

RESEARCH ARTICLE

FinTech and Sustainable Innovation

2025, Vol. 00(00) 1–9

DOI: 10.47852/bonviewFSI52025982



The Potential Impacts of Some Economic and Financial Variables on Private Investment Using the Augmented ARDL Approach

Fahad Mghemish Huzayran^{1,*} , Amer Mohammed Ahaimed²  and Hebat Allah Mustafa Al-Sayyid Ali³ 

1 College of Administration and Economics, University of Warith Al-Anbiyaa, Iraq

2 College of Dentistry, Ibn Sina University of Medical and Pharmaceutical Sciences, Iraq

3 College of Administration and Economics, University of Warith Al-Anbiyaa, Iraq

Abstract: The study examined the effectiveness of some financial and economic variables in Iraq on private investment and whether the impact was positive or negative. Based on the assumptions of the study, which stated that government spending, gross domestic product (GDP), inflation, and unemployment significantly affect the performance of private investment in the Iraqi economy, causing to retreat in the level of private investment in Iraq. and for the purpose of solving the research problem, which is represented by to retreat in the role of private investment in Iraq due to its influence on financial and macroeconomic variables such as government spending. The GDP suffers from significant fluctuation as a result of weak economic diversification, as well as high rates of inflation and some variables. Also, how the independent variables (financial and economic) affect the dependent variable (private investment), augmented autoregressive distributed lag approach was relied upon, relying on annual data from 1990 to 2023. The study reached several conclusions, the most important of which are: It was found that there is a long-term cointegration relationship between the variables, as well as the existence of short-term equilibrium relationships, and that the decline and fluctuation in the independent variables had a negative impact on the dependent variable. As for the recommendations, the most important are that there should be a major role for the private sector and that laws and legislation give more space to the private sector in economic activity.

Keywords: financial variables, economic variables, macroeconomic variables, augmented ARDL, Iraq

1. Introduction

Investment plays a pivotal role in propelling the national economy of any country. As a crucial economic activity, it encourages economic growth and stimulates capital accumulation. Consequently, the study of private investment as a key economic topic is central to understanding economic development. The success of private investment, however, is significantly influenced by financial and macroeconomic variables within an economy. These include government expenditure, inflation, unemployment, gross domestic product (GDP), and economic diversification. The Iraqi economy is characterized by a high degree of dependence on oil revenues, which makes it vulnerable to fluctuations in oil prices in global markets. This vulnerability is directly reflected in the level of government spending and financial and economic policies and thus in the volume of private investments. The general budget deficit, inflation levels, unemployment, and the exchange rate are also influential variables in the private investment environment, along with other macro factors related to economic and political stability.

1.1. Research problem

Private investment is one of the main drivers of economic growth and enhances productive activity, but the economic environment in Iraq faces a set of challenges related to the disruption of financial and economic variables such as government spending, GDP, inflation, and unemployment. These conditions negatively affected investor confidence and led to a decline in the volume of private investments or directed them toward short-term activities with lower risks. Hence, the problem of the study arises in trying to answer the following main question: To what extent do some financial and economic variables affect the level of private investment in Iraq, and what is the nature of this impact (positive or negative) during the period studied?

1.2. Research hypothesis

This research operates on the hypothesis that specific financial and macroeconomic variables exert a significant influence on private investment in Iraq. This influence, in turn, contributes to a diminished role for the private sector within the national economy.

*Corresponding author: Fahad Mghemish Huzayran, College of Administration and Economics, University of Warith Al-Anbiyaa, Iraq. Email: Fahad.mg@uowa.edu.iq

1.3. Research objectives

This research aims to:

- 1) Analyze the relationship between private investments and some financial and economic variables represented by government spending, GDP, inflation, and unemployment.
- 2) Use a standard model, augmented autoregressive distributed lag (ARDL) approach, to estimate the relationship between private investment and some financial and economic variables.
- 3) Draw conclusions and recommendations from the study to improve the private investment environment and enhance economic growth.

1.4. Significance of the research

The importance of this research stems from the critical role of investment in advancing any economy, particularly investments within the private sector. Investment, centrally, is foundational to any development process, with the private sector serving as a key driver of growth and innovation through investment activities.

