Riding the Wave: Oil Shocks, Inflation, and Economic Growth in the MENA Region Amidst Global Crises (2014-2024)

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Abstract

This paper investigates the impact of oil price shocks and inflation on real GDP growth in the Middle East and North Africa (MENA) region during the turbulent period of 2014-2024. The decade was characterized by a unique sequence of major global disruptions, including the 2014 oil price collapse, the COVID-19 pandemic, and the Russia-Ukraine conflict, raising questions about the stability of traditional macroeconomic relationships. Utilizing a balanced panel dataset for 14 MENA countries, we employ a series of panel fixed-effects regression models to analyze the dynamic, asymmetric, and potentially time-varying nature of these linkages, distinguishing between oil-exporting and oil-importing economies. The principal finding is the existence of a profound structural break in the oil price-growth nexus post-2019. While oil price shocks had a marginally negative association with regional growth in the pre-pandemic era, the relationship reversed to become strongly and significantly positive in the period following the COVID-19 and Ukraine war shocks. Furthermore, the study uncovers significant

asymmetry in the response to oil shocks, with negative price shocks contrary to conventional wisdom exhibiting a more potent positive association with subsequent GDP growth than positive shocks. In contrast, the direct relationship between inflation and real GDP growth is found to be statistically weak and largely insignificant throughout the decade, suggesting that the powerful effects of external shocks overshadowed the traditional inflation-growth trade-off. These results indicate that the macroeconomic transmission mechanisms in the MENA region have been fundamentally altered by the recent succession of global crises, posing new challenges for economic diversification and fiscal policy management.

Keywords: Oil Price Shocks, Inflation, Real GDP Growth, MENA, Panel Data, Structural Break, Asymmetry.

ملخص البحث:

تبحث هذه الورقة في تأثير صدمات أسعار النفط والتضخم على نمو الناتج المحلي الإجمالي الحقيقي في منطقة الشرق الأوسط وشمال أفريقيا (MENA) خلال الفترة المضطربة الممتدة بين عامي ٢٠١٤ و٢٠٢٤. وقد تميز هذا العقد بتسلسل فريد من الاضطرابات العالمية الكبرى، بما في ذلك انهيار أسعار النفط عام ٢٠١٤، وجائحة كوفيد-١٩، والصراع الروسي الأوكراني، مما يثير تساؤلات حول استقرار علاقات الاقتصاد الكلي التقليدية. باستخدام مجموعة بيانات لوحية متوازنة (panel dataset) لأربع عشرة دولة في المنطقة، نستخدم سلسلة من نماذج انحدار التأثيرات الثابتة (panel fixed-effects) لتحليل الطبيعة الديناميكية وغير المتماثلة والمتغيرة زمنيًا المحتملة لهذه الروابط، مع التمييز بين الاقتصادات المصدرة للنفط والمستوردة

له. وتتمثل النتيجة الرئيسية في وجود كسر هيكلي عميق في العلاقة بين أسعار النفط والنمو بعد عام ٢٠١٩. فبينما كانت صدمات أسعار النفط ترتبط بشكل سلبي هامشي بالنمو الإقليمي في حقبة ما قبل الجائحة، انعكست هذه العلاقة لتصبح إيجابية بقوة وبدلالة إحصائية في الفترة التي أعقبت صدمتي كوفيد-١٩ والحرب في أوكرانيا. علاوة على ذلك، تكشف الدراسة عن عدم تماثل كبير في الاستجابة لصدمات النفط، حيث تُظهر صدمات الأسعار السلبية - على عكس الاعتقاد السائد - ارتباطًا إيجابيًا أقوى بنمو الناتج المحلي الإجمالي اللاحق مقارنة بالصدمات الإيجابية. في المقابل، وُجد أن العلاقة المباشرة بين التضخم ونمو الناتج المحلي الإجمالي الحقيقي ضعيفة إحصائيًا وغير مهمة إلى حد كبير على مدار العقد، مما يشير إلى أن التأثيرات القوية للصدمات الخارجية قد طغت على المفاضلة التقليدية بين التضخم والنمو. وتشير هذه النتائج إلى أن آليات انتقال تأثيرات الاقتصاد الكلي في منطقة الشرق الأوسط وشمال أفريقيا قد تغيرت بشكل جوهري بفعل الأزمات العالمية المتتالية الأخيرة، مما يطرح تحديات جديدة أمام التنويع الاقتصادي وإدارة السياسة المالية

الكلمات المفتاحية: صدمات أسعار النفط، التضخم، نمو الناتج المحلي الإجمالي الحقيقي، منطقة الشرق الأوسط وشمال أفريقيا، البيانات اللوحية، الكسر الهيكلي، عدم التماثل.

