

REGIONAL GEOPOLITICAL SHOCKS AND IRAQ'S PARALLEL EXCHANGE RATE: UNCOVERING THE OIL-PRICE TRANSMISSION MECHANISM

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ABSTRACT

The present study focuses on the connection between regional geopolitical changes and the parallel foreign-exchange market of Iraq and the possibility of international oil prices as a transmission channel. The data used is monthly data from January 2006 to December 2025 and it is for regional geopolitical risk (GPR), Brent crude oil prices, and the parallel IQD/USD exchange rate. An Autoregressive Distributed Lag (ARDL) modeling methodology is used to analyze relationships. The findings suggest that geopolitical risk affects the short-run depreciation pressure on the Iraqi dinar, and it has a statistically significant effect on the current depreciation pressure. This, however, is not a long-term relationship. The results of the ARDL bounds test also do not suggest a stable cointegration relationship between geopolitical risk and oil price as well as parallel exchange rate. Based on these findings, the link between international oil prices and the main transmission mechanism for region geopolitical shocks to Iraq's parallel exchange market has limited effects. Rather, the movements in exchange rates seem to be more dependent on domestic conditions, such as foreign-currency supply, the market's expectations, precautionary demand for U.S. dollars, and institutional arrangements concerning exchange rates. In general, the geopolitical risk influences Iraq's parallel exchange rate in the short term, thereby emphasizing the need to enhance the foreign exchange market's ability to withstand regional instability.

Keywords: geopolitical risk; parallel exchange rate; oil prices; ARDL; foreign exchange market.

INTRODUCTION

Geopolitical risk is a significant factor of economic and financial unpredictability, especially during times of escalation between countries, international crises, economic sanctions, armed conflict and political conflicts. The impact of these events is not limited to the countries which are directly affected. Rather, they can transgress international boundaries via a number of channels such as international trade, foreign investment,

commodity markets, capital flows, and financial markets. Such spillover effects could derail the economy, impact investor expectations, raise market volatility, and create doubts in the domestic and global financial system. Therefore, geopolitical uncertainties can spread to a broader economy directly affected and to countries indirectly affected via trade and financial relationships (Trebesch et al., 2025). According to Caldara and Iacoviello (2022), geopolitical risk tends to spike at large-scale international events, and these

are typically linked with a decline in economic activity and heightened uncertainty in financial markets. But what is equally key is geopolitical shocks do not impact evenly across countries or regions. These vary in intensity and economic impact, based on geographical proximity, the risk of conflict, trade relations and the nature of the domestic economy.

This is an unequal exposure pattern so that regional analysis is particularly relevant. It is important to consider how geopolitical shocks are experienced in different geographical contexts, and through the economic pathway relevant to each shock (Caldara & Iacoviello, 2022; Trebesch et al., 2025).

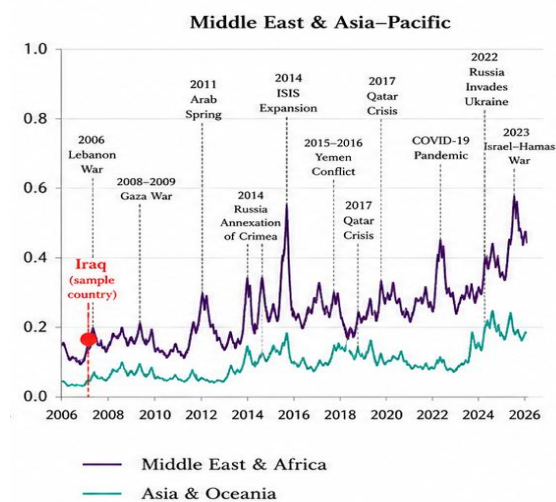


Figure 1. Geopolitical Risk Index by World Regions

Source: Geopolitical Risk Index created by Caldara and Iacoviello (2022)

The geopolitical risks vary significantly from country to country and region to region as shown in Figure 1.

Caldara and Iacoviello (2022) report significant heterogeneity in geopolitical risk intensity across countries and provide country-specific geopolitical risk indices that reflect this. Their results show that geopolitical exposure is not the same for all economies but depends on the political, economic and regional context of each country. Accordingly, the extent of geopolitical risk can vary across countries and country-specific measures need to be employed when assessing the economic and financial implications of geopolitical uncertainty. This variation is particularly significant for Iraq. The nation is surrounded by a conflicted regional area and is very dependent on the oil industry. The World Bank estimates that oil generated an estimated 53% of Iraq's real GDP, 88% of government revenues, and 91% of merchandise exports in 2025, making the economy highly vulnerable to external shocks related to the oil sector and Iraq's ongoing conflict.

These features make the case for a regional approach to geopolitical shocks, in addition to a global approach based on a single geopolitical risk index. A regional view may be more likely to reflect critically the geopolitical pressures that are economically relevant to Iraq, and the way in which such pressures can be

transmitted to its foreign exchange markets.

For oil dependent economies, the impacts are especially important as energy markets are a significant transmission channel. Additionally, geopolitical events can impact crude oil prices by affecting supply security, production conditions and global demand (Kisswani & Elian, 2021).

