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Impact of Credit Granted to Economic Sectors on Some Macroeconomic Variables in Iraq

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In this research, cash credit's influence on private investment and economic growth in Iraq from 2009-2023 is examined using the ARDL model. The present research examines cash loan allocation to economic sectors. The study found a long-term association between main economic sector credit, economic growth, and private investment in Iraq. Furthermore, the commerce and restaurant sector were the only sector that experienced a short-term impact on economic growth, whereas the construction sector exhibited a statistically significant impact and a positive correlation with economic growth. Long term, credit has no statistically significant effect on the evolution of the key economic segments. Regarding the influence of credit on private investment, throughout both the short as well as long periods the manufacturing and construction industries were the most statistically significant economic sectors.

Keywords: Monetary Credit, Economic Growth, Private Investment, Construction, Manufacturing, Agricultural Sectors.

Introduction

The private sector permanently needs bank credit in order to develop productive projects (Barral, 2021). Furthermore, credit provides it with an additional source of funding that enables it to build or develop productive capacities (Feil & Feijó, 2021). It seeks to obtain it from banks that have surplus reserves that it aims to invest (Jie et al., 2024). Central banks seek to increase the volume of credit approved to economic activity in order to achieve the economic goals they seek to reach, which is to increase the volume of investment to build new productive capabilities or develop current productive capacities (Ali & Nazmi, 2023), and then provide goods and services through local production instead of importing them from abroad (Biygautane, 2023). In the end, it contributes to increasing GDP or economic growth, as well as providing new job opportunities that reduce unemployment rates (Huang & Lesutis, 2023). There is a critical role of banks in economic growth of any country. The credit allocated by the banks to the government projects helps to grow the infrastructure which is a contribution to economy (Jabbour et al., 2023).

However, the easy way and target oriented credit allocation is necessary for successful growth of the projects. In addition, when the banks are working effectively with the government departments, the credit related issues are resolved (Falchetta et al., 2022). The growth in banks and economic development is necessary which even improves with private investments. There is a critical role of private investments in construction and manufacturing industries which contributes to the economic development and wellbeing of the citizens (Mundonde & Makoni, 2023). However, the monitoring of these investments and credit allocation can be helpful to work in effective directions by the banks (Yurieva et al., 2022). Furthermore, the central bank can allocate credit towards economic sectors or between economic activities (Tan, 2024). The efficiency of the allocation of credit resources will achieve positive results on the economic activity of the country (DiLeo, 2023). Therefore, the optimal allocation of the financial resource leads to an important result, which is that increasing interest in credit helps to increase GDP, and also helps to alleviate economic problems (Blondeel, Van Doorslaer, & Vermeiren, 2024), and then to alleviate the crises that occur from time to time (Schroeder, 2023). This research is performed to answer the following questions.

RQ1: Does credit have an impact on investment and economic growth?

RQ2: How does credit affect investment and growth and what kind of relationship do they have?

To answer the questions, the study determines cash loan allocation to economic sectors. The study found a long-term association between main economic sector credit, economic growth, and private investment in Iraq. Furthermore, the commerce and restaurant sector were the only sector that experienced a short-term impact on economic growth, whereas the construction sector exhibited a statistically significant impact and a positive correlation with economic growth. Long term, credit has no statistically significant effect on the evolution of the key economic segments. Regarding the influence of credit on private investment, throughout both the short and long periods the manufacturing and construction industries were the most statistically significant economic sectors.

Literature Review

The role of economic development is influential in the

development of any country and overall potential development (Ahmed et al., 2021). The economic development is based on the improvement of private sector businesses in any country. The private sector business is required to contribute enough to GDP of any country which is based on micro and small level business (Ashraf, 2021). The corporate level businesses have different sources and investors that can contribute to improve their productivity and performance. However, small and medium businesses are required to have appropriate investment and resources to grow the business. In this way, the role of banking sector is important to provide business opportunities with the help of credit and loans. The loans and credit have the importance of backbone of any business. The development of any business is positively improved when a higher level of satisfaction in the profit-making is achieved (Karadima & Louri, 2021). On the other hand, when the businesses are failed to get investment and proper loans to improve their business performance and grow into the market, it becomes a destructive situation for the businesses to work sustainably in the market (Katuka, Mudzingiri, & Vengesai, 2023).

Therefore, the banking sector is required to support the small and medium businesses for their productive growth in the market. The role of bank is to provide loans and credit to small businesses that has a social and economic impact on the country GDP (Ashoor, Ismaiel, & Al-Ahmad, 2023). The productive performance of small and medium businesses helps to grow the business active and recruit many people as employed (Kim, 2022). This is helpful in circular economy where a significant level of working is required to improve the business performance and practises. However, the banking sectors are mostly concerned to provide business opportunities to the corporate sector businesses (Li et al., 2022). The corporate sector businesses play a significant role in contribution to GDP, but the small-scale businesses have or significant role in it (Lin & Qiao, 2021; Lu, Huang, & Hsu, 2024). The small sector businesses should be supported by the government to develop effective policies and attract the investors to contribute to these businesses. It is a significant way to improve the impact of business an increase the productivity of business performance (Mohapatra & Purohit, 2021). The modern level of business required development and franchising in different geography. To improve the performance of business and invest in the franchising of business, it is recommended to provide reliable level of loans to businesses.

Hence, it can support the business in productivity which is needed to increase their overall performance in the market. In the emerging economies, the small businesses face a lot of challenges to get invested by the banks (Küçük, Özlü, & Yüncüler, 2022). Even it is challenging for the small and medium businesses to attract the private investors. Competitively multinational companies and corporate sector have advantage to get credit and loans from the banking sector (Duong et al., 2023). On the one hand, it is significant for the growth and business development to contribute to the economic expansion of the country. On the other hand, the little level of support too small and medium businesses reduces the overall productivity all of them all businesses and their impact to the economic growth (Ben Bouheni, Obeid, & Margarint, 2022). Therefore, it is essential to provide sufficient loans and credit related schemes to the small and medium businesses that can effectively improve their performance and productivity. In the same way, the small businesses are recommended to work in an effective way that can improve their productivity and performance in the market (Danisman, Demir, & Ozili, 2021). The higher level of investment in small businesses can provide reliable business opportunity to the owners of small businesses which can help them to grow in the market. In different countries, department have different policies to support the small business (Ilarslan & Yildiz, 2022). It is required for the government to develop useful policies that are reliable to support the small businesses that can have influence on the performance of the business (Kalu et al., 2021).