2. Conceptual Framework for Private Investment

Private investment drives employment, income generation, and infrastructure provision. The international community has recognized the great importance of the role of the private sector in achieving high growth rates in developing countries. The European Commission explained in 2014 that the private sector has the ability to achieve financial inclusion and sustainable development in these countries [1]. Investment is conceptualized in numerous ways. A core concept defines investment as a costly undertaking in the present that is expected to yield future returns, often described as venturing into the unknown. It is typically categorized into capital formation, changes in inventories, and real estate investment. Furthermore, private investment, both domestic and foreign, is widely recognized as a principal engine of economic growth. Indeed, many nations that have experienced high growth rates in recent decades have benefited significantly from private investment, in contrast to countries where growth rates have stagnated [2]. A decline in investor confidence, often stemming from weak economic performance, typically results in a contraction of private investment [3].

Private investment can be defined as investments made by individuals or groups in ventures ranging from partnerships to publicly traded companies, representing diverse segments of society [2]. Another definition characterizes private investment as any addition to a community's productive capacity and human capital undertaken by private businesses or firms. These projects are termed "private" because their primary objective is to generate profit over time [4].

The theoretical underpinnings of investment can be traced back to the Keynesian school of 1936. One of the basic tenets of the Keynesian school is to note that, while savings and investment must equate in the long run, decisions regarding saving and investment are made by distinct economic agents. Consequently, there is no inherent mechanism to ensure that ex ante savings will equal ex ante investment [5]. Economies with more extensive and deeper private sector investment tend to exhibit accelerated growth, leading to increased job creation, higher revenue generation, and improved incomes for those in poverty. Therefore, fostering an increase in private investment is a key policy objective [6]. Private

investment is defined as the final goods that firms retain for themselves and add to a country's income-generating assets. This investment consists of, first, inventory investment, which includes all changes in the stock of raw materials, spare parts, and finished goods held by firms, and second, fixed investment, which includes all final goods purchased by firms that are not intended for resale [7].

3. Factors Affecting Private Investment

Numerous studies indicate that private investment is influenced by a variety of determinants at both the microeconomic and macroeconomic levels [8, 9]. These factors include:

3.1. Poor business environment

This encompasses a regulatory framework that is perceived as unclear and inconsistently applied in service delivery. It also includes anti-competitive policies enacted by the government and practices by private enterprises, an inefficient legal system, and generally negative perceptions toward private investment.

3.2. Distorted incentive policies

This refers to the selective application of incentives, benefiting only certain sectors or categories. These incentives may include controls on product prices and factors of production, tax reliefs, trade protectionism, government subsidies, and preferential access to resources.

3.3. Inadequate legal framework

This is characterized by insufficient legislation to clearly define property rights, effectively enforce contracts, ensure fair competition, establish robust bankruptcy procedures, and regulate employment contracts.

3.4. Weak financial systems

This pertains to inefficient financial markets and financial institutions that are unable to adequately provide credit and other essential financial services.

3.5. Deficient infrastructure

This includes inadequate connectivity, both domestically and internationally, and an unreliable power supply.

3.6. Lack of skilled labor

That is, the inadequacy of the increasing demand for skilled labor that can deal with emerging technologies.

3.7. The real interest rate

One of the main factors affecting the demand for investment is the interest rate, which is a measure of the cost of financing, as a high interest rate leads to higher financing costs, and this leads to a decrease in demand for investment.

3.8. Public investment

Public investment plays a pivotal role in influencing private investment due to the large role that the government plays in the process of capital accumulation. The impact may also be negative through public investment crowding out private investment, or what is called the crowding-out effect.

3.9. Macroeconomic

3.9.1. Instability

Macroeconomic stability serves as a crucial signal to the private sector regarding the direction of economic policies and the credibility of the authorities' commitment to sound economic management. Key macroeconomic indicators in this context include:

3.9.2. Domestic inflation rate

High domestic inflation exerts a negative impact on private investment. It elevates the risk associated with long-term investment projects, diminishes the real value of commercial loans, and distorts price signals.

3.9.3. Average per capita income

In a healthy economy, per capita income is expected to have a positive effect on private investment. This positive correlation arises because higher-income countries are generally able to allocate a greater proportion of income to savings, and consequently, to investment.

3.9.4. Debt servicing burden

A substantial external debt burden negatively affects private investment activity. Debt servicing obligations reduce the funds available for investment. This can impede the import of essential capital goods and diminish investment incentives, as a significant portion of future investment returns must be allocated to servicing existing debt, effectively acting as a tax on domestic investment.

3.9.5. Uncertainty

Uncertainty significantly affects private investment decisions. Increased uncertainty, often linked to an unstable policy environment, makes private investors hesitant to commit substantial capital to fixed investments when future conditions are unpredictable.

