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MEASURING AND ANALYSING THE IMPACT OF EXCHANGE RATE FLUCTUATIONS ON IMPORTS AND THEIR IMPLICATIONS FOR INFLATION IN IRAQ USING THE ARDL MODEL

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Abstract. The current study attempts to measure and analyse the impact of exchange rate fluctuations on imports and their implications for inflation rates in Iraq over the period 2004–2025. To identify the nature of the short- and long-run relationships among the study variables, an econometric approach based on (ARDL) model was adopted. The estimation covered only the period 2013–2025 because quarterly data were not available for the remaining years, despite the importance of the economic events and changes that occurred during that period. The findings uncovered the existence of a long-run cointegrating relationship among government expenditure and imports. Government expenditure constitutes the main driver of the increase in the import bill. By contrast, the effect of the parallel exchange rate on imports is confined to the short run because of the low price elasticity of demand. The study also showed that variations in the parallel exchange rate constitute the direct driver of imported inflation in the short run, with no evidence of a long-run equilibrium relationship between imports and inflation owing to monetary coverage at the official exchange rate. Accordingly, the study recommends tighter control over the exchange-rate gap and directing government expenditure towards developing the domestic productive base.

Keywords: Parallel exchange rate; import bill; imported inflation; government expenditure; Iraqi economy

Introduction

According to the dynamic relationship and the concept of price elasticity of demand, an adjustment in the exchange rate of the local currency changes the prices of imported possessions and services, which in turn affects inflation rates. A depreciation of the exchange rate raises import prices. In theory, this increase is expected to stimulate domestic demand to shift towards substitute domestic products (the substitution effect), thereby improving the trade balance as the overall volume of imports declines, provided that the elasticity condition, the Marshall–Lerner condition, is satisfied. Developing economies, particularly rentier economies, however, continually suffer from low demand elasticity for essential goods and services because of their weak productive base. Consequently, an exchange-rate depreciation does not necessarily produce a noticeable decline in the actual volume of imports; rather, it directly increases the value of the import bill [1].

The transmission of an exchange-rate adjustment to final consumer prices occurs through two main stages. The first is direct pass-through across national borders, whereby import prices rise in domestic currency as soon as goods enter the country. The second is indirect pass-through, whereby the prices of domestically produced goods and services rise because of increases in the prices and costs of imported inputs used in production, thereby generating imported inflation [2].

The impact of this inflation becomes more pronounced in open economies because of the absence of domestic substitutes for final and intermediate consumer goods, which facilitates the faster transmission of exchange-rate pressures to consumer price indices [3].

Within this framework, the Iraqi dinar/US dollar exchange rate plays a direct role in defining the prices of imported goods and services. During 2004–2024, the Iraqi economy underwent numerous structural economic and financial transformations, resulting in intensive use of the foreign-currency sales window mechanism to maintain the stability of the national currency. However, exchange-rate adjustment decisions, particularly those taken at the end of 2020 and the subsequent adjustments in 2023 and 2024, threatened this stability and also increased the cost of the import bill, thereby raising domestic production costs and threatening living standards [4].

Therefore, this research problem focuses on the impact of exchange-rate variation in Iraq. The absence of domestic alternatives and the dependence of the import structure on foreign goods reduce the price elasticity of domestic demand, thereby limiting the impact of exchange-rate adjustments on imports and contributing to the direct transmission of the effect to prices.

First: Literature Review and Previous Studies.

The association among exchange rates, import dynamics, and inflation has occupied a central position in the modern economic literature, particularly following supply-chain disruptions and the increasingly pronounced global inflationary waves after 2021. This literature has emphasised that the exchange-rate pass-through mechanism depends on domestic prices. Exchange-rate fluctuations produce asymmetric and nonlinear effects on import prices and domestic inflation [5]. In resource-rich developing economies that rely on imports to meet domestic market needs, exchange-rate shocks pass rapidly through the supply chain because of incomplete pass-through and incomplete currency pricing in import invoices [6].

Depreciation of currency directly increases the local currency cost of imported intermediate and consumer goods. In these markets, import volumes are insensitive to price changes, hence the importance of price in increasing import values, but not a shift in expenditure towards domestic products [7]. This imbalance creates an inflationary effect of imported prices (cost-push inflation) and makes the inflationary impact more significant in the presence of parallel market pressures on central banks [8]. Due to this, the expectations of inflation quickly rise in the domestic commercial markets, and temporary exchange-rate shocks turn into a permanent phenomenon of inflation [9].

Thus, there are two main channels of transmission of exchange-rate effects to the price structure. The direct channel works if when the domestic currency depreciates, the local currency prices of imports immediately increases, thus impacting the domestic-currency prices of imports of consumer goods. The indirect channel is when higher prices of imported production inputs cause higher domestic production prices and hence core inflation. In an analysis of the triangular links between exchange rates, imports, and inflation, Orlov, Forbes, and English [10] focused on the data for 32 developing and advanced economies spanning the 2020–2022 period, and applied Panel SVAR models to estimate transmission of supply-chain shocks and exchange-rate shocks. It was found that the

negative impact of exchange rate depreciation on import prices was exacerbated by supply-chain bottlenecks all around the world. The data suggested low short-run import-demand elasticity because there was no availability of domestic substitutes, so that exchange-rate shocks were quickly translated into movements in the CPI.

