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The Impact of Some Banking Variables on Gross Domestic Product in Iraq for 2010-2023

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Abstract:

Most governments have adopted diverse monetary policies over the past century to implement measures aimed at developing and advancing the banking sector through major reform projects. This involves optimally utilizing savings and ensuring the effective reinvestment of these funds into financing economic projects. The relationship and interconnection between financial systems and economic development has been the subject of controversial debate over the past several decades, both theoretically and practically.

The study sought to demonstrate the impact of the banking sector on economic growth in Iraq through the impact of some banking variables on the gross domestic product (GDP). To estimate the relationship, the ARDL model was used, both in the long and short run, between variables measuring the effectiveness of the banking system and the economic growth rate. Initial results indicated that credit to the private sector has a significant impact on GDP and plays an important role in supporting and financing investment projects, thus stimulating economic growth. **Keywords: banking sector, GDP, banking variables, causality, ARDL model.**

Introduction:

Economic growth and the banking system are closely linked, and the banking system, by providing financing for economic projects, plays a significant role in global economic development. Financial institutions are generally the primary source of financing for businesses. Discussions about the relationship between banking sector development and economic growth have been controversial, both empirically and theoretically. (Al-Rawi,2009)

Schumpeter (1912) was one of the first researchers to study the essential role of bank credit in economic growth and development. Schumpeter argued that banks play a key role in facilitating and mediating savings, which leads to capital accumulation and supports economic growth. Other researchers (Goldsmith, 1969; Gurley and Shaw, 1955; MacKinnon, 1973) support this argument, particularly the significant contribution made by financial development to economic growth, as resources are directed by the financial sector toward productive investments. However, Schumpeter's view has been challenged by many scholars who question the financial-led growth hypothesis, admitting that it overestimates economic growth. (Ahmed Hussein,2007)

Many theoretical and empirical studies have attempted to demonstrate how the banking system can stimulate economic growth. The results of previous studies on the links between banking and growth are mixed, although a large number of empirical studies have concluded that sophisticated and efficient banking intermediation reduces information and transaction costs, encourages investment, and ultimately stimulates economic growth (Beck et al., 2000; Beck and Levine, 2004). (Adeeb Qasim,2006).

Given all these factors, the primary focus of this study is to answer the following question: To what extent does the banking system contribute to supporting economic growth?

To address this problem, the ARDL model was used to verify the type of relationship, in the short or long term, between the banking sector and economic growth. This model was used through a number of variables. The study is divided as follows. The second part is devoted to a literature review that provides an overview of theoretical approaches, as well as focusing on empirical approaches to analyzing the relationship between banking systems and economic growth. The third part of the study addresses the empirical approach adopted to verify the

existence of a potential causal relationship between the banking system and economic growth in Iraq. The final part will be devoted to the conclusion, explaining the resulting results.

Study problem:

Every type of different investments in any country, regardless of the level of economic growth, is very necessary to provide financial credit support in order to establish the basic rules for sustainable development. Therefore, it is necessary to study the impact of the banking system on economic growth.

The importance of Study:

The research focused on the important and fundamental role played by the banking system in supporting economic growth through the funds it provides for investment and the provision of credit facilities that would raise investment rates in the country.

Study Hypothesis:

Following the financial developments in banking systems and leveraging the expertise and experience of neighboring countries, which, through investments in various fields, have made it clear that the banking system plays a key role in supporting economic projects, the research is based on the premise that "there is a positive impact of banking variables on the gross domestic product."

Study objectives:

1. To identify the role played by the banking system in supporting economic growth.

2. To analyze the impact of some internal variables within the banking system on raising GDP rates.

3. To support future studies within this area using the scientific and practical outcomes provided by the research.

4. To develop strategies that will increase the contribution of some banking indicators to GDP.

Temporal and spatial boundaries of the study:

The spatial boundaries of the study included a sample of Iraqi commercial banks, while the temporal boundaries were the period from 2010 to 2023.

