

Measuring The Impact Of Private Investment In Poverty Rates In Iraq For The Period (2004-2021) By Using The (NARDL) Model

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Abstract : Macroeconomic theory emphasizes the pivotal role of total investment in activating the income and production cycles. By increasing the multiplier, the targeted output is achieved, which supports sustainable development and increases employment opportunities. This process results in new incomes granted to the household sector and works to reduce poverty levels. The research aims to measure the impact of private investment on poverty rates in Iraq because the Iraqi economy faces the problem of high rates of poverty and deprivation and an increase in the number of marginal families with a significant decline in investment in general and private investment in particular, which has resulted in a major deficiency in the supply of local production. And then, for economic growth, the research used the NARDL model to monitor the targeted effect to prove the validity of its assumption during the period (2004–2021) in Iraq. The research found that there is an adverse effect of private investment on poverty rates in Iraq, which contributed to the increase in the poverty problem in Iraq on a large scale. The research recommended Adopting a national strategy to revive the role of the private sector in the Iraqi economy by activating partnership contracts between them in a way that enhances the national development and financing role in the service of the public interest.

Keywords: private investment, poverty rates, NARDL model

INTRODUCTION: The unstable economic environment in Iraq for a long period of time has caused serious economic changes, the most important of which is the decline of the role of the private sector compared to the sagging role of the government sector and the collapse of the overall level of quality of services, whether provided by the government sector or the private sector.

The deterioration of the macroeconomic environment caused disruption in most local economic variables and a decline in the growth of productive activities in favor of oil sector activity, which led to a distortion of the labor market, a decline in worker productivity, a sharp decline in job opportunities, and a significant increase in the population growth rate and unemployment rates.

Sustained distortions in productive activities and the decline in the investment role of the private sector caused a decline in the growth of family incomes and the loss of many families' jobs due to conditions of security and political instability, which led to the spread of poverty among the population.

Problem Statement: The Iraqi economy faces the problem of high rates of poverty and deprivation and an increase in the number of marginal families, with a significant decline in investment in general and private investment in particular, which has resulted in a major deficiency in the supply of local production and thus economic growth.

The Aims of the Study: The research aims to measure the impact of private investment on poverty rates in Iraq using the (NARDL) model.

The Significance of the Study: The decline in the role of the private sector contributed to the weakness of investment activity, which negatively affected the generation of income and output, which exacerbated the problem of poverty throughout society and at the level of the Iraqi governorates, which suffered and continue to suffer from the deterioration of the environment for productive activities, which caused a decline in income growth for most Iraqi families.

(II):- The Hypothetical Scheme of the Study:

After addressing the problem, importance and objectives of the research, it is necessary to build a model in which it can clarify the nature and type of relationship between the research variables, see Figure (1):

