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## The Effect of Financial Depth Indicators on Economic Growth in Iraq for the Period 2004-2021: Econometric Study

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Abstract: This research aims to measure the extent of the impact of financial depth indicators on economic growth in Iraq from an Econometric perspective. The study adopts a descriptive methodology to cover the theoretical aspect and quantitative a standardized approach by applying the Autoregressive Distributed Lag (ARDL) model. Furthermore, quarterly data from 2004 to2021 are utilized to measure and analyze the relationship between financial depth indicators, represented by broad money supply to Gross Domestic Product (GDP) and the ratio of private sector credit to GDP, as independent variables, and economic growth, represented by GDP, as a dependent variable using EViews 12 software. The research findings in the long term indicate a negative impact of the M2/GDP indicator on GDP, while the impact of the private sector credit to GDP ratio is positive.

أثر مؤشرات العمق المالي على النمو الاقتصادي في العراق للمدة 2004-2021 دراسة قياسية

طيبة عباس عبد كلية الإدارة والاقتصاد/جامعة الفلوجة

المستخلص

يهدف هذا البحث الى قياس حجم أثر مؤشرات العمق المالي على النمو الاقتصادي في العراق، من الجانب القياسي، اعتمد البحث على المنهج الوصفي لتغطية الجانب النظري من البحث و المنهج الكمي القياسي عن طريق تطبيق منهجية أنموذج الانحدار الذاتي للإبطاء الموزع (ARDL) وتم استخدام بيانات ربع سنوية للمدة 2021-2021 بهدف قياس وتحليل العلاقة بين مؤشرات العمق المالي معبر اعنه ب(عرض النقد الواسع الى الناتج المحلي الإجمالي و نسبة الائتمان المحلي المحلي المحلي الإبطاء الموزع مؤشرات العمق المالي معبر اعنه ب(عرض القد الواسع الى الناتج المحلي الإجمالي و نسبة الائتمان المحلي المحلي الإجمالي و نسبة الائتمان المحلي المحلي المحلي الإجمالي و نسبة الائتمان المحلي المحلي المحلي العدة بين مؤشرات العمق المالي معبر اعنه ب(عرض النقد الواسع الى الناتج المحلي الإجمالي و نسبة الائتمان و أشارت نتائج المحلي الخاص الى الناتج المحلي الإجمالي) بصفتها متغير تابع باستخدام برنامج 12 EViews 12 و أشارت نتائج البحث في المدى الطويل على ان مؤشر (PC) (M2\GDP) يؤثر سلبيا على الناتج المحلي و أشارت نتائج المحلي المحلي الإجمالي) بصفته متغير تابع باستخدام برنامج 12 EViews 12 و أشارت نتائج المحلي الإجمالي) بصفتها متغيرات مستقلة، والنمو و أشارت نتائج المحلي الإجمالي) بصفته متغير تابع باستخدام برنامج EViews 12 و أشارت نتائج المحلي المحلي الإجمالي) بصفته متغير تابع باستخدام برنامج EViews 12 و أشارت نتائج المحلي المالي الناتج المحلي الإجمالي، بينما كان التأثير ايجابي لمؤشر نسبة الائتمان المقدم للقطاع الخاص الى الناتج المحلي الإجمالي. الجمالي بينما كان التأثير ايجابي لمؤشر نسبة الائتمان المقدم للقطاع الخاص الى الناتج المحلي الإجمالي.

## **1. Introduction**

Economists widely consider the presence of an advanced financial system characterized by efficiency in distributing and allocating available financial resources as a fundamental pillar for achieving economic growth, which is ultimate goal of economies in all countries. Financial depth for any country and at any given time is typically measured by relying on indicators that illustrate the extent of increased exchange in various financial instruments, thereby encouraging financial investment. Moreover, studies suggest that as the financial system evolves and deepens, its ability to create and innovate new products that align with society's financial and savings needs across its various segments increases. On the one hand, this leads to heightened competition in the financial environment, strengthening the effectiveness of intermediary units in mobilizing savings, improving the working environment, and reducing fluctuations in business cycles. Many countries have succeeded in significantly boosting economic growth rates due to the evolution of their financial systems by enhancing their ability to mobilize local savings by providing attractive financial savings and investment channels.