Study Methodology:

The study includes several parts. The beginning of the study includes an introduction. The first part covers the theoretical aspect of the study, while the second part covers the applied statistical aspect. The third part concludes with conclusions and recommendations, followed by a listing of the sources

First: Theoretical Framework

1.1 Literature Review

A significant amount of literature has focused on the relationship between financial development and economic growth in recent years, relying on econometric approaches, both locally and internationally. This aspect has been enriched by numerous studies.(Al-Rawi,2009).

Levine (2010) conducted a detailed literature review aimed at evaluating and critiquing theoretical and empirical research on the links between the functioning of financial systems and economic growth. He discussed various empirical studies that addressed this topic: time series studies, country studies using cross-sectional data, as well as studies related to firms or industries. (Brihi & Faris,2011)

Goldsmith (1959), one of the first researchers to prove the existence of a positive relationship between financial development and economic activity, also emphasized the existence of a causal relationship between the two. His study focused on a sample of 35 countries over the period from 1860 to 1963. (Ahmed Hussein,2007) (Al-Attiyah,2011).

It is worth noting that the early 1990s witnessed more advanced studies on this subject, clarifying how the financial system affects economic growth. These studies focused primarily on analyzing banking sector indicators and their relationship to economic activity, particularly the study by King and Levine (1993), which was conducted on a sample of 77 countries over the period from 1960 to 1989. (Adeeb Qasim,2006).

The aim was to examine the channels through which financial development can be linked to long-term growth. They used four indicators of financial development: credit to the private sector divided by government credit plus credit to public and private enterprises, credit to private enterprises divided by GDP, the liquid liabilities-to-GDP ratio, and bank assets/deposits. They demonstrated that improving banking intermediation services enhances future economic growth and technological innovation.

In addition, Greenwood and Jovanovic (1990) argued that growth and financial structure are closely linked. Indeed, growth allows for the development of the financial structure, which, in turn, contributes to higher growth as investments can be made more efficiently. They showed that, at the threshold of maturity, an economy with a fully developed financial structure can achieve a stable distribution of income among the people and record a higher growth rate than at its inception. In the general context, the relationship between financial development and economic growth has also divided researchers. Arguments in favor of one study have been advanced by criticizing the other.(Al-Rawi,2009)

A study by Adjasi & Biekpe (2006) showed that stock markets have a significant impact on the economic growth of countries with moderate capital markets by improving the total value of traded shares.

The results of a study by Adou et al. (2013) on the impact of financial development on long-term growth indicate that this effect is sensitive to the choice of financial development indicator. The ratios of private sector credit to GDP and total domestic credit are favorable for growth, while the ratio of money supply to GDP is unfavorable for growth. The results obtained here indicate that whether financial development is good or bad for growth depends on the indicator used to assess financial development.

It should be noted that the study (Uddin et al., 2013) confirmed the positive impact of financial development on long-term growth using the Autoregressive Distributed Model (ARDL) approach, and this result is consistent with the result of (Samargandi et al., 2014) in the Kingdom of Saudi Arabia. Another study (Wolde-Rufael, 2009) confirmed the existence of a bidirectional causal relationship between growth and financial development. Speaking of the study (Francis et al., 2015), they studied the impact of capital market development on economic

growth in selected countries and showed that real GDP per capita increases significantly after the establishment of stock exchanges.

Their results also suggest that stock markets play a complementary role to the banking sector in contributing to the availability of private credit. Although Asian capital markets are relatively less developed than those in other continents (particularly in terms of technology, structure, and liquidity), this study was able to demonstrate that their establishment was crucial in helping Asian countries catch up with the rest of the world. According to Puatwoe & Piabuo (2017), there is a short-term positive relationship between money supply and economic growth and a short-term negative relationship between bank deposits and economic growth.

However, in the long run, all indicators of financial development have a positive and significant impact on economic growth. It is worth noting that Kamel et al. (2018) confirmed a bidirectional causal relationship between financial development and growth in Egypt from 2000 to 2016. Ibrahim and Al-Ajeedi (2020) demonstrated the impact of financial development on growth in 29 countries from 2006 to 2019.