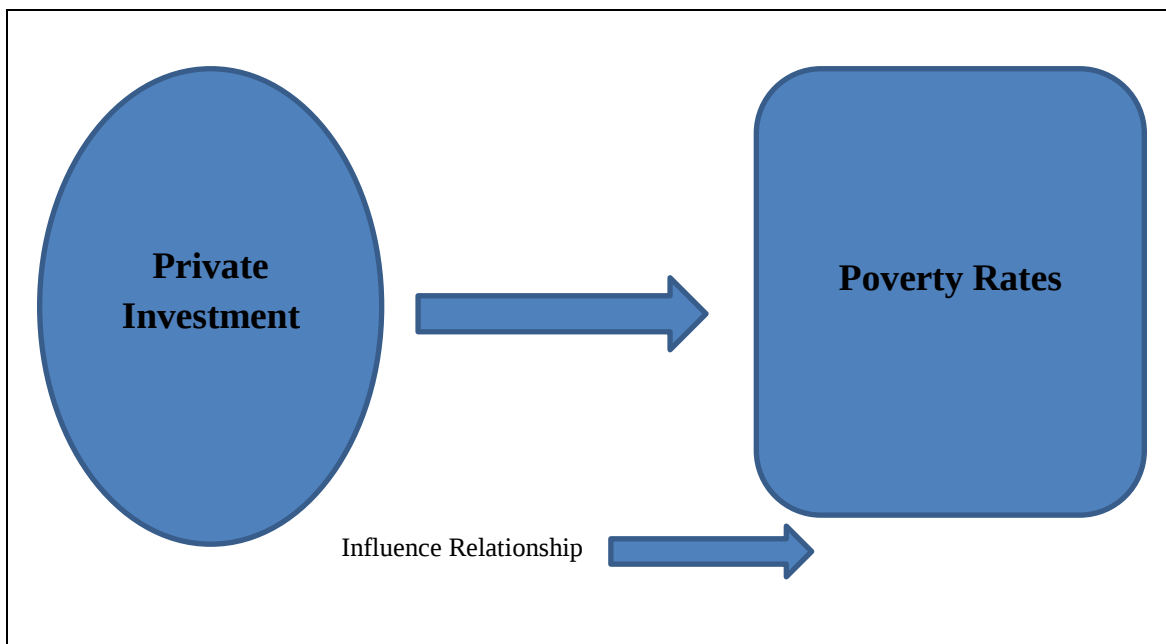


Figure (1) The Hypothetical Scheme of the Study

(III): - The Hypotheses of the Study:

Reviving the role of the private sector in the Iraqi economy ensures an increase in investment effort and, thus, income generation and a decrease in the level of poverty.

(IV): - The Community and the Sample of the Study

The sample of the study consist of (18) years for the study variables, which are private investment, government investment, and poverty rates.

The second topic: -

First:- Investment: Investment is defined as the mobilization of capital in the production process in order to obtain profits. This investment may be material (in fixed assets) or immaterial (in financial assets). (Hardan, 1997, 13), and investment is also defined as (employing capital to increase income and achieve actual additions to the original capital through the possession of assets that generate returns based originally on the individual sacrificing his current benefit in order to obtain rewarding cash flows in the future. According to the criterion of return and risk (Siyam, 1997, 19).

Investment in terms of assets includes two types: the first (financial investment), which is that investment that does not result in a flow of production of goods and services but rather includes only the process of transferring ownership of the means of production, capital, and assets from one individual to another, and that this process generates revenues and savings. Finance. (Khaled, 2008, 6) The second is known as real investment, which is the employment of capital for the purpose of trading in productive assets, which leads to the production of a flow of goods and services, which includes increasing the gross domestic product and the wealth of society. (Al-Khasawneh, 1996, 94).

There is also another classification of investment, which is direct foreign investment (in productive assets) and indirect foreign investment (in financial assets). Foreign direct investment is defined as the process of establishing new projects in the host country, increasing the stock of productive assets by foreign investors, or purchasing some local companies in the host country according to the law. (Hess & Ross, 1997, 490)

Second: - poverty: The World Bank defined poverty as (depriving a citizen of his basic rights to live, his right to own and use natural resources and invest them for his benefit, his right to obtain a social status among his peers, his right to participate in community and political activities, as well as his right to obtain educational, health, housing, and banking services in a comprehensive manner., and the right to consume food and clothing and to live without marginalization. (World Bank, 2021, 16)

In order to reach poverty levels in the local economy, there are several economic indicators that indicate this, including the poverty gap index, poverty severity, multidimensional poverty, and human poverty. This last index reflects the human development reports issued by the United Nations Development Program and works to define the dimensions of poverty in the local economy. Poverty has three axes: deprivation of a healthy life, which is measured by the probability existing at birth of not surviving until reaching the age of forty; deprivation of knowledge and

education, which is measured by the illiteracy rate among adults; and deprivation of the level of well-being. Social, which is measured by the average of those deprived of access to clean drinking water, those unable to access adequate health care, and the underweight among children under the age of five. (Ministry of Planning and Development Cooperation, 2016, 2)