1. Introduction

The global economic landscape of the past decade has been defined by unprecedented volatility, driven by a confluence of geopolitical tensions (Marangoz, 2025), a global pandemic and profound shifts in energy markets (Khalilnezhad and Eslamloueyan, 2025). Central to this turbulence have been the dramatic fluctuations in international oil prices and the subsequent surge in global inflation (Ha et al., 2023; Asab, 2025). For the Middle East and North Africa (MENA) region an

area intrinsically linked to the global energy economy, understanding the macroeconomic consequences of these shocks is not merely an academic exercise, but a critical component of effective economic policymaking and strategic planning (Bigerna, 2024; ElSherif, 2024).

The MENA region presents a unique and compelling case study due to its profound economic heterogeneity. It is home to some of the world's largest hydrocarbon exporters, such as Saudi Arabia and the United Arab Emirates, for whom oil price movements directly translate into significant shifts in national income, fiscal capacity, and aggregate demand (Nasir et al., 2019). Simultaneously, the region includes a number of net oil-importing nations, such as Egypt, Jordan, and Morocco, which face the classic stagflation pressures of a negative supply shock when energy costs rise (Al Sawaie et al., 2025; Ritahi and Echaoui, 2025). This inherent dichotomy makes the MENA region a natural laboratory for examining the differential impacts of global shocks.

While a vast body of literature has explored the oil price-macro economy nexus (Herreraet al., 2019), the period from 2014 to 2024 remains a distinct and under-analyzed epoch. This decade witnessed a sequence of powerful and often contradictory shocks: the oil price collapse of 2014-2016, the historic demand destruction and price crash during the COVID-19 pandemic in

2020, and the subsequent sharp, supply-driven price spike following the conflict in Ukraine in 2022. The compounding nature of these events raises a critical question: Have the long-established relationships between oil prices, inflation, and economic growth remained stable, or have they undergone a fundamental structural change, as suggested by studies employing time-varying parameter models (Yang et al., 2023)?

This paper seeks to answer that question by providing a comprehensive empirical analysis of the impact of oil price shocks and inflation on real GDP growth across 14 MENA countries for the period 2014-2024. Specifically, we investigate three core hypotheses: (1) oil price shocks have a significant, heterogeneous, and asymmetric effect on real GDP growth, differing between oil-exporting and oil-importing nations; (2) inflation exhibits a negative and potentially non-linear relationship with economic growth; and (3) the macroeconomic transmission of these shocks has been subject to a structural break in the wake of the recent global crises.

To test these hypotheses, we employ a series of panel fixed-effects regression models. This approach allows us to control for unobserved country-specific characteristics while systematically analyzing the complex dynamics at play. We decompose oil price shocks to test for asymmetric responses and

utilize interaction terms to model heterogeneity and structural breaks.

Our findings are threefold. First, we identify a significant structural break in the oil price-growth nexus around 2020, where the relationship reversed from being marginally negative to strongly positive. Second, we uncover evidence of a strong but counterintuitive asymmetry, where negative oil price shocks are associated with a more pronounced positive effect on subsequent growth than positive shocks. Third, and contrary to much of the conventional wisdom, the direct relationship between inflation and real GDP growth appears statistically weak and largely insignificant for the MENA region during this tumultuous period.

This study contributes to the literature by providing an updated and nuanced analysis of a strategically vital region during a period of unprecedented global turmoil. The results offer crucial insights for policymakers on the changing nature of external shocks and the challenges of fostering sustainable growth amidst heightened uncertainty.

Research Problem

The central problem confronting policymakers in the MENA region is the heightened macroeconomic uncertainty stemming from the potentially altered relationship between oil price shocks, inflation, and economic growth. Traditional policy frameworks, built on historical data from more stable periods,

may no longer be adequate for navigating the post-2014 economic environment. The succession of unprecedented global shocks, from the 2014 price collapse to the pandemic and the Ukraine conflict, may have induced a structural break, rendering past policy responses ineffective or even counterproductive. This uncertainty creates significant challenges for fiscal planning, monetary policy formulation, and long-term economic diversification strategies for both oil-exporting and oil-importing nations in the region. Failure to understand these new dynamics could lead to policy errors that exacerbate economic volatility and undermine sustainable growth.

This study addresses the aforementioned problem by seeking to answer the following specific research questions:

1. What is the direction and magnitude of the impact of oil price shocks on real GDP growth in the MENA region, and does this impact differ significantly between oil-exporting and oil-importing countries?
2. Do MENA economies exhibit an asymmetric response to oil price increases versus oil price decreases?
3. What is the relationship between domestic inflation and real GDP growth in the MENA region during this period of high external volatility?
4. Is there evidence of a structural break in the relationship between oil price shocks, inflation, and real GDP growth after

2019, corresponding to the period of the COVID-19 pandemic and the Russia-Ukraine war?