Nonlinear VAR and Panel Threshold Models are also used by Casallis and Forero [11] to analyse the economic data for developing and advanced economies until the end of 2022. Based on their analysis of the results, they concluded that the pass-through of exchange-rate changes to import prices is non-linear and influenced by the size of the shocks, the economic conditions, and inflation expectations. The exchange-rate pass-through rate to imports and domestic inflation rose compared to periods of low inflation, when importing firms could pass-through the costs generated by exchange-rate depreciation to the final consumers more quickly, during periods of high inflation following 2021.

In their analysis of price data at the firm level and for imported goods in the euro area over 2021–2023, Gautier et al [12]. have found that the pass-through effect for euro area firms and imported goods was 60%–80% at the wholesale level but reduced to 20%–35% when the price reached the final consumer. The paper arrived at that in the very short run, market-structure dynamics and importers' profit margins contribute to some degree in absorbing shocks but when the currency depreciation continues, it will eventually pass through to the inflation. Boubaker and Zorgati [13] employed an MS-VAR model to detect regime changes in the exchange-rate transmission pattern during the volatile era of developing economies and concluded that exchange-rate fluctuations are transmitted through import channels as the main channel in these developing economies. Furthermore, they demonstrated that high growth rates and external shocks are associated with higher exchange-rate sensitivity, because an increase of import prices has a stronger impact on the economy and triggers the emergence of inflationary waves.

Applied studies of the Iraqi economy have concentrated on the mechanism by which the exchange-rate fluctuations are passed to imported inflation and on the connection among the fluctuations in the exchange-rate and foreign trade. This orientation is related to the economic profile of the Iraqi economy that relies on oil income for over 90% of its income and relies on foreign-currency sales window and external imports for its needs. Kadhim and Dhhan [14] examined the effect of the foreign-currency sales window and official and parallel exchange-rate fluctuations on inflation rates in Iraq. Their findings showed that the parallel exchange rate is a determinant of local prices, as importers quickly adjust the prices of imported products based on the parallel exchange rate due to the fear of volatility risks, thus strengthening the imported inflation.

Al-Jubouri et al [15]. employed the Nonlinear Autoregressive Distributed Lag (NARDL) model to measure the influence of exchange-rate variations on imported inflation and the trade balance in Iraq over 2004–2019

. The study examined whether increases and decreases in the official and parallel exchange rates exert asymmetric effects on foreign-trade flows and consumer prices. The results showed asymmetric effects in the long and short run: depreciation of the Iraqi dinar produced a rapid and direct increase in imported inflation because of the low price elasticity of imports, whereas appreciation of the dinar did not reduce domestic-goods prices to the same extent, reflecting greater upward price flexibility and downward rigidity associated with importers' behaviour in the parallel market.

Al-Bayati et al [16]. measured the influence of exchange-rate changes and inflation on Iraq's gross domestic product over 1988–2020 using the bounds-testing approach within an (ARDL) model. The results established a significant inverse relationship, in the long and short run, between an increase in the official exchange rate and output growth. This contractionary structural effect was attributed to the higher cost of the import bill and its direct impact on raising the cost of intermediate production inputs, together with the erosion of purchasing power and the decline in aggregate consumption and investment demand. Salih and Hussain [17] examined the effect of the foreign-currency sales-window mechanism and the exchange rate on the structure of foreign trade and inflation in Iraq over 2005–2021 using a (VECM).

The study analysed the channels through which the Central Bank's dollar sales affect domestic prices and external balances.

The results revealed a cointegrating relationship between the volume of currency sales and imported

inflation rates. The foreign-currency sales window was the inflationary pressure absorption window and any increase in the exchange-rate spread from the official to the parallel market rate was instantly reflected in the prices of imported goods in the domestic market. Taha and Abdullah [18], it was found that the Iraqi domestic productive apparatus was weak, so that the depreciation of the Iraqi dinar did not lead to the decrease of demand for consumer imports. Rather, it raised the dinar value of imported goods and services and boosted imported inflation.

Al-Khafaji and Hadi [19] assessed the most recent Iraqi dinar depreciation shock on consumer-goods prices and the components of non-oil foreign trade by measuring the influence of the 2020 official exchange-rate change on import and inflation dynamics in Iraq using a (SVAR) model with monthly data covering 2018–2023.

