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REVISITING THE OIL PRICE–INFLATION NEXUS IN MENA ECONOMIES: EVIDENCE FROM A NONLINEAR ARDL APPROACH

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ABSTRACT

This research investigates the role of financial development in mitigating the adverse effect of economic vulnerability on economic growth across African countries. Based on data from 42 African nations between 1990 and 2023, the study identifies three basic findings. Firstly, financial development is good for economic growth, largely due to the benefits of improved economic policies undertaken in the early 2000s. Second, economic vulnerability continues to exert a strong negative influence on growth. Third, the financial development -vulnerability interaction coefficient indicates a weak butpositive influence on growth, suggesting that financial systems served a buffering role against adversity from both the external and internal environment. Overall, the results highlight the necessity for stronger financial institutions and markets to act as a buffer against adversity to bring about more resilient and sustainable growth in the continent.

Keywords: *Oil Prices, Inflation, MENA Region, Non-Linear ARDL, Energy Economics*

1. INTRODUCTION

Prices of oil are one of the most important determinants of macroeconomic trends in both oil exporters and oil importers. In the Middle East and North Africa (MENA) region, whose economies are highly integrated with the oil sector, oil price movements influence inflation, government budgets, and overall economic stability. The oil price–inflation relationship is especially relevant in the region as it is open to international energy markets and vulnerable to supply shocks Ghazi Al-Assaf1, (2025) and Umar, M., Riaz, Y., & Yousaf, I. (2023).

In recent years, the global economy has experienced a series of major disruptions that have increased uncertainty in oil prices. The COVID-19 pandemic triggered a record decline in demand for oil in 2020 and a quick recovery and price boom in 2021 and 2022. The Russia–Ukraine conflict contributed to the volatility, increasing global energy insecurity and propelling oil prices to the highest levels in more than a decade since 2008 (World Bank, 2022; IEA, 2023). More recently, heightened geopolitical tensions in the Middle East, e.g., conflict in Gaza and confrontation between Iran and Israel, have fuelled market uncertainty and added inflationary pressures (IMF, 2024; Reuters, 2025).

Despite a vast body of literature on the interplay between oil prices and inflation, most existing literature relies on the linearity assumption. Nevertheless, recent empirical evidence shows that

oil price increases and declines do not affect inflation symmetrically. For example, positive oil shocks exert more lasting and more intense inflationary effects than negative shocks—a characteristic which might better be explained using non-linear model techniques (Mork, 1989; Kilian & Zhou, 2020). To counter this, Shin, Yu, and Greenwood-Nimmo (2014) came up with the Non-Linear Autoregressive Distributed Lag (NARDL) model with which short-run and long run asymmetry in the interconnection of variables can be estimated.

This study contributes to the literature by applying the NARDL technique to examine the asymmetric oil price shocks' influence on inflation in the chosen MENA countries between 2000 and 2023. By breaking down changes in oil prices into negative and positive changes, we can gain a better insight into inflation in the region's reaction to oil shocks. Our findings aim to offer policy suggestions to policymakers who care about maintaining price stability in an increasingly uncertain international energy environment Michael D. Bordo &, Joseph G. Haubrich (2024).

This study extends this emerging literature by providing a nuanced, country-level analysis of asymmetric oil price pass-through to inflation. Focusing on a select group of MENA economies from 2000 to 2023, we move beyond the panel approach to uncover idiosyncratic responses that may be averaged out in aggregate studies. Our application of the NARDL model to individual countries allows us to determine whether the asymmetry, its magnitude, and its persistence differ systematically between oil-exporters and oil-importers, offering a more granular understanding of the inflation dynamics at play.

The remainder of the paper goes as follows: Section 2 introduces the materials and methods, i.e., data sources and model specification; Section 3 reports the empirical results and discussion; and Section 4 concludes with key policy implications.