Poverty arises for many reasons, including economic reasons related to weak income, economic instability, weak government performance, economic shocks, etc.; social reasons related to the nature of family structure, forced displacement, customs and traditions, etc.; and political reasons related to political instability, weak law, etc. (Gharib Faraj, 2017, 406)

Third: The relationship between investment and poverty:

Investment exerts its impact on poverty through the impact of investment on the business environment by increasing the effectiveness of productive activities in the local economy and then increasing output through the work of the investment multiplier. This impact contributes to increasing job opportunities, reducing unemployment rates, and generating new incomes that are distributed among shareholders in The production process results in reducing the spread of poverty among the population, improving their standard of living, and achieving economic well-being. (Chudnovsky & Lopez, 1999), investment increases the flow of capital and thus increases capital formation, which leads to increased job opportunities and then reduces the spread of poverty in the economy. (Kokko, 1998, 517–518). Investment also contributes to strengthening the forward and backward links of economic and productive activities, which enhances local production, raises the efficiency of industrial projects, and expands their activities in the economy, thus achieving more new incomes that will be redistributed among the ranks of participants in the scientific study. Productivity, which reduces the incidence of poverty. (Kortam, Ms. Kamal, 2018, 12).

Many studies have proven that there is a direct relationship between investment and poverty reduction, meaning that increasing investment leads to reducing poverty in the economy. (Gohou & Soumare, 2012).

A study was presented to prove the positive impact of investment in reducing poverty in a number of African countries, as it proved that increasing investment contributes to the efficient use of natural resources available in the economy, thus enhancing the optimal use of local production and thus reducing the trend of poverty in the long term. (Tsaurai, 2018), another study has proven the moral and positive impact of investment in reducing poverty by increasing employment opportunities through increased government spending and trade openness. (Jugurnath et al., 2016)

The Third Topic :- Econometric analysis of the research model

(I) Development of investment trends and poverty rates in Iraq Development of investment trends and poverty rates in Iraq

After the American war on Iraq in 2003, which left behind high poverty rates as a result of the cessation of many factories and businesses and the dismantling of the Iraqi army at that time and others, poverty rates then began to decline with the gradual return to life, until in 2007 a setback occurred again due to the security conditions at that time, and in 2007 In 2009 and 2010, there was a boom in private investment as a result of security stability and government initiatives to encourage investment, as the annual growth rate of private investment in these years reached (64.20) and (85.24), respectively. Despite this, poverty rates increased in these years, and in 2012 and 2013, the highest level of investment was reached. Private and public due to the explosive public budgets, as the annual growth rate of private investment reached (41.45) and (149.27), respectively. In contrast, poverty rates decreased in the same two years to 18.9% and 19.3%, respectively, since 2014 and the beginning of the war against terrorist organizations. Public investment levels began to decline due to increased military expenditures in exchange for increased levels of private investment, which kept poverty rates at approximately stable levels even as public investment levels increased in 2018 and 2019 due to the cessation of military operations, until 2020 witnessed a sharp decline in private investment. In the year, the annual growth rate for private investment reached (-31.38) and for public investment (-81.96) due to the spread of the COVID-19 epidemic, which led to the poverty rate reaching its highest level, reaching (31.7), meaning 12,680,000 people out of the total population of Iraq. Approximately 40 million people are below the poverty line, as shown in the table and figure (1).

