.5	25559.5	383064.1	9.14	6.67

According to the data in Table (2), the total credit granted by banks showed positive development during the study period (2004–2022). In 2004, total credit amounted to 744.6 billion IQD, with credit granted to the private sector accounting for 389.1 billion IQD, contributing 0.73% of GDP. Meanwhile, credit extended to the public sector was 355.5 billion IQD, contributing 0.67% of GDP. These were low levels during the study period, largely due to exceptional conditions at the beginning, including the political regime change and the security instability in Iraq. Commercial banks reduced the volume of credit granted to avoid the risks of default. The low credit levels were also due to declining cash reserves at these banks, a consequence of tight monetary policies related to the loans granted to them, which reduced their ability to provide credit. Subsequently, bank credit began to rise noticeably in the following years, reaching 11,721.5 billion IQD in 2011. Of this, 8,527.1 billion IQD was granted to the private sector, accounting for 5.23% of GDP, and 8,987.9 billion IQD to the public sector, representing 4.14% of GDP. This increase was due to rising cash reserves at the Central Bank following Iraq's permission to export oil products, which led to a reduction in interest rates on loans extended to commercial banks by the Central Bank to about 6%. This increase in reserves enabled commercial banks to expand their credit offerings. Credit granted to the private sector continued to grow steadily from 2012 to 2022, reaching approximately 14,650.1 billion IQD (5.76% of GDP) in 2012 and 35,016.5 billion IQD (9.14% of GDP) in 2022. Meanwhile, credit to the public sector reached 13,788.6 billion IQD (4.14% of GDP) in 2012 and rose to 25,559.5 billion IQD (6.67% of GDP) in 2022. It is noted that credit to the private sector led in terms of GDP contribution throughout the study period (2004–2022). This reflects financial sector liberalization policies, especially regarding interest rates and the removal of all forms of financial repression previously imposed by

the Central Bank of Iraq. These repressive measures included credit allocation plans that restricted the freedom to allocate credit resources across different economic sectors, dispersed savings, and hindered the efficient and competitive operation of demand and supply in the financial market.

Third: Non-performing Loans to Private Sector Credit Ratio

Table (3)

Non-performing Loans / Private Sector Credit

Year	Private Sector Credit (billion IQD)	Non-Performing Loans (billion IQD)	Annual Growth Rate (%)	Non-Performing Loans / Private Sector Credit (%)
2004	389.1	58.5	-	15.03
2005	622.5	143.9	145.98	23.12
2006	1881.0	151.0	4.93	8.03
2007	2387.4	210.0	39.07	8.80
2008	3978.3	219.0	4.29	5.50
2009	4646.2	239.0	9.13	5.14
2010	8257.1	275.0	15.06	3.33
2011	11356.2	459.0	66.91	4.04
2012	14650.1	490.0	6.75	3.34
2013	16947.5	1994.4	307.02	11.77
2014	17745.1	2361.1	18.39	13.31
2015	18070.1	3079.7	30.43	17.04
2016	18180.9	3346.5	8.66	18.41
2017	19450.3	4340.6	29.71	22.32
2018	20216.1	4862.6	12.03	24.05
2019	21042.2	4147.4	-14.71	19.71
2020	25866.6	4450.8	7.32	17.21
2021	29578.3	4635.2	4.14	15.67
2022	35016.5	4355.5	-6.03	12.44