In a recent study, Mushtaq et al. (2020) demonstrated that banking sector development in the short term has a positive impact on economic growth, as measured by bank asset deposits and bank credit to the private sector. The results of the ARDL model developed by Zaki and Hadi (2020) show that financial development and economic growth are negatively related in the short term and positively related in the long term. According to Diedhiou and Sambou (2021), financial development represents a stimulating channel for economic growth (Khalil and Mohammed, 2022), highlighting a positive and significant association between the development of financial institutions and growth in Middle Eastern countries.

2.1 Development of the Iraqi Banking System

The financial system has undergone profound reforms since the early 1990s to efficiently allocate resources for productive and economic investment. The primary objective of these reforms was to establish a regulatory framework for banks that meets international standards. The Banking Law, which regulates credit institutions and similar bodies, has been the subject of numerous reforms. Following the 1993 and 2006 laws, the 2014 Banking Law brings the system into effect. (Al-Attiyah,2011).

It is necessary to strengthen the macroeconomic supervisory role by establishing a committee to coordinate and monitor systemic risks. A legislative framework governing the activities of new financial actors and services was also established. In 2006, a reform was implemented to liberalize interest rates and launch the interbank foreign exchange market. (Ahmed Hussein,2007)Within the same framework, and to meet the financing needs of productive projects, particularly real estate, several measures were taken to diversify the financial resources available to investors. In this context, several directives were issued to update the legal framework governing debt securitization.(Al-Rawi,2009)

The Iraqi financial market has witnessed a remarkable revolution, with its volume now equivalent to 50% of the country's GDP. These reforms have also impacted small and micro enterprises in need of financing, particularly through the implementation of a guarantee lever for those excluded from traditional financing schemes, supporting these companies and social classes through access to credit. (Brihi & Faris,2011), to finance short-term projects, a national strategy was developed, improving access to financing for low-income households and small and micro enterprises. The guarantee lever was also activated to support social groups and small businesses, previously excluded from traditional credit channels, in accessing credit. (Adeeb Qasim,2006).

2- Experimental Methodology

2.1 Presentation of the Model and Data

The table below shows the data used in this work. It is quarterly data, covering a period of 60 quarters from 2010 to 2023. Table 1 describes all the variables used.

Table 1: Research Variables

Definition	Classification	Types of Variables
Gross Domestic Product	Y	**Dependent variable**
Ratio of cash to Gross Domestic Product	x_1	**Independent**

Percentage of Deposits to Gross Domestic Product	x_2	**variables**
Credit ratio of Gross Domestic Product	x_3	
Private sector credit as a percentage of GDP	x_4	
Total exports and imports divided by gross domestic product	x_5	**Control variables**
Expenditures ratio of Gross Domestic Product	x_6	

Source: Prepared by the researcher

Through the main question of our study, which includes explaining the impact of some banking system variables on GDP, we will attempt to estimate GDP based on the impact of the banking system. (Al-Attiyah,2011).

The variables used to measure the banking sector will be incorporated into the growth model according to the following equation:

$$\mathbf{GDP = a_0 + a_1X_1 + a_2X_2 + a_3X_3 + a_4X_4 + a_5X_5 + a_6X_6}$$

The depth of the banking system is measured in this study by the liquidity-to-GDP ratio (M3/GDP), which is the sum of demand deposits, time deposits, and savings expressed as a percentage of GDP.