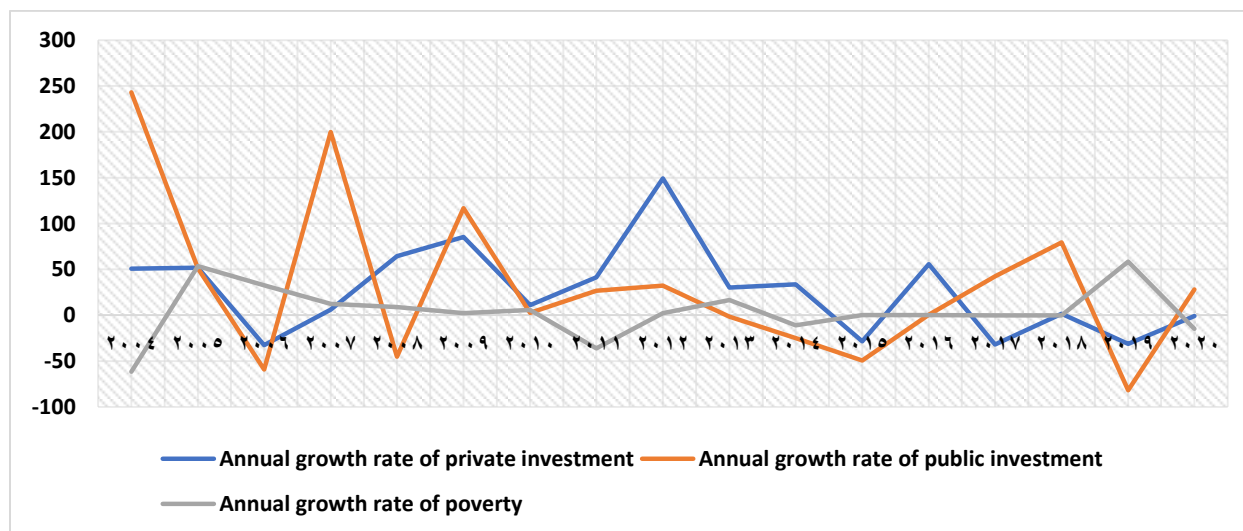
Table (1): Private and public investment and poverty rate in Iraq for the period (2004-2021)
(million dinars, %)

Years	Private investment	Annual growth rate of private investment	Public investment	Annual growth rate of public investment	Poverty rate	Annual growth rate of poverty

2004	434,764,860	/	3,247,625,700	/	28.7	/
2005	654,988,706	50.65	11,133,972,700	242.83	11.02	-61.6
2006	993,523,333	51.69	16,837,603,400	51.23	16.9	53.36
2007	669,364,565	-32.63	6,861,039,874	-59.25	22.4	32.54
2008	709,425,127	5.98	20,554,542,800	199.58	25.2	12.5
2009	1,164,868,890	64.2	11,254,116,300	-45.25	27.4	8.73
2010	2,157,756,930	85.24	24,400,333,224	116.81	28.02	2.26
2011	2,390,242,750	10.77	24,989,344,194	2.41	29.6	5.64
2012	3,381,094,541	41.45	31,652,831,406	26.67	18.9	-36.15
2013	8,428,008,089	149.27	41,857,085,682	32.24	19.3	2.12
2014	10,961,751,357	30.06	41,150,560,104	-1.69	22.5	16.58
2015	14,648,946,082	33.64	30,879,439,961	-24.96	20.04	-10.93
2016	10,460,244,848	-28.59	15,652,411,010	-49.31	20.06	0.1
2017	16,293,114,754	55.76	15,710,925,528	0.37	20.1	0.2
2018	11,063,522,736	-32.1	22,375,589,054	42.42	20.05	-0.25
2019	11,246,459,135	1.65	40,093,673,325	79.18	20.01	-0.2
2020	7,717,113,663	-31.38	7,234,651,767	-81.96	31.7	58.42
2021	7,649,318,193	-0.88	9,266,792,322	28.09	27	-14.83
compound growth rate	17.27%	/	6%	/	-0.39%	/

Source: From the work of researchers based on investment data at constant prices (2007 = 100) (thousand dinars), in the Ministry of Planning / Central Bureau of Statistics, 2023. Poverty rate data in the Ministry of Planning/Poverty Alleviation Strategy in Iraq, 2018, pp. (1, 40, 131). And the follow-up report on the implementation of poverty alleviation strategy activities, 2014, p. 6.