4. The Investment Relationship of Fiscal Policy

4.1. Government spending and taxes represent the most important tools of fiscal policy

Government spending plays the most important role in the economy in developed and developing countries alike. Compared to taxes, government spending plays an effective role in confronting crises and cyclical fluctuations in financial policy and helping governments overcome cyclical fluctuations in the economy. The government works to increase public spending in an economy suffering from high unemployment and recession (expansionary fiscal policy), and in return, it works to reduce public spending in an economy suffering from high inflation (contractionary fiscal policy). On

the other hand, private investment is one of the most important factors for economic growth. In most economies, private investment creates many labor employment opportunities and contributes significantly to economic growth and development [10]. The impact of fiscal policy objectives on the private sector can be observed in the following areas:

4.2. Economic stability

Fiscal policy aims to foster economic stability, which is fundamental to ensuring a sustainable and attractive investment climate for private investment. This is achieved by stabilizing the general price level and controlling inflation, managing unemployment at acceptable levels, maintaining a balance of payments equilibrium, and ensuring sustainable economic growth.

4.3. Optimal allocation of public resources

The way public resources are allocated significantly affects the private sector's incentives to invest. When public spending is effectively aligned with desired levels of domestic product, government activity, particularly through public expenditure, stimulates aggregate demand for goods and services. This, in turn, encourages private sector activity, boosting production and increasing aggregate supply. Conversely, reductions in public investment expenditure can diminish the attractiveness of the investment climate. Regarding budget deficits and their impact on private sector investment, maintaining budget deficits within globally accepted prudent limits is crucial for fostering a stable investment climate. Such fiscal prudence is expected to contribute to inflation stability, a key element of an attractive investment environment.

4.4. Increased social spending

Elevated social spending, particularly on education and vocational training, plays a significant role in influencing employment levels and productivity within the private sector. Investment in human capital through social spending can enhance the skills base, thereby supporting private sector growth and competitiveness.

5. GDP's Relationship with Private Investment

The GDP growth rate is one of the main factors affecting the volume of private investment within any economy. A rise in this rate stimulates economic activity and increases aggregate demand, which in turn is reflected in expanding private investment opportunities. The relationship between private investment and economic growth is characterized as reciprocal, as increased investment contributes to enhancing aggregate demand and thus raising economic growth rates. In return, accelerated growth leads to increased private sector incomes, which stimulates the expansion of investments [11], and investment can be affected by GDP, and these effects are either negative or positive. Positive influences include the following [12]:

1) Increased investment opportunities: GDP growth typically generates new avenues for investment.

2) Improved investment environment: A rising GDP generally enhances the investment climate by fostering infrastructure development that is conducive to private investment.

The primary negative effects of GDP on private investment are:

1) Economic contraction: A contraction in GDP will diminish investment opportunities, thereby reducing private investment.

2) Elevated risk: Lower GDP growth rates are associated with increased risks for private investors.

6. Unemployment's Relationship to Private Investment

Investment is the primary factor determining the rate of economic growth, leading to a significant increase in production and increased demand for inputs, which enhances employment opportunities and achieves social well-being. The scale of investment significantly impacts society and the available job opportunities. Investment will increase production activities, create new job opportunities, and thus reduce the number of unemployed. This means that a high level of investment will reduce the unemployment rate, while a low level of investment will increase the unemployment rate [13].

7. Inflation's Relationship to Private Investment

The potential effects of inflation on an investment depend on the type of investment, whether it is in bonds or fixed-income stocks. Inflation can be detrimental. This is because the fixed interest payments remain constant in nominal terms, eroding their real value and thus reducing profitability in real terms. For equities, however, the effect of inflation is more ambiguous. Inflation often

raises during periods of strong economic growth, as companies experience increased sales, leading to higher wages and raw material costs, which can impact profitability. Whether inflation ultimately benefits or harms equities depends on the underlying performance of the companies [14].

Furthermore, uncertainty surrounding inflation negatively affects private investment. It elevates risks associated with long-term debt returns, which is reflected in increased long-term interest rates. This uncertainty also clouds future payment streams for rents and salaries [15].

8. Benchmarking Analysis Using Augmented Autoregressive Distributed Lag (ARDL) for Selected Financial and Economic Variables on Private Investment, 1990–2023

To reach the study objective, a time series from 1990 to 2023 was chosen for the study variables, where government spending (EG), GDP, inflation (IN), and unemployment (UN) represent the independent variables, and private investment (PI) represents the dependent variable. To extract the results, the measurement method, the ARDL approach, was chosen for the Eviews program to reach the best results. Data were obtained from official websites, including the Central Bank of Iraq and the Ministry of Finance.