There are export revenues, export balance, foreign currency inflows, and external financial conditions to consider when it comes to oil price dynamics and their impact on exchange rates (Beckmann et al., 2020; Salisu et al., 2021). Newer evidence suggests that the geopolitical risk, oil prices and foreign exchange markets are dynamically interconnected, but the intensity and direction of such relationships differ from one country to another and over time (Kisswani & Elian, 2021; Shang & Yilmazkuday, 2025; Hamori, 2025).

Iraq is an important area for scientists to evaluate the transmission process in this region. The country remains very dependent on export of crude oil, a source of revenues for the state as well as capital inflows from abroad, making its economy sensitive to global oil price fluctuations (World Bank, 2022, 2023). According to the International Monetary Fund (IMF) assessment, Iraq's public budget is based

primarily on oil exports, and its international financial stability relies on the same. (International Monetary Fund [IMF] 2024). Geopolitical events have an impact on foreign money flows across domestic markets in the global oil market.

This relationship is further supported by the foreign-exchange market structure in Iraq. The form of Iraq's foreign exchange market also reinforces this linkage. In addition to the official administratively fixed exchange rate, the Iraq has a parallel exchange rate on which the dinar-US dollar exchange rate is more sensitive to the effective dollar availability and demand. According to World Bank reports, episodes of restriction on access to official foreign exchange resulted in an increase in the rate differential between the official and parallel exchange rates, whereas episodes of improvement in access to formal foreign exchange channels led to reductions in the differential between the official and parallel exchange rates (World Bank, 2018, 2023). The parallel exchange rate thus serves as a useful indicator of the foreign exchange pressure in the markets, and which may not be adequately captured by the official exchange rate.

While the literature on geopolitical risk has grown, no research work has been conducted to understand the regional

geopolitical shocks' effect on Iraq's two markets system of foreign exchange transactions. Previous studies have been concentrated on two aspects: the effect of geopolitical risk on currency prices, and the relationship between oil price changes and currency market reactions in various countries (Beckmann et al., 2020; Kisswani & Elian, 2021; Salisu et al., 2022; Yilmazkuday, 2025). The impact that geopolitical conflict has on the alternative exchange rate of Iraq through the global oil market prices has not been the subject of adequate research.

There is a crucial missing link on the transmission of regional geopolitical events to Iraq's parallel foreign exchange market and on whether international oil prices offer a meaningful transmission channel. This is a significant question in the context of the oil-rich economies as the geopolitical events could impact the commodity markets, as well as the domestic financial conditions (Caldara & Iacoviello, 2022; Mignon et al., 2024). The study relates monthly data from January 2006 to December 2025 between geopolitical risk in the region, the price of Brent crude oil, and the exchange rate between the IQD and USD. The geopolitical shocks are studied one after another, first to see if there is a relationship between the geopolitical

shocks and the movements of the Brent price, and second to see if the Brent-price changes are then reflected in Iraq's parallel exchange rate.

The study has three important contributions. First, it contributes to the empirical literature on geopolitical risk and exchange-rate dynamics, by studying an economy that is still underrepresented in this literature: an oil-dependent and geopolitically exposed economy like Iraq. Second, it focuses on the parallel or unofficial exchange rate, which is a more market sensitive indicator of foreign exchange pressure. Third, it examines oil price developments as a possible transmission channel between geopolitical shocks in the region and exchange rate dynamics within a common monthly time series.

LITERATURE REVIEW

Geopolitical Risk and Oil Prices

The crude oil markets experience geopolitical risk, which drives changes in market expectations about the stability of oil production, the functionality of supply chains, and the future demand for oil. The Geopolitical Risk Index by Caldara and Iacoviello (2022) offers a standardized method for tracking geopolitical disturbances, which researchers

extensively use in their empirical work. Research studies from modern times have proven that geopolitical shocks create changes in oil prices, but they fail to determine the size and direction of these price changes during different time periods and market environments. Mignon and Saadaoui (2024) find that higher geopolitical risk tends to increase oil prices, largely through concerns about possible supply disruptions, while Shahbaz et al. (2024) document heterogeneous and, in several countries, bidirectional causal relationships between geopolitical risk and oil-price movements (Naser, 2026). These findings suggest that oil markets represent an important but potentially time-varying channel through which geopolitical disturbances are transmitted to oil-dependent economies (Caldara & Iacoviello, 2022; Mignon & Saadaoui, 2024; Shahbaz et al., 2024).

Oil Prices and Exchange Rate Dynamics

The connection between oil price movements and exchange rate movements proves vital for countries which export oil because their foreign currency earnings from oil sales determine how much foreign money they receive and their financial position and their money exchange rates. The research by

Beckmann and his team in 2020 demonstrated that oil prices maintain strong long-term connections with exchange rates while their relationship shifts across different time periods. The study by Kisswani and Elia (2021) demonstrates that oil price fluctuations produce both equal and unequal international money exchange rate movements. Research from Iraq demonstrates that this relationship exists between these two variables.