Figure (1): Annual growth rates of private and public investment and poverty in Iraq for the period (2004-2021)



Source: From the work of researchers based on data from Table (1)

The fourth topic:- Measuring the impact of private investment on the poverty rate in Iraq for the period (2004-2021)

First: - Specification of the NARDL model

The research studies the analysis of the relationship between private investment and the poverty rate in Iraq, as the poverty rate is considered a dependent variable (Poverty) and private investment is considered an independent variable (PI), and the general formula of the model is as follows:

$$\text{Poverty} = f(\text{PI}) \dots\dots\dots (1)$$

$$\Delta \text{Poverty}_t = C + \sum_{t-1}^n \alpha_1 \text{Poverty}_{t-1} + \sum_{t-1}^n \alpha_2 \text{PI}(+)_{t-1} + \sum_{t-1}^n \alpha_3 \text{PI}(-)_{t-1} + \beta_1 \text{PI}(+) + \beta_2 \text{PI}(-) + \mu_t \dots\dots\dots (2)$$

Where:

Poverty: poverty rate.

PI (+): High private investment.

PI (-): Decrease in private investment.

Δ : the first difference of the variable.

C: fixed limit.

N: The upper limit of the optimal deceleration period.

$\alpha_1, \alpha_2, \alpha_3$: slope in the short run.

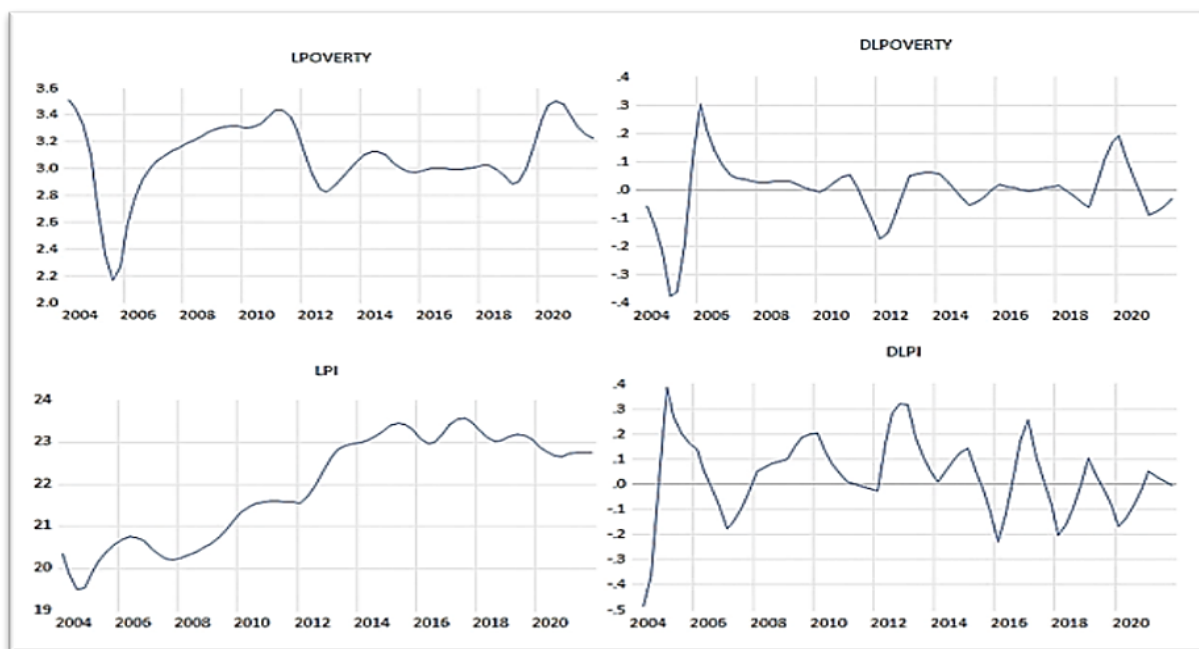
β_1, β_2 : slope in the long run.

μ_t : is the limit of the random error.

Second: - Determining NARDL model data

The researchers used poverty and investment rate data at constant prices in Iraq for the period 2004–2021. The researchers worked on converting the data from annual to quarterly (quarterly) for the period (2004.Q1-2021.Q4) using the Litterman method. Using the natural logarithm formula, the number of views is 72, as shown in Figure 2:

Figure (2): Poverty rate and private investment in Iraq for the period (2004.Q1-2021.Q4)



Source: From the work of researchers based on the statistical program (Eviews12).