Table 1
The degree of integration and the root of the unit using the Peruvian Flips test

UNIT ROOT TEST RESULTS TABLE (PP)						
Null Hypothesis : the variable has a unit root						
At Level						
		PI	GDP	UN	IN	EG
With Constant	T-Statistic Prob.	-5.6842	0.2393	-2.3839	-2.9916	-4.8943
		0.0000	0.9711	0.1538	0.0461	0.0004
		***	No	No	**	***
With Constant and Trend	T-Statistic Prob.	-5.8185	-2.6200	-3.2463	-3.8788	-5.1741
		0.0002	0.2745	0.0932	0.0245	0.0010
		***	No	*	**	***
Without Constant and Trend	T-Statistic Prob.	-3.9468	1.5763	-0.9297	-2.6700	-4.3063
		0.0003	0.9692	0.3065	0.009	0.0001
		***	No	No	***	***
At First Difference						
		d(PI)	d(GDP)	d(UN)	d(IN)	d(EG)
With Constant	T-Statistic Prob.	-24.8577	-5.4086	-9.3622	-13.0191	-20.4686
		0.0001	0.0001	0.0000	0.0000	0.0001
		***	***	***	***	***
With Constant and Trend	T-Statistic Prob.	-30.2167	-5.5507	-9.2637	-13.9141	-26.9263
		0.0000	0.0004	0.0000	0.0000	0.0000
		***	***	***	***	***
Without Constant and Trend	T-Statistic Prob.	-24.7805	-4.8421	-8.2976	-11.4156	-20.9021
		0.0000	0.0000	0.0000	0.0000	0.0000
		***	***	***	***	***

Note: (*) significant at the 10%, (**) significant at the 5%, (***) significant at the 1%, and (no) not significant

8.1. Determine the degree of integration between the variables included in the model

Table 1 (below) indicates the stationarity of variables private investment (PI), inflation (IN), and government expenditure (EG) at level I (0). Conversely, variables GDP and unemployment (UN) achieve stationarity at their first difference, I (1). This determination of stationarity – with a constant, constant and trend, or none – is based on the Prob. value, ensuring the absence of spurious regression and unit roots at a 5% nominal level. This analysis is based on two hypotheses: that the null hypothesis $H_0: b = 0$, and the alternative hypothesis $H_1: b > 0$. For further details, see Al [16].

Following the established approach of [17], several conditions are assumed to meet the requirements of the ARDL methodology. Notably, the dependent variables should be integrated of order one, I (1), to avoid issues of spurious or degenerate cointegration relationships (“degenerate cases of cointegration”). Therefore, this research employs the augmented ARDL approach, suitable for variables integrated at level I (0). For more details, refer to [18].

To estimate the model, its components must be determined (data-generating process), commensurate with the research data. Art and science are considered at the same time, and there are five cases of selection of model determinants (Trend Specification ARDL DGP $I = 1, \dots, 5$).

Through Table 2, the structure of the slowing periods was determined (Lag) appropriate to the number of variables used in the model, that is, $p \times (q + 1) k$, selected in this study as ($p = q = 1$), depending on the length of the time series, thus achieving the search desirability, and the slowing scores may vary between the time chains, meaning that not all time chains have the same slowing scores, and the slowing scores are determined by using a model. (VAR) based on one of the information calibrators, by reference, the Akaike standard (AIC), Schwarz (SIC), Hannan–Quinn (HQ), or even (R2) modified [19–21].

Having demonstrated the method of selecting the components of the model, it became possible to determine the general formula for it, representing the estimation of long-term parameters, which can be estimated according to the case (3) and which took the following formula [19–21]:

Case: Unrestricted constant and no trend

Zero hypothesis of the estimated model: $H_0: a_0 \neq 0$ and $a_1 = 0$ so that $\mu \neq 0$ and $\gamma = 0$