In the competitive business environment, it is necessary for the government to provide a level rose resources to the small businesses to convert to the market (Hegde & Kozlowski, 2021). The attention paid to the small business and by the government factor can improve the productivity and performance. When a business has no opportunity to get credit or loan as compared to the corporate sector, it becomes a challenge for the sustainability of business in the market (Ashraf, 2021). In this way, a significant level of working to improve the business performance after activity in marketing required. The business management should be improved with the help of modern tools and equipment including loans. Furthermore, these loans help the business owners and management to run the business operations in a fairway (Ben Bouheni et al., 2022). When the business operations are in a productive way, a higher level of productivity is produced in the business. On the other hand, the management of these businesses should develop a good portfolio to get loans from the banking sector (Ashoor et al., 2023). It is helpful for the businesses to sustain in the market and improve their productivity over time. However it is important to enhance the business performance with the assist of loans, but there should be an effective mechanism to return the loans granted by the banks (Ahmed et al., 2021). It is a process of binding working between the businesses that can cool the trust with bank and working with the banks in future.

Methodology

We used the ARDL model and all of its statistical tests to find out how much of an influence monetary credit had on investment and growth in Iraq's economy, in the short as well as long term, and how much of an impact credit had on the economic sectors' ability to achieve growth and increase private investment. Data related to economic variables (monetary credit, economic growth, and private investment) were sourced from the official statistics of the Central Bank of Iraq, the annual statistical reports of the banks, and the annual statistical totals issued by the Central Statistical Organization. The ARDL model was estimated to estimate the economic growth function and the private investment function, which can be further clarified by the following formula:

Function 1:

$$\Delta GDP = c + \lambda GDP_{t-1} + \beta_1 AG_{t-1} + \beta_2 IND_{t-1} + \beta_3 TR_{t-1} + \beta_4 BC_{t-1} + \beta_5 CDS_{t-1} \sum_{i=1}^{n} a_1 \Delta GDP_{t-i} + \sum_{i=0}^{m} a_2 \Delta AG_{t-i} + \sum_{i=0}^{m} a_3 \Delta IND_{t-i} + \sum_{i=0}^{m} a_4 \Delta TR_{t-i} + \sum_{i=0}^{m} a_5 \Delta BC_{t-i} + \sum_{i=0}^{m} a_6 \Delta CDS_{t-i} + \mu_t$$

Function 2:

$$\Delta IND = c + \lambda IND_{t-1} + \beta_1 AG_{t-1} + \beta_2 IND_{t-1} + \beta_3 TR_{t-1} + \beta_4 BC_{t-1} + \beta_5 CDS_{t-1} \sum_{i=1}^{n} a_1 \Delta IND_{t-i} + \sum_{i=0}^{m} a_2 \Delta AG_{t-i} + \sum_{i=0}^{m} a_3 \Delta IND_{t-i} + \sum_{i=0}^{m} a_4 \Delta TR_{t-i} + \sum_{i=0}^{m} a_5 \Delta BC_{t-i} + \sum_{i=0}^{m} a_6 \Delta CDS_{t-i} + \mu_t$$

Data Analysis

According to Table 1, the growth of cash credit and the percentage granted to the economic sectors, as it was noted that the value of cash credit in 2009 amounted to (5690062) million dinars, then in 2010 it grew to (11721535) million dinars, with a high growing rate of (106%). The growth came because of the recovery of the economy from the mortgage crisis and the rise in oil prices again, then cash credit continued to grow at positive and varying rates during the period 2011-2023, as credit achieved growth at a rate of (14.32%) in 2023. The data in Table 1 and Figure 1 indicate that the agricultural sector received 7.28% of the credit in 2009, which then decreased to 4.57% in 2010. The percentage of credit to the agricultural sector continued to fluctuate between the rise and fall in the period 2011-2023, as there was a clear decline in 2022 and2023 to (3.52%, 2.98%), respectively, between the lack of interest in the agricultural sector and the weakness of credit provided to it, which makes the role of this sector limited. As for the credit ratio granted to the manufacturing sector, it was also not at the required level, as the credit ratios for this sector in 2009 reached (7.33%). The credit ratio of this sector continued to fluctuate until it decreased in 2020 to (2.79%), which is the lowest percentage achieved by the credit granted to the manufacturing segment during the study period.

In 2021 and 2022, the credit ratio of the industrial sector improved to (4.46%, 5.25%), respectively, while it decreased in 2023 to reach the credit ratio granted to this sector (4.09%), indicating the lack of a trend to support the manufacturing sector, as well as continuing to rely on importing from abroad to meet local need. As for the percentage of credit granted to the trade, restaurants and hotels sector, it reached (34.15%) in 2009, and then it decreased in 2010 to (18.41%). It will continue to fluctuate between the rise and fall in the period 2011-2023, according to the Central Bank, so that the credit ratio of the trade and restaurants sector in 2023 reaches (18.89%). It was also noted that the credit ratio of the construction sector in 2009 was (20.89%), and then it continued to fluctuate until it reached (21.25%) in 2023. As for the community services sector, it was noted that it was the sector that benefited the most from the credit granted, as it was noted that the credit ratio in 2009 was (22.05%), then the period 2010-2023 increased to exceed 35% except for 2020. It reached (14.81%), which is the lowest percentage of the study period, due to the events of the Corona pandemic and the accompanying prohibitions and the suspension of many projects, as this decrease was at the expense of the increase in the credit ratio in the same year in the trade sector to reach (42.76%), then the credit ratio granted to the community services sector improved in 2022 and2023, reaching (44.51%) in 2023. With regard to the percentage of credit granted to other sectors (mining and quarrying sector, water and electricity, transport and communications, finance and insurance, the outside world), its share of credit granted was very low, as the percentage of credit granted to these sectors combined in 2009 was (8.31%), and it did not significantly improve during the period 2010-2022, the highest percentage in 2017 was (15.78%), while the percentage of credit to these sectors in 2023 was (8.28%).

Table 1: Growth of Cash Credit and the Relative Importance of Credit by Sectors.

Year	Total Cash Credit (Million Dinars)	Growth Rate (%)	Agriculture Sector Credit Ratio of Total Credit (%)	Manufacturing Sector Credit Percentage of Total Credit (%)	Trade and Restaurants Sector Credit Percentage of Total Credit (%)	Building and Construction Sector Credit Ratio of Total Credit (%)	Community Services Credit Percentage of Total Credit (%)	Credit Ratio of Other Sectors to Total Credit (%)
2009	5690062	-	7.33	7.28	34.15	20.89	22.05	8.31
2010	11721535	106.00	4.88	4.57	18.41	18.52	49.77	3.85
2011	20344076	73.56	6.41	12.32	16.99	20.69	38.15	5.44
2012	28438688	39.79	5.98	5.19	20.39	22.37	37.58	8.48
2013	29952012	5.32	6.04	5.48	16.18	25.94	34.88	11.47
2014	34123067	13.93	5.68	5.85	14.28	26.02	35.82	12.37
2015	36752686	7.71	5.55	6.52	14.27	22.86	38.92	11.88
2016	37180123	1.16	5.73	4.99	15.21	21.3	39.02	13.75
2017	37952830	2.08	4.6	4.57	16.07	20.79	38.19	15.78
2018	38486946	1.41	5.1	4.64	15.51	25.34	35.89	13.51
2019	42052511	9.26	5.15	5.63	18.02	23.76	36.88	10.56
2020	49817737	18.47	4.21	2.79	42.76	20.3	14.81	15.12
2021	52971526	6.33	3.98	4.46	19.22	21.06	35.87	15.41
2022	60576391	14.36	3.52	5.25	16.11	23.68	40.9	10.54
2023	69252894	14.32	2.98	4.09	18.89	21.25	44.51	8.28

