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**The impact of Terrorist attacks in selected countries on OPEC Basket
Price Using Panel Data Model**

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Abstract: This study aims to explore the relationship between terrorist attacks and OPEC Basket prices in the selected countries (Afghanistan, Iraq, and Nigeria). To achieve its objectives, an analytical approach was employed to examine how terrorist attacks correlate with OPEC Basket prices fluctuations in these countries from 2000 to 2020. Economic methods such as co-integration, the Pooled Regression, Random Effects, and Fixed Effects Models were applied.

The study revealed a positive relationship between terrorist attacks and the rise in OPEC Basket prices during the period from 2000 to 2020, where the increase in terrorist attacks in Iraq, Nigeria, and Afghanistan contributed to the rise in OPEC Basket prices in global markets. These countries are major oil producers or are located near vital oil pipelines, causing any instability or conflict in these regions to affect the increase in OPEC basket prices directly. Additionally, the study found a positive correlation between OPEC Basket prices and crude oil production, while a negative relationship was observed between global oil consumption and OPEC Basket prices. These findings align with the complex and interconnected set of factors related to geopolitical and supply-demand dynamics.

To mitigate the negative impact of terrorist attacks on OPEC basket prices, Afghanistan, Iraq, and Nigeria must prioritize strengthening security around oil infrastructure. This involves implementing advanced surveillance systems, robust cybersecurity measures, and deploying dedicated security forces.

تأثير الهجمات الإرهابية في دول مختارة على سعر سلة أوبك باستخدام نموذج البيانات اللوحية

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المستخلص

تهدف هذه الدراسة إلى استكشاف العلاقة بين الهجمات الإرهابية وأسعار النفط في الدول المختارة (أفغانستان، العراق، ونيجيريا). لتحقيق أهدافها، تم استخدام نهج تحليلي لفحص كيفية ارتباط الهجمات الإرهابية بتقلبات أسعار النفط في هذه الدول خلال الفترة من 2000 إلى 2020. تم تطبيق أساليب اقتصادية مثل التكامل المشترك، نموذج الانحدار التجميعي، ونماذج التأثيرات العشوائية والثابتة

توصلت الدراسة إلى وجود علاقة إيجابية بين الهجمات الإرهابية وارتفاع أسعار سلة أوبك خلال الفترة من 2000 إلى 2020، حيث أسهم زيادة الهجمات الإرهابية في العراق ونيجيريا وأفغانستان في رفع أسعار سلة أوبك في الأسواق العالمية. وتُعد هذه الدول من كبار منتجي النفط أو تقع بالقرب من خطوط أنابيب النفط الحيوية، مما يجعل أي حالة عدم استقرار أو صراع في هذه المناطق تؤثر بشكل مباشر على ارتفاع أسعار سلة أوبك. بالإضافة إلى ذلك، وجدت الدراسة وجود علاقة إيجابية بين أسعار سلة أوبك وإنتاج النفط الخام، بينما لوحظت علاقة سلبية بين استهلاك النفط العالمي وأسعار سلة أوبك. تتوافق هذه النتائج مع المجموعة المعقدة والمتراصة من العوامل المتعلقة بالجغرافيا السياسية وديناميكيات العرض والطلب. للتخفيف من التأثيرات السلبية للإرهاب على أسعار سلة أوبك، يجب على أفغانستان والعراق ونيجيريا أن تعطي الأولوية لتعزيز الأمن حول البنية التحتية النفطية. يشمل ذلك تنفيذ أنظمة مراقبة متقدمة، تدابير قوية للأمن السيبراني، ونشر قوات أمن متخصصة.

الكلمات المفتاحية: الهجمات الإرهابية؛ سعر سلة أوبك، نموذج البيانات اللوحية، أفغانستان، العراق، نيجيريا.

1. Introduction

Terrorism is a severe issue with wide-reaching impacts on society, affecting economics, social structures, and politics. Defined broadly as criminal acts aimed at instilling fear, the UN General Assembly's 1994 declaration and Security Council Resolution 1566 emphasize its intent to harm or coerce governments. The Global Terrorism Database further defines it as the use of force by non-state actors to achieve objectives through intimidation. (Nations Office Drugs, 2018) (UNSCR, 2004). Finally, Terrorism involves the use of violence or threats by individuals, groups, or governments targeting cities or state agencies, leading to moral and material harm. This includes creating terror, chaos, and insecurity that disrupt people's lives and interests.

The September 11, 2001, attacks marked a significant turning point, highlighting the evolving nature of Terrorism. Its roots can be traced to diverse regions, including the Middle East and Europe, and its motivations can range from religious extremism to secular ideologies (Steinhäusler et al., 2008).