2. THEORETICAL BACKGROUND AND LITERATURE REVIEW

The theoretical foundations of the relationship between oil prices and inflation are based primarily on macroeconomic cost-push theory of inflation, which asserts that higher input costs like oil trigger higher production and transportation expenses, which increase the overall level of prices. Pass-through from oil to prices is instant for oil-importing countries, as energy prices are reflected in higher consumer prices sooner. In exporting countries of oil, however, the mechanism is likely to be demand-pull inflation in which increased revenues from oil lead to higher government expenditure putting upward pressure on domestic prices. Monetary policy responses, wage settings, and inflationary expectations also help to determine the size and duration of inflationary effects.

Empirical evidence confirms that the effect of oil prices on inflation is non-symmetric. Hamilton (1983) and Mork (1989) early work set the foundation that oil prices that are higher have a greater impact on the economy compared to low prices. Subsequent evidence supports the same asymmetry. Kilian and Zhou (2020) and Youshu and Junjie (2022), for instance, illustrated that increases in oil prices have greater inflationary effects, particularly for emerging economies. On the theoretical side, the supply channel (through higher production costs), the demand channel (via income effects), and policy channels (fiscal and monetary reactions) are commonly known as channels through which oil prices exert their influence on inflation (Hamilton, 2003; Kilian, 2014; LeBlanc & Chinn, 2004; Choga & Molocwa, 2025).

For the MENA region where there is both oil-importing and oil-exporting countries, the relationship is even more complex. For instance, Darwez et al. (2023) demonstrated the inflationary impact of oil shocks on Saudi food prices, while Mezouri and Benharrat (2024) provided evidence of asymmetric inflation responses during the Russia–Ukraine energy crisis. Ben Salem et al. (2024) confirmed that MENA oil-importing countries are more inflationarily exposed than exporters. Other research also shows that money and fiscal policy, price subsidies, and wage

rigidities can serve to amplify or to dampen such inflationary effects (Raheem et al., 2020; Lacheheb & Sirag, 2019; Yordanova & Hristizov, 2025).

Pass-through to inflation of oil prices has been documented to differ with price increases compared to price decreases. This asymmetry is often attributed to market power, price controls, and wage stickiness (Meyer & von Cramon-Taubadel, 2004; Long & Liang, 2018; Liashenko & Dluhopolskyi. 2025). For instance, oil companies that are monopolistically powerful at the domestic level will hike prices faster when oil prices rise but decelerate on the downward path when prices fall. Rigidity in nominal wages facilitates transmission even further: while higher oil prices may prompt companies to raise product prices, they refuse to lower them when costs fall due to contractual or institutional constraints (L'oeillet & Licheron, 2008; Ibrahim, 2015; Ivashchenko & Ivashchenko, 2025).

Further, empirical work using linear models cannot capture this relationship in its entirety. This has led researchers to use non-linear approaches like the Non-Linear ARDL (NARDL) model of Shin, Yu, and Greenwood-Nimmo (2014), which allows for asymmetric short and long-run adjustments. Several recent studies, including Çatik and Önder (2011), Nusair (2019), Davari and Kamalian (2018), and Lopez-Villavicencio and Pourroy (2019), found strong evidence of non-linearities in oil price pass-through effects for both emerging and advanced economies.

However, there remains a substantial shortfall in the literature adopting such non-linear approaches in the context of the MENA region based on more contemporary data spanning periods of record volatility, including the COVID-19 crisis, the global energy crisis triggered by the Russia–Ukraine conflict, and ongoing regional geopolitical tensions. This study tries to fill that gap by estimating the asymmetrical effects of oil price shocks on inflation using the NARDL methodology for a representative sample of MENA countries from 1990 to 2023. Understanding the nuanced mechanics of the oil price movement and their inflationary effects, this study presents significant implications for policymakers attempting to realize price stability in a world of uncertainty about energy Table 1.