Source: Based on the Central Bank of Iraq, Department of Statistics and Research, Annual Statistical Bulletin 2009-2023, the researchers' findings/ https://cbi.iq/news/view/492

Note: The annual development rate was calculated due to the equation: $R = \frac{Y_t - Y_0}{Y_0} * 100\%$

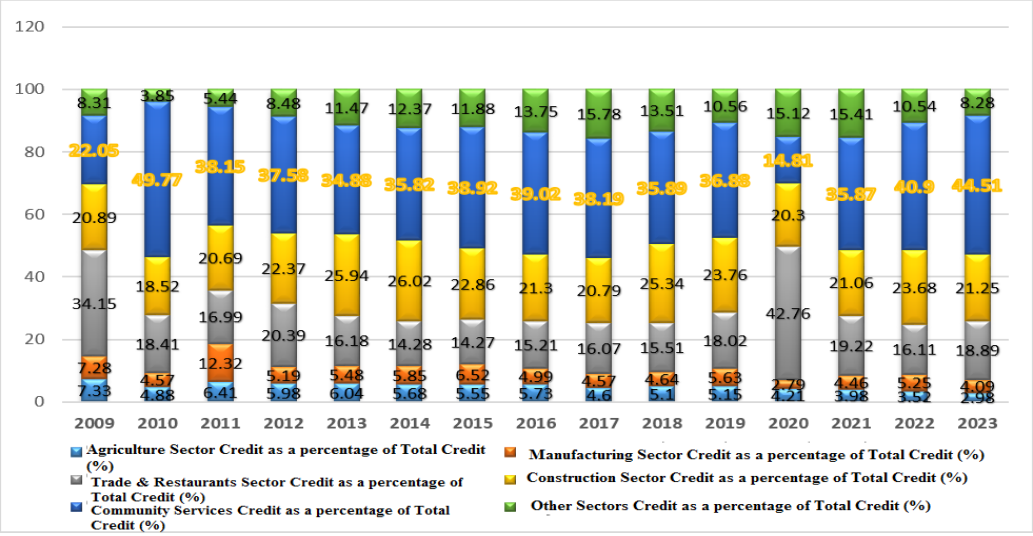

Figure 1: Relative Importance of Credit Distribution to Economic Sectors for Period 2009-2023.
Source: Researchers' work based on Table 1.

Based on Table 2 and Figure 2, the development of both GDP and private investment in Iraq for the period 2009-2023 was observed, as the GDP in 2009 amounted to (130642187) million dinars, and then achieved an increase in 2010 to (162064565.5) million dinars, with a growing rate of (24.05%). The output continued to rise with growth rates until 2013, after which it declined in 2014 and 2015 with negative growth rates, reaching successively (2.62%, 26.93%). The decrease in prices of oil, exhibited in Iraqi economy's rentier nature, GDP, and occupation of terrorist gangs, along with infrastructure destruction, non-oil activities, and trade disruptions, have contributed to the situation. Then GDP returned to increase in 2016 to grow positively at a rate of (1.15%), which continued to rise at positive growth rates during the period 2017-2022, except for 2020, which fell at a negative growth rate of (21.91%), the decline resulting from the Corona pandemic and the accompanying health bans and the disruption of economic activities, as well as the decrease in oil prices worldwide, to be a double shock to the economy.

In 2022, output grew at a positive rate of (27.20%) after the improvement in oil prices and the health situation. As for 2023, GDP achieved a negative growth of (13.84%). The decline in oil prices and decreased production and export quantities post-OPEC agreement is primarily due to the reduction of production and export quotas for member countries. Returning to the data of Table 2 and Figure 2, it was well-known that the investment in 2009 amounted to (13471242.2) million dinars, then in 2010 it grew at a positive rate of (94.88%), and continued to grow in 2014, but in 2015 and2016 it grew at rates of (9.29-%, 43.33 - %) respectively, due to low oil prices and the war with terrorist gangs. Then, in 2017, investment grew at a positive rate of (12.64%). Investment continued with growth during the period 2018-2022 with varying growth rates except for 2020. It expanded at a negative rate of (69.76%) owing to the consequences of the Corona epidemic and the drop in oil prices, which was a major catastrophe for Iraq's economy. As for 2022, investment amounted to (36485328.5) million dinars, with a growth rate of (55.41%) compared to 2021.

Table 2: GDP Growth and Private Investment (Million Dinars).

Year	GDP	Growth Rate (%)	Private Investment	Growth Rate (%)
2009	130642187.0		13471242.2	
2010	162064565.5	24.05	26252776.8	94.88
2011	217327107.4	34.10	37255269.4	41.91
2012	254225490.7	16.98	38139871.0	2.37
2013	273587529.2	7.62	55036676.2	44.30
2014	266420384.5	-2.62	55837402.9	1.45
2015	194680971.8	-26.93	50650572.7	-9.29
2016	196924141.7	1.15	28703209.2	-43.33
2017	221665709.5	12.56	32330275.7	12.64
2018	268918874.0	21.32	38107188.8	17.87
2019	276157867.6	2.69	54580010.0	43.23
2020	215661516.5	-21.91	16502522.4	-69.76
2021	301152818.8	39.64	23476163.6	42.26
2022	383064152.3	27.20	36485328.5	55.41
2023	330046390.6	-13.84	-	

Source: Central Bank of Iraq, Statistics and Research Department, Annual Statistical Bulletin (2009–2023)/ https://cbi.iq/news/view/492
* Private Investment Data for 2023 are not available.