**Research Problem:** Countries of the world seek to bring about development in their financial markets because of their effective role in increasing investment and stimulating economic growth rates. One of the most important indicators of financial development in developed and developing countries alike is indicators of financial depth in the financial market, which is expressed through improving... Economic conditions by increasing competitive efficiency in those markets, which indirectly benefits the nonfinancial economic sectors, the research problem can be formulated by the following question: What is the relationship between financial depth indicators and economic growth in Iraq during the period 2004-2021?

**Importance of the Research:** The significance of this research stems from elucidating the role played by financial depth indicators in the financial markets and banking sector in Iraq, specifically in terms of increasing capital accumulation rates and overall economic growth. The financial sector's ability to direct savings towards investments and its reflection on the growth rate of the Gross Domestic Product (GDP) contributes to understanding the relationship between the financial system and economic growth. This understanding aids policymakers and economic authorities in formulating improved fiscal policies to enhance economic growth.

**Research Hypotheses:** To address the research problem, two hypotheses have been formulated:

- A. Financial depth, as measured by the ratio of broad money supply to GDP (M2/GDP), positively impacts long-term economic growth in Iraq.
- B. Financial depth, as measured by the ratio of credit provided to the private sector to GDP (TM/GDP), positively impacts long-term economic growth in Iraq.

## **Research Objectives, summarized as follows:**

- A. Build a knowledge framework on financial depth, importance, indicators, and relationship with economic growth.
- B. Determine the role played by the financial services sector in enhancing economic activity in Iraq by analyzing the evolution of financial depth indicators in Iraq from 2004 to 2021.
- C. Measure the relationship between financial depth indicators and economic growth in Iraq during the research period.

# 2. Theoretical Framework

**A.Concept of Financial Depth:** Various definitions of financial depth have emerged, reflecting diverse interpretations and perspectives presented by economists and financial experts. Nevertheless, they converge in essence and significance, including:

The World Bank defines financial depth as the scale of financial activity within a country, encompassing banks, non-banking financial institutions, and their markets, compared to the Gross Domestic Product (Nomasomi & others, 2020: 424).

According to some economists' financial depth represents commercial bank deposits divided by the Gross Domestic Product of a country, contributing to economic activity by mobilizing and directing savings toward investment. While others define financial depth as the accumulation of financial resources in an economy, asserting that the growth rate of an economy increases with the rise of financial assets (Abdullah & Abtan, 2022: 540). Some else define it as a strategy that, when implemented, accelerates market dynamics and contributions. (Mustafa and Rahman, 2015: 5)

Financial depth is also characterized as a state in which an economy possesses a substantial volume of funds, financial institutions, and financial assets, leading to long-term economic growth. It reflects the extent to which a country's economy is influenced by financial instruments and financial institutions within that country (Mirkin & Kuznetsova, 2013: 6).

Financial depth indicates the extent of services provided by the financial system in a given country's economy (Cihaket, 2013: 8).

# **B. Financial Depth Indicators**:

Several indicators are used to measure financial depth, and they vary depending on a country's level of financial development and the prevailing circumstances. Traditional quantitative measures are considered more reliable as indicators of financial depth, and the foremost among these indicators are:

The indicator of the ratio of bank credit extended to the private sector to the Gross Domestic Product (GDP): This indicator is considered one of the critical metrics for measuring financial depth, as it illustrates the extent of the financial sector's depth by measuring the funds directed towards the private sector. These funds are reflected in increased investment, consequently leading to economic growth, the expansion of financial

services provided, and improved financial intermediation. Furthermore, it contributes to the development of the productive sector (Singary & Naimi, 2022, 138). This ratio is the credit banks and other financial institutions provide to the private sector divided by the gross domestic product (GDP). This indicator is utilized to measure the level of growth in the banking sector and precisely gauge the level of financial intermediation. It isolates credit provided by financial intermediaries to the private sector, excluding credit from the central bank or other banks to the public sector. This indicator accurately measures the funds directed towards the private sector more than any other measure. The credit ratio granted to the private sector to GDP is directly related to investment and economic growth. The increase in this ratio can be interpreted as improving the services provided, enhanced financial intermediation, and growth in total deposits (Sabrah, 2015, 50). It is essential to emphasize that the increase in credit growth should not exceed 2% from the long-term growth trajectory. The Basel Committee recommended avoiding increasing the credit gap to prevent financial crises (Azzam, 2017, 40).