Third: Unit root tests

There are many statistical tests to determine whether time series are stationary or not, and the Extended Dickey-Fuller (ADF) and Phillips-Perron (PP) tests are among the most famous of them. The stationarity of a time series means that its mean, variance, and covariance are constant over time, and as in Table (2), it is clear that the time series for both variables (LPoverty and LPI) are stationary at the first difference [I(1)]. According to the value of (P - Value), it is less

than 5% at the intersection (intercept), and this means rejecting the null hypothesis and accepting the alternative hypothesis. Which states that the two time series are at rest at the first difference.

Table (2): Unit root tests (ADF, PP)

(Level)			1 diff.	
Tests	ADF	PP	ADF	PP
Ver.	Prob	Prob	Prob	Prob
LPoverty	0.1830	0.0484	0.0000	/
LPI	0.5104	0.6949	0.0178	0.0005

Source: From the work of researchers based on the statistical program (Eviews12).

Fourth:- NARDL model estimation

Through Table 3, it was concluded that the R-squared value is (0.99), meaning that (99%) of the changes in the poverty rate are explained by private investment, and the P-value of the calculated F statistic is (0.000), which is smaller than (5%), which means rejecting the null hypothesis and accepting the alternative hypothesis, which states that the model is statistically significant, and the value of DW is (2.186773), which indicates that there is no problem of autocorrelation.

Table (3): NARDL model estimation results

Dependent Variable: LPOVERTY			
Method: ARDL			
Date: 03/24/24 Time: 01:40			
Sample (adjusted): 2005Q2 2021Q4			
Included observations: 67 after adjustments			
Maximum dependent lags: 4 (Automatic selection)			
Model selection method: Akaike info criterion (AIC)			
Dynamic regressors (4 lags, automatic): LPI_POS LPI_NEG			
Fixed regressors: C			
Number of models evaluated: 100			
Selected Model: ARDL(4, 4, 0)			
R-squared	0.991111	Mean dependent var	3.081232
Adjusted R-squared	0.989523	S.D. dependent var	0.263126
S.E. of regression	0.026932	Akaike info criterion	-4.241957
Sum squared resid	0.040620	Schwarz criterion	-3.879993
Log likelihood	153.1056	Hannan-Quinn criter.	-4.098727
F-statistic	624.3729	Durbin-Watson stat	2.186773
Prob(F-statistic)	0.000000		

Source: From the work of researchers based on the statistical program (Eviews12).

Fifth: - Cointegration test of the NARDL model

After estimating the NARDL model, the F-Bounds Test is used to confirm the existence of a long-term relationship between the research variables. It is clear from Table (4) that the value of the F-statistic reached (4.540446), which is greater than the upper limit I (1) at significant levels (10%, 5%, 2.5%), respectively, which means rejecting the null hypothesis and accepting the alternative hypothesis, which states that there is a long-term equilibrium relationship between the variables of the model, i.e., the existence of cointegration

Table (4): F-Bounds test

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
Asymptotic: n=1000				
F-statistic	4.540446	10%	2.63	3.35
k	2	5%	3.1	3.87
		2.5%	3.55	4.38
		1%	4.13	5

Source: From the work of researchers based on the statistical program (Eviews12).