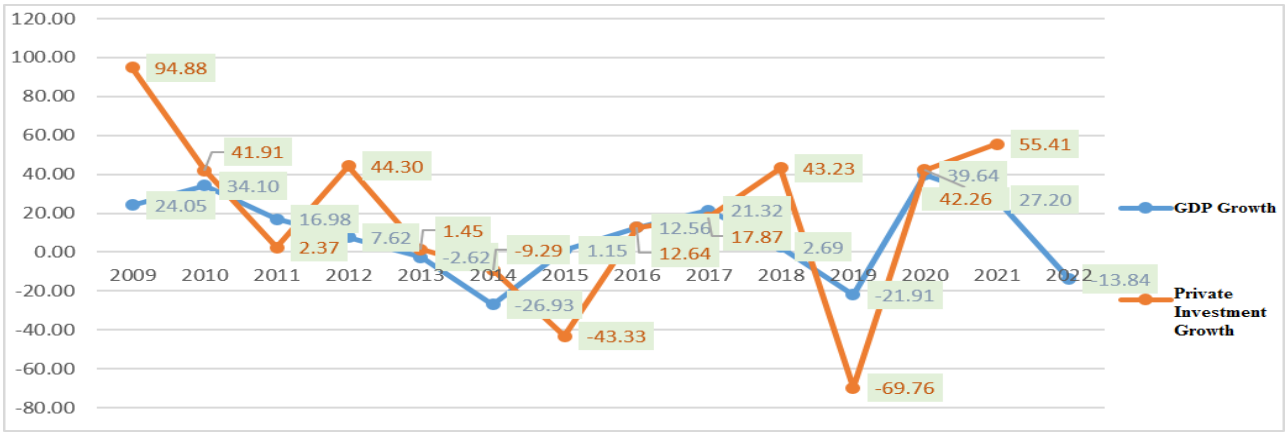

Figure 2: GDP Growth and Private Investment in Iraq.
Source: Researchers' work based on Table 2.

Measuring and Analysing the impact of Cash Credit on some Macro Variables

Standard Model Characterization and Time Series Stability Test: Before testing the root of the unit, it is necessary to characterize the standard models and determine the variables used, as follows:

GDP= f (AG, IND TR, BC, CDs) …… (1)
Inv= f (AG, IND TR, BC, CDs) …….. (2)

Whereas:

GDP growth.
Inter-country variations.
AG: Ratio of agricultural sector credit to total credit.
IND: Industrial Sector Credit Ratio of Total Credit.
TR: Trade, Restaurants and Hotels Sector Credit Percentage of Total Credit.
BC: Percentage of Construction Sector credit out of Total Credit.
CDs: Community Services Sector Credit Ratio of Total Credit.

Semi-annual data were used for credit ratios for the most important economic sectors except the extractive industries sector for the period 2009-2022, as well as GDP and private investment, noting that private investment data for 2023 are not available. For assessing the consistency of the research variables' time series, the E-views 12–based Dickie Fuller Extended Test (ADF) was used. The objective of this test is to assess the level of integration and to ascertain if the variables are stable or unstable, since they possess a unit root. The findings listed in Table 3 were obtained after the variables were tested. Table 3 revealed that all variables have stabilized at the 5% and 10% levels, with the exception of the variable (TR) in a Constant, a Constant & Trend, both, or Non. This variable will be integrated with a grade I (0), and the initial discrepancies will be presented to me. The variables have stabilized at the 5% and 10% levels with the presence of a, as they are integrated with a grade I (1). Therefore, we will use the ARDL model to predict the correlation matrix between the investment as well as GDP as well as the link between the cash credits given to key sectors and both the short- and long-term impacts.

Table 3: Unit Root Test.

Null Hypothesis: the variable has a unit root								
At Level								
		GDP	INV	AG	IND	TR	BC	CDS
With Constant	t-Statistic	-3.5786	-3.4795	1.8284	-3.5128	-2.5483	-3.7538	-2.9209
	Prob.	***0.0139***	***0.0174***	***0.9995***	***0.0175***	***0.1178***	***0.0093***	***0.0583***
		**	**	n0	**	n0	***	*
With Constant & Trend	t-Statistic	-3.4717	-3.3651	-4.5364	-4.4522	-1.4313	-3.6682	-3.2411
	Prob.	***0.0646***	***0.0791***	***0.0070***	***0.0093***	***0.8220***	***0.0439***	***0.1013***
		*	*	***	***	n0	**	n0
Without Constant & Trend	t-Statistic	-3.0765	-3.1226	-2.0450	-2.9363	-0.0439	0.3121	-0.4812
	Prob.	***0.0035***	***0.0031***	***0.0414***	***0.0055***	***0.6572***	***0.7680***	***0.4956***
		***	***	**	***	n0	n0	n0
At First Difference								
		d(GDP)	d(INV)	d(AG)	d(IND)	d(TR)	d(BC)	d(CDS)
With Constant	t-Statistic	-4.2545	-5.5452	-9.9479	-4.6358	-3.6731	-2.5837	-3.1725
	Prob.	***0.0030***	***0.0001***	***0.0000***	***0.0017***	***0.0124***	***0.1095***	***0.0357***
		***	***	***	***	**	n0	**
With Constant & Trend	t-Statistic	-4.2883	-4.2414	-3.6055	-5.7496	-4.3975	-2.5415	-6.4597
	Prob.	***0.0125***	***0.0165***	***0.0551***	***0.0008***	***0.0109***	***0.3073***	***0.0001***
		**	**	*	***	**	n0	***
Without Constant & Trend	t-Statistic	-4.3773	-5.6611	-8.8618	-7.3289	-3.7763	-2.5945	-6.7110
	Prob.	***0.0001***	***0.0000***	***0.0000***	***0.0000***	***0.0006***	***0.0117***	***0.0000***
		***	***	***	***	***	**	***

Notes: a: (*) Significant at the 10%; (**) Significant at the 5%; (***) Significant at the 1% and (no) Not Significant

Source: created using E-views 12 by researchers.

Estimation of the ARDL Model for GDP and Investment Functions

The GDP function was approximated using the Lag (2) periods, yielding the findings mentioned in Table 4.

Table 4: Estimating the Function of GDP.

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
GDP (-1)	0.552853	0.158520	3.487594	0.0036
GDP (-2)	-0.238350	0.125992	-1.891793	0.0794
AG	-2.531881	2.128892	-1.189295	0.2541
IND	0.667520	1.014665	0.657873	0.5213
TR	-0.630381	0.759488	-0.830007	0.4205
TR (-1)	0.929335	0.297503	3.123788	0.0075
BC	0.897908	1.945054	0.461637	0.6514
BC (-1)	0.430068	1.928615	0.222993	0.8268
BC (-2)	-4.402392	1.651325	-2.665975	0.0184
CDS	0.264323	0.563829	0.468799	0.6464
C	68.84136	55.61041	1.237922	0.2361
R-squared	0.960483	Mean dependent var		9.843653
Adjusted R-squared	0.932256	S.D. dependent var		17.81200
S.E. of regression	4.636047	Akaike info criterion		6.205783
Sum squared resid	300.9011	Schwarz criterion		6.742088
Log likelihood	-66.57228	Hannan-Quinn criter.		6.354531
F-statistic	34.02753	Durbin-Watson stat		2.009143
Prob(F-statistic)	0.000000			

Source: Developed by the current study using E-views 12.