Terrorism, conflict, and violence destroy both physical and human resources, weaken socio-political institutions, and erode investor confidence, both domestic and international. This, in turn, inhibits domestic and foreign investment, impeding economic development. Furthermore, economic progress is contingent upon stability, while sustainable peace and security necessitate economic growth (Bayar & Gavriltea, 2018). In the literature, scholars generally find that economic circumstances significantly influence patterns of terrorist activity. However, their views on the relationship between economic conditions and Terrorism vary. Many argue that poor economic conditions are the root cause of Terrorism, while economic development is seen to reduce or eliminate it. (COCCIA, 2018; Lee, 2018). (Orbaneja et al., 2018). Others argue that Terrorism is a global issue, not influenced by local economic factors alone but shaped by globalization and technological advances. (Matseketsa & Mapolisa, 2013) (Ghosh, 2014) as they see Terrorism, war and other forms of conflict as aggravating or causal factors in energy supply shocks abroad and the oil and natural gas markets.

There are numerous papers about Terrorism and oil resources (Piazza, 2016) (Lee, 2018); (Su et al., 2020); quite simply, oil resource is a source of power, so any threat such as Terrorism that can affect the security of such a power for example, Rubin, (2003) Notice the Iranian Revolution and the Iraq / Iran war OPEC Basket Price more than doubled from \$ 14 in 1978 to \$ 35 each Barrel in 1981(Blomberg et al., 2009). This is likely due to a sudden increase in OPEC Basket prices at that time due to the Iraqi invasion of Kuwait, thus affecting the –demand-supply chain (Kollias et al., 2013) after the 11th September attack Some researchers believe that launching of wars in Afghanistan and the US invasion of Iraq in 2003, it was because of crude oil (Jones, 2012), ISIS operations in Syria and Iraq had a significant impact on OPEC Basket Price and energy markets. The terrorist activities disrupted oil production, leading to volatility in the market. For instance, the price of Brent crude oil increased from around \$105 per barrel in early June 2014 to \$115 per barrel in July 2014, because of concerns over disruption supply.

This significant study underscores the crucial link between terrorist attacks and global energy markets. Afghanistan, Iraq, and Nigeria have faced substantial terrorist threats that directly or indirectly affect oil production and distribution. Understanding how these threats influence fluctuations in the OPEC basket price can assist in developing policies to improve energy security, stabilize markets, and protect economic growth. The findings offer valuable insights for both national governments and international organizations to address vulnerabilities in the oil sector and enhance resilience against

The primary aim of this study is to examine the impact of terrorist attacks on the OPEC basket price, focusing on Afghanistan, Iraq, and Nigeria. By analyzing how terrorist activities in these countries disrupt oil production and supply chains, the study aims to reveal the extent to which geopolitical instability influences OPEC Basket prices volatility and economic stability. This research provides valuable insights for policymakers, economists, and energy market stakeholders to develop strategies that mitigate the economic risks associated with terrorist attacks in oil-producing regions.

- 2. Literature Review and Hypothesis Development:** Many studies focus on the impact of terrorist attacks on global markets, including their impact on financial markets, e.g., (Chesney et al., 2011) and commodity markets (as investigated by (Procasky & Ujah, 2016)). However, the impact of terrorism and war on global markets can be both positive and negative, i.e., variable over time (Song et al., 2022) (Gong & Xu, 2022). The impact of terrorist attacks also varies based on the characteristics of the attack, with incidents targeting the oil industry in OPEC countries having a larger positive impact on oil revenues and a negative impact on volatility (Bassil et al., 2018). War has a deeper and longer-lasting impact on the variance of stock and oil returns than terrorist events, which generally cause short-term shocks. Different markets show different responses to these events, with some appearing to be more efficient at absorbing the impact of terrorist attacks (Kollias et al., 2011). One of the studies that addressed the relationship between terrorist attacks and oil prices is the study conducted by (Phan et al., 2021) on the impact of terrorist attacks on oil prices, which assumes that such attacks can predict oil price fluctuations, especially in oil-producing

countries. The research explains two main mechanisms through which terrorism affects oil prices: first, the disruption of oil production facilities, which leads to a decrease in production and an increase in prices (the production mechanism), and second, the increase in risk perceptions in the investment market, which affects the behaviors of commercial investors (the investment risk mechanism). Empirical analysis using data from 1996 to 2016 confirms this hypothesis, showing that terrorist attacks significantly affect oil price dynamics, especially when they occur in oil-producing countries.

Moreover, the study reveals that trading strategies responsive to terrorist incidents can achieve higher returns compared to traditional buy-and-hold strategies. The study (Monge & Cristóbal, 2021) confirmed that terrorist attacks affect oil production and prices in OPEC countries in the short term. However, this effect is temporary as oil production and prices gradually recover and return to their original levels. Geopolitical risks play a significant role in influencing oil prices and stock markets. As demonstrated by (Khan et al., 2021), the volatility in OPEC Basket Price is closely aligned with the Baltic Dry Commodity Exchange and shipping indices, with geopolitical risks acting as a key determinant of the Baltic Dry Commodity Exchange Index. These risks heighten uncertainty, triggering fluctuations in both oil prices and financial markets; then, the study (Liu et al., 2019) confirmed that geopolitical risks are the main factor affecting OPEC Basket Price. The study (Demirer et al., 2019) highlights that global geopolitical risks significantly affect oil markets, but the impact varies across different oil types. Notably, its impact is primarily on price volatility in global markets.