The remainder of the paper is structured as follows. Section 2 provides a review of the relevant theoretical and empirical literature. Section 3 details the data and econometric methodology. Section 4 presents and discusses the empirical results. Finally, Section 5 concludes with a summary of findings, policy implications, and avenues for future research.

2. Literature Review

2.1. Theoretical Framework

The theoretical framework for this study is grounded in standard macroeconomic theory, integrating elements from both Keynesian and New Keynesian perspectives, which provide channels for both oil price shocks and inflation to affect real economic activity.

Transmission Channels of Oil Price Shocks:

First, Supply-Side Channel. For the MENA region's oil importers (e.g., Jordan, Morocco), an increase in oil prices represents a classic cost-push shock. It raises the cost of production for firms, leading to a decrease in aggregate supply, which in turn reduces output and increases the price level (stagflation) (Williams, 2025).

Second, Demand-Side Channel. For the region's numerous oil exporters (e.g., Saudi Arabia, UAE, Kuwait), an oil price

increase leads to a significant rise in export revenues and national income. This wealth effect stimulates aggregate demand through increased government spending and private consumption, potentially boosting real GDP growth (Al Jabri et al., 2022). Conversely, a price decline can trigger fiscal austerity and reduce aggregate demand.

Third, Uncertainty Channel. High volatility in oil prices can increase uncertainty, causing firms to delay investment and hiring decisions, thereby depressing economic activity regardless of the direction of the price change (Qureshi and Ahmad, 2025; Williams, 2025).

Transmission Channels of Inflation:

The uncertainty and investment has been a crucial topic. As, high and volatile inflation obscures the information content of price signals, making it difficult for firms and households to distinguish between changes in relative prices and changes in the overall price level. This increased uncertainty complicates long-term planning and elevates the risk associated with investment projects, often leading firms to delay or cancel capital expenditures. This can result in a reduction in both the level and efficiency of investment, thereby hindering real GDP growth (Friedman, 1977; Dixit and Pindyck, 1994).

Moreover, erosion of real balances was highlighted by many researchers. As, unanticipated inflation erodes the real

value of nominally denominated assets, including money holdings and fixed-income securities. This "inflation tax" reduces the purchasing power of households and can lead to a contraction in private consumption, a key component of aggregate demand (Mankiw, 2021). This phenomenon also creates "shoe-leather costs" as individuals and firms expend real resources to minimize their holdings of depreciating currency.

In addition, distortionary effects should be considered. As, Inflation interacts with the tax system, which is often based on nominal income, to create significant distortions. For instance, taxes on nominal capital gains or interest income can reduce the real after-tax return to saving and investment, thereby discouraging capital accumulation (Feldstein, 1997). Additionally, inflation imposes "menu costs," which are the real costs firms incur when they have to frequently update their prices, such as re-printing menus, catalogues, and labels (Mankiw, 1985).

2.2. Previous Empirical Studies and Results

The empirical literature provides a rich but varied picture of the macroeconomic consequences of oil price shocks and inflation, with findings often dependent on the country's economic structure (oil-importer vs. oil-exporter), the methodology employed, and the time period under consideration.

Real GDP Growth

For oil-importing countries, a consistent finding is that positive oil price shocks have a detrimental effect on economic growth. Using an SVAR model for Jordan, Al Sawaie et al. (2025) found that oil price shocks lead to a delayed negative response in GDP growth. Similarly, studies on Namibia (Mabuku et al., 2025) and Morocco (Ritahi & Echaoui, 2025) confirm a negative relationship between oil price shocks and economic growth. A broader GVAR analysis by Attilio and Mollick (2025) reinforced this, showing that oil price shocks cause a generalized fall in industrial production across emerging and industrial economies. For China, Liu et al. (2025) found that unexpected oil price changes led to significant GDP losses, particularly during the COVID-19 pandemic.

For oil-exporting countries, the results are more nuanced. A study on Iraq by Rodhan (2024) demonstrated that oil price fluctuations significantly impact GDP. In an analysis of GCC countries, Nasir et al. (2019) found that positive oil price shocks have significant positive effects on GDP, though with considerable heterogeneity among the member states. In a similar vein, Charfeddine and Barkat (2020) showed that for Qatar, positive oil price shocks have a larger long-run impact on real GDP than negative shocks do. However, the benefits are not guaranteed. Mgbomene et al. (2025) found a significant *negative* effect of oil price *volatility* on the Nigerian economy, highlighting the disruptive potential of price instability even for

producers. Furthermore, a study on the MENA region by Khalilnezhad and Eslamloueyan (2025) showed that the oil price crash during the COVID-19 pandemic led to a decline in output growth across the region, which was only partially offset by fiscal stimulus measures.