According to the data presented in Table (3), non-performing loans (NPLs) of Iraqi banks reached their lowest level during the study period in 2004, amounting to approximately 58.5 billion IQD, representing 15.03% of the total credit granted to the private sector. This was due to the political regime change and the increased freedom of banks to grant credit. The ratio of NPLs to private sector credit reached 23.12% in 2005, which is considered high compared to the Central Bank's benchmark ratios, which range between 2% and 5%. This high ratio was attributed to the deteriorating security situation in Iraq, the reduced financial capacity of borrowers, the decline in collateral value, and the emigration of many citizens abroad. Thereafter, non-performing loans increased fluctuatingly, reaching 490.0 billion IQD in 2012. However, the ratio of NPLs to private sector credit significantly declined to 3.34% in 2012, the second-lowest after 2010. This decline was due to the notable increase in credit granted to the private sector following Iraq's permission to export oil products. The Central Bank's cash reserves increased substantially, enabling it to lower the borrowing cost for commercial banks, which boosted demand for loans from these banks. This, in turn, led to an increase in banks' reserves at the Central Bank, enhancing their capacity to expand lending. Nevertheless, this expansion resulted in an increase in non-performing loans. During the period 2014–2018, NPLs surged excessively, reaching their highest level in 2018 at about 4,862.6 billion IQD, representing 24.05% of total loans. This rise was caused by falling oil prices, which led to lower oil revenues and consequently reduced public revenues, coupled with Iraq's ongoing security challenges. As a result, the government adopted austerity measures by cutting public spending, reducing borrowers' repayment capacity, which in turn increased non-performing loans. A high ratio of NPLs to total loans limits commercial banks' ability to influence economic activity by draining their reserves and restricting their lending capacity. From 2019 to 2022, the NPL ratio to private sector credit declined notably, dropping gradually to 12.44% in 2022. This indicates an improvement in lending efficiency and borrowers' repayment capacity. Despite the increase in private sector credit from 21,042.2 billion IQD to 35,016.5 billion IQD, NPLs did not rise at the same pace. This may reflect improved lending terms, better creditworthiness assessments, or enhanced Central Bank policies overseeing the banks.

Fourth: Capital Adequacy and Liquidity Ratio

Table (4)

Development of Capital Adequacy Ratio for Iraqi Banks during the period (2004–2022)

Year	Capital Adequacy Ratio (%)	Annual Growth Rate (%)	Comparison with Standard Benchmark (%)
2004	102	-	12 <102
2005	109	6.86	12<109
2006	112	2.75	12<112

2007	116	3.57	12<116
2008	157	35.34	12<157
2009	138	-12.10	12<138
2010	130	-5.79	12<130
2011	107	-17.69	12<107
2012	138	28.97	12<138
2013	195	41.30	12<195
2014	104	-46.66	12<104
2015	87	-16.34	12<87
2016	109	25.28	12<109
2017	181	93.57	12<181
2018	285	35.07	12<285
2019	173	-39.29	12<173
2020	253	46.24	12<253
2021	243	-3.95	12<243
2022	341	40.33	12<341

Source: Central Bank of Iraq, Annual Statistical Bulletin, Directorate General of Statistics and Research, for the period (2004–2022).

The data in Table (4) show that the capital adequacy ratio (CAR) of Iraqi banks exceeded the benchmark ratio set by the Central Bank of Iraq, which is 12%, although it fluctuated throughout the study period (2004–2022). In 2004, the CAR stood at 102%, rising to 157% in 2008, with a growth rate of 35.34%. However, the ratio declined in the years 2009, 2010, and 2011, reaching 138%, 130%, and 107%, respectively, with negative growth rates of -12.10%, -5.79%, and -17.69%. The CAR increased again in 2011 and 2012, with growth rates of 28.97% and 41.30%, respectively, due to banks raising their capital in compliance with the Central Bank of Iraq's decision in 2012, which required banks to increase their capital to 250 billion IQD within three years. Additionally, these banks recorded profits, which positively affected their capital adequacy ratios. Subsequently, the CAR declined in 2014 and 2015, with negative growth rates of -16.34% and -46.66%, respectively, reaching 104% in 2014 and 87% in 2015. This was the lowest ratio recorded during the study period. While this figure was low compared to previous years, it remained acceptable relative to the Central Bank's benchmark. The CAR rose again to its highest level in 2018, reaching 285%, with a growth rate of 35.07% compared to 2017. These high ratios reflect the banking sector's ability to withstand financial and banking risks, especially unforeseen ones. However, such excessively high ratios—several times above the benchmark—also highlight the banking sector's weak performance, poor investment efficiency, and limited operational capabilities. Banks tended to focus on safe investment opportunities only, failing to play a more active role in the development of the Iraqi economy through large-scale investments that contribute to long-term economic growth. From 2019 to 2022, the CAR remained significantly higher than the benchmark, exceeding it by more than tenfold (i.e., over 120%). The particularly sharp increases in 2020 and 2022 reflect a highly conservative banking policy, likely in response to credit and liquidity risks, or due to limited investment opportunities and a constrained expansion in lending.