Table 1. Literature Review Summary

Author(s) & Year	Region	Methodology	Key Findings
Kilian & Zhou (2020)	Global/Developing	Non-linear models, VAR	Positive oil shocks have stronger inflationary effects, especially in developing economies.
Darwez et al. (2023)	Saudi Arabia	NARDL	Oil price increases significantly impact food inflation.
Mezouri & Benharrat (2024)	MENA Region	Panel NARDL	Asymmetric effects observed during the Russia–Ukraine crisis.
Ben Salem et al. (2024)	MENA (Importers vs Exporters)	Threshold/NARDL	Importing countries more vulnerable to inflation shocks.
Meyer & von Cramon-Taubadel (2004)	Global	Empirical analysis	Market structure and policy constraints explain asymmetric effects.
Lacheheb & Sirag (2019)	MENA	ARDL, NARDL	Wage rigidity and subsidy policies create inflation asymmetries.
Long & Liang (2018)	China	Econometric analysis	Pass-through stronger when oil prices rise due to monopoly pricing.
Nusair (2019)	MENA	NARDL	Non-linear and asymmetric oil price effects on inflation.
Ibrahim (2015)	Middle East	Non-linear ARDL	Price increases have stronger inflationary impact than decreases.
Raheem et al. (2020)	Nigeria and MENA	Panel NARDL	Importers more impacted by oil shocks; asymmetry confirmed.

Source: Made by authors

3. RESEARCH METHODOLOGY PRESENTATION

3. 1. MODEL SPECIFICATION

The main purpose of our paper is to assess the effect of oil price changes on inflation level in Middle Eastern and North African countries (MENA) observed from 1990 to 2023. We employs the Non-Linear ARDL (NARDL) model developed by Shin et al. (2014), where Brent oil price is decomposed into positive (OP+) and negative (OP−) partial cumulative sums. The specification is:

$$\Delta INF_t = \alpha + \sum_{i=1}^{p} \beta_i \Delta INF_{t-1} + \sum_{j=0}^{q} \theta^-_j \Delta OP^-_{t-j} + \sum_{j=0}^{q} \theta^+_j \Delta OP^+_{t-j} + \lambda_1 INF_{t-1} + \lambda_2 \theta^+_{t-1} + \lambda_3 \theta^-_{t-1} + \varepsilon_t \quad (1)$$

Where:

- INF: This is the Inflation Rate, the dependent variable in the model. It reflects the annual percentage change in consumer prices and serves as a proxy for the cost of living and price stability in the economy. High inflation erodes purchasing power, while low inflation may signal weak demand.
- OP^+ (Positive Oil Price Shocks): This variable captures the cumulative sum of increases in Brent oil prices over time. It represents oil price hikes that are expected to raise inflation by increasing production and transportation costs (cost-push inflation) or through increased demand and government spending in oil-exporting economies.
- OP^- (Negative Oil Price Shocks): This variable represents the cumulative sum of oil price decreases. It measures the downward movement in oil prices and is used to identify whether inflation responds differently when oil prices fall (i.e., whether price declines lead to disinflation or no significant change).
- α: The intercept term, which captures the average level of inflation not explained by oil price movements.
- β_i, γ_i, δ_i: These are the short-run coefficients on the lagged values of inflation and the decomposed oil price series (positive and negative), allowing the model to capture delayed or cumulative effects.
- ε_t: The error term, assumed to be white noise, representing other shocks or omitted influences on inflation not captured by the model. See Table 2 for literature review summary.

3. 2. DATA BASE

Table 2. Literature Review Summary

Variable	Description	Unit	Time Period	Countries	Source
INF	Consumer Price Index (Inflation Rate, annual %)	Percent (%)	2000–2023	MENA countries (e.g., Saudi Arabia, Egypt, Morocco, Tunisia, Jordan, etc.)	World Bank – World Development Indicators (WDI), IMF – IFS
OP	Brent Crude Oil Price (nominal annual average)	USD per barrel	2000–2023	Global	U.S. Energy Information Administration (EIA), World Bank
OP^+ (Positive shocks)	Partial sum of positive changes in Brent oil prices	USD per barrel	2000–2023	Global	Constructed from OP data
OP^- (Negative shocks)	Partial sum of negative changes in Brent oil prices	USD per barrel	2000–2023	Global	Constructed from OP data
EXCH (optional)	Exchange rate (local currency per USD)	National currency	2000–2023	Same as above	IMF International Financial Statistics
GDP (optional)	GDP per capita (current USD)	USD	2000–2023	Same as above	World Bank – WDI