Using monthly data, Salim and Al-Bakri (2025) find cointegration between crude-oil prices and the Iraqi dinar exchange rate and report Granger causality running from oil prices to the exchange rate. These findings support the view that oil-price fluctuations are an important source of exchange-rate pressure in Iraq (Beckmann et al., 2020; Salim & Al-Bakri, 2025; Kisswani & Elia, 2021).

Geopolitical Shocks, Oil Prices, and Exchange Rate Transmission

Foreign-exchange markets experience direct effects from geopolitical risk because of the growing number of academic investigations into this subject. Salisu et al. (2022) find that geopolitical risk contributes to exchange-rate volatility in BRICS economies, while Yilmazkuday

(2025) demonstrates that exchange-rate responses to geopolitical shocks differ considerably across countries. The research by Shang and Hamori (2025) shows how geopolitical risk together with crude-oil prices and foreign-exchange markets maintain changing levels of interconnection throughout different time periods. The research studies focus on international data sets, but they fail to investigate Iraq's parallel currency system through a combined transmission model which Salisu et al. (2022) and Shang & Hamori (2025) and Yilmazkuday (2025) have not addressed.

The Iraqi literature, by contrast, has mainly examined the direct relationship between oil prices and the dinar without explicitly identifying geopolitical risk as an upstream source of oil-price movements (Salim & Al-Bakri, 2025). This leaves a clear gap concerning whether regional geopolitical disturbances are transmitted to Iraq's parallel foreign-exchange market through international oil prices. The present study addresses this gap by jointly examining regional geopolitical risk, Brent crude-oil prices, and Iraq's parallel-market exchange rate within a monthly dynamic framework. Rather than claiming formal statistical mediation, the study treats oil prices as a potential transmission channel linking

external geopolitical disturbances to domestic foreign-exchange conditions (Beckmann et al., 2020; Kisswani & Elian, 2021; Shang & Hamori, 2025).

RESEARCH GAP AND HYPOTHESES DEVELOPMENT

Research Gap

Previous research has demonstrated how geopolitical risk impacts crude-oil markets and how fluctuating oil prices can affect exchange rates, particularly in countries that are dependent on commodities (Beckmann et al., 2020; Mignon & Saadaoui, 2024; Shahbaz et al., 2024). However, these relationships have typically been studied separately. Research on geopolitical risk has focused on its impact on either the oil or foreign-exchange market, while research on Iraq has examined the relationship between oil prices and the Iraqi dinar exchange rate (Khader & Alwan, 2014; Salisu et al., 2022; Yilmazkuday, 2025).

Given Iraq's dependence on oil-generated foreign-currency revenues, international oil prices represent an important channel through which regional geopolitical disturbances impact domestic foreign-exchange conditions.

Previous studies have examined geopolitical risk, oil prices, and exchange rates from different perspectives, but little

attention has been given to how they interact in Iraq's parallel market. This study explores that relationship using monthly data from January 2006 to December 2025.

Hypotheses Development

Geopolitical tensions in oil-producing regions can influence crude oil prices by raising concerns about possible supply disruptions and higher production or transportation costs (Mignon & Saadaoui, 2024; Shahbaz et al., 2024). Recent studies show that these channels can contribute to oil-price movements. Based on this relationship, the study proposes the following hypothesis:

H1: Regional geopolitical shocks significantly affect international oil prices.

Oil prices can influence exchange-rate conditions in oil-exporting economies through changes in export revenues, foreign-currency inflows, external balances, and market expectations (Beckmann et al., 2020; Kiswani & Elian, 2021). In Iraq, where oil revenues constitute the principal source of foreign-exchange receipts, previous evidence has also identified a significant relationship between oil prices and the dinar exchange rate (Salim & Al-Bakri, 2025). Therefore:

H2: Oil-price changes have a significant effect on Iraq's parallel-market exchange rate.

Based on the available evidence, it seems that geopolitical disturbances may impact Iraq's foreign exchange market indirectly through their impact on the price of oil on the international market. Since geopolitical risk can impact the oil markets and movements in oil prices can impact the foreign currency markets of oil-dependent economies like Iraq, oil prices may serve as an intermediate transmission channel between external geopolitical shocks and the parallel-market exchange rate in Iraq (Beckmann et al., 2020; Mignon & Saadaoui, 2023; Shang & Hamori, 2025). This leads to the following hypothesis:

H3: International oil prices constitute a significant transmission channel through which regional geopolitical shocks affect Iraq's parallel-market exchange rate.

DATA AND METHODOLOGY

The purpose of this study is to discuss the effect of geopolitical shocks in the region on the parallel foreign exchange market in Iraq with a specific focus on the possible transmission mechanism of international oil prices. To look into this relationship, three key variables are used:

geopolitical risk (GPR), Brent crude oil prices, and the parallel IQD/USD exchange rate (Caldara & Iacoviello, 2022; Mignon & Saadaoui, 2024).

These variables are looked at in a shared dynamic context to reflect their interactions across time. Monthly data is used as the monthly time frame is sufficiently sensitive to short-run changes in geopolitical, oil-market and foreign-exchange conditions to accommodate delayed market responses. The study duration is 21 years (from Jan. 2006 to Dec. 2025) and a maximum of 240 monthly observations of each variable are provided. The use of monthly data also provides a consisted.