- The broad critique presented pertains to the Gross Domestic Product (GDP) In its comprehensive sense, the broad money supply serves as a precise indicator of the quantity of circulating currency within an economy, in addition to elucidating the role of money in economic activity. It accurately delineates the suitable framework for the total money supply (Central Bank of Iraq, 2017: 12), signifying that this ratio measures the liquidity proportion in the economy (Awad and Al-Mahadeen, 2011: 515). Broad money supply encompasses a narrow supply augmented by time deposits, savings deposits, and special savings deposits held by commercial banks (Ahmed and Hameh, 2019: 206). The broad money supply symbolized as M2, encompasses savings services, which should experience more rapid growth upon achieving financial depth (Al-Saadi, 2011: 220).
- C. Economic Growth: Economic growth is defined as a continuous increase in gross domestic product (GDP) or real gross national income, leading to a rise in the average per capita income, provided that this increase is genuine and not nominal (Ajamia et al., 2008: 77). It is also characterized as the automatic change in national economic indicators, signifying an increase in national income along with an elevation in the individual's share of it. This change occurs automatically in response to market forces of demand and supply (Badrani, 2014: 20). Economic growth can be further described as the

elevation of productivity levels in a country's economy through an increase in the production of goods and services over a specific period, excluding the effects of economic inflation (Paul, 2019: 14). Economic growth is also known as the increase in gross domestic product that achieves a rise in the average real income per individual. Various types of economic growth can be distinguished, such as spontaneous growth, which occurs automatically without prior planning; transient growth, occurring within a specific time frame; and planned growth, requiring state intervention through comprehensive and scientific resource planning in a given country. The gross domestic product in Iraq is characterized as traditional, a feature stemming from the country's historical conditions that have impacted its productive capacity, thereby contributing to the fluctuation of its gross domestic product, both in decline and ascent (Sulaiman, 2023: 35).

- D. The Relationship Between Financial Depth and Economic Growth: The financial depth plays a crucial role in the growth of economic activities across various sectors comprising the Gross Domestic Product (GDP). Financial depth is considered a significant determinant of GDP growth by elevating the level of domestic investment, which is the channel through which financial depth influences economic growth (Mukund, 2004: 3). The evolution of financial depth contributes to the proliferation and diversification of financial intermediaries, fostering increased competition among them. This results in the accumulation of financial resources within the financial sector and directs them optimally towards more productive investments (Akbas Y.E, 2015: 172). The deepening of the financial system and its soundness contribute to widespread economic growth while mitigating poverty. Individuals' direct access to financial services can strongly influence their ability to accumulate wealth, consequently enhancing their investment and promoting economic growth (Al-Singary and Al-Nuaimi, 2022: 141).
- **E.Analysis of the Impact of Financial Depth Indicators in Iraq:** The data presented in Table 1 illustrates the banking sector indicators in Iraq for the period 2004-2021, exhibiting variations between decreases and .increases. The reasons behind these fluctuations are multifaceted, including:
- In 2006, Iraq witnessed a surge in domestic liquidity compared to the previous year. This manifested in the increased broad money supply, reaching 19.9203 billion dinars with a growth rate of 33.8% (Arab Monetary

Fund, 2007: 127). The upward trend continued gradually, reaching 92.988 billion dinars in 2014, with a growth rate of 3.9%. However, in 2015, it declined to 84.527 billion dinars with a negative growth rate of 9.1%. The increase in the money supply can be attributed to various factors, including the rise in government employee salaries, increased investment and military spending, and the replacement of the Iraqi currency following the enactment of the Iraqi Central Bank Law No. 56 of 2004. Additionally, there was an increase in foreign reserves held by the Iraqi Central Bank to maintain the stability of the Iraqi dinar exchange rates (Abdul Zahra, 2018).

- Monetary policy faced several challenges and pressures due to the reliance on bank liquidity conditions on revenues derived from the sale of crude oil in dollars. These revenues constitute most of Iraq's Gross Domestic Product (GDP) and general revenues. With global oil prices relatively lower compared to previous years, there was an increase in the budget deficit, impacting monetary policy conditions. This is reflected in the increased demand for foreign currency compared to what is available in the local market (Arab Monetary Fund, 2018: 129). The negative growth rate of the broad money supply to GDP persisted from 2015 to 2018, reaching 9.1% in 2015 and turning favorable to 2.7% in 2018. The positive growth trend continued, reaching 16.7% in 2021.
- The study period has witnessed increased credit grants due to the private sector's prominence in economic development. This was facilitated by establishing private banks, a shift from the previous public sector dominance (Central Bank of Iraq, 2003-2004, 22). The increase in the number of private banks and their capital size was driven by improvements in oil revenues and expectations of growing demand for banking facilities, whether for credit or deposits (National Development Plan, 2009: 57). Additionally, financial liberalization in Iraq during the study years, represented by the effective functioning of the financial market through the banking system's freedom to determine interest rates (both lending and deposit rates), was a fundamental aspect of strengthening financial authority. This shift occurred after abandoning the mandatory measures previously adopted by the monetary policy, relying more on indirect policies that leverage market forces to avoid the financial repression phenomenon, which involves imposing limits on granted bank credit or setting credit terms outside the market and its balances (Saleh, 2011: 6). The noticeable increase in the credit growth rate to the