The results showed that in the short run, the pass-through effect to import prices was swift and nearly complete, leading to higher inflation rates. Dinar depreciation could also not encourage non-oil export due to the lack of another domestic productive base, further aggravating the structural elements of imported inflation in Iraq. As the result of the review of selected theoretical and applied literature, it was found that the study of the influence of variations of the exchange rate on the dynamics of imported goods and inflation in Iraq is still very important as Iraq's economy is a very extreme example of a rentier economy open to the foreign exchange market, and also lacks productive flexibility and is very dependent on imported goods to achieve the requirements of the domestic market. In this context, the significance of this study is based on the fact that it puts light on the structural channels by which official and parallel exchange rate shocks could be translated into imported inflation. The study aims to provide recommendations to monetary and fiscal policy makers on the adoption of suitable mechanisms to resolve the foreign-currency sales window imbalances, regulate the import dynamics and ultimately enhance economic stability.

Methods

This research relies on official data collected from various bulletins issued by the Ministry of Finance and the Central Bank of Iraq. The principal data include official and parallel exchange rates, imports and exports, inflation rates, and government expenditure for 2004–2025. To address the research problem, the study employed a deductive approach based on the econometric method represented by (ARDL) model to determine the nature of the short- and long-run dynamic relationship among the variables. The study principally assumes that changes in official exchange rates generate variations in the parallel-market exchange rate, which in turn lead to changes in the import bill and are reflected in imported inflation rates.

Third: Hypotheses.

There is a statistically significant long-run impact of the parallel exchange rate and government expenditure on imports. Short-run changes in both variables also contribute to imports, while the Error Correction Mechanism (ECM) has a significant effect that ensures a gradual return towards long-run aggregate equilibrium.

Short-run changes in imports, the parallel exchange rate, and government expenditure have a statistically significant effect on inflation rates.

Fourth: Analysis of the Dynamics of the Relationship among Exchange Rates, Imports, and Inflation. The exchange rate has been a prominent item on the list of monetary-policy instruments, because of the nature of the Iraqi economy, which is one-sided rentier economy and oil is the main source of income for the government. The exchange rate has also grown into a key nominal anchor for the purchasing power of the domestic currency, directly and indirectly shaping domestic price developments and inflation rates, as a result of the fragility and limited flexibility of the productive base, and as a balancing instrument for external imbalances in the economy. To understand the connection between exchange rates, imports and inflation, one should analyse and decompose the main transmission channels between the two. The first one is the direct-cost and imported-inflation channel. This is the most important channel because as the dinar weakens, the home market becomes ever more reliant on imports, and the price of imports will go up straight away, which will cause the price of the final product to go up too, which means "imported inflation."

Alternatively, a rise or levelling off of the dinar lowers import prices and slows down inflation. The second channel is import demand elasticity, that is, the structural imbalance of the Iraqi economy.

Now, there is no alternative at home and the price elasticity of demand for imports is also low, thus purchasing imports becomes inevitable. So, the depreciation of the dinar does not diminish the quantities imported, rather it increases the price of the imports in dinars, which increases inflationary pressures. The third channel is the difference among the official and parallel exchanging rates. The inflationary effect is related to the amount of financing for trade transactions offered in the official market compared to the parallel market. Under regulatory constraints, traders turn to the higher cost parallel market, thereby inflating domestic prices, while increasing financing at the official rate helps to buffer essential commodities from prices volatility on the parallel market and boosts price stability. The fourth, and final channel is the channel of expectation and government spending.

An increase in the exchange rate of the dollar increases the amount of liquidity (dollar) that enters the economy, boosts the government's spending and aggregate demand, and brings some of that demand into the country. But rising expenditure also raises dealers' inflation expectations, leading them to raise their profit margins to protect against future losses and thus magnifying the inflationary impact. These dynamics, combined with the association among the exchange rate, imports and the general price level, can be used to identify four economic phases in the Iraqi economy during 2004-25 for which monetary-policy behaviour and its impact was different due to economic shocks and monetary-policy measures, as follows:

Phase One: Dinar Appreciation and Inflation Containment (2004–2008).

During this phase, monetary-policy directions aimed at addressing the monetary distortions and severe inflationary pressures inherited from the pre-2003 regime and the political-change shock underwent major changes. These included a gradual decrease in the dollar against the dinar to strengthen the exchange value of the national currency. Consequently, the official exchange rate dropped from 1,454 dinars to one dollar in 2004 to 1,206 dinars by 2008. This was accompanied by a high degree of discipline in the parallel market, which was characterised by a narrow gap and close convergence with the official rate. Indeed, in 2008 the parallel rate stood below the official rate (1,180 compared with 1,206 dinars per dollar), reflecting the effectiveness of the foreign-currency sales-window instrument in controlling the money supply and building strong confidence in the national currency. The effect of the strengthening of the dinar was passed on directly to the trade balance, especially imports, which grew significantly from BD 26.137 billion in 2004 to BD 42.022 billion in 2008.

This rising trend resulted from the lower cost of obtaining foreign currency due to the augmented purchase power of the dinar, enabling both the public and private sectors to increase imports to meet growing domestic demand generated by reconstruction projects, expanded government expenditure, trade openness, and higher income levels. In this period monetary policy played a major role in restricting price developments which were caused by the rise in aggregate demand and in ensuring that the inflationary pressures were contained. Consequently, inflation rates fell markedly, from 44.7% in 2004 to 13.0% in 2008.