Financial depth measures the system's ability to fulfill its primary role of converting deposits into credit. Economic growth is measured by the rate of change in gross domestic product (GDP), so we used two control variables: trade openness, measured by the sum of exports and imports of goods and services expressed as a percentage of GDP, and expenditures as a percentage of GDP, given their essential role in stimulating economic activity. (Brihi & Faris,2011)

In the next part of our work we will move to the logarithmic transformation of variables in order to reduce differences in variance over time and approximate the distributions of variables to the assumptions of normality, which can facilitate the use of some statistical techniques and parameter estimation. (Ahmed Hussein,2007)

To achieve the main objective of the study, we used the standard economic model, which is to evaluate the relationship between the banking sector and economic growth. We relied on the autoregressive model known as ARDL, which was developed by Pesaran et al. (2010). The basic form of the ARDL model is written as follows:

$$yt = \sum_{i=1}^{p} aiyt_{-i} + \sum_{i=1}^{q} bixt_{-i} + c + \epsilon t$$

In fact, it is an approach based on testing the existence of a relationship, at the level, between a dependent variable and a set of explanatory variables, when we do not know for certain whether the variables are constant in trend or in first difference. This econometric approach is adopted due to the nature of the series under study and the primary objective of assessing this relationship in the short and long term.

2.2 Stationarity

Studying stationarity is a crucial step before embarking on any type of time series analysis. To do this, we followed the sequential strategy based on the Augmented Dickey-Fuller statistical test(Al-Rawi,2009).

The results presented in Table 2 show that the variables lnY ، lnX_3، lnX_4 et lnX_5 Only stationary at the first level with probabilities less than 5%, on the other hand, the other series are stationary at the first difference. In other words, the series lnY lnX_3 , lnX_4 , lnX_5 , lnX_1, lnX_2 et lnX_6 Class 1, i.e. That (1). These results justify, among other things, the choice to use the ARDL model. In fact, this difference in the order of integration of the series discourages the choice of another model to process time series: the VAR model, for example.

Table 2: Reliability test

Unsteadiness		**Continuity and immutability**		**Steadiness state**		**Variables**
Probability	**t-statistic**	**Probability**	**t-statistic**	**Probability**	**t-statistic**	

0.9698	1.5641	0.2365	-2.711	0.7968	-0.8497	LnX_1
0.8599	0.6803	0.6276	-1.9264	0.7344	-1.0359	LnX_2
0.7796	0.3386	0.1106	-3.126	0.0125**	-3.4735	LnX_3
0.7205	0.1331	0.1686	-2.9063	0.0332**	-3.0897	LnX_4
0.2687	-1.032	0.0057***	-4.3345	0.0109**	-3.5243	LnX_5
0.5463	-0.3714	0.4642	-2.2294	0.1384	-2.4299	LnX_6
0.9998	3.5519	0.0345**	-3.6445	0.2382	-2.1193	LnY
0.0000***	-6.6269	0.0000***	-6.8338	0.0000***	-6.8981	$d(LnX_1)$
0.0000***	-7.3048	0.0000***	-7.3236	0.0000***	-7.2978	$d(LnX_2)$
0.0038***	-2.9553	0.00926*	-3.2127	0.0512*	-2.9053	$d(LnX_3)$
0.0047***	-2.8797	0.1389	-3.01	0.0648*	-2.8003	$d(LnX_4)$
0.0000***	-4.4476	0.0000***	-6.6501	0.0000***	-6.7212	$d(LnX_5)$
0.0001***	-4.1337	0.0000***	-8.3875	0.0021***	-4.1057	$d(LnX_6)$
0.0000***	-8.6062	0.0023***	-4.6555	0.0000***	-10.1085	d(LnY)
(*) (**)(***) :Statistically significant at 1%, 5% and 10% thresholds, respectively						
Number of delays based on the AIC criterion						
Probability based on MacKinnon (2006)						

Source: Statistical Program Outputs

To estimate the direction of causality and check whether the variables are integrated, we chose an optimal number of non-integrations, p=4, according to the AIC criterion.

Table 3: Unit Cointegration Test

The values						F statistic
1%		5%		10%		
l(1)	l(0)	l(1)	l(0)	l(1)	l(0)	11.25672
4.9	3.6	4	2.87	3.59	2.53	

Source: Statistical Program Outputs

It is clear from Table 3 that there is a long-run relationship between the variables. Indeed, the F statistic (11.25) is statistically significant at the 1% level. Therefore, we reject the null hypothesis that there is no cointegration between the studied variables. (Ahmed Hussein,2007)

2.3. The effect of variables on GDP in the long term :

The estimate of the long-run relationship is shown in Table 4.