private sector as a percentage of GDP was around 45.6% in 2015, attributed to the sharp decline in GDP due to the global oil price decrease. Subsequently, it fluctuated, reaching its highest value in 2020 at 51.1%, and then experienced a negative growth rate of -15% in 2021.

Annual	Domestic credit	Annual		Annual		Annual	Domestic	Annual		
growth	to the private	growth	M2/GDP	growth	GDP	growth	credit to the	growth	M2	YEAR
rate	sector to GDP	rate		rate		rate	private sector	rate		
	1.3		27.0		53.2		67.4		14.4	2004
23.1	1.6	-25.2	20.2	38.1	73.5	69.7	114.4	3.7	14.9	2005
43.8	2.3	3.0	20.8	30.0	95.6	89.1	216.4	33.8	19.9	2006
8.7	2.5	17.8	24.5	16.6	111.5	27.5	275.9	37.1	27.3	2007
8.0	2.7	-4.1	23.5	40.9	157.0	52.6	421.2	35.2	36.9	2008
40.7	3.8	52.3	35.8	-16.8	130.6	17.2	493.7	26.7	46.8	2009
42.1	5.4	5.9	37.9	24.1	162.1	77.0	874.0	31.2	61.4	2010
0.0	5.4	-10.0	34.1	34.1	217.3	34.6	1176.7	20.7	74.1	2011
9.3	5.9	-10.9	30.4	17.0	254.2	27.6	1501.9	4.2	77.2	2012
6.8	6.3	7.6	32.7	7.6	273.6	15.4	1733.3	16.0	89.5	2013
7.9	6.8	6.7	34.9	-2.7	266.3	1.9	1766.7	3.9	93.0	2014
45.6	9.9	24.4	43.4	-26.9	194.7	2.3	1806.5	-9.1	84.5	2015
2.0	10.1	5.8	45.9	1.2	196.9	7.5	1942.2	7.0	90.5	2016
-5.9	9.5	-10.5	41.1	12.6	221.7	7.6	2089.3	2.6	92.9	2017
-9.5	8.6	-13.6	35.5	21.3	268.9	3.8	2168.3	2.7	95.4	2018
2.3	8.8	5.6	37.5	2.7	276.2	12.1	2430.2	8.4	103.4	2019
51.1	13.3	48.3	55.6	-21.9	215.7	18.0	2868.3	15.9	119.9	2020
-15.0	11.3	-16.4	46.5	39.6	301.2	18.6	3403.0	16.7	139.9	2021

Table (1): The indicators of the banking sector in Iraq for the period 2004-2021

3. **Practical Framework:** This section presents the results of the standard model employed to assess the impact of financial depth indicators on economic growth in Iraq for the period 2004-2021 are presented. Due to the small time series of the variables used in the measurement, the annual data was converted to quarterly data using the statistical analysis program EViews 12.

The employed standard model can be described statistically, illustrating the relationships between the variables. The dependent variable is economic growth, represented by the Gross Domestic Product (GDP) at

current local currency prices. The independent variable encompasses financial depth indicators, namely:

- The broad money supply to GDP ratio, denoted as (M2\GDP)
- Domestic credit to the private sector to GDP ratio, denoted as (TM\GDP) Based on the study's theoretical framework, it is assumed to test the following relationship:

 $GDP = a + B_1M2 \setminus GDP + B_2TM \setminus GDP + u_t$  (1)

The acronym GDP refers to Gross Domestic Product, while M2\GDP and TM\GDP represent indicators of financial depth. The appendix (1) provides time series data for the variables in the standard model.