Data and Variables

This study will span the years 2006 to 2025 in January. The baseline empirical framework is comprised of regional geopolitical risk (GPR), Brent crude oil prices (OIL) and Iraq's parallel-market exchange rate (EXR). Besides, the official exchange rate (OER) and the parallel-market premium (PMP) are included in the robustness analysis. The definitions, measurements, roles, and sources of each variable are summarized in Table 1.

Geopolitical risk is computed as in Caldara and Iacoviello (2022), who built an index based on the news. Adverse

geopolitical events and related risks are reflected in the index, and it shows significant surges and falls in geopolitical moments (Mamoori, 2026). In this study, the regional GPR measure is built using the relevant series at country-specific level and then kept at the monthly level to capture the variations of geopolitical conditions at the regional level.

The monthly price of U.S. dollar per barrel of the Brent crude-oil price is used to represent international oil-market conditions in this study. Data on Brent prices are sourced from the World Bank's Commodity Markets database (Pink Sheet) which offers historical commodity price time series at a monthly frequency. Given the importance of oil prices for the foreign exchange earnings of the oil exporting countries, and the strong price effects on oil prices on the countries in the sample, oil prices have been treated as the main transmission variable (Beckmann et al, 2020; World Bank, 2023).

The dependent variable is Iraq's parallel-market exchange rate (EXR), which is defined as the number of Iraqi dinars required to buy one U.S. dollar (IQD/USD). The observations are made every month and extracted from official Iraqi statistical publications, mainly the Central Bank of Iraq and the Central Statistical Organization. The parallel rate

is used as the basis exchange rate due to its sensitivity to the effective supply and market pressure of foreign currencies compared to the official rate (administered) (World Bank, 2023).

The analysis is also done using the official Iraqi dinar–U.S. dollar exchange rate (OER) and the parallel-market premium (PMP) for robustness. The official rate is drawn from the statistics of exchange rates of Central Bank of Iraq, and the premium is the percentage difference between the parallel rate and the official rate:

$$\text{PMP}_t = [(\text{EXR}_t - \text{OER}_t) / \text{OER}_t] \times 100$$

A positive value therefore indicates that the U.S. dollar trades at a premium in the parallel market relative to the official market.

Table 1. Variables, Measurement, and Data Sources

Variable	Empirical Role	Measurement	Data Source
Regional Geopolitical Risk GPR	Geopolitical shock	Regional monthly GPR index	Caldara and Iacoviello (2022)
Brent Crude Oil Price OIL	Transmission variable	USD per barrel, monthly average	World Bank Commodity Markets (Pink Sheet)
Parallel Exchange Rate EXR	Dependent variable	IQD per USD, monthly average	Central Bank of Iraq; Central Statistical Organization

Official Exchange Rate OER	Reference/robustness variable	IQD per USD, monthly average	Central Bank of Iraq
Parallel-Market Premium PMP	Robustness variable	Percentage deviation of EXR from OER	Author's calculation

Note: The baseline analysis uses GPR, OIL, and EXR. OER and PMP are employed only for robustness checks

Descriptive Statistics and Preliminary Analysis

The initial part of the analysis involves computing the descriptive statistics for the three variables in the model: the regional geopolitical risk (GPR), Brent crude-oil prices (OIL), and Iraq's parallel-market exchange rate (EXR). For each variable, the mean, standard deviation, minimum, maximum, skewness, and kurtosis are reported over the entire study period from January 2006 to December 2025 (Wooldridge, 2020).

The Time-Series behavior of the variables is then analyzed graphically to look for significant changes, outliers, and times of increased geopolitical, oil-market or foreign-exchange volatility. The visual inspection is complemented with Pearson correlation analysis to determine contemporaneous linear relationships between GPR, OIL and EXR. Selected lead-lag correlations are also calculated for the cases where transmission effects may be delayed and provide preliminary evidence of whether the movements of

geopolitical risk lead oil price movements, and whether they occur concurrently with parallel exchange rate movements (as in Hamilton, 1994; Brooks, 2019).

The procedures explained in this section are both descriptive and exploration in nature. They give a preliminary understanding of the data and the relationship among the variables prior to formal dynamic estimation. The unit root test, cointegration analysis and (ARDL) framework are included in the analysis. The goal of these techniques is to separate the short-run relationship between the variables from the long-run relationship between the variables and to not make causal inferences about the cause of one variable to the other on the basis of the correlations between the two (Wooldridge, 2020; Pesaran et al., 2001).

Empirical Model and Estimation Strategy

The study employs the Autoregressive Distributed Lag ((ARDL)) framework to examine the dynamic relationships among regional geopolitical risk (GPR), Brent crude-oil prices (OIL), and Iraq's parallel-market exchange rate (EXR). The (ARDL) approach is appropriate when variables are integrated of order I (0), I (1), or a mixture of both, provided that none is I

(2), and it allows short-run and long-run relationships to be estimated within a single framework (Pesaran & Shin, 1999; Pesaran et al., 2001).