Table 4 displays the model estimation results. The independent variables that are involved in the model account for 96% of the changes in GDP, as indicated by the model's explanatory power R2 (0.96). The remaining 4% is attributed to factors not accounted for within the model. The R-squared value changed to 93%. With a 5% level, the F-statistic value of (34.02) indicated that the morale of the model was moral, less than the 5% Prob (F-statistic). Consequently, the null hypothesis was rejected. Regarding the best lag test for the estimated model in Figure 3, the Akaike Criteria revealed that the best lag was (2, 0, 0, 1, 2, 0).

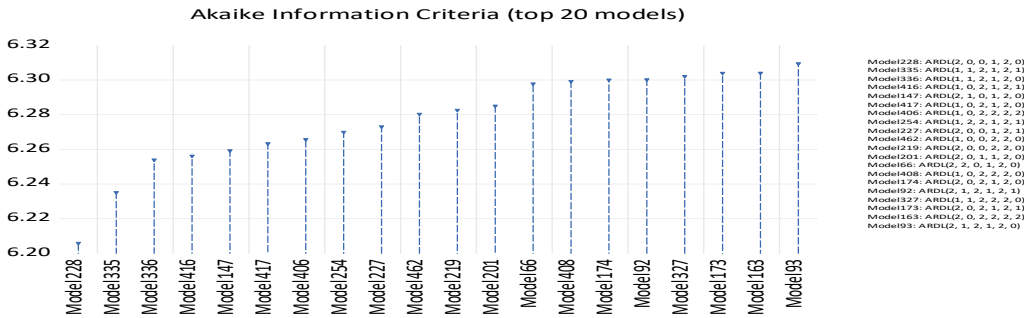

Figure 3: Estimated Model Optimal Lagging.
Source: created using E-views 12 by researchers.

Bounds Test for GDP function

As shown in Table 5, the estimated model's variables were subjected to the Bounds Test to ascertain their long-term equilibrium connection. The F-statistic for the Bounds Test was (6.39), as the table shows; this value exceeds the higher tabular value at the 5% significance level (3.38). Long-term equilibrium exists for model variables. Thus, we reject the null hypothesis and embrace the long-term equilibrium hypothesis.

Table 5: Bounds Test of the GDP Function.

F-Bounds Tes	t	Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I (0)	I (1)
F-statistic	6.391896	10%	2.08	3
K	5	5%	2.39	3.38
		2.5%	2.7	3.73
		1%	3.06	4.15

Source: created using E-views 12 by researchers.

Estimated Model Testing

Serial Correlation and Heteroscedasticity Test

Table 6 displays the estimated model test for the Breusch-Godfrey Serial Correlation and LM Test Heteroscedasticity problems with serial correlation. According to the Prob value, the F and Chi-Square values are not significant at the 5% significance level. The model is unaffected by the Serial Correlation and Heteroscedasticity Test. Thus, we may accept the null and reject the alternative.

Table 6: Serial Correlation and Heteroscedasticity Test.

Breusch-Godfrey Serial Correlation LM Test:			
F-Statistic	0.001269	PROB F (1,13)	0.9721
Obs*R-squared	0.002441	PROB Chi-Square	0.9606
Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-Statistic	2.029315	PROB F (10,14)	1098
Obs*R-squared	14.79388	PROB Chi-Square	1398
Scaled explained SS	6.671085	PROB Chi-Square	7,561

Source: Prepared by researchers using E-views 12.

Normal Distribution Test of Residuals

Figure 4 illustrates the results of the model's Normal Distribution test. The value of (Jarque-Bera) (1.43) was non-significant at a significance level of 5%, as indicated by the value of (prob.) which was greater than 5%. Consequently, the remaining data will be normally distributed.

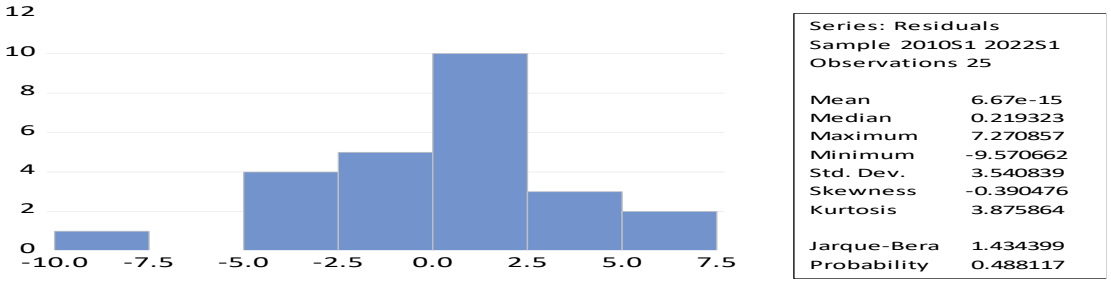

Figure 4: Normal Distribution Test of Residuals.
Source: Prepared by researchers using E-views 12.

Estimated Model Stability Test

The structural test of the calculated framework is shown in Figure 5. The estimated model is stable in the near run, as shown by the Cumulative Total Test of the Residuals in Part A, which was within the essential restrictions at the 5% significant level. The projected model seems to be stable in the short and long future, since the Cumulative Total Test of the Remaining Squares in Part B was also within the critical limitations at the 5% level.

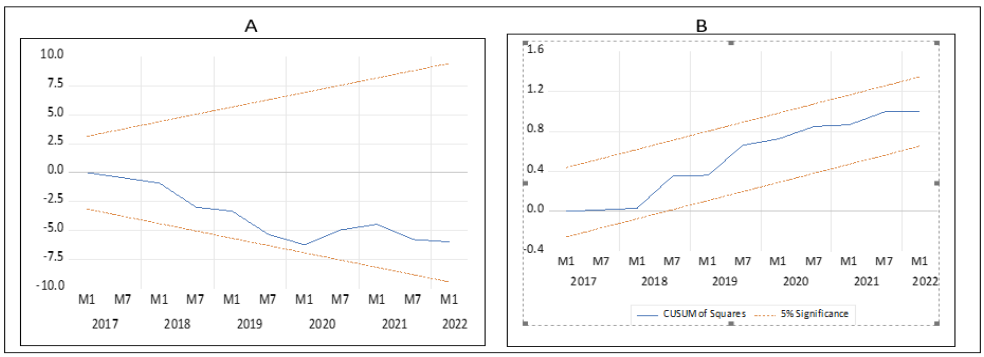

Figure 5: Structural Stability Test.
Source: Prepared by researchers using E-views 12.