Figure (4)

Fifth: Trading Volume to GDP Ratio × 100

Table (5)

Trading Volume to GDP in Iraq for the Period (2004–2022)

Ask ChatGPT

Year	*Trading Volume*	*Annual Growth Rate (%)*	*GDP*	*Annual Growth Rate (%)*	*| Trading Volume / GDP*
2004	91.9	-	53235.4	-	0.17
2005	279.7	204.35	73533.6	38.13	0.38
2006	115.9	-58.56	95587.9	29.99	0.12
2007	405.9	250.22	111455.8	16.60	0.36
2008	267.2	-34.17	157026.0	40.89	0.17
2009	319.2	19.46	130642.1	-16.80	0.24
2010	259.4	-18.73	162064.5	24.05	0.16
2011	389.1	50.00	217327.1	34.10	0.18
2012	542.3	39.37	254225.4	16.98	0.21
2013	953.9	75.90	273587.5	7.62	0.35
2014	763.6	-19.95	266420.3	-2.62	0.29
2015	355.8	-53.40	194680.9	-26.93	0.18
2016	312.9	-12.06	196924.1	1.15%	0.16
2017	305.8	-2.27	225722.3	14.62	0.14
2018	127.4	-58.34	251064.4	11.23	0.05

2019	581.4	356.36	276157.9	9.99	0.21
2020	355.8	-38.80	215661.5	-21.90	0.16
2021	545.5	53.31	301158.8	39.64	0.18
2022	871,3	59.72	383064.1	27.19	0.22

Sources:

- Central Bank of Iraq, *Annual Statistical Bulletin*, Directorate General of Statistics and Research, for the period (2004–2022).
- Annual Reports of the Iraq Stock Exchange, for the period (2004–2022).

Table (5) shows that in 2004, the trading volume for the banking sector recorded 91.9 billion IQD, representing only 0.17% of the GDP. This rose significantly in 2005 to 279.7 billion IQD, accounting for 0.38% of GDP. This increase resulted from a rise in the value and volume of shares traded in this sector, driven by the relative recovery of the Iraqi economy, the influx of international investments, and foreign aid for reconstruction. The opening of new economic activities also stimulated the financial market and increased stock trading .Moreover, the Iraq Stock Exchange (ISX) was officially launched that year under a new, more modern regulatory framework, replacing the old system. This attracted new investors and boosted confidence in trading, particularly in the banking sector, which was one of the most vital economic sectors at the time and served as a backbone for Iraq's economic reconstruction. The focus on banking stocks helped attract further investment in this sector. In 2006, however, trading volume dropped to 115.9 billion IQD, marking a negative growth rate of -58.56% compared to 2005, and accounting for only 0.12% of GDP. This decline was attributed to escalating security tensions and sectarian violence. The year 2006 was among the worst in terms of security deterioration in Iraq, with rising sectarian conflict creating an unstable environment, prompting investors to withdraw from the financial market and significantly impacting confidence in banking sector stocks .In contrast, 2007 witnessed a remarkable recovery in overall trading volume, with a growth rate of 250.22% and a contribution of 0.36% of GDP. However, between 2008 and 2013, the trading volume in the banking sector experienced fluctuations, alternating between increases and declines. The lowest value was recorded in 2010, at 259.4 billion IQD, with a negative growth rate of -18.73%, due to declining stock values and trading volumes caused by ongoing security issues and weakening activity in banking sector stocks—which continued to dominate total trading volume relative to other sectors .Trading volume rebounded in 2011 and 2012, reaching its peak in 2013 at 953.9 billion IQD, with a growth rate of 75.90% and a contribution of 0.35% to GDP. However, it declined afterward, reaching its lowest level in 2018 at 127.4 billion IQD, with a negative growth rate of -58.34%, largely due to the lingering effects of the COVID-19 pandemic. Trading volume recovered in 2021, rising to 545.5 billion IQD, with a growth rate of 53.31%. The trading-to-GDP ratio improved slightly from 0.21% in 2019 to 0.22% in 2022. Despite fluctuations in trading volume, the ratio remained very low—well below 1%—indicating the small size of Iraq's financial market relative to the economy, its weak role in financing economic activity, and limited market liquidity.