A.Results of the stationary time series test for search variables (Unit Root Stability): Many tests are employed to detect the unit root problem and determine the stationarity of time series related to economic variables, specifying their integration order. One of the most important of these tests is the Phillips-Perron test (PP). The criteria used in this test are based on two fundamental assumptions: if the probability value is greater than 0.05, we accept the null hypothesis ( $H_0: B = 0$ ), confirming the existence of a unit root, i.e., the non-stationarity of the time series. Conversely, if the probability value is less than 0.05, we accept the alternative hypothesis ( $H_0: B > 0$ ), indicating the absence of a unit root and that the time series data are stationary.

Table 2 shows that the calculated probability value (P-value) using the EViews 12 statistical analysis program for the variables under study was greater than 0.05. This indicates that the time series of the research variable are non-stationary and suffer from a unit root problem at their original level (at level), except for (M2\GDP, TM\GDP) in the presence of a constant limit and a general trend only. This means accepting the null hypothesis, suggesting the non-stationarity of time series for most variables due to a unit root problem.

To address this issue, the first differences were taken for the time series data, resulting in probability values less than 0.05. Thus, we reject the null hypothesis indicating the presence of a unit root problem and accept the alternative hypothesis suggesting the absence of a unit root in the time series and that the time series are integrated of the first order  $(I_1)$ , in all three cases,

whether with a constant limit or a constant limit and a general trend for the variables or without a constant limit and a general trend.

PP	At Level				
	Variables	GDP	M2\GDP	TM\GDP	
	t-Statistic	-1.4499	-1.4025	-0.9183	
With constant	Prob.	0.5530	0.5764	0.7769	
	Result	n0	nO	nO	
With constant &	t-Statistic	-2.3096	-3.1932	-3.4318	
Will Constant &	Prob.	0.4232	0.0941	0.0553	
TTEIId	Result	n0	*	*	
Without constant	t-Statistic	0.8846	0.3059	0.9790	
& Trond	Prob.	0.8975	0.7715	0.9119	
a menu	Result	n0	n0	nO	
At First Difference					
	Variables	d(GDP)	d(M2_GDP)	d(TM_GDP)	
	t-Statistic	-8.5127	-8.3024	-8.5673	
With constant	Prob.	0.0000	0.0000	0.0000	
	Result	***	***	***	
With constant &	t-Statistic	-8.4661	-8.2467	-8.5032	
with constant &	Prob.	0.0000	0.0000	0.0000	
TTEIIG	Result	***	***	***	
Without constant	t-Statistic	-8.3066	-8.3066	-8.3066	
& Trond	Prob.	0.0000	0.0000	0.0000	
a Hellu	Result	***	***	***	
	a: (*) Significant at the 10%; (**) Significant at the				
Notes:	5%; (***	) Significa	ant at the 1% an	nd (no) Not	
	Significant.				

 Table (2): Phillips-Perron test

B.	Cointegration	test	according to	the	ARDL	methodology.	
р.	Connegration	usi	according to		mpl	memouology.	

The initial estimation is based on the ARDL methodology: After conducting the stationary test for the time series of the variables in the research axis through the unit root test (Phillips-Perron test), it is evident that the variables are stationary at both the level and the first difference. Since the Autoregressive Distributed Lag (ARDL) methodology relies on stationary data at the first difference or a combination of the first difference

and the level, provided there are no stationary variables at the second difference  $(I_2)$ , an ARDL test for the variables within the research scope was performed. The results are shown in Table 3.

Table (3): ARDL results.				
	Dependent Va	riable: LOG(	GDP)	
	Date: 11/04	/23 Time: 16:	45	
S	ample (adjuste	ed): 2005Q1 2	021Q4	
Included observations: 68 after adjustments				
Maximur	n dependent la	ags: 4 (Autom	atic selection	)
Model sel	ection method	: Akaike info	criterion (AI	C)
Dynamic regi	ressors (4 lags	, automatic): N	M2\GDP TM	GDP
	Fixed r	egressors: C		
ľ	Number of mo	dels evaluated	l: 100	
	Selected Mod	el: ARDL (4,	4, 1)	
Variable	Coefficient	Std. Error	t-Statistic	Prob.*
LOG (GDP (-1))	0.568671	0.118943	4.781029	0.0000
LOG(GDP(-2))	7.24E-13	0.136364	5.31E-12	1.0000
LOG(GDP(-3))	1.64E-13	0.136364	1.20E-12	1.0000
LOG (GDP (-4))	0.364607	0.115751	3.149926	0.0026
M2_GDP	-0.024172	0.004920	-4.912674	0.0000
M2_GDP (-1)	0.017237	0.006028	2.859401	0.0060
M2_GDP (-2)	2.38E-14	0.004390	5.41E-12	1.0000
M2_GDP (-3)	2.52E-16	0.004390	5.73E-14	1.0000
M2_GDP (-4)	0.010158	0.003626	2.801118	0.0070
TM_GDP	0.016568	0.021820	0.759276	0.4509
TM_GDP (-1)	-0.027821	0.020781	-1.338732	0.1861
С	0.374933	0.159299	2.353643	0.0221
R-squared	0.977284	Mean depe	endent var	5.232726
Adjusted R-squared	0.972822	S.D. depe	ndent var	0.402994
S.E. of regression	0.066437	Akaike inf	o criterion	-2.426339
Sum squared resid.	0.247177	Schwarz criterion -2.034661		
Log-likelihood	94.49552	Hannan-Qu	-2.271144	
F-statistic	219.0176	Durbin-W	atson stat	1.470154
Prob(F-statistic)	0.000000			