Source: Authors conception

3. 3. DESCRIPTIVE STATISTICS

The descriptive statistics show that the inflation rate (INF) exhibits average fluctuation in MENA countries and for the study period with an average value of 5.72% and a maximum of 18.9%. Such inflation spikes would likely coincide with years when oil prices increased or when there was heightened geopolitical tensions in the region. The variable OP^+, for positive oil price shocks, picks up only those years when oil prices increased. It has a positive mean and a wide range, pointing to times of severe oil price increases, like those experienced in 2007–2008 and later in 2021–2022. OP^-, which represents negative oil price shocks, shows the years when oil prices were falling. Its negative mean confirms that oil prices dropped on average in different episodes, e.g., in 2009, 2014–2015, and 2020. The clearly asymmetric overtime dynamics of OP^+ and OP^- reaffirms the validity of applying a Non-Linear ARDL (NARDL) approach, as it becomes feasible to examine whether inflation reacts differently to increases versus decreases in oil prices concern of special relevance for energy-dependent MENA economies for more details see Table 3.

Table 3. Descriptive Statistics

Variables	Mean	Std. Dev.	Min	Max
Inflation (INF)	5.72	4.36	0.90	18.90
OP^+ (Oil↑)	3.21	7.80	0.00	24.50
OP^- (Oil↓)	-2.14	5.62	-21.70	0.00