The baseline model specifies EXR as a function of its lagged values as well as those of GPR and OIL. Optimal lag lengths are determined using the Akaike information criterion (AIC), which is widely used in the modelling of dynamic time-series data (Lütkepohl, 2005). Augmented Dickey–Fuller (ADF) and Phillips–Perron (PP) unit-root tests are applied to the variables prior to the estimation of the model to determine the integration order of the variables and to ensure that none of the variables are integrated of order 2 (I (2)) (Dickey & Fuller, 1979; Phillips & Perron, 1988). An (ARDL) bounds test is then applied to test for the existence of a stable long-run relationship among the variables (Pesaran et al., 2001).

Where cointegration is confirmed, an error correction model is estimated to distinguish short-run adjustments from long-run effects. A negative and statistically significant error correction coefficient indicates convergence toward long-run equilibrium after a short-run disturbance (Brooks, 2019; Pesaran et al., 2001).

The proposed transmission channel is evaluated by jointly assessing whether geopolitical risk significantly affects oil prices and whether Oil-Price movements subsequently influence the parallel exchange rate. This is interpreted as evidence of dynamic transmission rather than formal statistical mediation.

Diagnostic and Stability Tests

The evaluation process for the estimated (ARDL) model includes various diagnostic tests which determine its suitability. The Breusch–Godfrey LM test serves to detect serial correlation while standard residual-based tests check for heteroskedasticity and the Jarque–Bera test assesses residual normality (Breusch, 1978; Godfrey, 1978; Jarque & Bera, 1987).

The CUSUM and CUSUM of Squares (CUSUMSQ) tests perform tests to determine if the model maintains its stability. The evaluation process determines if the estimated coefficients maintain their initial values throughout the entire sample period because dynamic time-series models use these tests to identify structural changes (Brown et al., 1975; Pesaran et al., 2001).

Dynamic Transmission and Robustness Analysis

Dynamic transmission is assessed by examining the timing and significance of the relationships among regional geopolitical risk, Brent oil prices and Iraq's parallel-market exchange rate. A particular focus is paid to whether geopolitical risk changes lead oil-price changes, and whether oil-price changes are then followed by changes to the parallel exchange rate, consistent with the suggested transmission channel from geopolitical risk to oil price change (Kisswani & Elian, 2021; Shang & Hamori, 2025).

We re-estimated the model with the parallel-market premium (PMP) and the official exchange rate (OER) as the alternative dependent variables to examine the robustness of the baseline model. Comparing these results with those obtained for the parallel exchange rate will help gauge whether the estimated relationships in the model hold true if the exchange rate measure changes or if it remains stable across alternative specifications of the model (Beckmann et al., 2020; World Bank, 2023).

EMPIRICAL RESULTS AND DISCUSSION

It is an introduction to the Empirical Analysis.

It is introduction to the Empirical Analysis. The empirical results for the dynamic relationship between the regional geopolitical risk (GPR), Brent crude oil prices (OIL) and Iraq's exchange rate of the parallel market (EXR) are presented in this section. Analysis begins with descriptive statistics and correlation analysis then followed by stationarity and ARDL bounds test. Short- and long-run relationships are then estimated, and diagnostic and robustness checks are used to make sure the relationships were reliable. The analysis includes the investigation of the impact of regional geopolitical shocks on oil prices and the subsequent impact of oil prices on the parallel exchange rate in Iraq. Table 1 presents the basic statistical information of regional geopolitical risk (GPR), prices of Brent crude oil (OIL), and Iraq's parallel-market exchange rate (EXR) for January 2006 to December 2025. There are 240 monthly observations for each variable.

Table 2. Descriptive Statistics

Variable	Observations	Mean	Std. Dev.
GPR	240	99.519	28.257
OIL (USD/barrel)	240	77.405	23.161
EXR (IQD/USD)	240	1,301.606	124.809

Table 3. Descriptive Statistics

Min	Max	Skewness	Kurtosis
58.421	318.955	2.836	15.897
26.849	133.585	0.264	-0.699
1,178.000	1,603.000	0.806	-0.994

There are significant differences among the three series. GPR averages 99.519 and reaches a maximum of 318.955. It is highly positively skewed, and has a high kurtosis, indicating that geopolitical risk tends to be moderate, with spikes during high-tension times.

The main oil prices for both crude and refined types were quite volatile, with the average prices for all crude oil prices being USD 77.405 per barrel, ranging from USD 26.849 to USD 133.585. Foreign exchange pressures experienced significant changes over the study period as the parallel exchange rate averaged IQD 1,301.606 per USD with a min of IQD 1,178 and a max of IQD 1,603. There are also differences in the distribution of the variables. GPR is the most asymmetric, and typical of the sporadic and unpredictable nature of geopolitical shocks.

The distribution of oil prices is more symmetrical. The exchange rate in parallel markets is moderately positively skewed, suggesting that the episodes of dinar depreciation are more severe than episodes of dinar appreciation. The distributional properties suggest that there is a lot of variability within these variables. These properties are not enough to determine the direction and/or strength of the relationship between these variables, however (Brooks, 2019; Wooldridge, 2020).