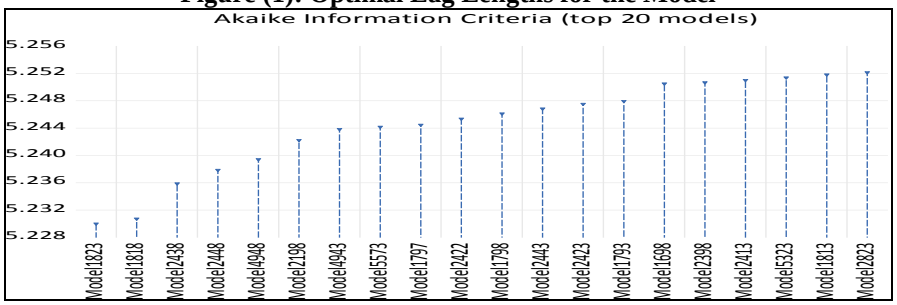
Third Axis

Estimating the Impact of Banking Sector Fragility on Financing the Public Budget in Iraq (Fiscal Deficit Model)

First: ARDL Model

The estimated ARDL model is based on lag lengths of (4, 2, 0, 2, 0, 2), selected according to the Akaike Information Criterion (AIC), which provides the lowest value for this criterion. The lag structure was determined automatically by the software, as shown in Figure (1).

Figure (1): Optimal Lag Lengths for the Model



It is evident from **Table (6)** that the model has passed the statistical tests, indicating the **validity and robustness of the estimated model**. This is demonstrated by the **adjusted R-squared (R^2)** value of **0.90**, which means that banking sector variables explain approximately **90% of the variations in the budget variable**. Additionally, the **F-Statistic** value of **45.39564** with a statistical significance level of **0.0000** confirms the model's overall significance.

Furthermore, the **Durbin-Watson (D.W)** statistic of **2.158871** suggests **no problem of autocorrelation** in the model's error term, leading to the acceptance of the null hypothesis ($\mathbf{H_0}$) that there is no autocorrelation.

Table (6)
Estimation of the **ARDL Model**
Ask ChatGPT

Dependent Variable: FSG
Method: ARDL
Sample (adjusted): 2005Q1 2021Q4
Included observations: 68 after adjustments
Dynamic regressors (4 lags, automatic): SG CG DP CA VG
Fixed regressors: C
Selected Model: ARDL(4, 2, 0, 2, 0, 2)

4.524706	Mean dependent var	0.929052R-squared
9.885440	S.D. dependent var	0.908587Adjusted R-squared
5.229963	Akaike info criterion	2.988827S.E. of regression
5.752200	Schwarz criterion	464.5205Sum squared resid
5.436890	Hannan-Quinn criter.	-161.8188Log likelihood
2.158871	Durbin-Watson stat	45.39564F-statistic
		0.000000Prob(F-statistic)

Source: Prepared by the researcher based on EViews 13 statistical software**.**

Second: Co-Integration Test

After confirming that the time series of the study variables are stationary (i.e., free from unit roots), it becomes possible to conduct a co-integration test to detect the presence of both short-run and long-run equilibrium relationships among the model variables.

According to the results of the unit root tests, the variables are integrated at different orders. Therefore, the Johansen-Juselius test cannot be applied since it requires that all variables be integrated of the same order. As a result, the Bounds Test developed by Pesaran et al. (2001) within the ARDL methodology will be used.

This method combines the Autoregressive (AR) model with Distributed Lag Models (DL). In this methodology, the time series is a function of its own lagged values and the current and lagged values of the explanatory variables. The test allows for mixed integration orders among the variables.