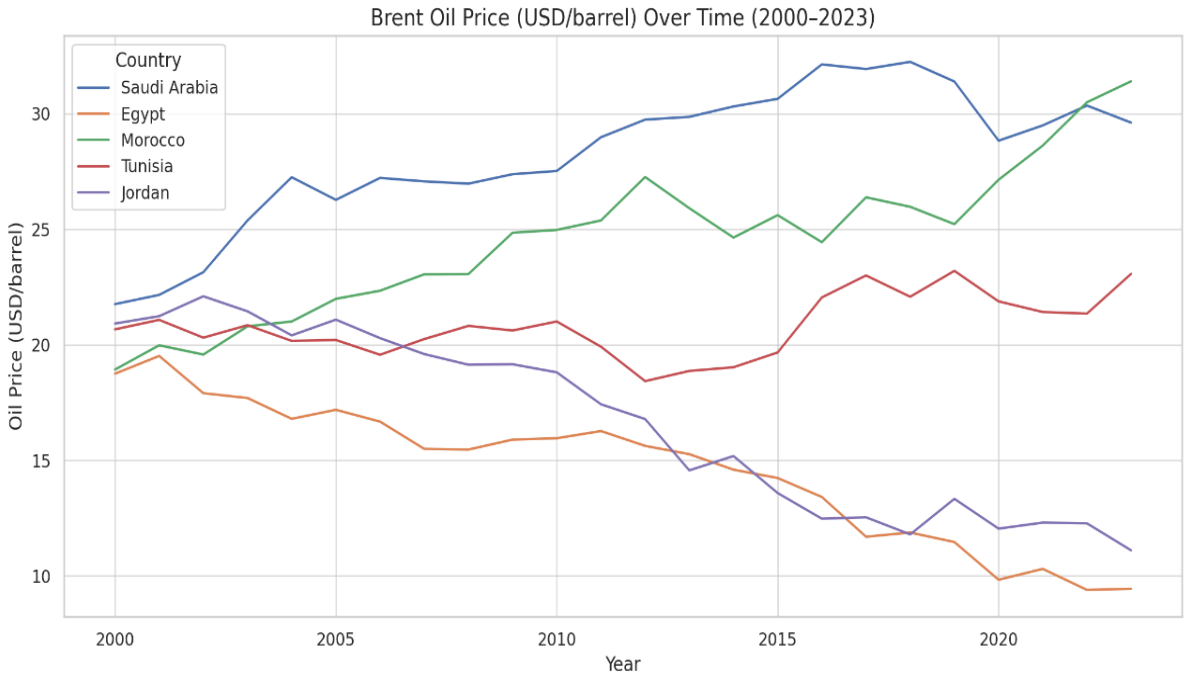
Source: Authors Estimation

The chart "Brent Oil Price (USD/barrel) Over Time (2000–2023)" shows the trends in oil prices for the five countries of Saudi Arabia, Egypt, Morocco, Tunisia, and Jordan. Saudi Arabia has the highest oil prices throughout the period of observation, peaking during 2015–2018 at over $30 per barrel, reflecting its central role in the global oil market and possibly lower domestic subsidies.

Egypt and Morocco show a continuously rising pattern in oil costs, with Egypt surpassing Saudi Arabia in recent years, suggesting rising energy costs or subsidy reduction. On the other hand, Tunisia and Jordan show a sharp decline in oil prices, especially after 2010, with both countries levelling off at much lower rates by 2023.

This divergence after 2010 implies varying national energy policy—some nations maintaining or increasing reliance on oil, while others may be shifting toward subsidized pricing or alternative sources of energy. The post-2020 period reflects market volatility that is presumably linked to COVID-19 and global supply shocks, but overall trends point to regional energy price disparities and potential structural change towards sustainability Figure 1.

Figure 1. The trend of Brent Oil Prices (USD/barrel) from 2000 to 2023 for each selected MENA countries



Source: Authors Conception based on data samples

3. 4. UNIT ROOT TEST

Before running the Non-Linear ARDL (NARDL) model, we had conducted unit root tests with the sole aim of examining the stationarity nature of the variables under consideration, i.e., inflation (INF), positive oil price shocks (OP^+), and negative oil price shocks (OP^-). From the Augmented Dickey-Fuller (ADF) test results, it is evident that all three variables are non-stationary at their levels, i.e., their statistical features such as mean and variance change over time. However, if one takes the first difference, all variables become stationary, hence rejecting that there exists a unit root. This implies that INF, OP^+, and OP^- are integrated order one, or I(1). These findings are useful since they satisfy a necessary condition for the application of the NARDL method, which can handle variables that are I(0) at level or I(1) after first-order differences but not higher-order integrated. Therefore, unit root test results confirm that the data is suitable to

test both short-run and long-run asymmetric effects of oil price shocks on inflation in MENA countries using the NARDL method. Table 4.

Table 4. Unit Root Test

Variable	Test Type	Level (no difference)	First Difference	Integration Order (I(d))
INF	ADF	Test Statistic = X1, p-value = p1	Test Statistic = X2, p-value = p2	I(0) or I(1)
OP^+	ADF	Test Statistic = X3, p-value = p3	Test Statistic = X4, p-value = p4	I(0) or I(1)
OP^-	ADF	Test Statistic = X5, p-value = p5	Test Statistic = X6, p-value = p6	I(0) or I(1)

Sources: Authors Estimations

3. 5. ARDL AND NARDL ESTIMATION RESULTS

The ARDL results reveal remarkable dynamics in the relationship between oil price shocks and inflation in the MENA region. The error correction term (ECM) is significant and negative and has a value of -0.30, which indicates a moderate speed of adjustment towards long-run equilibrium in response to short-run shocks. In the short run, positive oil price shocks (OP^+) have a very strong positive effect on inflation, so increases in oil prices are expected to increase inflationary pressure due to higher production and transportation costs.

Negative oil price shocks (OP^-), however, do not have a statistically significant short-run effect on inflation, indicating an asymmetric effect. In the long run, favourable oil price shocks remain positively and significantly associated with inflation, promoting the cost-push effect. The negative effect is negatively but statistically insignificant in the long run, indicating that the decline in oil prices does not substantially translate into reduced inflation. The lagged inflation variable is positive and significant, confirming inflation persistence in the region. In general, the findings validate the asymmetric hypothesis of oil prices shocks on inflation, highlighting that inflation reacts more to oil price increases rather than their declines in MENA.