Table 4 Estimate of long-term relationship

Probability	t-Statistic	Standard Error	Factories	Variables
0.399200	-0.855177	0.192520	-0.164638	LnX_1
0.269700	-1.124584	0.193756	-0.217895	LnX_2
0.029500	-2.285307	0.216357	-0.494442	LnX_3
0.013700	2.617886	0.189693	0.496594*	LnX_4
0.014600	2.591197	0.068812	0.178306*	LnX_5
0.000000	-6.233189	0.340820	-2.124393	LnX_6
-(*) and (**) are statistically significant at the 5% and 1% thresholds, respectively. Estimation				

is based on the ARDL(4,0,1,4,2,3) model.

Source: Statistical Program Outputs.

The variables LnX1 and LnX2 have a negative and insignificant effect on economic growth, while the remaining exogenous variables have a significant effect on GDP. This is in contrast to the findings of Puatwoe & Piabuo (2017), which state that liquid liabilities and bank deposits significantly affect GDP in the long run.

Analysis of this long-run relationship shows that a one-unit increase in LnX3 contributes to a 0.49% decrease in economic growth (LnY). However, a one-unit increase in LnX4 means a 0.49% increase in LnY. (Al-Attiyah,2011).

2.4 The impact of variables on GDP in the short term:

We found a close relationship in the short term between the economic growth rate and all exogenous variables from the results of the error correction model estimation (Table 5). These results are consistent with the findings of Adu et al. (2013), who recorded a significant correlation between credit granted to the private sector and economic growth.

In addition to the above, we would like to clarify that the error correction coefficient (-0.72) is negative and statistically significant at the 1% level. This confirms the existence of a short-term relationship between the variables representing the banking system and economic growth. Therefore, we can conclude that there is a return to equilibrium in the event of an imbalance at an adjustment rate of 72%. In other words, 72% of the previous year's errors are corrected in the current year. (Ahmed Hussein,2007)

Model validation:

The main objective of this step is to test the standard error hypotheses, namely the autocorrelation test (LM), the error normality test (JB), and the final heteroscedasticity test (ARCH). Table 6 summarizes the results of all these tests.

Model robustness diagnostics show that the parameters reject the hypotheses of non-normality of errors, autocorrelation of errors, and absence of heteroscedasticity, with probabilities greater than 5%.

Table 5: Impact of variables in the short run

Probability	t-Statistic	Standard Error	Factories	Variables
0.00	-4.70	0.08	-0.38	**D(LNY(-1))**
0.02	-2.53	0.09	-0.23	**D(LNY(-2))**
0.00	-3.28	0.08	-0.27	**D(LNY(-3))**
0.00	-6.49	0.05	-0.32	**D(LNX_2)**
0.00	-5.76	0.05	-0.30	**D(LNX_2(-1))**
0.00	-3.60	0.07	-0.23	**D(LNX_2(-2))**
0.02	-2.52	0.07	-0.15	**D(LNX_2(-3))**
0.02	-2.37	0.06	-0.16	**D(LNX_3)**
0.00	-3.49	0.05	-0.25	**D(LNX_4)**
0.00	-4.85	0.03	-0.34	**D(LNX_4(-1))**
0.01	-2.69	0.03	-0.16	**D(LNX_4(-2))**
0.00	-3.04	0.10	-0.15	**D(LNX_4(-3))**
0.00	3.23	0.14	0.10	**D(LNX_5)**
0.01	-2.71	0.13	-0.09	**D(LNX_5(-1))**
0.00	-3.75	0.07	-0.36	**D(LNX_6)**
0.00	6.42	0.07	0.92	**D(LNX_6(-1))**
0.00	3.57	0.13	0.45	**D(LNX_6(-2))**

0.00	-9.72	0.10	-0.72	**CointEq(-1)***

Source: Statistical Program Outputs.