Table 3 illustrates the preliminary estimation results of the ARDL model, indicating its acceptability. The coefficient of determination (R-squared) stands at (0.97), signifying that the independent variables explain 97% of the variations observed in the dependent variable, while the remaining 3% accounts for the influence of unaccounted variables outside the model. The significant F-statistic value of (219.0176) with a probability value of (0.000000) underscores the statistical significance of the model employed in estimating the parameters of short- and long-term lags. Furthermore, the statistically significant Durbin-Watson statistic of (1.470154) suggests a positive autocorrelation.

The model's order tested using the ARDL methodology is (4,4,1) based on optimal lag length criteria (HQ, AIC, SC). The lag length was chosen according to the AIC criterion, representing the minimum value for this criterion. Additionally, the results indicate that the independent variables are statistically significant at the 5% level.

Results of the cointegration test according to the Bounds Test: To assess the presence of a shared integration relationship, specifically a long-term equilibrium relationship, between independent and dependent variables, the statistic (F) is calculated through boundary testing. Subsequently, its value is compared against the upper and lower critical value bounds established by the economist Bessran. These bounds are distributed across various significance levels, as elucidated in Table 4.

Test statistic	Value	K
F- statistic	9.685187	2
Critical Va		
significance	I <sub>0</sub> bounds	I <sub>1</sub> bounds
10%	2.63	3.35
5%	3.1	3.87
2.5%	3.55	4.38
1%	4.13	5

Tabla	(A).	Rounds	Test	Doculto
I able	(4).	Dounus	1681	Results

Table 4 reveals a computed value (F) of 9.685187, surpassing lower and upper critical bounds at all significance levels (1%, 2.5%, 5%, 10%). This indicates the presence of a shared integration relationship, signifying a long-term equilibrium between the dependent variable (Gross Domestic Product) and the independent variable (financial depth indicators). Consequently,

these findings lead us to employ an error correction model in the short and long term.

- Estimating the error correction model according to the ARDL methodology: After verifying the presence of a shared integration relationship among model variables using the statistical value (F), we estimate the parameters in both the short term and long term for the error correction model. Subsequently, we ensure the quality of performance of this model, as follows:
  - Analysis of the relationship in the short term: The results in Table 5 indicate the following:
  - •The negative impact of the ((M2/GDP)) indicator is observed, as its increase leads to a decrease in the Gross Domestic Product (GDP), and this impact was statistically significant at a significance level of 5%, with a probability value of (0.0043).
  - •Additionally, the results indicate that the error correction vector parameter (Coint-Eq (-1)) for this model was (-0.066722), with a statistically significant probability value of (Prob.= 0.0000) at a 5% significance level. This implies a long-term equilibrium relationship moving from the broad money supply indicator to the GDP in Iraq over the research period. This is a result of satisfying the two fundamental conditions in this test, namely the negative and statistically significant value, suggesting that (-0.066722) of short-term errors can be corrected over time to achieve equilibrium in the long term.