Correlation Analysis

Table 4 and 5 presents the Pearson correlation coefficients among regional geopolitical risk (GPR), Brent crude oil prices (OIL), and Iraq's parallel-market exchange rate (EXR), together with their statistical significance.

Table 4. Pearson Correlation Matrix

Variable	GPR	OIL	EXR
GPR	1.000	0.072	0.470***
OIL	0.072	1.000	-0.008
EXR	0.470***	-0.008	1.000

Table 5. p-values

Relationship	Pearson r	p-value
GPR–OIL	0.072	0.264
GPR–EXR	0.470	<0.001
OIL–EXR	-0.008	0.907

Note: *** denotes statistical significance at the 1% level.

The results indicate a moderate, and statistically significant, positive

correlation between geopolitical risk and the parallel exchange rate in Iraq ($r=0.470$), $p<0.001$. Given that the exchange rate is expressed as Iraqi dinars per U.S. dollar, this positive association suggests that higher geopolitical risk is associated with a weaker Iraqi dinar in the parallel market.

In contrast, the correlation between GPR and Brent oil prices is positive but weak and statistically insignificant ($r=0.072$, $p=0.264$). The contemporaneous relationship between Brent oil prices and the Parallel Exchange Rate is also negligible and insignificant ($r=-0.008$, $p=0.907$).

These findings provide preliminary evidence of a direct association between geopolitical risk and parallel-market exchange-rate pressure. However, they do not support a strong contemporaneous oil-price transmission channel. However, because transmission may occur with lags and because simple correlations do not account for persistence, integration or long-run adjustment, these results should be interpreted as exploratory rather than causal (Brooks, 2019; Wooldridge, 2020).

Unit-Root Tests

To assess the time series properties of all the variables, time series diagnostics were conducted using Augmented

Dickey–Fuller (ADF) test and Phillips–Perron (PP) test prior to the estimation of the Autoregressive Distributed Lag (ARDL) model. It was necessary to take this preliminary step, in order to be able to know the order of integration of each variable, and also to check that none of the variables was integrated a second time, I (2). The ARDL bounds-testing approach can be used when the variables are

stationary at level (I (0)), first difference (I (1)) or a mixture of the two but not when stationarity occurs at second difference (I (2)). So, to test and confirm that there was no second order integration was crucial before applying ARDL estimation and bounds-testing procedure (Dickey & Fuller, 1979; Phillips & Perron, 1988; Pesaran et al., 2001).

Table 6. Unit-Root Test Results

Variable	ADF Level	ADF p-value	ADF First Difference	PP Level p-value	PP First Difference p-value	Integration Order
GPR	-6.586***	<0.001	-7.881***	<0.01	<0.01	I (0)
OIL	-3.173**	0.022	-10.297***	0.250	<0.01	I(0)/I (1)
EXR	-1.552	0.508	-8.556***	0.550	<0.01	I (1)

Notes: ** and *** indicate significance at the 5% and 1% levels, respectively. The ADF lag structure was selected using the Akaike Information Criterion.

The analysis indicates that GPR is stationary at the level. The parallel exchange rate is non-stationary at the level but becomes stationary after first difference. For the Brent oil prices, the ADF test rejects the unit-root null at the 5% level, whereas the PP test does not reject it at the level. However, both tests strongly reject the unit-root null after first differencing. This mixed evidence suggests that the oil price can be treated conservatively as I (1).

Overall, the variables exhibit a mixture of I (0) and I (1) properties, with none integrated of order I (2). The stationarity results therefore satisfy the principal precondition for applying the

((ARDL)) bounds-testing approach (Pesaran et al., 2001).

((ARDL) Bounds Test for Cointegration

Following the Unit-Root analysis, the ((ARDL)) bounds-testing procedure is applied to determine whether a stable long-run relationship exists among regional geopolitical risk (GPR), Brent crude-oil prices (OIL) and Iraq's parallel-market exchange rate (EXR). The lag structure is selected using the Akaike Information Criterion (AIC), while ensuring that the explanatory variables remain included in the dynamic specification (Pesaran et al., 2001).

Table 7. (ARDL) Bounds Test for Cointegration

Test	Statistic	Lower-bound p-value	Upper-bound p-value	Decision
(ARDL) Bounds F-test	0.845	0.751	0.926	No cointegration

Note: Null hypothesis, No long-run level relationship.

The calculated F-Statistic of 0.845 is insufficient to reject the null hypothesis of no level relationship. Both the lower- and upper-bound probability values are well above conventional significance levels, indicating that (GPR) Brent oil prices, and Iraq's Parallel Exchange Rate do not form a stable cointegrating relationship over the sample period.

This result suggests that the proposed transmission mechanism is unlikely to operate through a persistent long-run equilibrium relationship. The effects of geopolitical risk or oil-price movements on the parallel exchange rate are more likely to appear through short-run dynamics, lagged adjustments, or episodic responses. Accordingly, the subsequent analysis focuses on the short-run (ARDL) dynamics rather than estimating an error-correction model that would require confirmed cointegration (Pesaran et al., 2001; Brooks, 2019).