Table 6 Robustness of the model

Probability	Statistic	The test
0.86*	0.29	JB
0.13*	1.92	LM
0.70*	0.54	ARCH

LM error autocorrelation test, JB Jarque-Berra error normality test, ARCH heteroscedasticity test. *Significant result at 5% threshold

From the above, we can confirm the existence of a long-term relationship between banking system variables and economic growth. All tests applied at this stage demonstrated the robustness of the model's use in estimating causality, as well as the long- and short-term relationship between economic growth and banking sector indicators(Al-Rawi,2009).

The study sought to demonstrate the impact of the financial sector and banking system variables on economic activity. An empirical study was conducted over the period from 2010 to 2023, using the econometric approach based on the ARDL econometric model. After verifying the validity of all necessary steps of this model, it was found that the banking system significantly impacts the economic growth rate.

The hypothesis of our study was about the presence of an impact of banking system variables on GDP. This can be explained by examining the role the financial system plays in improving productivity. Indeed, when the financial system develops, productivity improves by mobilizing resources to finance promising projects. (Brihi & Faris,2011)

To ensure a banking system fully performs its functions of stimulating economic growth by accelerating productivity gains and mobilizing the financing needed for investment, other reforms could be considered. First, enhancing competition and competitiveness in bank lending and mobilizing savings. Second, reducing banking intermediation costs to encourage

investment. Finally, creating new savings and investment products with inflation-indexed rewards. (Ahmed Hussein,2007)

Despite all the efforts made, our work, like any scientific research, has limitations. Specifically, these limitations relate to the nature and availability of the data. The study focused on macroeconomic aggregates with 2010 as the base year; however, the revised calculations, based on the 2021 baseline, incorporate data from statistical sources (the Central Bank, the Department of Statistics and Planning).

Conclusions:

Through the above, we would like to show that we have reached a number of conclusions

1. Most reference theoretical studies have indicated the close relationship between the banking system and economic growth. It should also be noted that this relationship is linked to advanced banking systems that are formed as a result of accumulated experiences through joint cooperation among the various banking sectors.
2. The gross domestic product depends on the percentage of investments within the country, and these percentages are directly linked to monetary banking support. Through our study, we concluded that cash liquidity plays an important role in providing the funds necessary for investment.
3. The relative importance of bank deposits, which are the main source of funds for borrowing, has increased. This indicates the important role played by the deposits index in supporting various economic activities within the country, thus raising the percentage of the gross domestic product.
4. Given the weak effectiveness of the private sector in productive investments in the country, we note that credit provided by the private sector has a critical role in supporting economic growth. Therefore, we see that the gross domestic product is little affected by private credit.
5. The balance of payments is one of the most important balances that determine and clarify the proportion of international trade's contribution to supporting economic growth. Therefore, our study, through the use of export and import ratios, concluded that there is a clear impact of international trade on supporting the gross domestic product.

6. By directing certain percentages of funds towards public spending in order to provide general welfare for individuals and by using expenditure ratios as a tool or indicator for control, we notice that there is an effect of public spending on the gross domestic product.

Recommendations:

Based on the findings, we can offer a number of recommendations that will raise the overall level of economic growth, including:4. Establish an integrated banking system that supports economic growth through the implementation of a successful monetary policy.

1. Focus on increasing the percentages of cash allocated to support various projects within the country, which in turn raises the percentages of the gross domestic product.
2. Providing services to bank customers that contribute to increasing customer confidence in banks, thus encouraging them to deposit money instead of hoarding it. This, in turn, is directed towards investments, which supports raising GDP rates.
3. Directing the funds allocated for lending towards investment projects that will raise the level of economic growth within the country.
4. Taking into consideration the importance of the balance of payments, which shows the proportions of international trade in exports and imports and their role in raising their contribution to the gross domestic product.
5. Obtaining an integrated banking system that supports the economic growth process through the implementation of a successful monetary policy.
6. Attracting foreign capital by enhancing confidence in the existing banking system.
7. Raising the level of competitiveness between banks operating in the public and private banking sectors in order to build a high cash flow in the financial market, which in turn provides financial support for economic growth.

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