As shown in Table (7), the F-test value of 3.988204 is greater than both the lower and upper bounds at significance levels of 5% and 10% for a sample size of 68. Therefore, we reject the null hypothesis and accept the alternative hypothesis, indicating the presence of co-integration — that is, a long-run equilibrium relationship among the variables in the model**.**

Table (7)
Bounds Test for Co-Integration

Null Hypothesis: No levels relationshipF-Bounds Test

I(1)	I(0)	Signif.	Value	Test Statistic
Asymptotic: n=1000				
3	2.08	10%	3.988204	F-statistic
3.38	2.39	5%	5	k
3.73	2.7	2.5%		
4.15	3.06	1%		
Finite Sample: n=70			68	Actual Sample Size
3.161	2.193	10%		
3.65	2.564	5%		
4.717	3.373	1%		

Source: Prepared by the researcher based on EViews 13 statistical software**.**

Third: Error Correction Model (ECM) According to the ARDL Methodology

Table (8) shows the short-run relationship based on the Error Correction Model (ECM), which expresses the variables in their first-difference form, with the addition of a lagged error correction term (ECM_{-1}) as an explanatory variable. The error correction term measures the speed of adjustment from short-run disequilibrium toward long-run equilibrium. If the coefficient of the error correction term is negative and statistically significant, this indicates the presence of a long-run equilibrium relationship among the variables.

Table (8)
Estimation of the Error Correction Model (ECM)
Ask ChatGPT

ARDL Error Correction Regression
Dependent Variable: D(FSG)
Selected Model: ARDL(4, 2, 0, 2, 0, 2)
Case 2: Restricted Constant and No Trend
Sample: 2004Q1 2022Q4
Included observations: 68

ECM Regression
Case 2: Restricted Constant and No Trend

Prob.	t-Statistic	Std. Error	Coefficient	Variable
0.0000	5.847713	0.097424	0.569706	D(FSG(-1))
0.0305	2.224577	0.099229	0.220742	D(FSG(-2))
0.1144	1.605523	0.097643	0.156768	D(FSG(-3))
0.0004	-3.794540	0.250401	-0.950155	D(SG)
0.1174	1.592153	0.260624	0.414954	D(SG(-1))
0.0000	4.923538	0.349730	1.721908	D(DP)
0.0004	-3.796712	0.366131	-1.390094	D(DP(-1))
0.0001	-4.404361	10.42397	-45.91094	D(VG)
0.0015	3.345322	10.82898	36.22641	D(VG(-1))
0.0000	-5.580204	0.059378	-0.331343	CointEq(-1)*

Source: Prepared by the researcher based on EViews 13 statistical software**.**

From Table (8), we observe that the error correction coefficient of the model is negative and statistically significant, which satisfies the necessary and sufficient condition for accepting the model. The coefficient is approximately -0.331343, indicating that banking sector indicators can correct around 33% of short-term imbalances in the fiscal balance in the long run. This implies an adjustment period of approximately 3.018 quarters, or about three quarters to return to long-run equilibrium. Accordingly, this rate is considered economically acceptable, given the relative speed of response to imbalances and the relatively slow pace of correction over a reasonable timeframe.

As for the long-run relationship, Table (9) shows a negative and significant relationship between the deposits-to-GDP ratio and the fiscal deficit ratio—a result consistent with economic theory. Specifically, a 1% increase in the contribution of deposits to GDP leads to a 0.93% decrease in the fiscal deficit, indicating that higher deposit ratios enhance the ability to finance the public budget deficit. Conversely, lower deposit-to-GDP ratios (deposit fragility) lead to an increase in the fiscal deficit.

Similarly, the credit-to-GDP ratio also shows a negative and significant relationship with the fiscal deficit. A 1% increase in the credit efficiency ratio (credit/GDP) results in a 0.19% reduction in the fiscal deficit. Conversely, increased credit fragility leads to a higher fiscal deficit—again, consistent with economic logic.

In contrast, the ratio of non-performing loans (NPLs) to private credit has a positive and significant effect: a 1% increase in NPLs increases the fiscal deficit by 0.09%, indicating that credit fragility contributes to greater budgetary stress—consistent with economic reasoning.

The capital adequacy ratio has a negative and significant effect: a 1% increase in capital efficiency leads to a 0.03% reduction in the fiscal deficit.

The most significant effect of the banking sector on the fiscal deficit was found in the market capitalization-to-GDP ratio (banking sector capitalization). This indicator had a strong negative effect: a 1% increase in banking sector capitalization leads to a 20.5% reduction in the fiscal deficit. Conversely, a decline in capitalization results in a higher deficit. This finding aligns with economic theory and highlights the substantial impact of this indicator's fragility on financing the fiscal deficit.