Short-Run Dynamic Results

Following the absence of cointegration, the analysis focuses on short-run dynamics using monthly percentage changes in Brent oil prices and the parallel exchange rate. The Akaike Information Criterion (AIC) is used to determine the dynamic lag structure, while heteroskedasticity- and autocorrelation-consistent (HAC) standard errors are employed for inference.

Table 8. Short-Run Dynamic Results

Relationship	Coefficient	Std. Error	p-value	Decision
GPR → Δ OIL	0.079	0.604	0.896	Not significant
GPR → Δ EXR	-0.083	0.059	0.158	Not significant
Δ OIL → Δ EXR	0.008	0.008	0.282	Not significant

Model diagnostics: Oil-price equation: ($R^2 = 0.182$); Adjusted ($R^2 = 0.132$); ($N = 227$).
Exchange-rate equation: ($R^2 = 0.108$); Adjusted ($R^2 = 0.050$); ($N = 227$).

The results provide no statistically significant evidence that contemporaneous regional geopolitical risk affects short-run changes in Brent crude-oil prices. The GPR coefficient in the oil-price equation is positive but highly insignificant ($p=0.896$). Accordingly, H1 is not supported in the short run.

Similarly, short-run changes in Brent oil prices do not significantly affect movements in Iraq's parallel exchange rate (($p=0.282$)). The direct GPR coefficient in the exchange-rate equation is also statistically insignificant ($p=0.158$)). Consequently, hypothesis 2 is not supported in the short run.

Combined, the non-significant effect of an oil price on the GPR and the non-significant effect of Exchange Rates on the GPR do not support a short-run oil-price transmission channel. So, it is not expected that a model of H3 will be supported in its proposed short run. Instead, the findings indicate that the geopolitical risk-Iraq's parallel exchange rate relationship could be episodic, have a lag effect and/or be contingent on domestic foreign-exchange-market considerations, rather than transmitted mechanically by the contemporaneous movements of oil prices.

Diagnostic and Stability Tests

Diagnostic tests were conducted to assess the adequacy of the short-run dynamic specification. Serial correlation was examined using the Breusch–Godfrey LM test, heteroskedasticity using the Breusch–Pagan test, and residual normality using the Jarque–Bera test. Parameter stability was further evaluated

using the CUSUM and CUSUMSQ procedures (Breusch, 1978; Brown et al., 1975; Godfrey, 1978; Jarque & Bera, 1987).

Table 9. Diagnostic and Stability Tests

Test	Statistic	p-value	Result
Breusch–Godfrey LM (12 lags)	14.981	0.242	No serial correlation
Breusch–Pagan heteroskedasticity	12.686	0.005	Heteroskedasticity detected
Jarque–Bera normality	1051.342	<0.001	Residuals are non-normal
CUSUM	0.849	0.467	Stable
CUSUMSQ	—	—	Evidence of variance instability

The Breusch–Godfrey test fails to reject the null hypothesis of no serial correlation (($p=0.242$)), indicating that residual autocorrelation is not a major concern. In contrast, the Breusch–Pagan test rejects homoskedasticity (($p=0.005$)), while the Jarque–Bera test strongly rejects residual normality (($p<0.001$)). These results are consistent with the presence of episodic and unusually large movements in geopolitical, oil, and foreign-exchange conditions.

The CUSUM test remains within the conventional 5% stability bounds, suggesting that the estimated coefficients are broadly stable over the sample period. The CUSUMSQ procedure, however,

indicates episodes of variance instability. Accordingly, the inference is based on heteroskedasticity- and autocorrelation-consistent (HAC/Newey–West) standard errors. The robustness analysis evaluates whether the main conclusions remain unchanged under different exchange rate specifications.

Robustness Analysis

As a robustness check, the short-run model was re-estimated after excluding all 2025 observations thereby restricting the sample to fully observed monthly data for 2006–2024. The results remain qualitatively unchanged.

Table 10. Robustness Results: Excluding 2025

Variable	Coefficient	p-value
GPR	-0.045	0.471
Δ OIL	0.007	0.293
Lagged Δ EXR	0.273*	0.073

Note: * indicates significance at the 10% level. HAC/Newey–West standard errors are used.

The robustness results confirm the baseline findings. Neither geopolitical risk nor short-run oil-price changes significantly explain monthly movements in Iraq’s parallel exchange rate, while limited persistence remains in exchange-rate changes. The main conclusion is therefore not driven by the treatment of the 2025 observations.

Summary of Empirical Findings

The empirical results give a consistent picture of the relationship between the geopolitical risk, oil prices and Iraq's parallel exchange rate. Results from the correlation analysis indicate a significant positive relationship between GPR and EXR, meaning that the higher the geopolitical risk the more the Iraqi dinar will be depreciated on the parallel market. The ((ARDL)) bounds test, however, does not show any evidence of the presence of a stable long run cointegrating relationship between GPR, oil prices, and parallel exchange rate.