This drop was brought about by the reverse of imported inflation, namely the greater purchasing power of the dinar and the larger supply of goods created by the heavy inflow of foreign products, which absorbed the price bottlenecks and helped to moderate the inflationary pressures that had threatened social and economic stability.

The second phase (2009-2019): Steady monetary conditions and expansion of imports.

During these ten years, prices were undoubtedly very stable in modern Iraqi history. The Central Bank kept the official exchange rate at a more or less stable rate of 1189-1200 dinars per dollar. This stabilisation was directly reflected in the parallel-market exchange rate, which remained stable and almost identical to the official rate for nine years, except for an exceptional and temporary increase in 2016 resulting from the dual shock of the sharp fall in international oil prices and the high costs of the war against terrorist organisations, when the rate reached 1,304 dinars per dollar compared with the official rate of 1,200 dinars per dollar. This caused a temporary loss of dollar inflows which was soon filled and confidence in the dollar was restored because of foreign-exchange reserves. The resulting stability reinforced a steadily expanding import pattern: import values rose in successive jumps to reach their highest level during this period in 2013, at 74.767 billion dinars, and then remained at very high levels, reaching 68.877 billion dinars in 2019.

This pattern was caused by the exchange rate being kept at these levels, which allowed foreign

currency to be cheaper and more available and thus enabled the foreign goods to be imported more cheaply than the domestic goods that were produced by the domestic industries and sectors, which were not able to offer them these terms. This left the economy in a 'Dutch disease' condition and reinforced its structural reliance on the international markets. Regarding inflationary pressures, this period was marked by a very high and unprecedented drop in the inflation rate, which went to 7.1% in 2009 and then started to decrease until it became negative in 2019 with a value of -0.1%. This stability can be attributed to the dual role of the fixed exchange rate, which became a Nominal Anchor that stabilised inflation expectations, together with the heavy flow of inexpensive imports. These factors kept prices at low levels and established a low-inflation environment, despite the adverse effect of import penetration in constraining the national productive base.

Phase Three: Dinar Depreciation Shock and Increased Imported Inflation (2020–2022).

The decision to adjust the official exchange rate at the end of 2020, from 1,210 to 1,470 dinars per dollar, represented a major shift in the philosophy and management of monetary and fiscal policy. The decision was taken to address the severe liquidity crisis faced by the government following the collapse in oil prices caused by the COVID-19. However, the adjustment progressively widened the gap with the parallel exchange rate, which rose to 1,480 dinars per dollar in 2021 and then jumped to 1,512 dinars per dollar in 2022 as pessimistic expectations increased and monetary imbalances emerged in the markets. The actual outcomes of the depreciation did not achieve the theoretical and conventional objective announced by monetary and fiscal policymakers. The exchange-rate depreciation was fully reflected in imports: their value in Iraqi dinars jumped from 58.308 billion dinars in 2020 to a sharp increase of 80.786 billion dinars in 2022. This resulted from the same factor discussed earlier, namely, the very low price elasticity of import demand in Iraq, which forced traders to import the same quantities at a higher dinar-denominated cost.

This increased the total import bill in domestic currency. In the end, the adjustment in the exchange rate resulted in a very abrupt inflationary wave: from 1.0% in 2020 to 6.4% in 2021 and 4.8% in 2022. This imported inflation was a quick effect of exchange-rate pass-through, where traders and importers passed along the price increase of the dollar and shipping to the final consumer, thus lowering real incomes and raising living costs while not producing any productive improvements in economic activity.

Phase Four - Revaluation of the Dinar and Restoration of Price Stability (2023-2025).

Monetary and government authorities attempted to counter the inflationary pressures seen in the preceding phase by taking a decision in February 2023 to reverse the official exchange-rate adjustment by raising the valuation of the dinar against the dollar first to 1,336, then to 1,320, dinars per dollar. That period occurred at the same time as a comprehensive move towards stricter international financial-compliance procedures and the introduction of an electronic platform to control external transfers, which cut off direct access to dollars without official channels. That led to a record variance among the official and parallel rates. The parallel rate peaked at over 1,548 dinars per US dollar in the same year and then slowly but steadily fell to 1,444 dinars per dollar by 2025 when traders started to prefer the official trading platform. These changes were also reflected in import activity, whose value rose to unprecedented levels of 115.106 billion dinars in 2024, and stabilised at 110.953 billion dinars in 2025. This significant rise in imports was due to two reasons: firstly the official exchange rate was reduced to 1,320 dinars per dollar, which made trade financing cheaper; and secondly, the aggregate demand was boosted by the expansion of government spending in the three-year budget. However, in this period monetary policy managed to noticeably control prices and bring them back to price stability. The rate of inflation has decreased significantly, from 4.6% in 2023 to 2.8% in 2024, and will gradually reach an extremely low level of 0.3% in 2025. This improvement and price stabilisation were attributable to the Central Bank's ability to cover the vast majority of foreign trade, particularly food and essential goods, at the subsidised official rate of 1,320 dinars per dollar through the electronic platform, together with traders' adaptation to the platform. This insulated the prices of these goods from parallel-market fluctuations and absorbed the inflationary effects of the parallel exchange rate.