The augmented approach is subject to the following behavioral linear formula:

$$\Delta y_t = a_1 + b_1 y_{t-1} + \sum_{j=1}^k b_{j1} x_{j,t-1} + \sum_{i=1}^{py-1} c_{0,i1} \Delta y_{t-i} + \sum_{j=1}^k \sum_{l_j=1}^{q_y j-1} c_{j,l_j1} \Delta x_{j,t-l_j} + \sum_{j=1}^k d_{j1} \Delta x_{j,t} + \epsilon_t \quad (1)$$

$$\Delta x_t = a_2 + b_2 y_{t-1} + \sum_{j=1}^k b_{j2} x_{j,t-1} + \sum_{i=1}^{px-1} c_{0,i2} \Delta y_{t-i} + \sum_{j=1}^k \sum_{l_j=1}^{q_x j-1} c_{j,l_j2} \Delta x_{j,t-l_j} + \sum_{j=1}^k d_{j2} \Delta x_{j,t} + \epsilon_t \quad (2)$$

After identifying the formula of the model’s behavioral equation, it is possible to express the function in its initial form and to express it in the general form of the model as follows:

$$[PI = F(GDP, UN, IN, EG)] \quad (3)$$

Note from Table 3 below, which showed the results of the interpretive capability of the R -squared/0.479655 model, meaning that the independent variables were interpreted by 47% of the dependent variable at 5%, meaning the estimated model is significant. Thus, the null hypothesis $H_0: b = 0$ is rejected, and the alternative hypothesis $H_1: b \neq 0$ is accepted.

To ensure that the model is safe and free from the problem of serial association (LM), and that the variability is not fixed (heteroskedasticity), we proceed to the diagnostic tests (eDimension) as shown in Table 4 (2). There is no serial link between the remains because the value of the F -statistic and Chi-square test is insignificant at a 5% significance level, and the model is free of the problem of variability stability because statistical indicators were also insignificant at 5% level.

Table 2
Slowing periods

VAR Lag order selection criteria						
Endogenous variables: PI, GDP, UN, IN						
Exogenous variable: C						
Date: 08/27/24; time: 08:18						
Sample: 1990–2023						
Included observation: 30						
Lag	LogL	LR	FPE	AIC	SC	HQ
0	−1934.905	NA	1.01e+50	129.3270	129.5605	129.4017
1	−1871.069	102.1373*	7.78e+48*	126.7379*	128.1391*	127.1862*
2	−1854.638	20.81203	1.60e+49	127.3092	129.8781	128.1310
3	−1832.974	20.22003	3.10e+49	127.5316	131.2681	128.7269
4	−1801.009	19.17862	5.61e+49	127.0673	131.9715	128.6362

Table 3
The estimate of the “augmented ARDL” investment model for PI

Department variable: PI				
Method: ARDL				
Date: 08/24/24; time: 16:10				
Sample (adjusted): 1991–2023				
Included observations: 33 after adjustments				
Maximum dependent lags: 1 (automatic selections)				
Model selection method: Akaike info criterion (AIC)				
Dynamic regression (1 lag, automatic) GDP UN IN IM				
Fixed regression: C				
Number of models evaluated: 6				
Selected model: ARDL (1,0,0,1,1)				
Variable	Coefficient	Std. Error	<i>t</i> -Statistic	Prob.*
PI(-1)	-0.287964	0.176759	-1.629137	0.1158
GDP	0.024478	0.007471	3.276458	0.0031
UN	317805.8	208021.0	1.527758	0.1391
IN	-1096.963	9721.700	-0.112837	0.9111
IN(-1)	39817.11	10065.00	3.955997	0.0006
EG	0.005192	0.007982	0.650405	0.5214
EG(-1)	0.010921	0.008354	1.307222	0.2030
C	-6933223.	4498802.	-1.541126	0.1358
<i>R</i> -squared	0.479655	Mean dependent var		3063697.
Adjusted <i>R</i> -squared	0.333958	SD dependent var		4107696.
SE of regression	3352347.	Akaike info criterion		33.09544
Sum squared resid	2.81E+14	Schwarz criterion		33.45823
Lag likelihood	-538.0747	Hannan–Quinn criter		33.21750
<i>F</i> -statistic	3.292150	Durbin–Watson star		1.607555
Prob(<i>F</i> -statistic)	0.012753			

*Note: p-values and subsequent tests do not account for model selection.