Inflation

There is a strong consensus that oil price shocks are a key driver of inflation. Asab (2025) identified oil price shocks as a primary contributor to both CPI and GDP deflator inflation across a panel of 20 economies. For the MENA region specifically, multiple studies confirm a significant and positive pass-through from oil prices to inflation. ElSherif (2024), using a TVP-VAR model for OAPEC countries, found a positive but heterogeneous pass-through effect, influenced by factors like exchange rate regimes and monetary policy frameworks. Bigerna (2024) also found asymmetric effects of oil shocks on inflation for 11 MENA countries, noting that the relationship was perturbed by the COVID-19 pandemic and the Ukraine crisis.

Asymmetry is a recurring theme. Hassine and Ben Amor (2025) revealed for Saudi Arabia that inflation increases more rapidly when oil prices fall than it decreases when they rise, a finding with significant policy implications. Similarly, Odo et al. (2025) documented asymmetric effects on different components of inflation across oil-rich Sub-Saharan African nations. This

asymmetry underscores the complexity of the pass-through mechanism, which can be influenced by consumer expectations, government subsidies, and the overall inflation environment (Ndou & Gumata, 2025).

This framework leads to the formulation of the following testable hypotheses:

- **Hypothesis 1 (H1):** Oil price shocks have a significant and asymmetric effect on real GDP growth across the MENA region.
  - **H1a:** For oil-exporting MENA countries, positive oil price shocks have a positive effect on real GDP growth, while negative shocks have a negative effect.
  - **H1b:** For oil-importing MENA countries, positive oil price shocks have a negative effect on real GDP growth.
  - **H1c:** The magnitude of the response of real GDP growth to positive oil price shocks differs from the response to negative shocks of the same size.
- **Hypothesis 2 (H2):** Inflation has a significant negative relationship with real GDP growth in the MENA region, particularly when inflation exceeds certain threshold levels.
- **Hypothesis 3 (H3):** The structural relationship between oil price shocks, inflation, and real GDP growth has undergone significant changes during the 2014-2024 period, particularly following the major global shocks of 2020 and 2022.

3. Data and Methodology

3.1. Data and Sample

The study utilizes a balanced panel dataset covering 14 Middle East and North Africa (MENA) countries over the period from 2014 to 2024. All statistical analyses were implemented using STATA Statistical Software Package version 13. The annual frequency of the data is chosen to align with the availability of national accounts data and to analyze macroeconomic relationships at a business-cycle frequency. The dataset comprises a total of 154 country-year observations. The sample is further disaggregated into two distinct subgroups to account for the fundamental structural differences in how their economies interact with the global oil market:

- **Oil-Exporting Countries (8):** Algeria, Bahrain, Iran, Kuwait, Oman, Qatar, Saudi Arabia, and the United Arab Emirates.
- **Oil-Importing Countries (6):** Djibouti, Egypt, Israel, Jordan, Morocco, and Tunisia.

The study's final sample of 14 MENA countries was carefully constructed to ensure data availability, consistency, and macroeconomic comparability for the 2014-2024 period. The primary objective was to analyze the impact of market-based global shocks on economies operating under relatively stable institutional frameworks. Consequently, several nations geographically within the MENA region were excluded to maintain the internal validity of the econometric analysis and

avoid the significant bias that would be introduced by extreme, non-economic events and severe data inconsistencies.

A key criterion for exclusion was the presence of prolonged, large-scale internal conflict. For this reason, Syria, Yemen, and Libya were omitted from the sample. In these nations, the collapse of state institutions has rendered macroeconomic data either unavailable or highly unreliable. More importantly, their economic performance during the study period was overwhelmingly dictated by the devastating, country-specific shocks of civil war, which would completely obscure the effects of the global oil price and inflation dynamics central to this research.

Similarly, other countries were excluded due to unique circumstances that make them unsuitable for a comparative panel analysis. Lebanon was excluded due to its singular post-2019 economic and financial collapse, characterized by hyperinflation and a banking crisis that makes its data non-comparable. Iraq was set aside because of the profound impact of the ISIS conflict from 2014 to 2017 on its security and economic stability, which introduced non-market shocks that directly affected its oil production and overall economy. Finally, the Palestinian territories were excluded due to their unique economic structure, which is heavily influenced by international aid and structural constraints not present in the other sovereign states of the sample.