Table 1. Evolution of Exchange Rates, Import Values, and Inflation Rates in Iraq, 2004–2025

Year	Imports (Billion dinars)	Nominal exchange rate	Parallel exchange rate	Inflation %
	(1)	(3)	(4)	(5)
2004	26,137	1454	1462	44.7
2005	34,589	1472	1478	31
2006	32,357	1475	1396	31.7
2007	24,745	1275	1214	19.6
2008	42,022	1206	1180	13
2009	49,107	1190	1185	7.1
2010	52,132	1193	1185	2.9
2011	56,732	1193	1217	6.5
2012	69,673	1189	1222	5.6
2013	74,767	1189	1222	2.4
2014	69,531	1198	1206	1.6
2015	56,640	1200	1216	1.7
2016	40,953	1200	1304	1.5
2017	45,565	1200	1246	0.6
2018	55,560	1200	1198	0.2
2019	68,877	1200	1206	-0.1
2020	58,308	1210	1342	1
2021	59,837	1470	1480	6.4
2022	80,786	1470	1512	4.8
2023	87,578	1336	1548	4.6
2024	115,106	1320	1510	2.8
2025	110,953	1320	1444	0.3

Source: Iraq Central Bank / Dept. of Statistics and Research / Monetary and Financial Statistics Division, various years.

Results and Discussion

Fifth: Measuring the Association among the Exchange Rate, Imports, and Inflation in Iraq, 2013–2025

First: Specification of the Econometric Model

Based on the theoretical framework and the nature of the relationship under investigation, two econometric models were constructed to measure the influence of the parallel exchange rate on imports and then trace the transmission of this effect to inflation. The two models are rested upon the assumption that variations in the parallel exchange rate may affect import costs and importers' decisions, while import demand is also affected by the level of domestic demand, reflected in government expenditure. Accordingly, imports were adopted as the dependent variable in the first model, while inflation was adopted as the dependent variable in the second model.

Model One

$$LNIMP_t = C - \beta_1 LNPEX_t + \beta_2 LNEXPE_t + \varepsilon_t$$

Model Two

$$INF_t = C - \alpha_1 LNIMP_t + \alpha_2 LNPEX_t + \alpha_3 LNEXPE_t + \mu_t$$

Where:

1. LNIMP: the natural logarithm of imports, representing the dependent variable in Model One and the principal independent variable in Model Two.
2. INF: the inflation rate, representing the dependent variable in Model Two.

3. LNPEX: the natural logarithm of the parallel exchange rate.
4. LNEXPE: the natural logarithm of government expenditure.
5. C: the constant term.
6. β : coefficients of the explanatory variables.
7. ε : the random error terms in the two models.

Second: Unit Root Test

1. Findings of the Phillips–Perron (PP) Test

Table 2 shows that the Phillips–Perron (PP) test results indicate that the variables under study did not consistently satisfy the stationarity condition at level under the three test specifications (Intercept, Trend & Intercept, and None), as some variables appeared stationary under one specification but not under another. However, the first-difference results showed that all variables were stationary under all three specifications, with probability values below the 0.05 significance level, i.e. acceptance of the alternative hypothesis (H1), stating that the time series are static.

Table 2. PP Test of the Time Series at Level and First Difference for 2013Q1–2025Q4

Variables		Level			First Difference		
		Intercept	Trend & Intercept	None	Intercept	Trend & Intercept	None
	LNIMP	0.0818	0.0517	0.8543	0.0000	0.0000	0.0000
	LNPEX	0.6995	0.5942	0.8456	0.0000	0.0000	0.0000
P-value	LNEXPE	0.0001	0.0000	0.9164	0.0001	0.0001	0.0000
0.05	INF	0.2919	0.6345	0.0987	0.0000	0.0000	0.0000

Source: The table was made out by the author depending upon EViews 10.

Third: Estimation of the ARDL Model

Model One: Estimation and Analysis of the Association between the Parallel Exchange Rate and Imports

Determination of the Optimal Lag Lengths and Bounds Test for Cointegration in the ARDL Model:

The selection results showed that ARDL (3,1,0) represents the optimal model because it achieved the lowest information criterion value compared with alternative models, indicating its suitability for representing the temporal dynamics of the association among the study variables. The ARDL Bounds Test results, shown in Table 3, also indicated that the F-statistic value of 12.43541 was higher than the upper I(1) critical values at all significance levels, implying the existence of a long-run equilibrium relationship (cointegration) among the study variables.