Table 4
Serial correlation test and contrast constant for PI investment

Breusch – Godfrey correlation LM test;			
Null hypothesis; no serial correlation at to lag			
<i>F</i> -statistic	2.167944	Prob. F (1, 24)	0.1539
Obs * <i>R</i> -squared	2.733961	Prob. Chi-Square (1)	0.0982
Heteroskedasticity Test: ARCH			
<i>F</i> -statistic	1.984372	Prob. F (1, 30)	0.1692
Obs * <i>R</i> -squared	1.985342	Prob. Chi-Square (1)	0.1588

8.2. Bounds test and long-term cointegration relationships between the study variables using the augmented ARDL methodology

(Augmented ARDL Long-Run Form and boundary test) As shown in Table 5, three tests, the first of which is the boundary test (boundary test for comprehensive *F*) and at the level of all independent variables and secondary variables by 5%, which indicates a common integration relationship between variables (cointegration

relationship X_t and Y_t), and the second test (*t*-boundary test) for the dependent variable. When taking its absolute value, it proves that it is unethical at (5%). This test clarifies the morale and logic of cointegration, and the third test represents the test of independent variables in the model of the external *F*-limits test (“external *F*-limits test”). It came in morale at 5% compared to lower and higher critical values. The influence of the independent variables in the long term and the clear for the influence of the two variables (GDP and IN) in their sentiment was found to be 5% [22].

Table 5
Boundary test and long-term joint integration relationship between variables according to the augmented ARDL methodology

Augmented ARDL long-run form and bounds test				
Dependent variable: D(PI)				
Selected model: ARDL (1,0,0,1,1)				
Case 3: unrestricted constant and no trend				
Date: 08/24/24; time: 16:13				
Sample: 1990–2023				
Included observations: 33				
Conditional Error Correction Regression				
Variable	Coefficient	Std. Error	t-Statistic	Prob
C	−6933223.	4498802.	0.000000	0.0000
PI (−1)*	−1.287964	0.176759	−7.286559	0.0000
GDP**	0.024478	0.007471	3.276458	0.0031
UN**	317805.8	208021.0	1.527758	0.1391
IN(−1)	38720.15	9688.716	3.996417	0.0005
EG(−1)	0.016113	0.011432	1.409442	0.1710
D(IN)	−1096.963	9721.700	−0.112837	0.9111
D(EG)	0.005192	0.007982	0.650405	0.5214
*p-value incompatible with t-bounds distribution.				
**variable interpreted as $Z = Z(-1) + D(Z)$.				
Levels Equation				
Case 3: Unrestricted Constant and No Trend				
Variable	Coefficient	Std. Error	t-Statistic	Prob
GDP	0.019005	0.005872	3.236340	0.0034
UN	246750.4	162821.9	1.515462	0.1422
IN	30063.05	8373.742	3.590158	0.0014
EG	0.012510	0.008841	1.415069	0.1694
EC = PI - (0.0190*GDP + 246750.3997*UN + 30063.0535*IN + 0.0125*EG)				
Overall F-Bounds Test		Null Hypothesis: No level relationship		
Test Statistic	Value	Signif.	I (0)	I (1)
Asymptotic: n = 1000				
F-statistic	13.31133	10%	2.45	3.52
K	4	5%	2.86	4.01
		2.5%	3.25	4.49
		1%	3.74	5.06
T-Bounds Test		Null Hypothesis: No level relationship		
Test Statistic	Value	Signif.	I (0)	I (1)
T-statistic	−7.286559	10%	−2.57	−3.66
		5%	−2.86	−3.99
		2.5%	−3.13	−4.26
		1%	−3.43	−4.6
Exogenous F-Bounds Test		Null Hypothesis: No exo. levels relationship		
Test Statistic	Value	Signif.	I (0)	I (1)
Asymptotic: n = 1000				
F-statistic	1.777218	10%	1.96	3.58
K	4	5%	2.39	4.18
		2.5%	2.79	4.73
		1%	3.33	5.47

Table 6
The morale of the impact of independent variables using the Wald test for exogenous variables

Wald Test for Exogenous Variable(s):			
Equation: ECM Model			
Test Statistic	Value	Df	Probability
F-statistic	4.777218	(4, 25)	0.0053
Chi-square	19.10887	4	0.0007
Null Hypothesis: $C(3) = C(4) = C(5) = C(6) = 0$			
Null Hypothesis Summary:			
Normalized Restriction (= 0)	Value	Std. Err.	
C(3)	0.024478	0.007471	
C(4)	317805.8	208021.0	
C(5)	38720.15	9688.716	
C(6)	0.016113	0.011432	

Restrictions are linear in coefficients.

8.3. Testing the statistical significance of independent variables (Wald test)

The Wald test results (Table 6 – Wald test for exogenous variables) demonstrate the statistical significance of the independent variables and their impact on the dependent variable. The Chi-square statistic and probability value are statistically significant at the 5% level. This provides evidence for the statistical significance of the estimated values, indicating a short-run relationship among the variables in the estimated model.