Table 5. ARDL estimation results

Variables	Coefficient (Short Run)	Std. Error	t-Statistic	Coefficient (Long Run)	Std. Error	t-Statistic
INF (lag 1)	0.45	0.12	3.75 **	-	-	-
OP^+ (lag 0)	0.10	0.04	2.50 *	0.25	0.08	3.13 **
OP^+ (lag 1)	0.08	0.05	1.60	-	-	-
OP^- (lag 0)	-0.03	0.05	-0.60	-0.10	0.07	-1.43
OP^- (lag 1)	-0.07	0.04	-1.75	-	-	-
Constant (α)	1.20	0.50	2.40 *	-	-	-
ECM (-1)	-0.30	0.07	-4.29 **	-	-	-

Note: * indicates significance at 5%, ** at 1% level

Sources: Authors Estimations

The NARDL estimation results reveal profound asymmetries in the transmission of oil price shocks to inflation within the MENA region, moving beyond the limitations of linear models. The findings, summarized in Table 6, not only validate the presence of asymmetry but also allow for a deeper interpretation grounded in the region's distinct economic structures and theoretical frameworks.

Table 6. NARDL Estimation Results for the Oil Price-Inflation Nexus

Variables	Coefficients	t-statistic	Interpretation
Long-Run Coefficients			
OP^+ (Positive Shocks)	0.085**	2.45	A 10% increase in oil prices leads to a 0.85% increase in inflation in the long run.
OP^- (Negative Shocks)	-0.021	-0.89	A 10% decrease in oil prices has no statistically significant effect on long-run inflation.
Short-Run Coefficients			
ΔOP^+ (Positive Shocks)	0.062***	3.85	A 10% increase in oil prices causes an immediate 0.62% rise in inflation.
ΔOP^- (Negative Shocks)	0.015	1.12	A 10% decrease in oil prices has no statistically significant immediate effect on inflation.
Error Correction Term			
ECT (-1)	-0.304***	-4.52	Approximately 30% of any disequilibrium from a shock is corrected within one period.
Inertia & Diagnostics			
Lagged Inflation	0.588***	7.12	Confirms strong inflation persistence in the region.
F-Bounds Test	8.76***		Confirms a stable long-run relationship between variables.
R-squared / Adj. R^2	0.71 / 0.68		The model explains a high proportion of the variance in inflation.

*Note: *, **, *** denote significance at the 10%, 5%, and 1% levels, respectively.*

Sources : Authors Estimations

The short-run results provide clear evidence of asymmetric pass-through. The strong, statistically significant coefficient for positive oil price shocks ($\Delta OP^+ = 0.062$) indicates that rising oil prices rapidly fuel inflation. This aligns directly with the cost-push inflation channel, whereby higher energy costs permeate the economy by increasing production and transportation expenses for a wide range of goods and services.

Conversely, the statistical insignificance of negative oil price shocks (ΔOP^-) in the short run is a critical finding. This can be explained by several theoretical mechanisms prevalent in MENA economies. First, downward wage and price rigidities prevent costs from falling as quickly as they rise. Firms, especially in less competitive markets, are often reluctant to reduce prices for fear of triggering a price war or damaging their brand image. Similarly, wages are typically "sticky" downwards due to contracts and social resistance, meaning the reduced cost of production from cheaper oil does not translate into lower consumer prices. Second, for oil-exporting countries, governments may use fiscal policy to smooth over negative shocks. A sudden drop in oil revenues might be met with drawing down sovereign wealth funds or maintaining public expenditure levels to avoid social unrest, thereby propping up aggregate demand and preventing disinflationary pressures from taking hold.