Table 3. Results of the ARDL Bounds Test for Model One

Test Statistic	Value	K
F-Statistic	12.43541	2
Critical Value Bounds		
Upper bound I(1)	Lower bound I(0)	Significance
4.14	3.17	10%
4.85	3.79	5%
5.52	4.41	2.5%
6.36	5.15	1%

Source: The table was made out by the author centering upon EViews 10.

Estimating the Short- and Long-Run Relationship of the Estimated ARDL Model

a. Estimation of the Short-Run Relationship (Error-Correction Speed) of the Estimated ARDL Model:

(ECM) is adopted to measure the speed at which the dependent variable returns to its long-run equilibrium state after short-run disequilibria occur. The results presented in Table 4 show that the error-correction coefficient $CointEq(-1)$ was negative and statistically significant at the 5% significance level, with a value of -0.511093 and a probability value of 0.0000. This approves there is a mechanism for correcting short-run disequilibria and returning towards long-run equilibrium. It means that approximately 51.1% of short-run disequilibria are corrected within one period (one quarter), indicating a relatively rapid restoration of equilibrium after shocks.

Table 4. Estimate of Error-Correction Speed in the Short Run (ECM), Model One

Variables	Coefficient	Std. Error	t-statistic	P-value 0.05
D(LNIMP(-1))	-0.190942	0.097378	-1.960830	0.0566
D(LNIMP(-2))	-0.251705	0.099112	-2.539590	0.0149
D(LNPEX)	-2.563744	0.905306	-2.831910	0.0071
CointEq(-1)*	-0.511093	0.081754	-6.251618	0.0000

Source: The table was made out by the author depending upon EViews 10.

Estimation of the Long-Run Relationship of the Autoregressive Distributed Lag (ARDL) Model

The long-run estimation findings in Table 5 show that the coefficient of the parallel exchange rate was 0.9128, but it was not statistically significant, with a probability value of 0.1742. This can be interpreted in light of the nature of the Iraqi economy and the measures adopted to limit the transmission of the parallel exchange rate to imports. The Central Bank provides foreign currency to finance imports through official channels at the nominal rate, in addition to regulatory measures aimed at limiting the transmission of exchange-rate changes to commodity prices. Moreover, the high dependence on imports, combined with the weakness of the domestic productive apparatus, has enabled importers and the market to adapt to exchange-rate fluctuations, thereby limiting the persistence of the parallel exchange rate's consequence on import volume in the long run. The coefficient of government expenditure was positive and statistically significant (0.7584), at the 5% level (probability value of 0.0003). This means that a 1% increase in government expenditure leads to an approximately 0.76% rise in imports in the long run, holding other factors constant. This reflects the role of government expenditure in strengthening domestic demand and, consequently, increasing demand for imported goods and services, particularly given the limited domestic productive capacity.

Table 5. Long-Run Relationship Estimate for the ARDL Model, Model One

Variables	Coefficient	Std. Error	t-statistic	P-value 0.05
LNPEX	0.912813	0.660393	1.382226	0.1742
LNEXPE	0.758402	0.194252	3.904210	0.0003
LNIMP=0.912813LNPEX+0.758402LNEXPE				

Source: The table was made out by the author depending upon EViews 10.

Diagnostic Tests for the Estimated Model: Test of the Validity of the Estimated Model

Table 6. Estimated-Model Validity Results, Model One

	Statistic value	P-value
Jarque -Bera	0.992	0.609
Serial Correlation LM test	0.466	0.6307
Heteroskedasticity test	2.201	0.0617
Multicollinearity		
Variables	VIF	
LNPEX	1.329618	
LNEXPE	1.329618	

Source: The table was made out by the author depending upon EViews 10.

The results of the estimated-model validity test in Table 6 show that the model is free from econometric problems and that the null hypothesis of no econometric problems is accepted at the 5% significance level.

CUSUM Test of Residuals: Figure 1 shows the stability of the estimated model in long and short run through the cumulative sum of residuals (CUSUM) test, which examines model stability at the 0.05 significance level. The estimated line remains within the confidence limits (critical bounds) throughout the study period, supporting the null hypothesis and confirming the stability of the estimated parameters over time.