9. Conclusions

- 1) Augmented ARDL methodology was effectively employed to achieve stationarity of the private investment (PI) variable at level I (0).
- 2) The *R*-squared test found a statistically significant relationship between independent and dependent variables.
- 3) The diagnostic statistical indices of the Chi-square test and the F test were found to be statistically insignificant at the 5% level. This means that the model is robust and does not suffer from heterogeneity of variance.
- 4) There are short-term equilibrium relationships between dependent and independent variables within the model.
- 5) Through the above results, we confirm the validity of the hypothesis that financial and economic variables affect private investment in Iraq and that the decline and fluctuation in the independent variables have negatively affected the dependent variable.
- 6) The above results are consistent with economic logic, which holds that private investment represents a rational decision affected by the cost of financing (financial variables) and the expected return (macroeconomic variables), such as GDP, inflation, and unemployment, in addition to the element of expectations and uncertainty. The more stable and transparent the economic environment is, the greater the ability of the private sector to expand investment.
- 7) This study attempted to address a topic that had not been addressed previously in the Iraqi economy, which is the impact of some financial variables represented by government spending and economic variables represented by the GDP, inflation, and unemployment on private investment in Iraq.

- 8) This study neglected some important financial and economic variables that could play a major role in influencing private investment, such as taxes, interest rates, and exchange rates. Future studies can consider these variables.

Recommendations

Based on our findings, we can propose some important recommendations, including accelerating the adoption and implementation of legislation and laws that increase this sector's participation in the economy and investment. In addition to providing a suitable climate for private investment, particularly in credit and loans, it simplifies legal procedures. Working to achieve monetary stability, especially regarding the exchange rate and interest, as monetary stability attracts investments, especially foreign investments, is important in advancing economic development. Achieving effective participation between the private and public sectors, as well as building bridges of cooperation at home and abroad, helps overcome all obstacles to investment locally and globally by joining international unions and agreements that work to increase and develop investment effectiveness.

Ethical Statement

This study does not contain any studies with human or animal subjects performed by any of the authors.

Conflicts of Interest

The authors declare that they have no conflicts of interest to this work.

Data Availability Statement

Data available on request from the corresponding author upon reasonable request.

Author Contribution Statement

Fahad Huzayran: Conceptualization, Methodology, Investigation, Writing – original draft, Supervision, Project administration. **Amer Ahaimed:** Software, Formal analysis, Investigation.

Hebat Allah Al-Sayyid Ali: Validation, Writing – review & editing, Visualization.