Error Correction Model and Long-Term Relationship

As with Prob, the outcomes of Table 7 show that there is a statistically significant correlation between GDP growth and growth from a preceding era at the 5% level. In accordance with economic theory, a 1% upsurge in output growth for the earlier period resulted in a 0.238% increase in GDP growth. The credit of the trade and restaurant sector is inversely correlated with the growth of output. The relationship is significant at the 5% level, with a 1% increase in sector credit causing a 0.63% decrease in output. This is in direct opposition to economic theory, as the sector is reliant on foreign imports to reduce the local production of goods. Therefore, if this industry is given more credit, it will increase imports, which will lower GDP. There was a direct correlation between GDP and the amount of credit extended to the construction industry in the prior period; according to economic theory, a 1% increase in lending to the industry in the prior period would result in a 4.4% increase in output, and this correlation is statistically significant at the 5% level. We note that the credit granted to this sector is the most influential in GDP because this sector is rapidly expanding. Due to Prob, the Error Correction Parameter is statistically important at the 5% level. As it is negative, it reaches (0.68-), 68% of the errors are rectified in the same period towards the long-term equilibrium value, with the remaining percentage adjusted in the next period.

Table 7: Error Correction Model for GDP Function.

ECM Regression				
Case 2: Restricted Constant and No Trend				
Variable	Coefficient	Std. Error	t-Statistic	PROB
D (GDP (-1))	0.238350	0.064906	3.672236	0.0025
(TR)	-0.630381	0.209285	-3.012061	0.0093
Bc	0.897908	0.807234	1.112327	2847
D (BC (-1))	4.402392	1.286431	3.422174	0.0041
CointEq (-1) *	-0.685498	0.085742	-7.994934	0.0000

Source: Prepared by researchers using Eviews 12.

All factors were found to be non-significant at a significance level of 5%, corresponding to the long-term association data shown in Table 8. In summary Historically, when looking at both the short and long term, the construction sector's credit had the greatest impact on GDP growth.

Table 8: The Long-Term Relationship of the GDP Function.

Variable	Coefficient	Std. Error	t-Statistic	PROB
AG	-3.693493	2.707254	-1.364295	1940.
IND	0.973775	1.342086	0.725568	4801
TR	0.436113	0.827534	0.527003	0.6064
BC	-4.484939	2.459198	-1.823740	0.0896
CDS	0.385592	0.763104	0.505295	6212
C	100	95.22527	1.054608	3095
EC = GDP- (-3.6935*AG + 0.9738*IND +0.4361* TR-4.4849*BC + 0.3856 *CDs + 100.4254)				

Source: Prepared by researchers using Eviews 12.

Estimating the ARDL Model of the Investment Function

The periods of Lag (2) were used to estimate the investment function. He won't get the outcomes shown in Table 9 below.

Table 9: ARDL Model of Investment Function.

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
INV (-1)	0.266267	0.239456	1.111967	0.3029
INV (-2)	-0.931563	0.169524	-5.495165	0.0009
AG	-19.26094	9.884916	-1.948518	0.0924
AG (-1)	13.96110	15.70714	0.888838	0.4036
AG (-2)	12.87010	10.44693	1.231950	0.2577
IND	25.08281	6.563798	3.821387	0.0065
IND (-1)	-1.197871	4.335050	-0.276322	0.7903
IND (-2)	-6.905149	3.311890	-2.084957	0.0755
TR	15.05820	4.389635	3.430399	0.0110
TR (-1)	2.101635	3.853750	0.545348	0.6024
TR (-2)	-5.180871	3.564629	-1.453411	0.1894
BC	25.38643	5.669004	4.478111	0.0029
BC (-1)	0.817371	5.134602	0.159189	0.8780
BC (-2)	-10.84435	4.878467	-2.222901	0.0616
CDS	13.74095	3.378158	4.067585	0.0048
CDS (-1)	0.841811	3.241279	0.259716	0.8026
CDS (-2)	-4.267350	3.657120	-1.166861	0.2815
C	-1058.740	308.0478	-3.436935	0.0109
R-squared	0.987318	Mean dependent var		15.70940
Adjusted R-squared	0.956518	S.D. dependent var		36.33662
S.E. of regression	7.577078	Akaike info criterion		7.055167
Sum squared resid	401.8848	Schwarz criterion		7.932757
Log likelihood	-70.18958	Hannan-Quinn criter.		7.298573
F-statistic	32.05566	Durbin-Watson stat		1.800091
Prob(F-statistic)	0.000052			

Source: Prepared by researchers using E-views 12.

Table 9 shows model estimation results. If the model's explanatory capacity was 0.98, the independent variables would explain 98% of local investment changes. The remaining percentage is attributable to variables that were not incorporated into the model. The adjusted R-squared value was 95%. The F-statistic of 32.05 for the model proved its relevance as, using the Prob (F-statistic) value. The null hypothesis will be rejected, and the alternative hypothesis will be adopted, as this value is less than 5%. The Optimal Lag was determined to be (2, 2, 2, 2, 2, 2) in accordance with the Akaike Criteria for the optimal default test of the estimated model represented in Figure 6.

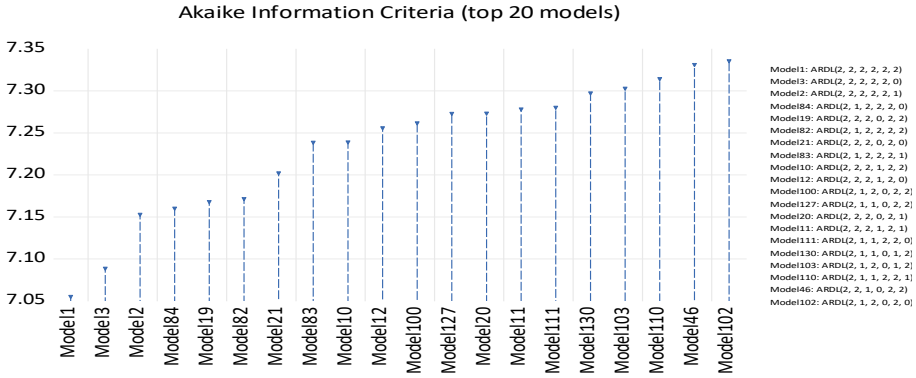

Figure 6: Optimal Lag of the Investment Function.
Source: Developed by the current study using E-views 12.

Bounds Test for Investment Function

The Bounds Test was used to assess the long-term equilibrium of the estimated model's variables, as shown in Table 10. The F-statistic for the Bounds Test was (6.15), which is higher than the higher tabular value at the significance level of 5% (3.38). The model's variables show a connection of long-term equilibrium. Consequently, we will accept the alternative hypothesis, which presupposes a long-term equilibrium connection, and reject the null hypothesis.

Table 10: Bounds Testing of the Investment Function.