Table (9)
Estimation of the Long-Run Relationship

Levels Equation
Case 2: Restricted Constant and No Trend

Prob.	t-Statistic	Std. Error	Coefficient	Variable
0.0086	-2.732666	0.341882	-0.934251	SG
0.0517	-0.318076	0.609294	-0.193802	CG
0.0389	-0.416287	0.229645	0.095598	DP
0.0143	1.345632	0.025436	-0.034228	CA
0.0204	-1.068179	19.21988	-20.53026	VG
0.0036	3.050644	10.37814	31.66001	C

EC = FSG - (-0.9343*SG -0.1938*CG +0.0956*DP - 0.0342*CA -20.5303*VG + 31.6600)

Source: Prepared by the researcher based on EViews 13 statistical software

Fourth: Diagnostic Tests for the Estimated Model

1- Autocorrelation Test After confirming the statistical significance of the model, we proceed to conduct diagnostic tests to assess whether the model satisfies econometric assumptions. To verify that the model is free from the problem of autocorrelation, we rely on the test shown in the table below:

-

Table (10)
Autocorrelation Test

Breusch-Godfrey Serial Correlation LM Test:
Null hypothesis: No serial correlation at up to 2 lags

0.2718	Prob. F(2,50)	1.337112	F-statistic
0.1780	Prob. Chi-Square(2)	3.452299	Obs*R-squared

Source: Prepared by the researcher based on EViews 13 statistical software

The results indicate that the estimated model is **free from the problem of autocorrelation**, based on the **Breusch–Godfrey Serial Correlation LM Test**, as the value of **Prob. Chi-square** was **0.1780**, which is greater than **0.05**. Therefore, we accept the null hypothesis that the residuals are **not autocorrelated**.

2- Heteroskedasticity Test

To ensure that the residuals do **not suffer from heteroskedasticity**, the **Prob. Chi-square** value for the **ARCH Heteroskedasticity Test** was found to be **0.5929**, which is also greater than **0.05**. Accordingly, we accept the null hypothesis that the residuals are **homoscedastic**, and thus, **do not exhibit heteroskedasticity**.

Table (11): Test for Heteroskedasticity

Heteroskedasticity Test :Breusch-Pagan-Godfrey
Null hypothesis: Homoskedasticity

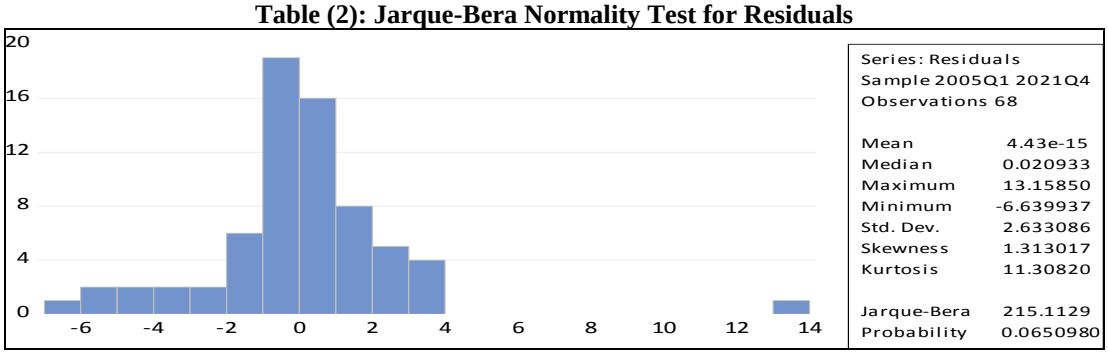
0.6422	Prob. F(15,52)	0.828886	F-statistic
0.5929	Prob. Chi-Square(15)	13.12154	Obs*R-squared
0.07065	Prob. Chi-Square(15)	39.54817	Scaled explained SS

Source: Prepared by the researcher based on EViews 13 statistical software

1- Normality Test:

Table (2) shows that the p-value of the Jarque-Bera test is 0.0650980, which is greater than the significance level of 0.05. This indicates that the null hypothesis is accepted, and thus the variable follows a normal distribution.