This deliberate sample selection process, by excluding nations whose economies are dominated by severe internal conflicts or unique structural crises, results in a more methodologically robust panel. While the final sample remains diverse, its members are more likely to be systematically influenced by the global macroeconomic shocks central to this paper's research questions. This approach strengthens the confidence that can be placed in the empirical findings regarding the transmission of oil price shocks and inflation to economic growth in the region.

3.2. Variable Definition and Measurement

The variables for this study are defined and sourced based on standard practices in the macroeconomic literature to ensure comparability and validity.

Dependent Variable:

Real GDP Growth (Real_GDP_Growth) is measured as the annual percentage change in the Gross Domestic Product, adjusted for inflation. This is a standard measure for cross-country analysis of economic performance. Data are sourced from the International Monetary Fund's (IMF) World Economic Outlook database (IMF, 2024) and the World Bank's World Development Indicators (World Bank, 2024).

Independent Variables:

Inflation Rate (Inflation_Rate) is measured according to the annual percentage change in the Consumer Price Index (CPI). The CPI is the most common measure for headline inflation in macroeconomic studies of this nature (e.g., Bigerna, 2024; ElSherif, 2024). Data are compiled from the IMF and World Bank databases (IMF, 2024; World Bank, 2024).

While the Oil Price Shock (Oil_Price_Shock) is defined as the annual percentage change in the average nominal price of Brent crude oil. Data for Brent prices are sourced from the U.S. Energy Information Administration (EIA, 2024). Defining the shock as a simple percentage change (or "oil inflation") is a common and transparent method in the literature for capturing exogenous price movements, particularly in panel analyses (Choi et al., 2018). This variable is treated as a common exogenous shock (Z_t) affecting all countries in the panel simultaneously.

3.3. Research Model

To analyze the dynamic relationship between our variables while controlling for country-specific factors, we employ a panel fixed-effects (FE) regression framework (Wooldridge, 2010). The FE model is chosen over Pooled OLS and Random Effects specifications to account for unobserved, time-invariant country-specific heterogeneity (e.g., institutional quality, long-term economic structure, political stability) that may be correlated

with our explanatory variables, thus mitigating omitted variable bias. The general specification of our model is:

$$Real\_GDP\_Growth_{it} = \beta_1 * X_{it} + \beta_2 * Z_t + \alpha_i + \varepsilon_{it}$$

Where i denotes the country and t denotes the year. Real_GDP_Growth_it is the dependent variable. X_it is a vector of country-specific explanatory variables (i.e., Inflation_Rate), and Z_t is a vector of common shocks (i.e., Oil_Price_Shock). α_i represents the country-specific fixed effects, which capture all time-invariant differences across countries. ε_it is the idiosyncratic error term.

Given the strong economic and financial linkages within the MENA region and the presence of a common oil shock, we anticipate the presence of cross-sectional dependence, heteroskedasticity, and serial correlation in the error terms. To ensure the validity of statistical inference under these conditions, Driscoll and Kraay (1998) standard errors were employed, which are robust to such issues.

To rigorously test our research hypotheses, we specify a sequence of increasingly sophisticated models built upon the baseline fixed-effects framework.

Model 1: Baseline Specification

This model establishes the average relationship between the variables across the full panel.

$Real\_GDP\_Growth_{it} = \beta_0 + \beta_1 * Inflation\_Rate_{it} + \beta_2 * Oil\_Price\_Shock_t + \alpha_i + \varepsilon_{it}$

Model 2: Heterogeneous Effects of Oil Shocks (Hypothesis H1a, H1b)

To test whether the impact of oil price shocks differs between oil exporters and importers, we introduce a dummy variable, Oil_Exporter_i, which equals 1 for oil-exporting countries and 0 otherwise. This dummy is interacted with the Oil_Price_Shock variable, a standard technique for testing differential effects in panel models (Wooldridge, 2010).

$Real\_GDP\_Growth_{it} = \ldots + \beta_2 * Oil\_Price\_Shock_t + \beta_3 * (Oil\_Price\_Shock_t * Oil\_Exporter_i) + \ldots$

In this specification, β_2 captures the effect on oil-importing countries, while the total effect on oil-exporting countries is given by the sum ($\beta_2 + \beta_3$). A statistically significant β_3 would provide evidence of a heterogeneous impact.

Model 3: Asymmetric Effects of Oil Shocks (Hypothesis H1c)

To examine whether economies respond differently to oil price increases versus decreases, we decompose the Oil_Price_Shock variable into its positive and negative components, following the approach popularized by the Non-linear ARDL (NARDL) literature (**Shin et al., 2014**):

- OPS_pos_t = max(Oil_Price_Shock_t, 0)

- OPS_neg_t = min(Oil_Price_Shock_t, 0)

The regression model is then specified as:

$Real\_GDP\_Growth_{it} = ... + \beta_4 * OPS\_pos_t + \beta_5 * OPS\_neg_t + ...$

Asymmetry is formally tested using a Wald test on the equality of the coefficients ($H_0: \beta_4 = \beta_5$).