F-Bounds Tes	t	Null Hypothesis: No levels relationship		
Test Statistic	**Value**	**Signif.**	**0 I**	**I (1)**
F-Statistic	6.159613	10%	2.08	3
K	5	5%	2.39	3.38
		2.5%	2.7	3.73
		1%	3.06	4.15

Source: Prepared using E-views 12 by researchers.

Estimated Model Testing

Serial Correlation and Heteroscedasticity Test

The model was tested for serial correlation and heterogeneity using the Breusch-Godfrey Serial Correlation (LM Test) and non-significant F and Chi-Square values at the 5% significance level (Prob). Table 11 displays that the model is unaffected by Serial Correlation and Heteroscedasticity, as both tests yielded findings greater than 5%, demonstrating that the null hypothesis is established and the alternate hypothesis not supported.

Table 11: Serial Correlation and Heteroscedasticity Test.

Breusch-Godfrey Serial Correlation LM Test:			
F-Statistic	0.076792	PROB F (1,6)	7910
Obs*R-squared	0.315922	PROB Chi-Square	5741
Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-Statistic	1.206189	PROB F (17,7)	4225
Obs*R-squared	18.63757	PROB Chi-Square	3497
Scaled explained SS	2.667669	PROB Chi-Square	1.0000

Source: Prepared by researchers using E-views 12.

Normal Distribution Test of Residuals

The Normal Distribution test is illustrated in Figure 7, and the value of 2.86 is not statistically significant at a 5% significance level. This is a result of the fact that the value of (prob.) exceeds 5%. As a result, the remaining data will be distributed normally.

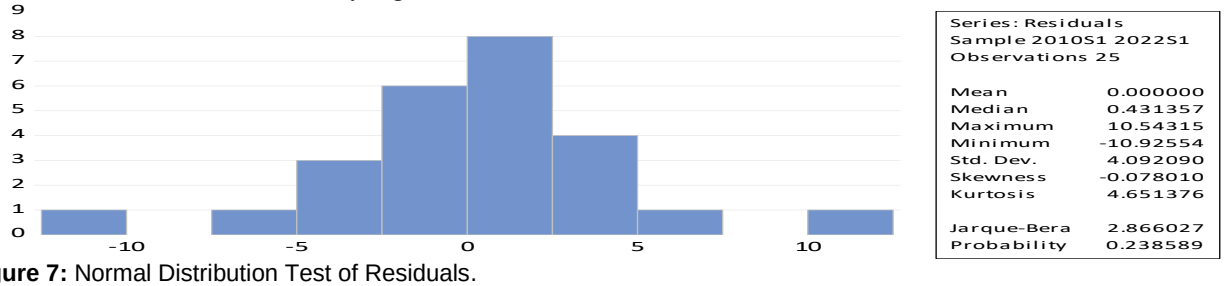

Figure 7: Normal Distribution Test of Residuals.
Source: Prepared by researchers using E-views 12.

C. Estimated Model Stability Test

Figure 8 illustrates the structural evaluation of the projected model. The estimation model is short-term stable, as evidenced by the Cumulative Total Test of the residuals in Part A, which was within the essential restrictions at the 5% significance level. The estimated model seems to be stable in the short and long future, since the Cumulative Total Test of the Remaining Squares in Part B was also within the critical limitations at the 5% level.

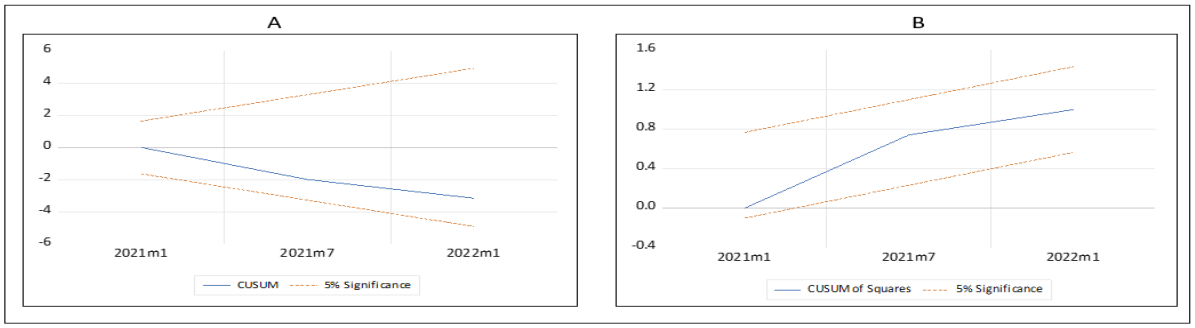

Figure 8: Model Structural Stability Test.
Source: Created using Eviews 12by researchers.

Error Correction Model and Long-Term Relationship

The findings of the Error Correction Model for the investment function are depicted in Table 12. The current investment is directly correlated with the investment from the previous period, which is significant at the 5% level, as denoted by Prob. Specifically, an increase of 1% in the investment from the previous period results in a 0.93% increase in the current investment, which is coherent with economic theory. As for the credit of the agricultural sector, it has an inverse relationship with investment, which is moral at the level of 5%, that is, the rise in the percentage of credit granted to the trade and restaurant sector by 1%, the investment decreases by 19.26%, contrary to the economic theory, as most of the projects that were established were temporary and unrealistic projects because the goal is to obtain loans, especially in the field of livestock.

The Prob value for the variables (IND, IND (-1), TR, TR (-1), BC (-1), CDs, CDs (-1)) was statistically significant at the 5% level, demonstrating a positive correlation with investment. This is in accordance with the logic of economic theory, which posits that a 1% rise in these variables' findings in a corresponding rise in investment in percentages (25.08%, 6.9%, 15.05%, 5.18%, 25.38%, 10.84%, 13.74%, 4.26%). Specifically, the construction and manufacturing sectors are the most influential sectors in terms of investment, as they will introduce new fixed capital. The trade and restaurant sector and community services sector follow that order. The Error Correction Parameter is substantial at the 5% level, as referred to by the value of Prob, and it is negative (1.66-). This suggests that the long-term equilibrium value is achieved by a rapid rate of adjustment, provided that all defects are rectified within the same period.

Table 12: Investment Function Error Correction Model.

	ECM Regression			
	Case 2: Restricted Constant and No Trend			
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**PROB**
D (Inv (-1))	0.931563	0.087369	10.66234	0.0000
AG	-19.26094	5.408455	-3.561265	0.0092
D (AG (-1))	-12.87010	7.175486	-1.793620	1160
IND	25.08281	2.800111	8.957791	0.0000
D (IND (-1))	6.905149	1.958942	3.524937	0.0097
(TR)	15.05820	2.551541	5.901612	0.0006
D (TR (-1))	5.180871	1.446472	3.581728	0090
Bc	25.38643	3.076863	8.250751	0.0001
D (BC (-1))	10.84435	2.328378	4.657470	0.0023
D	13.74095	1.905537	7.211062	0.0002
D (CDs (-1))	4.267350	1.285045	3.320778	[0128]
CointEq(-1) *	-1.665296	0.186099	-8.948462	0.0000

Source: Prepared by researchers using E-views 12.