Table (2): Jarque-Bera Normality Test for Residuals

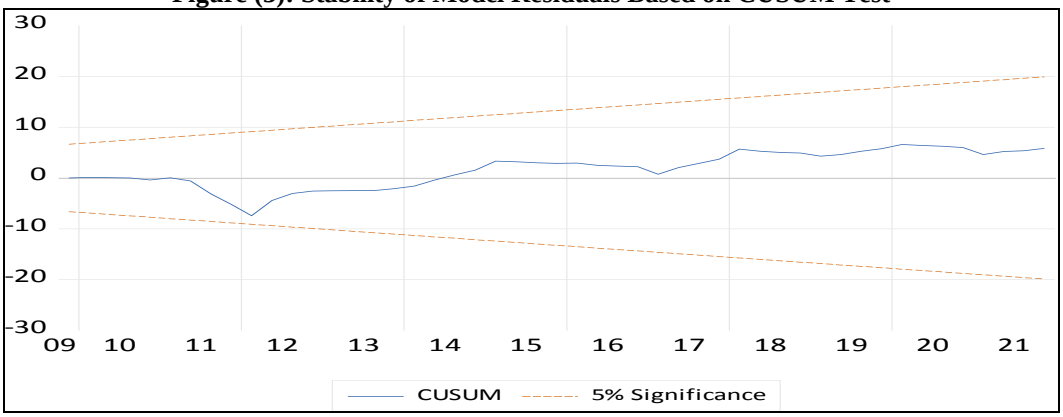


Source: Prepared by the researcher based on EViews 13 statistical software

- Stability Test of ARDL Model Coefficients:

Figure (3) shows that the residuals of the model lie within the two boundary lines, indicating the stability of the estimated model coefficients and the absence of evidence for instability

Figure (3): Stability of Model Residuals Based on CUSUM Test



Source: Prepared by the researcher based on EViews 13 statistical softwareConclusions

1. The research hypothesis is confirmed: the fragility of the banking sector negatively affects the financing of the public budget in Iraq.
2. Statistical tests for stationarity and cointegration have proven the existence of both short-term and long-term equilibrium relationships between the fiscal deficit indicator and various banking sector indicators.
3. In the short run, the results show that banking sector indicators are capable of correcting (adjusting) **33%** of short-term errors in the budget indicator toward long-term equilibrium. The speed of adjustment is approximately **3.018 quarters**, meaning it takes about three quarters to return to the long-run equilibrium.
4. As for the long-term relationship, it was found that there is a significant inverse relationship between the deposit-to-GDP ratio and the fiscal deficit ratio, with a coefficient of **-0.93%**. The credit-to-GDP ratio also showed a significant negative relationship with the fiscal deficit ratio at **-0.19%**, while non-performing loans had an effect of **-0.09%**, which aligns with economic logic. The capital adequacy ratio had a small but significant negative effect of **-0.03%**. The largest impact of the banking sector on the fiscal deficit was through the trading volume-to-GDP ratio (banking sector capitalization). This indicator had a significant negative effect on the fiscal deficit ratio; specifically, a 1% increase in the banking sector's capitalization contributed to a **20.5%** decrease in the fiscal deficit.

Recommendations

1. The continued fragility of the Iraqi economy is largely attributed to weak productive diversification and the heavy reliance of the budget on oil revenues. Therefore, it is necessary to adopt well-designed economic policies to address sectoral bottlenecks and activate the role of productive sectors such as agriculture and industry, which will help reduce revenue fragility and strengthen the resilience of the public budget.
2. There is an urgent need to diversify national income sources and decouple oil rent from public finance to reduce the structural budget deficit and enhance the ability to respond to economic shocks.

3. The fragility of the financial infrastructure necessitates reforming the banking sector to play an effective role in financing development projects and the public budget. This can be achieved by mobilizing available liquidity into local debt instruments, thereby reducing the deficit and minimizing the need for external financing.
4. Improving budget reliability through adopting a flexible budgeting mechanism and conservative estimates for oil revenues based on average prices rather than optimistic forecasts. Additionally, linking these estimates to risk analysis and macroeconomic policies enhances the accuracy of projections and reduces the fiscal performance gap.

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