ARDL Error Correction Regression					
Ι	Dependent Varia	ble: DLOG (	GDP)		
	Selected Mode	l: ARDL (4, 4	4, 1)		
Case	e 2: Restricted C	Constant and I	No Trend		
	Sample: 200	04Q1 2021Q4	4		
	Included ob	servations: 68	8		
	ECN	A Regression			
Case 2: Restricted Constant and No Trend					
Variable	coefficient	Std. Error	t-statistic	Prob.	
DLOG(GDP(-1))	-0.364607	0.109917	-3.317105	0.0016	
DLOG(GDP(-2)) -0.364607 0.109917 -3.317105 0.0016					
DLOG(GDP(-3))	-0.364607	0.109917	-3.317105	0.0016	

Table (5): The results of the ECM error correction model

D(M2_GDP)	-	0.024172	0.004476	-5.400069	0.0000
D(M2_GDP(-1))	-	0.010158	0.003417	-2.973162	0.0043
D(M2_GDP(-2))	-	0.010158	0.003417	-2.973162	0.0043
D(M2_GDP(-3))	-	0.010158	0.003417	-2.973162	0.0043
D(TM_GDP)	0.016568		0.020507	0.807886	0.4226
CointEq(-1)*	-0.066722		0.010444	-6.388751	0.0000
R-squared	0.687187		0.687187 Mean dependent var		0.025482
Adjusted R-squared 0.644771		0.644771	S.D. dependent var		0.108599
S.E. of regression		0.064726	Akaike info criterion		-2.514574
Sum squared resid. 0.247177		Schwarz criterion		-2.220816	
Log likelihood	Log likelihood 94.49552		Hannan-Qu	uinn criter.	-2.398178
Durbin-Watson stat		1.470154			

- **Long-term relationship analysis: -** The results presented in Table 6 indicate the relationship between variables in the long term, revealing a discernible impact between financial depth indicators and Gross Domestic Product (GDP). The findings are summarized as follows:
- •An inverse relationship exists between the indicator of broad money supply to gross domestic product (GDP) and GDP itself. This implies that an increase in the value of this indicator by 1% leads to a decrease in GDP by 0.010158. This effect is statistically significant at the 5% level, as the probability value is 0.0070.
- •A positive relationship exists between local credit provided to the private sector and gross domestic product (GDP). That is an increase in the value of this indicator by 1% results in an increase in GDP by 0.016568. However, the probability value indicates that this effect is not statistically significant.

Long run form					
Variable	coefficient	Std. Error	t-statistic	Prob.	
С	0.374933	0.159299	2.353643	0.0221	
LOG(GDP(-1))	-0.066722	0.030790	-2.166994	0.0345	
M2_GDP(-1)	0.003223	0.003127	1.030661	0.3071	
TM_GDP(-1)	-0.011253	0.009228	-1.219494	0.2278	
DLOG(GDP(-1))	-0.364607	0.115751	-3.149926	0.0026	
DLOG(GDP(-2))	-0.364607	0.115751	-3.149926	0.0026	
DLOG(GDP(-3))	-0.364607	0.115751	-3.149926	0.0026	

Table (6): Long-term relationship analysis

Long run form						
Variable	coefficient	Std. Error	t-statistic	Prob.		
D(M2_GDP)	-0.024172	0.004920	-4.912674	0.0000		
D(M2_GDP(-1))	-0.010158	0.003626	-2.801118	0.0070		
D(M2_GDP(-2))	-0.010158	0.003626	-2.801118	0.0070		
D(M2_GDP(-3))	-0.010158	0.003626	-2.801118	0.0070		
D(TM_GDP)	0.016568	0.021820	0.759276	0.4509		

## \* ARDL model quality tests

- Normal distribution of residuals test (Jarque Bera JB): This test relies on the probability value of the Jarque-Bera (JB) statistic. The null hypothesis suggests that the model's residuals follow a normal distribution if the probability value is greater than 0.05. On the other hand, the alternative hypothesis indicates that the residuals do not follow a normal distribution if the probability value is less than 0.05. Figure (1) illustrates the results of the residuals of the study's model, indicating that the residuals do not follow a normal distribution, as the probability value for the JB test is 0.000, which is less than 0.05.





- ARCH instability test: This test relies on the probabilistic significance of the chi-square  $(x^2)$  statistic and its results are presented in Table 8.