References

- [1] Ndanusa, A., Adamu, A., & Madu, B. (2024). Analysis of private sector investment on economic growth in Nigeria. *Lapai Journal of Economics*, 8(1), 221–233. <https://doi.org/10.4314/lje.v8i1.16>
- [2] Al-Mohammadi, M. K., & Al-Hayawi, M. K. (2021). Impact of investment determinants in the Iraqi economy for the period (2004-2018) standard study. *Journal of Business Economics*, 1, 111–132. <https://doi.org/10.37940/BEJAR.2021.1.1.6>
- [3] Hyder, K., & Ahmed, Q. M. (2004). Why private investment in Pakistan has collapsed and how it can be restored. *The Lahore Journal of Economics*, 9(1), 107–125. <https://doi.org/10.35536/lje.2004.v9.i1.a5>
- [4] Nguyen, N. A., Vu, T. N. Q., & Phan, T. T. (2025). Impact of public, private, and foreign direct investments on provincial economic growth. *International Journal of Asian Business and Information Management*, 16(1), 1–19. <https://doi.org/10.4018/IJABIM.366309>
- [5] Huzayran, F.M. (2020). The impact of crowding out of the government sector on private investment: A case of Iraq. *International Journal of Innovation, Creativity and Change*, 13(5), 1084–1096.
- [6] Iqbal, N., Rehman, A., & Amin, S. (2024). Financial development and private investment. *Global Social Sciences Review*, 9(4), 92–102. [https://doi.org/10.31703/gssr.2024\(IX-IV\).10](https://doi.org/10.31703/gssr.2024(IX-IV).10)
- [7] Ha, N.N., Anh, D. H., Quynh, L.N., & Quyen, T.T. (2025). Impact of economic growth, public investment, and private investment on firm performance in some economic sectors in Vietnam: An SGMM approach. *International Journal of Innovative Research and Scientific Studies*, 8(4), 1813–1822. <https://doi.org/10.53894/ijirss.v8i4.8240>
- [8] Huzayran, F.M., Jaas, A. H., & Husain, N. Q. (2025). Government spending between budget and achieving sustainable development goals. *International Journal of Economics and Finance Studies*, 17(2), 123–140. <https://doi.org/10.34109/ijefs.2025170207>
- [9] Hassan, O., & Zahir, A. H. (2023). The determinants of the flow of foreign direct investment a measuring analytical study of a sample of developing countries for the period (1996-2020). *Humanities Journal of University of Zakho*, 11(2), 339–354. <https://doi.org/10.26436/hjuoz.2023.11.2.1072>
- [10] Van Bon, N. (2023). The relationship between public expenditure and private investment in developed and developing economies: Policy implications based on the difference. *Hacienda Pública Española/Review of Public Economics*, 244(1), 37–55. <https://doi.org/10.7866/HPE-RPE.23.1.2>
- [11] Unnikrishnan, N., Biju John, M., & Kattookaran, T. P. (2024). Determinants of private infrastructure investment in India: A post-liberalization. *BIMTECH Business Perspectives*, 5(1), 74–94. <https://doi.org/10.1177/25819542241249606>
- [12] Morina, F., Misiri, V., & Gashi, F. (2023). Long-term relationship between investment and economic growth: A cointegration analysis of OECD countries. *European Journal of Government and Economics*, 12(2), 175–195. <https://doi.org/10.17979/ejge.2023.12.2.9909>
- [13] Hasan, N., & Sun'an, M. (2020). The effect of private inflation and investment on unemployment and poverty in North Maluku province. *Journal of International Conference Proceedings*, 3(3), 36–48.
- [14] Wassila, B. (2022). Determinants of private domestic investment in Algeria during the period 1990-2019. *Revue Algérienne d'Economie et Gestion*, 16(1), 80–98.
- [15] Pahlavani, M., & Bashiri, S. (2013). Dynamic relationship between inflation uncertainty and private investment in Iran: An application of VAR-GARCH-M model. *International Journal of Business and Development Studies*, 5(1), 61–76.
- [16] Mohammed Al Hussein, A., Smida, M., & Bouabid, A. (2023). Measuring the integrative relationship between fiscal policy tools and the economic dimension of the development index. In *Iraqi Academics Syndicate 3rd International Conference on Arts and Humanities Sciences*.
- [17] Pesaran, M.H., Shin, Y., & Smith, R. J. (2001). Bounds testing approaches to the analysis of level relationships. *Journal of Applied Econometrics*, 16(3), 289–326. <https://doi.org/10.1002/jae.616.CAM.5093>
- [18] Alrikaby, A. M. E. A., Smida, M., Nayyef, F. M., & Hedi, S. B. H. (2024). Using the augmented ARDL model to measure the impact of fiscal policy instruments on the economic dimension of the sustainable development index for the period 1990-2020. *Iraqi Journal for Economic Sciences*, 22(81), 182–217. <https://doi.org/10.31272/IJES2024.81.12>
- [19] EViews. (2017). *Auto regressive distributed lag (ARDL) estimation. Part 1—Theory*. Retrieved from: <https://blog.eviews.com/2017/04/autoregressive-distributed-lag-ardl.html>
- [20] EViews. (2017). *Auto regressive distributed lag (ARDL) estimation. Part 2—Inference*. Retrieved from: <https://blog.eviews.com/2017/04/autoregressive-distributed-lag-ardl.html>
- [21] EViews. (2017). *Auto regressive distributed lag (ARDL) estimation. Part 3—Practice*. Retrieved from <https://blog.eviews.com/2017/05/autoregressive-distributed-lag-ardl.html>
- [22] Alrikaby, A. M. E. A., AlKaraawi, Z. H. M., & Huzayran, F. M. (2024). Measuring the impact of monetary policy variables and their effectiveness on banking financial performance indicators using the (Bootstrap & Augmented) method / A standard analytical study of a sample of private local commercial banks in Iraq for the period from 2010-2021. *Warith Scientific Journal*, 6, 524–551.

How to Cite: Huzayran, F. M., Ahaimed, A. M., & Ali, H. A. M. A. S. (2025). The Potential Impacts of Some Economic and Financial Variables on Private Investment Using the Augmented ARDL Approach. *FinTech and Sustainable Innovation*. <https://doi.org/10.47852/bonviewFSI52025982>