Model 4: Non-linear Inflation Effects (Hypothesis H2) To test for a non-linear relationship between inflation and growth, we employ a threshold model. The established methodology for this is the Panel Threshold Regression (PTR) model, which allows the data to endogenously determine the inflation threshold γ (**Hansen, 1999**). As an approximation, we can specify an ex-ante threshold and test for a differential slope using an interaction term.

$Real\_GDP\_Growth_{it} = ... + \beta_6 * Inflation\_Rate_{it} * I(Inflation\_Rate_{it} > \gamma) + ...$

Where I(.) is an indicator function. A significant β_6 would suggest that the effect of inflation on growth changes once inflation surpasses the threshold.

Model 5: Structural Break Analysis (Hypothesis H3) To assess whether the relationships have changed in the recent period marked by the COVID-19 pandemic and the Russia-Ukraine war, we introduce a dummy variable, D_Post2019, which equals 1 for the years 2020-2024 and 0 otherwise. This dummy is interacted

with our key independent variables to test for a change in the slope coefficients after the structural break point.

Real_GDP_Growth_it = ... + β_7(Oil_Price_Shock_t * D_Post2019_t) + β_8*(Inflation_Rate_it * D_Post2019_t) + ...*

The significance of the interaction coefficients β_7 and β_8 indicates whether the impact of oil price shocks and inflation on GDP growth has been significantly different in the post-2019 period compared to the 2014-2019 period.

4. Empirical Results and Discussion

4.1. Descriptive Statistics

Table 1: Summary Statistics for the Full Sample and by Country Group (2014-2024)

Variable	Statistic	Full Sample (N=14)	Oil Exporters (N=8)	Oil Importers (N=6)
Real GDP Growth (%)	Mean	2.43	1.94	3.08
	Std. Dev.	3.86	4.41	2.82
	Min	-8.90	-8.90	-8.80
	Max	13.40	13.40	8.60
Inflation Rate (%)	Mean	5.81	5.51	6.20
	Std. Dev.	9.07	11.01	6.54
	Min	-4.50	-4.50	-0.90
	Max	45.80	45.80	33.90
Oil Price Shock (%)	Mean	3.99	3.99	3.99
	Std. Dev.	33.50	33.50	33.50
	Min	-47.14	-47.14	-47.14
	Max	68.88	68.88	68.88
Observations		154	88	66

The data in Table 1 highlight the extreme volatility of the period, with oil price shocks ranging from a severe contraction of -47.1% (2015) to a sharp rebound of +68.9% (2021). On average, oil importers grew faster than exporters (3.1% vs. 1.9%), but exporters experienced a wider range of outcomes, reflecting their greater exposure to oil market volatility.

4.2. Econometric Model Results

The results of the five-panel fixed-effects models are presented in the following tables. Each model controls for country-specific fixed effects, thereby isolating the impact of changes in the independent variables on GDP growth within each country over time.

Table 2: Model (1) - Baseline Fixed Effects Model

Variable	Coefficient	Std. Error	P-value
Inflation_Rate	-0.056	(0.049)	0.255
Oil_Price_Shock	0.028***	(0.007)	0.000
Model Statistics			
Observations	154		
Number of Countries	14		
R-squared (within)	0.100		

Notes: Significance levels: *** p<0.01, ** p<0.05, * p<0.1. The model includes country-specific fixed effects to control for time-invariant unobserved heterogeneity.

The Baseline Fixed Effects Model represented in Table 2, shows a statistically insignificant relationship between the inflation rate and real GDP growth. However, it reveals a highly significant and positive relationship between oil price shocks and GDP growth. Specifically, a 10-percentage point increase in oil prices is associated with a 0.28 percentage point increase in real GDP growth for the average MENA country. This result aligns with the expected demand-side channel for the region's numerous oil exporters, where higher oil revenues fuel government spending and economic activity (Nasir et al., 2019; Al Jabri et al., 2022).

Table 3: Model (2) - Heterogeneous Effects for Oil Exporters vs. Importers

Variable	Coefficient	Std. Error	P-value
Inflation_Rate	-0.055	(0.049)	0.263
Oil_Price_Shock	0.030***	(0.010)	0.003
OPS_x_Exporter	-0.004	(0.014)	0.769
Model Statistics			
Observations	154		
Number of Countries	14		
R-squared (within)	0.101		

Notes: Significance levels: *** p<0.01, ** p<0.05, * p<0.1. The model includes country-specific fixed effects. 'OPS_x_Exporter' is an

interaction term between the oil price shock and a dummy variable for oil-exporting countries.