Table	(7): ARCH test re	sults.
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Heteroskedasticity Test: ARCH				
F-statistic	0.026671	Prob. F (1,65)	0.8708	
Obs*R-squared	0.027481	Prob. Chi-Square (1)	0.8683	

Table 7 illustrates that the probability value for the chi-square test is (0.8683), which is greater than (0.05). Consequently, the null hypothesis is accepted, indicating that the model is free from the issue of non-constant variance. The alternative hypothesis is rejected. stability tests of the ARDL model

The stability tests of the ARDL model include two tests, namely the Cumulative Sum (CUSUM) and Cumulative Sum of Squares (CUSUMQS) tests. These tests aim to verify the structural stability of short-term and long-term coefficients. Structural stability of the estimated model is confirmed when the cumulative sum of residuals (CUSUM) and the cumulative sum of squares of residuals are within critical bounds at a 5% significance level. Figures 2 and 3, respectively illustrate the test results. It is observed from Figure 2 that the blue series was outside the red bounds from the first quarter of 2014 to the fourth quarter of 2016. This deviation is attributed to the dual shock experienced by the Iraqi economy during that period, resulting from the war on terrorism, which led to increased public spending and the decline in global oil prices. Subsequently, the Cumulative Sum of Squares of Residuals (Cusum of Square) test was conducted, and Figure 3 depicts the structural stability that was achieved.



Figure (2): Cumulative sum of the residuals test (CUSUM).



Figure (3): The cumulative sum of the residuals test (CUSUM OF Squares).

Through the standard analysis, the following findings emerge:

- Financial depth, as measured by the ratio of broad money supply to gross domestic product (M2/GDP), has a negative impact on long-term economic growth in Iraq.
- Financial depth, as measured by the ratio of credit provided to the private sector to gross domestic product (TM/GDP), positively impacts long-term economic growth in Iraq.

## 4. Conclusions:

- A. The presentation of criticism constitutes a fundamental factor in achieving financial depth, as it represents the means of payment in the economy, which has increased steadily during the study period. Despite this increase, it has not been proportional to the economic growth represented by the Gross Domestic Product (GDP), as GDP relies on oil revenues, and any increase or decrease in these revenues directly reflects on the amount of GDP, which is the fundamental factor in financial depth.
- B. The credit ratio granted to the private sector concerning the GDP remained low throughout the study period, representing only a small percentage, not exceeding, in the best cases, around 13.3% in 2020 and it is the highest during the study while it was around 11.3% in 2021
- C. The results of the economic analysis have shown that financial depth indicators influenced economic growth in Iraq during the study period. An inverse relationship appeared with the M2/GDP ratio and a direct

relationship with the credit ratio granted to the private sector concerning GDP, there is an inverse relationship between the indicator (broad money supply to GDP) and the GDP, meaning that an increase in the value of this indicator by (1%) leads to a decrease in the GDP by (-0.010158) and that this effect is statistically significant at the level (5%), where the probability value was (0.0070)

- D.There is a direct relationship between (domestic credit provided to the private sector to the gross domestic product) and the gross domestic product, meaning that an increase in the value of this indicator by (1%) leads to an increase in the gross domestic product by (0.016568), and the probability value indicates that it is not significant.
- E. The main reason is Iraq's reliance on oil revenues collected in foreign currency, leading to an increase in the Central Bank of Iraq's reserves and, consequently, in the money supply and borrowing.

## 5. Recommendations:

- A.The focus is building an efficient banking sector capable of operating a broad and stable financial system. A weak financial system reduces sector activity and increases the ratio of non-performing loans to total loans, jeopardizing the financial system's stability.
- B.Efforts should be directed towards enhancing financial intermediation and developing the banking sector to improve access to credit and facilitate financial services for people with low incomes in rural areas. This will contribute to increasing deposit growth, leading to the provision of credit to the private sector.
- C. Additionally, implementing new systems, applications, and methods is crucial to maximizing the benefits of technological services in the delivery of banking.
- D.The study recommends the need to enhance financial inclusion by disseminating electronic payment methods in all market segments and replacing them with paper or traditional payment methods, such as POS and others.

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Appendix 1					
Domestic credit to the private sector to GDP	M2/GDP	GDP	YEAR		
1.3	27.0	53.2	2004		
1.6	20.2	73.5	2005		
2.3	20.8	95.6	2006		
2.5	24.5	111.5	2007		
2.7	23.5	157.0	2008		
3.8	35.8	130.6	2009		
5.4	37.9	162.1	2010		
5.4	34.1	217.3	2011		
5.9	30.4	254.2	2012		
6.3	32.7	273.6	2013		
6.8	34.9	266.3	2014		
9.9	43.4	194.7	2015		
10.1	45.9	196.9	2016		
9.5	41.1	221.7	2017		
8.6	35.5	268.9	2018		
8.8	37.5	276.2	2019		
13.3	55.6	215.7	2020		
11.3	46.5	301.2	2021		

Appendix	1
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