Sixth: Diagnostic tests to estimate the NARDL model

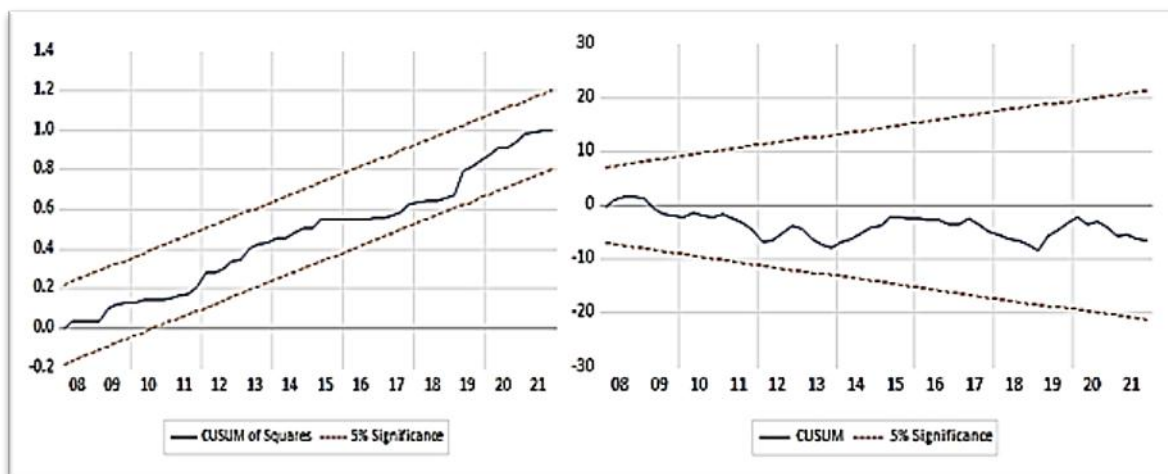
It appears from Table (5) that the remainder of the NARDL model is free from the problem of autocorrelation, as shown by the Breusch-Godfrey test, where the value of its chi-square (2) is (0.3554), which is greater than (5%), which means accepting the null hypothesis. The alternative hypothesis was rejected, in addition to the fact that the model is free of Heteroskasticity, as shown by the ARCH test, where the value of its chi-square (1) is 0.1312, which is greater than 5%, which means accepting the null hypothesis and rejecting the alternative hypothesis. The estimated model is well described, as proven by the Ramsey RESET test, as its F-statistic value is 0.148 and its P-value is 0.7015, which is greater than 5%, which means rejecting the higher hypothesis. Which means that the estimated model does not suffer from a mischaracterization problem. Finally, the NARDL model are stationary, as explained by my test (CUSUM) and (CUSUM of Squares), as the results of the estimation are located between the one who is a trust, and this means acceptance of the numbness and rejection of the imposition, as it explains (3).

Table (5): NARDL Model Estimation Tests

Breusch-Godfrey Serial Correlation LM Test: Null hypothesis: No serial correlation at up to 2 lags			
F-statistic	0.860325	Prob. F(2,54)	0.4287
Obs*R-squared	2.068957	Prob. Chi-Square(2)	0.3554
Heteroskedasticity Test: ARCH			
F-statistic	2.288662	Prob. F(1,64)	0.1352
Obs*R-squared	2.278695	Prob. Chi-Square(1)	0.1312
Ramsey RESET Test Equation: NARDL Omitted Variables: Squares of fitted values Specification: LPOVERTY LPOVERTY(-1) LPOVERTY(-2) LPOVERTY(-3) LPOVERTY(-4) LPI_POS LPI_POS(-1) LPI_POS(-2) LPI_POS(-3) LPI_POS(-4) LPI_NEG C			
	Value	df	Probability
t-statistic	0.385337	55	0.7015
F-statistic	0.148485	(1, 55)	0.7015
Likelihood ratio	0.180638	1	0.6708

Source: From the work of researchers based on the statistical program (Eviews12).

Figure (3) (CUSUM) and (CUSUM of Squares) tests



Source: From the work of researchers based on the statistical program (Eviews12).