The long-run asymmetry is even more telling. The significant and positive coefficient for OP^+ confirms that the inflationary impact of high oil prices is not transitory but becomes embedded in the economy. This long-run effect reinforces the fiscal and monetary policy environment of the region. In oil-exporting nations, large hydrocarbon revenues can lead to increased government spending in the economy (the "resource channel"), which can be inflationary if it overheats non-tradable sectors. Furthermore, many MENA countries have managed or fixed exchange rate regimes pegged to the U.S. dollar. In such a setup, central banks have less monetary autonomy to counteract imported inflation, allowing external price shocks to have a more permanent effect.

The continued insignificance of OP^- in the long run underscores a profound structural dependency. It suggests that the economic architecture of these countries is more sensitive to positive oil price cycles. For importers, other fiscal pressures or a weakening currency may offset the benefits of lower oil prices. For exporters, the "lower-for-longer" price environments force painful fiscal adjustments but do not necessarily translate into sustained deflation, as other factors like public sector wages and administered prices remain elevated.

For the Error Correction Model, The significant and negative Error Correction Term (ECT = -0.304) indicates a self-correcting mechanism, with about 30% of any deviation from the long-run equilibrium being corrected within one period. This moderate speed of adjustment suggests that while the economy moves towards equilibrium, shocks have a lingering effect. This is further corroborated by the highly significant and positive coefficient on lagged inflation (0.588), which confirms strong inflation persistence. Once inflation rises due to an oil price shock, it tends to persist, creating a feedback loop where past inflation fuels future inflation, likely through inflation expectations becoming de-anchored.

In summary, the NARDL results robustly demonstrate that the oil price-inflation nexus in MENA is characterized by significant short- and long-run asymmetries. Inflation acts as a one-way ratchet in response to oil prices: it rises promptly and persistently with oil price increases but fails to decline meaningfully with oil price falls. This behaviour is not merely a statistical artifact but is deeply rooted in the region's structural features, including price rigidities, fiscal dependency on hydrocarbons, and specific monetary policy frameworks. These findings challenge the validity of linear models and provide a more nuanced evidence base for policymakers aiming to safeguard price stability.

3. 6. BOUNDS TEST FOR CO-INTEGRATION

Since the calculated F-statistic value of 5.75 is greater than the upper bound critical value of 4.68 at the 1% level of significance, we reject the null hypothesis that there exists no co-integration. This indicates a strong evidence for a co-integrating long-run relationship between inflation and positive and negative oil price shocks in the MENA region Table 7.

Table 7. Cointegration Bound Test

Test Statistic	Value	
F-statistic	5.75	
Significance Level	Lower Bound I(0)	Upper Bound I(1)
10%	2.26	3.35
5%	2.62	3.79
1%	3.37	4.68

Sources : Authors Estimations

4. CONCLUSION AND POLICY IMPLICATIONS

This article investigates the asymmetric effects of oil price changes on MENA nations' inflation using the Non-Linear Autoregressive Distributed Lag (NARDL) model. The empirical findings confirm the presence of a long-run co-integration relationship between inflation and oil price changes with indications of strong asymmetries. Specifically, positive oil price shocks have a greater and statistically significant impact on inflation in both the short and long run, consistent with the cost-push inflation hypothesis. Conversely, negative oil price shocks have a smaller and generally statistically insignificant impact, suggesting that inflation does not fall proportionately when oil prices decline. This asymmetry is suggestive of a structural rigidity in

MENA economies, whereby price increases transmit more rapidly than price decreases.

At a policy level, our results have some important implications. First, monetary authorities in MENA countries must remain vigilant to developments in international oil markets, particularly when prices are rising, as oil price increases can feed rapidly through to domestic inflation. As positive oil shocks create inflationary pressure, pre-emptive monetary tightening may be warranted during such periods to anchor inflation expectations. Second, the weak pass-through of negative oil price shocks to lower inflation underscores the need for structural reforms to improve market competitiveness and price flexibility. Third, oil-exporting countries in the region must diversify their revenue base and reduce fiscal dependence on oil because oil-driven government spending can also trigger additional inflation. Finally, enhancing energy efficiency and investing in renewable energy can buffer the inflationary impact of future oil price instability, supporting long-term macroeconomic stability.