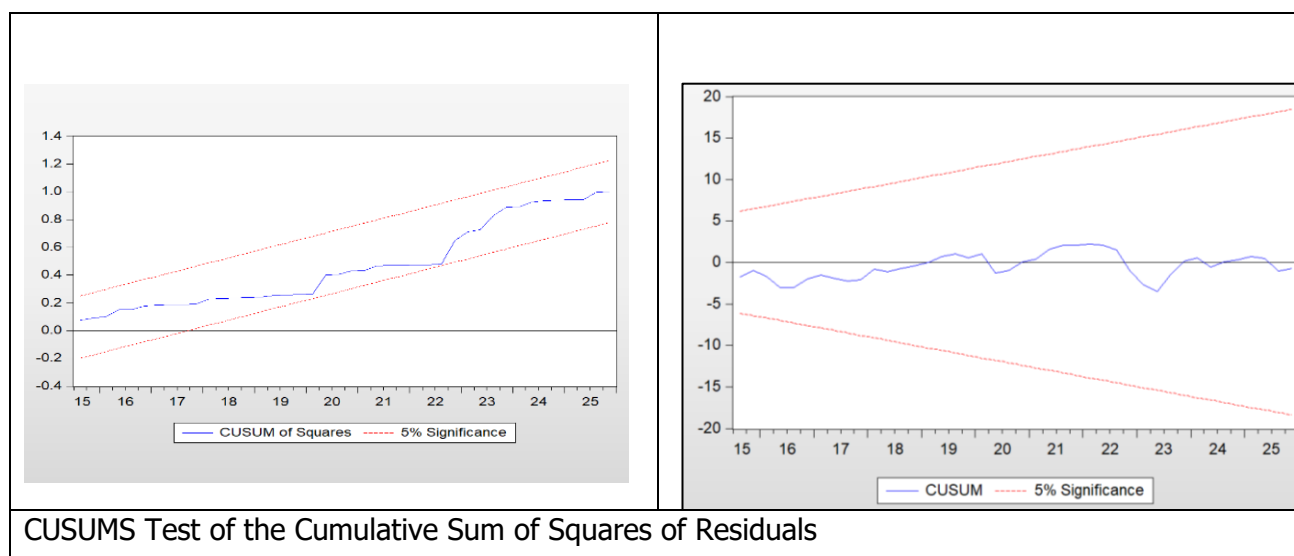


Figure 1. CUSUMS Test of the Cumulative Sum of Squares of Residuals for Model One

Source: The figure was made out by the author depending upon EViews 10.

Model Two: Estimation and Analysis of the Relationship between Imports and Inflation Determination of the Optimal Lag Lengths and Bounds Test for Cointegration in the ARDL Model:

The ARDL Bounds Test results in Table 7 indicate that the F-statistic was 2.683386, which is below the lower $I(0)$ bound of 2.79 at the 5% significance level. Therefore, the null hypothesis (H_0), stating

that there is no level relationship among the model variables, cannot be refuted. Accordingly, there is insufficient statistical evidence of a long-run equilibrium relationship (cointegration) among inflation, imports, the parallel exchange rate, and government expenditure at the 5% significance level.

Table 7. Results of the ARDL Bounds Test for Model Two

Test Statistic	Value	K
F-Statistic	2.683386	3
Critical Value Bounds		
Significance	Lower bound I(0)	Upper bound I(1)
10%	2.37	3.2
5%	2.79	3.67
2.5%	3.15	4.08
1%	3.65	4.66

Source: The table was made out by the author depending upon EViews 10.

Estimation of the Short- and Long-Run Relationship of the Estimated ARDL Model

a. Estimation of the Short-Run Relationship (Error-Correction Speed) of the Estimated ARDL Model:

The CointEq(-1) coefficient was -0.311663 with a probability value of 0.0004, as shown in Table 8. However, it shouldn't be accounted for as the speed of adjustment towards a long-run equilibrium because cointegration has not been established; the Bounds Test statistic was 2.683386, below the lower bound of 2.79 at the 5% significance level.

Table 8. Estimate of Error-Correction Speed in the Short Run (ECM), Model Two

Variables	Coefficient	Std. Error	t-statistic	P-value 0.05
D(LNPEX)	22.27014	4.756585	4.681960	0.0000
D(LNPEX(-1))	7.716630	4.803059	1.606608	0.1164
D(LNPEX(-2))	10.27655	4.654622	2.207816	0.0334
D(LNPEX(-3))	9.704037	5.118174	1.895996	0.0656
D(LNEXPE)	-0.198878	0.328997	-0.604498	0.5491
CointEq(-1)	-0.311663	0.080933	-3.850875	0.0004
R-squared	0.477368	Mean dependent var		-0.081042
Adjusted R-squared	0.415150	S.D. dependent var		1.246867
S.E. of regression	0.953548	Akaike info criterion		2.859214
Sum squared resid	38.18862	Schwarz criterion		3.093114
Log likelihood	-62.62113	Hannan-Quinn criter.		2.947605
Durbin-Watson stat		1.915073		

Source: The table was made out by the author depending upon EViews 10.

Estimation of the Long-Run Relationship of the Autoregressive Distributed Lag (ARDL) Model

The Bounds Test findings shown in Table 9 indicate that there is no cointegrating association among the model variables in the long run. The F-statistic was approximately 2.683386, below the lower critical bound of 2.79 at the 5% significance level. Therefore, the long-run relationship coefficients of the model cannot be estimated or interpreted.