To test for different effects between oil exporters and importers, we introduce an interaction term the Heterogeneous Effects for Oil Exporters vs. Importers Model represented in Table 3. The main Oil_Price_Shock coefficient (0.030) represents the effect on oil importers, while the interaction term (OPS_x_Exporter) of -0.004 is statistically insignificant. This implies we cannot statistically distinguish the effect on exporters from importers in this specification. The highly significant positive effect on oil importers is a surprising finding that contradicts the conventional wisdom that oil price hikes harm net importers (Al Sawaie et al., 2025; Ritahi and Echaoui, 2025). A possible explanation for this anomaly in the MENA context could be the powerful role of positive regional spillovers, where the economic boom in oil-exporting Gulf countries during high-price periods translates into increased investment, tourism, and remittance flows to their oil-importing neighbors, potentially offsetting the direct negative terms-of-trade shock (Akinlo and Ojo, 2021).

Table 4: Model (3) - Asymmetric Effects of Oil Price Shocks

Variable	Coefficient	Std. Error	P-value
Inflation_Rate	-0.058	(0.049)	0.243
OPS_pos	0.020	(0.012)	0.101
OPS_neg	0.042**	(0.018)	0.020

Model Statistics			
Observations	**154**		
Number of Countries	**14**		
R-squared (within)	**0.104**		

Notes: Significance levels: *** p<0.01, ** p<0.05, * p<0.1. The model includes country-specific fixed effects. 'OPS_pos' and 'OPS_neg' represent positive and negative oil price shocks, respectively.

The Asymmetric Effects of Oil Price Shocks Model represented in Table 4, tests whether the economy responds differently to oil price increases versus decreases. The results provide strong evidence of asymmetry, but in a counterintuitive direction. The coefficient for positive oil shocks is not statistically significant, while the coefficient for negative oil shocks is positive and significant (0.042). This finding is contrary to much of the literature that finds positive shocks to have a larger (though typically negative) effect. It may reflect the unique dynamics of the 2014-2024 period, where sharp oil price collapses (e.g., 2015 and 2020) were driven by global demand factors and followed by strong, V-shaped recoveries that were more vigorous than the growth observed during more gradual oil price increases.

Table 5: Model (4) - Non-linear Effects of Inflation (Threshold Model)

Variable	Coefficient	Std. Error	P-value

Inflation_Rate	**0.083**	**(0.139)**	**0.552**
Oil_Price_Shock	**0.027*** **	**(0.007)**	**0.000**
Inflation_x_High_Dummy	**-0.144**	**(0.135)**	**0.288**
Model Statistics			
Observations	**154**		
Number of Countries	**14**		
R-squared (within)	**0.107**		

Notes: Significance levels: *** p<0.01, ** p<0.05, * p<0.1. The model includes country-specific fixed effects. 'Inflation_x_High_Dummy' is an interaction term for inflation rates above an 8% threshold.

The Non-linear Effects of Inflation (Threshold Model) represented in Table 5, investigates if the effect of inflation on growth changes when inflation is high. The coefficients on both Inflation_Rate and the high-inflation interaction term are statistically insignificant. Therefore, we find no robust evidence to support the hypothesis that a specific inflation threshold exists above which the growth effects become significantly more negative in our sample, a common finding in other contexts (e.g., Khan and Senhadji, 2001).

Table 6: Model (5) - Structural Break Analysis (Post-2019)

Variable	Coefficient	Std. Error	P-value
Inflation_Rate	-0.128*	(0.071)	0.074
Oil_Price_Shock	-0.018*	(0.011)	0.091
OPS_x_Post2019	0.071***	(0.013)	0.000
Inflation_x_Post2019	0.079	(0.051)	0.125
Model Statistics			
Observations	154		
Number of Countries	14		
R-squared (within)	0.260		

Notes: Significance levels: *** p<0.01, ** p<0.

The Structural Break Analysis (Post-2019) Model represented in Table 6, provides the most compelling result of the analysis, showing a dramatic structural shift in the post-2019 period. The interaction term OPS_x_Post2019 is highly significant (0.071), indicating a fundamental change in the oil price-growth relationship. The results imply that prior to 2020, a 10-percentage point oil price shock was associated with a 0.18 percentage point decrease in growth. However, after 2019, the effect became strongly positive, with the same shock being associated with a 0.53 percentage point increase in growth. This finding strongly supports the notion that the combined global supply and demand shocks of the pandemic and the Ukraine conflict have altered the

transmission mechanism in the MENA region, a conclusion consistent with studies that find time-varying effects of global shocks (ElSherif, 2024; Yang et al., 2023).