The short run estimates also indicate that, in the month, neither geopolitical risk nor changes in the price of Brent oil have a statistically significant effect. This means that the short term H1, H2 and H3 supports are not strong, and the proposed oil-price transmission channel is not well supported empirically.

Main findings are robust to residual autocorrelation and treatment of 2025 observations, as demonstrated by the diagnostic and robustness checks. Overall, geopolitical risk seems to affect pressure on the parallel rate of Iraqi currencies, the impact is not uniform with oil prices and is not long-lasting.

DISCUSSION

The results show that there is a difference between simple association and dynamic transmission. Based on the ARDL result, there is no sign of a stable long run relationship, but on the other hand there is positive and significant relationship between GPR and the parallel exchange rate in Iraq.

There is also no significant direct effect of a change in GPR or in Brent oil price on any month's change in the exchange rate in the short run. This implies that geopolitical risk influences the foreign-exchange environment in Iraq, but not in an obvious and direct way via the oil price. The geopolitical risk–oil link is weak in this case, while other international studies have noted that geopolitical risks tend to push oil prices up, as investors worry about potential supply disruptions (Mignon & Saadaoui, 2024).

Such effects, however, differ from event to event and are not necessarily even by country (Yilmazkuday, 2023). The findings indicate that domestic economic and institutional factors have a significant impact on the transmission of geopolitical pressures to the foreign-exchange market in Iraq, and that this influence is not solely due to oil-price changes.

This explanation is particularly important for Iraq, where access to U.S.

dollars, and the existence of official foreign exchange channels, are closely tied to the parallel exchange rate. The World Bank (2023) explains that the stricter compliance rules and restrictions on access to dollars pushed a portion of foreign currency demand onto the parallel market, which took pressure off the dinar. The IMF (2024) also calls for the normalization of trade financing and the consolidation of reforms of foreign-exchange markets.

The key implication of these results is that oil price does not dominate the link between geopolitical shocks and the parallel exchange rate in Iraq. The findings suggest it is a more complicated process. Geopolitical risk can impact exchange-rate pressure via market expectations, dollar availability, regulatory limitations, and market segmentation. This makes sense of the fact that the parallel rate can react to geopolitical events even if the oil prices channel is statistically less powerful.

The overall geopolitical risk argument is echoed in these findings. While oil plays a key role in Iraq's fiscal and external position, short-run fluctuations in the parallel exchange rate seem to be more directly influenced by the state of the foreign exchange system than

current international oil prices (IMF, 2024).

POLICY IMPLICATIONS

The findings also have obvious policy implications for Iraq. Geopolitical risk adds to the stress on the parallel market, and the oil-price channel is also weak, exchange-rate policy should not only focus on stabilizing oil revenues but should also be directed towards strengthening the operation of the domestic foreign exchange market.

The Central Bank of Iraq should first have to enhance the supply of U.S. dollars via formal banking channels without any opacity and without breaching the regulations. By streamlining procedures and improving trade-finance arrangements, foreign currency demand can be kept off the parallel market, particularly when there is higher geopolitical uncertainty (World Bank, 2023; IMF, 2024).

Second, there is a need for more coordination between foreign exchange management, banking supervision and compliance. More robust correspondent banking relationships and improved compliance systems can help to decrease market fragmentation without compromising anti-money laundering and financial integrity standards.

Lastly, Iraq's overall susceptibility to outside shocks makes it even more crucial to limit fiscal and external dependence on oil income. Oil is a vital channel for short-term transmission in Iraq, but is not significant in this study, but it is the backbone of Iraq's foreign exchange capacity and macroeconomic strength. (IMF 2023, World Bank 2024).

CONCLUSION, LIMITATIONS AND FUTURE RESEARCH.

The study explores the dynamic interaction among regional geopolitical risk, the price of Brent crude oil and the parallel market exchange rate of the Iraqi pound in January 2006 to December 2022. The results show that there is a significant positive relationship between geopolitical risk and parallel exchange rate, but there is no long run cointegrating relationship between three variables. Furthermore, according to short-run estimates, neither geopolitical risk nor oil-price changes have an immediate statistically significant impact on exchange-rate changes.

The results suggest that the transmission channel of oil prices is not well supported empirically. Geopolitical risk has a more significant influence on the parallel foreign-exchange market in Iraq, and this influence is more likely to be related to the domestic market conditions,

foreign-currency availability, expectations and institutional constraints rather than the direct and systematic transmission of the international oil prices.

There are some limitations in the present study. First, it emphasizes three key variables and excludes others that might influence the transmission process, such as foreign reserves, dollar sales, trade-finance restrictions, monetary-policy actions and banking-sector conditions.

Second, within each geopolitical event, there may be variations in the regional GPR measure. Thirdly, the monthly exchange-rate values for 2025 are calculated using the monthly averages of the 2020–2024 periods. The robustness check, however, indicates that the principal findings would not be affected by excluding 2025 from the sample.

The model could be further developed by incorporating the sale of dollars by the central bank, foreign reserves, financial or trade-sanctions and banking or trade-finance conditions. Nonlinear, regime-switching, or event-based models can also be used to determine if geopolitical shocks are more likely to have effects during more severe market stress periods.

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