Seventh: Economic interpretation of NARDL model results

It is clear from Table (6) that increasing private investment by (1%) will lead to a decrease in the poverty rate by (0.14%), and that the value (P - Value) of the increase in private investment is (0.0236), which is less than (5%), meaning that the parameter Moral. Also, a decrease in private investment by (1%) will lead to a decrease in the

poverty rate by (0.48%), and the value (P - Value) of the decrease in private investment is (0.0076), which is smaller than (5%), meaning that the parameter is also significant. The reason for this is due to the presence of a crowding-out effect in the Iraqi economy. When public investment decreases due to a decrease in general budget revenues or an increase in consumer expenditures, or both, the role of private investment is highlighted, while an increase in public investment due to an increase in general budget revenues and a decrease in the country's consumer expenditures will be at the expense of Private investment thus increases employment and income-generating employment opportunities, causing poverty rates to decrease.

If any imbalance occurs in this relationship between the two variables in the short term from the equilibrium in the long term, the error correction model will restore equilibrium at a speed of (-0.0722) quarterly, meaning that (7.22%) of the imbalance is in shock The previous chapter will be corrected in the current chapter, as well In Table (7).

Table (6): Estimation results of the NARDL model in the long term

ARDL Long Run Form and Bounds Test				
Dependent Variable: D(LPOVERTY)				
Selected Model: ARDL(4, 4, 0)				
Case 2: Restricted Constant and No Trend				
Date: 03/24/24 Time: 02:45				
Sample: 2004Q1 2021Q4				
Included observations: 67				
Levels Equation				
Case 2: Restricted Constant and No Trend				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LPI_POS	-0.139386	0.059914	-2.326445	0.0236
LPI_NEG	-0.482142	0.173992	-2.771059	0.0076
C	2.616681	0.216195	12.10334	0.0000
EC = LPOVERTY - (-0.1394*LPI_POS -0.4821*LPI_NEG + 2.6167)				

Source: From the work of researchers based on the statistical program (Eviews12).

Table (7): Estimation results of the short-run error correction model

ARDL Error Correction Regression				
Dependent Variable: D(LPOVERTY)				
Selected Model: ARDL(4, 4, 0)				
Case 2: Restricted Constant and No Trend				
Date: 03/24/24 Time: 03:35				
Sample: 2004Q1 2021Q4				
Included observations: 67				
ECM Regression				
Case 2: Restricted Constant and No Trend				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LPOVERTY(-1))	1.320963	0.099206	13.31536	0.0000
D(LPOVERTY(-2))	-0.821599	0.145752	-5.636965	0.0000
D(LPOVERTY(-3))	0.243468	0.092356	2.636196	0.0108
D(LPI_POS)	0.039628	0.068679	0.577002	0.5663
D(LPI_POS(-1))	-0.051293	0.089592	-0.572518	0.5693
D(LPI_POS(-2))	0.019397	0.074724	0.259583	0.7961
D(LPI_POS(-3))	0.146016	0.054231	2.692483	0.0093
CointEq(-1)*	-0.072244	0.016515	-4.374327	0.0001

Source: From the work of researchers based on the statistical program (Eviews12).

The Fifth Topic: Conclusions and Recommendations:

First: - Conclusions

- 1- There is a long-term, non-linear inverse relationship between the rise in private investment and the poverty rate, and a long-term, non-linear direct relationship between the decline in private investment and the poverty rate in Iraq.
- 2- The effect of the increase in private investment on the poverty rate reached 0.14%, which is less than the effect of the decrease in private investment on the poverty rate, which amounts to 0.48%, meaning that the effect of public investment is greater than private investment on the poverty rate in Iraq.
- 3- It is clear from the compound growth rate of both private investment (17.27%) and public investment (6%) that despite the increase in investment in Iraq in general, this was not accompanied by a decrease in the poverty rate, except for a small thing (-0.39%).

Second: - Recommendations

- 1- The government's focus on investing in infrastructure enhances private investment and thus reduces competition in the Iraqi economy.
- 2- encouraging the private sector to invest in labor-intensive sectors that use national labor, which provides income-generating job opportunities for members of society and thus reduces poverty rates in Iraq.
- 3- Following a national strategy to combat poverty depends on targeting vulnerable groups in society through education, training, and rehabilitation, first to put them in the labor market, and second, to work to fight corruption and bureaucracy in implementing projects, especially public ones, to achieve the desired goals.

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