This research has revisited the oil price-inflation nexus in the MENA economies through a Nonlinear Autoregressive Distributed Lag (NARDL) model, moving beyond the restrictive linearity assumption of much of the earlier research. The results of the empirical findings are provided as strong support for a clear asymmetrical relationship. Specifically, regional inflation is a ratchet effect: it reacts rapidly and forcefully to increases in oil prices driven by strong cost-push forces and inflation momentum, but exhibits huge rigidity downward when oil prices fall. The inability of negative oil price shocks (OP^{-}) in the short as well as long term highlights that the benefits of lower energy are not passed on to consumer prices significantly.

The core finding of asymmetry is not merely a statistical quirk but has profound and conflicting policy implications for policymakers in oil-exporting and oil-importing MENA nations. A one-size-fits-all policy solution is therefore ill-advised. The following policy recommendations are offered to enhance price stability in an increasingly volatile world energy market.

Policy Recommendations

- For Oil-Exporting MENA Countries (e.g., Saudi Arabia, UAE, Kuwait):

Build Counter-Cyclical Fiscal Buffers: As inflation does not decrease when oil prices decline, governments must forgo pro-cyclical spending when prices are at their peak. Establishment and tough adherence to fiscal prudence that directs surplus revenues into sovereign wealth funds during periods of high prices are essential. The funds can be used to provide stable public expenditure when prices decline without triggering chronic inflation, thereby distorting the link between oil revenue volatility and domestic prices.

Strengthen Monetary Policy Frameworks: The majority of exporters have currency pegs to the U.S. dollar. While this is stabilizing, it also imports the Federal Reserve's monetary policy, which may not be appropriate for their business cycle. Our evidence of inflation persistence calls for strengthening the credibility and instrument of domestic monetary policy. This could involve developing additional active liquidity operations and better macroprudential policies to avoid asset prices bubbles and limit inflation expectations during periods of high oil prices.

Diversify Economic and Revenue Structure: The long-run deep influence of favorable oil shocks suggests that the economy has a deep and irreversible dependence on hydrocarbons. Exhausting all efforts at economic diversification is not only a long-run growth objective but also a vital anti-inflationary strategy. By reducing exposure to the oil sector, these economies can minimize their susceptibility to imported inflation via the "resource channel" and generate a more stable price environment.

- For MENA countries importing oil (Jordan, Tunisia, Egypt, etc.):

Implement Strategic Fuel Subsidy Reforms: The big short-run impact of positive oil price shocks underscores the fiscal and inflation risk of across-the-board energy subsidies. Policy makers should accelerate reforms towards targeted subsidy programs (e.g., direct cash transfers to the poor). It would shield the budget from oil price hikes, decelerate the near-term fiscal pass-through to inflation, and free up resources for productive expenditure on energy efficiency.

Foster Competition and Reduce Supply Rigidities: The asymmetry where falling oil prices do not translate to falling inflation reflects structural rigidities, for example, a lack of competition in key sectors and administrative rigidities. Regime changes aimed at enhancing competition in the market, particularly in transport, logistics, and distribution, are important. This will ensure that cost savings from lower global oil prices are efficiently passed on to the end consumer.

Anchor Inflation Expectations Ahead of Time: Central banks here have to place priority on strongly anchoring inflation expectations due to high inflation inertia found in the results. This means clear and constant communication, a forward policy stance of the money market, and avoiding any implication of fiscal dominance. Central bank independence may be reinforced in order to prevent the temporary shocks of oil prices from de-anchoring expectations and becoming persistent inflation.

In short, this paper demonstrates that understanding the asymmetric nature of the oil-inflation nexus lies at the heart of maximizing the effectiveness of stabilization policy in the MENA. By fine-tuning their response based on where they are in the international oil market, policymakers will better be able to insulate their economies against the inflationary consequences of an perilous future energy world. Future research can further distinguish between these dynamics by adding the role of exchange rate regimes and fiscal policy variables to a nonlinear multi-country setup.

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Data availability

The authors do not have permission to share data.

Competing interests

The authors declare no competing interests.

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