However, Table 7 summarizes the findings of testing the research hypotheses.

Table 7: Summary of Hypothesis Test Results

Hypothesis	Hypothesis Statement	Verdict	Findings
H1	Oil shocks have a significant & asymmetric impact on GDP growth.	**Accepted**	The oil price shock coefficient was statistically significant in the baseline model (Model 1), and the test for asymmetry (Model 3) confirmed that positive and negative shocks have different impacts.
H1a	Positive oil shocks have a positive effect on oil exporters' GDP.	**Partially Accepted**	While the average effect in the panel is positive, the formal test in Model 2 could not find a statistically significant *differential* impact for exporters compared to importers.
H1b	Positive oil shocks have a negative effect on oil importers' GDP.	**Rejected**	The results from Model 2 showed a statistically significant and *positive* relationship for oil-importing countries, contradicting the hypothesis.
H1c	The impact of positive vs. negative oil shocks is asymmetric.	**Accepted**	Model 3 showed that the coefficients for positive and negative oil price shocks were statistically different from each other.
H2	Inflation has a significant negative & non-linear impact on GDP.	**Rejected**	The coefficient on inflation was statistically insignificant in most specifications. The test for a non-linear threshold effect (Model 4) was also inconclusive.

H3	A structural break occurred in the relationships post-2019.	**Accepted**	Model 5 provided strong evidence for a structural break. The interaction term for the oil price shock post-2019 was highly significant ($p<0.01$) and substantially increased the model's explanatory power.

Note: The justifications refer to the results from the panel fixed-effects regression models presented in Table 2 of the "Empirical Results and Discussion" section.

5. Conclusion

This paper has conducted an empirical investigation into the dynamic and complex relationships between oil price shocks, inflation, and real GDP growth across 14 MENA countries during the exceptionally volatile period of 2014-2024. The econometric analysis yielded three main findings.

First, and most significantly, the relationship between oil price shocks and real GDP growth is not static. The analysis reveals a major **structural break** in this nexus following the onset of the global shocks beginning in 2020. Prior to this period, oil price shocks had a marginally significant negative association with regional growth. However, in the post-2019 era, this relationship reversed and strengthened dramatically, with positive oil price shocks being associated with a robust and highly significant increase in real GDP growth. This finding strongly supports our third hypothesis (H3).

Second, the impact of oil price shocks is characterized by significant **asymmetry**. The results show that while positive oil

price shocks have a statistically weak effect on growth, negative shocks are associated with a significant *increase* in subsequent GDP growth. This unexpected finding rejects the conventional direction of asymmetry (H1c). Contrary to our initial hypothesis (H1b), we found no evidence that oil-importing countries in the region suffered negative growth effects from rising oil prices.

Third, the direct relationship between **inflation and real GDP growth** was found to be largely weak and statistically insignificant across most model specifications for the 2014-2024 period. We could not find robust evidence to support a negative linear relationship, nor was there significant evidence for a non-linear threshold effect (H2).

Policy Recommendations

Based on the empirical findings, this study proposes a multi-pronged policy response to navigate the heightened volatility of the current economic landscape. The fundamental long-term priority for all MENA nations is to enhance economic diversification and build resilience. For oil exporters, this means accelerating the development of non-oil sectors to insulate their budgets from global price swings, while for importers, it requires strengthening domestic industries to reduce their fragile dependence on regional oil booms. Concurrently, oil-exporting nations must modernize their fiscal policy frameworks to better manage revenue volatility. By strengthening mechanisms like

sovereign wealth funds and delinking government spending from short-term oil price movements, they can avoid pro-cyclical policies that exacerbate boom-bust cycles. Finally, even though a strong, direct negative link between inflation and growth was not found in this specific period, monetary authorities must maintain vigilance on inflation. The high and persistent inflation in several MENA countries remains a critical threat to economic stability, eroding purchasing power and risking the de-anchoring of public expectations. Therefore, central banks must remain committed to their price stability mandates as a necessary foundation for sustainable long-term investment and growth

Limitations and Avenues for Future Research

This study is subject to several limitations which, in turn, open avenues for future research. First, the short time dimension of the panel restricts the use of more dynamic panel models. Second, the analysis is based on a parsimonious model, and future research should incorporate other crucial variables like fiscal policy, global demand, and geopolitical risk. Future research should revisit these questions as more data become available, preferably at a quarterly frequency, to allow for a more granular analysis of the dynamics using techniques like Panel VAR and Panel Threshold models.

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