Table 9. Long-Run Relationship Estimate for the ARDL Model, Model Two

Variables	Coefficient	Std. Error	t-statistic	P-value 0.05
LNIMP	1.461725	2.351110	0.621717	0.5378
LNPEX	12.87272	8.006990	1.607685	0.1162
LNEXPE	-2.856905	2.665620	-1.071760	0.2906
C	-76.82465	43.61920	-1.761257	0.0862
INF=1.4617LNIMP+12.8727LNPEX-2.8569LNEXPE-76.8246				

Source: The table was made out by the author depending upon EViews 10.

Diagnostic Tests for the Estimated Model Test of the Validity of the Estimated Model

Table 10. Estimated-Model Validity Results, Model Two

	Statistic value	P-value
Jarque -Bera	0.203	0.9036
Serial Correlation LM test	0.689242	0.5085
Heteroskedasticity test	1.705489	0.1216
Multicollinearity		
Variables	VIF	
LNIMP	2.135312	
LNPEX	1.389144	
LNEXPE	2.181204	

Source: The table was made out by the author depending upon EViews 10.

The estimated-model validity results shown in Table 10 showing that the model is free from econometric problems and that the null hypothesis of no econometric problems is accepted at the 5% significance level.

CUSUM Test of Residuals: Figure 2 shows the stability of the estimated model in both the long and short run through the cumulative sum of residuals (CUSUM) and the squared-residuals test to examine model stability at the 0.05 significance level. The estimated line remains within the confidence limits (critical bounds) throughout the study period, supporting acceptance of the null hypothesis and confirming the stability of the estimated parameters over time.

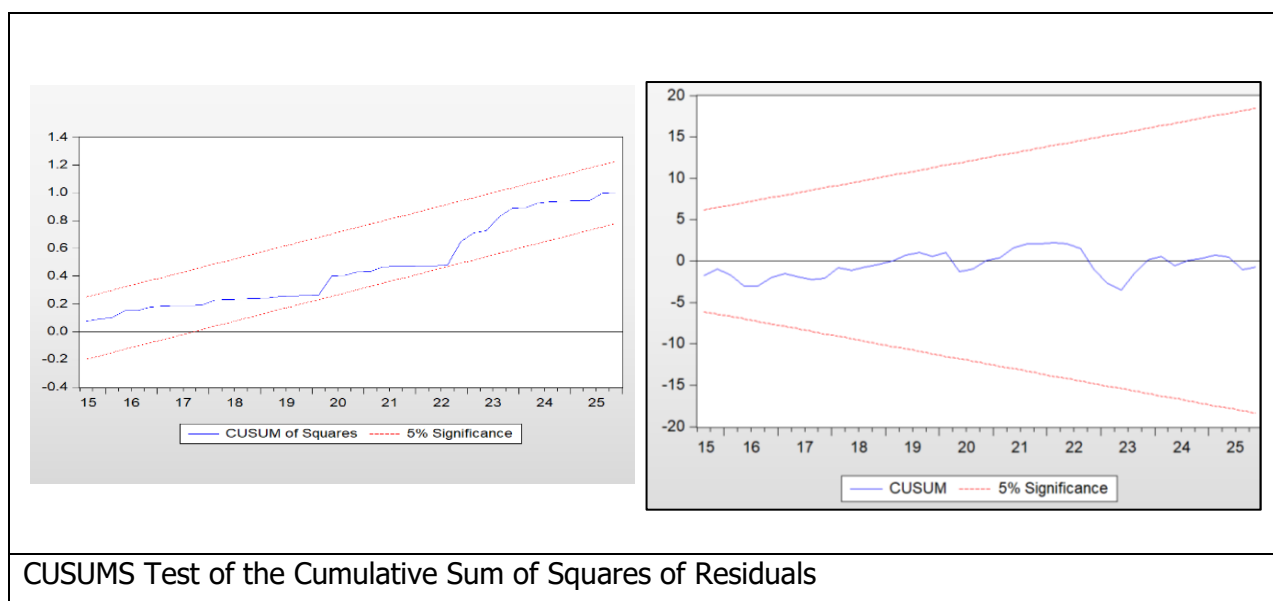


Figure 2. CUSUMS Test of the Cumulative Sum of Squares of Residuals for Model Two
Source: The figure was made out by the author depending upon EViews 10.

Conclusions and Recommendations

The econometric estimation findings confirmed there is a long-run association among government expenditure and imports, with government expenditure serving as the principal driver of higher import prices, whereas the effect of the parallel exchange rate on imports is confined to the short run because of low price elasticity of demand and the market's ability to adapt and absorb the effect in the long run. The findings also showed that the parallel exchange rate is the principal channel feeding imported inflation in the short run, with no long-run equilibrium association among imports and inflation as a result of the official monetary coverage provided by the Central Bank. To address the effects caused by exchange-rate fluctuations on imports and inflation, the following is required:

1. Develop a diversified productive base capable of meeting domestic market needs and creating substitutes for imports by redirecting government expenditure towards productive investment, thereby reducing imported inflation.
2. Expand import coverage until imports are fully covered at the official dollar exchange rate through the electronic platform, thereby narrowing the exchange-rate gap and preventing the transmission of exchange-rate fluctuations.

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