As for the long term, we note from Table 13 that all the variables were significant at a significant level of 5%, except for the percentage of credit to the agricultural sector. It was immaterial and correlated with a direct relationship with investment. In particular, economic theory predicts that a 0.19% rise in investment would follow a 1% improvement in credit extended to the industrial sector. The study discloses that a 1% increase in the trade and restaurant sector's credit ratio leads to a 7.19% increase in investment, while a 1% increase in the

construction sector outcome in a 9.22% increase in investment, and a 1% upsurge in the community services sector leads to a 6.19% rise in investment.

Table 13: Long-Term Relationship of the Investment Function.

Variable	Coefficient	Std. Error	t-Statistic	PROB
AG	4.545893	4.081330	1.113826	3021
IND	19626	2.538589	4.016508	0.0051
TR	7.193297	1.471221	4.889340	0.0018
BC	9.223259	2.270463	4.062281	0.0048
CDS	6.194341	2.101784	2.947183	0215
C	635	129	-4.906944	0.0017
EC = Inv - (4.5459*AG + 10.1963*IND + 7.1933*TR + 9.2233*BC + 6.1943 *CDS - 635.7670)				

Source: Prepared by researchers using E-views 12.

Discussion of Results

The community services sector received the highest credit percentage, followed by construction, trade, obedience, and hotels, and industry and agriculture, with the latter ranking fourth and fifth, respectively. In regard to the influence of credit on macroeconomic variables, we find, in agreement with previous research (Kismawadi, 2024), that bank lending for economic sectors has a long-term equilibrium connection with GDP growth. We observe that the credit of the wholesale trade sector, restaurants, and construction sector has a moral impact in the short term with respect to the influence of credit on GDP growth. In the long term, the moral impact is restricted to the construction sector. However, it was the opposite, as the construction sector is reliant on the import of raw materials from abroad, which represents a leakage element of GDP, as the sector's activity increases. Furthermore, the findings of the study in the long term contradict the findings of some studies, including (Foglia, 2022) and the study of Utouh & Kitole (2024), which found a positive long-term relationship between credit and economic growth. The results contradict the findings due to Iraq's heavily reliant GDP on the oil sector, which generates growth. Economic sector credit did not impact GDP growth, while construction sector credit negatively impacted output growth due to its dependence on foreign raw materials imports, resulting in a negative influence on output growth. The investment function demonstrates a long-term equilibrium link between credit and investment growth, in line with earlier findings (Wu, Wu, & Zhao, 2022). As for the credit effect on the growth of private investment, there are positive effects of the trusts granted to some sectors on investment, this matches the results of the study Saleem, Sági, & Setiawan (2021). The main sector affecting investment is credit to the industrial sector in the first place, because it adds new productive projects to investment in the country, followed by the construction and trade sector Restaurants, the latest of which is the community services sector, which is the least expensive, although it accounts for the largest percentage of credit granted. These findings match those of studies that have included a positive correlation to credit in private investment. As for the credit of the agricultural sector, it did not have a significant effect on investment, as this sector suffers from the decline in the credit granted to this sector, the lack of the necessary support, the scarcity of water and many other reasons.

Conclusions

The results proved that the impact of credit granted to economic sectors is a specific impact of some economic sectors on GDP in the long term represented by the construction sector. The study reveals that forbidden credit positively impacts long-term investment in all economic sectors, except for agriculture, confirming the hypothesis based on its impact on investment. Furthermore, the lack of a balanced policy in supporting economic sectors through credit, so the credit ratio fluctuates along the chain, in addition to the fact that credit ratios were low for some sectors. The study found the directing the largest percentage of credit towards the service sectors without the main productive sectors represented by the agricultural and industrial sectors, this led to a decline in the productivity of these two sectors, and dependence on the outside to meet the needs through the import of agricultural and industrial goods, which made the Iraqi economy exposed to crises and economic problems such as imported inflation. Furthermore, the study uncovered a long-term equilibrium relationship between credit granted to economic sectors and growth and investment in Iraq during the studied period. In addition, the credit granted to the main economic sectors has positive effects on private investment in Iraq, because it adds to the formation of capital through new projects or infrastructure, so it can support the growth of investment. Accordingly, the rentier nature of the Iraqi economy has led to a focus on service sectors, benefiting from the rentier revenues of the oil sector, which accounts for the largest percentage of GDP structure, making the economy vulnerable to external shocks, particularly when oil prices fall.

Implications

The results of this study have significant implications for policymakers, financial institutions, and economic stakeholders in Iraq, highlighting the nuanced impact of credit allocation on economic growth and private investment. First, the identification of a long-term correlation between credit allocation and economic growth underscores the importance of targeted credit policies aimed at fostering sustainable economic development. Policymakers should prioritize strategic credit distribution to sectors with high growth potential, particularly construction and manufacturing, as these sectors exhibit significant short- and long-term effects on economic performance. Second, the lack of a statistically significant

long-term impact of credit on the evolution of key economic sectors suggests that existing credit policies may lack sufficient focus or alignment with sector-specific needs. Financial institutions should enhance their credit assessment frameworks to identify and address the structural challenges within economic sectors, promoting more efficient resource allocation. Third, the study's emphasis on the short-term impact of credit on the commerce and restaurant sector suggests that these industries may offer rapid economic returns, potentially serving as focal points for immediate economic revitalization efforts. However, overreliance on short-term growth must be balanced with long-term sectoral development strategies. Finally, the study emphasizes the pivotal role of manufacturing and construction sectors in driving private investment. This finding calls for integrated policy approaches that combine credit facilitation with infrastructural and technological support to stimulate private sector dynamism and industrial innovation. Overall, the research contributes to a more refined understanding of sectoral credit allocation and its macroeconomic implications, serving as a foundation for more evidence-based economic policy formulation in Iraq.

Future Directions

The findings of this research are significant for knowledge and implication regarding the impact of credit granted to economic sectors on some macroeconomic variables in Iraq. However, future studies are required to collect survey-based data to reach on findings. The data should be collected from personnel of the Department of Economic and Financial Policies to provide a different insight into the findings of the study. In this way, scholarly contributions would be helpful to provide a different approach and new knowledge contributions.

Author Contributions

Conceptualization: KAH, KSA; Data curation: SJA, AAA; Formal analysis: KAH; Funding acquisition: KAH, KSA, SJA; Investigation: KSA, SJA; Methodology: AAA, KAH; Resources: AAA, KAH, KSA, SJA; Validation: KSA, SJA; Visualization: KAH, AAA; Writing – original draft: KAH, KSA; Writing – review & editing: AAA, KAH.

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