It is worth noting here that the impact of terrorist attacks varies according to the nationality of the terrorists, whether they are from inside or outside the country, and even according to the proximity of the terrorist operation to the site of the attack. Attacks carried out by local terrorists may have different effects compared to those carried out by foreign terrorists, and the proximity of the operation to economic or vital sites increases the extent of its impact on the security and economic situation, leading to different repercussions on financial markets and oil prices. (Farrell, 2016) found a direct correlation between domestic terrorism and rising oil prices. Using cross-sectional time series data from 147 countries between 1992 and 2014,

the study analyzed the impact of terrorism on oil leases, an alternative measure of oil prices. The results indicated that domestic terrorist activity leads to increased oil rents and, consequently, higher oil prices (Orbaneja et al., 2018). They expanded on this research by examining specific factors that influence the impact of terrorism on oil markets. They considered the proximity of attacks to oil facilities, the type of attack, and the number of casualties. Their findings revealed that bombings, large-scale attacks, and incidents near oil infrastructure have a more significant impact on OPEC Basket Price, particularly in the Middle East. (Blomberg et al., 2009) Investigated the relationship between oil profitability and conflict within the top 20 oil-producing and exporting countries. They did observe a positive correlation between conflict and oil stocks during periods of capacity constraints.

In conclusion, these studies collectively suggest that terrorism, especially domestic terrorism and attacks close to oil infrastructure, can have a significant impact on oil prices. However, the specific effects vary depending on factors such as the nature of terrorist activity, the geopolitical context, and the overall state of the oil market. In conclusion, after analyzing previous studies, this study stands out from others in the following aspects:

- ❖ Spatial boundaries: This study focuses on developing oil-producing countries or those located near major oil pipelines in Asia. It examines countries that have experienced refugee flows and were impacted by conflicts and terrorist operations. A selection of countries, including Iraq, Nigeria, and Afghanistan, was made, as the Global Terrorism Index classifies them as among the most affected by terrorist attacks and conflicts in the region.
- ❖ Temporal boundaries: The study selected the period from 2000 to 2020, a time marked by increased conflicts and terrorist activities in these countries, as well as significant fluctuations in OPEC Basket Price.

Based on the above and referring to previous studies that focused on geopolitical instability in the Middle East and oil producer countries and speculation in global markets, the hypothesis can be developed as follows:

" Terrorist attacks in the select countries (Iraq, Afghanistan, and Nigeria) lead to a significant increase in OPEC basket price due to heightened geopolitical instability and risks of supply disruptions"

3. Methodology: This study investigates the link between OPEC Basket prices and terrorist attacks in Iraq, Afghanistan, and Nigeria from 2000 to 2020. Therefore, the model takes the following form:

$$\text{Equation(1)} \quad P=F(T, OC,OP)$$

The logarithmic function of a form and its formula is used

$$LP_{it} = \beta_0 + \beta_1 LT_{it} + \beta_2 LOC_{it} + \beta_3 LOP_{it} + \varepsilon_t \dots \dots \text{Equation (2)}$$

Where

i = country (Iraq, Afghanistan, Nigeria)	Op= Crude Oil Production
t = time period (2000-2020)	Oc= World Oil Consumption
α = intercept	P= OPEC Basket Price
$\beta_1, \beta_2, \beta_3, \beta_4$ = coefficients to be estimated	T= Terrorist Attack
ε_{it} = error term	

Data Collection:

Table(1): Study Variables and Their Sources

Measurements and Resource data	Variable
Average annual crude oil price (in U.S. dollars per barrel)Data from https://www.opec.org/opec_web/en/data_graphs/40.htm	OPEC Basket Price (P)
Data were obtained from the Opec Annual Report(2000-2020) https://www.opec.org/opec_web/en/publications/337.htm	World Oil Consumption(OC)
Crude Oil Production of OPEC countries(million barrel per day)data from the Opec Annual Report(2000-2020)	Crude Oil Production(OP)
number of terrorist attacks data from Global Terrorism Database (GTD) https://www.start.umd.edu/gtd/	Terrorist Attack(T)

Table (1) below details how each variable of study is measured and the corresponding data source. In order to provide more details, we will present a summary of the evolution of study variables

3-1. OPEC Basket Price: Changes in OPEC Basket prices can reflect both global demand fluctuations and factors specific to the oil market. Generally, variations in OPEC Basket prices are interpreted as "oil shocks," which account for shifts in global economic activity influencing both oil demand and prices (Al-Anzi & Hussein.,2024,5). These oil shocks often result from disruptions in oil supply due to geopolitical events, natural occurrences, or

shifts driven by precautionary actions, conflicts, terrorism, or speculative demand for oil. Figure 1 illustrates the average change in OPEC Basket Price from 2000 to 2020.

3-2. World Crude Oil Consumption: The annual series of world crude oil consumption (2000-2020) is used in our analysis. Figure (1) shows that World Oil Consumption averaged 76.0 m.b / d in 2001, and world oil demand increased by 0.15 m.b / d compared to 2001. And it continued to rise to 85 m.b / d in 2005. However, this percentage of World Oil Consumption decreased by (−0.3) m.b / d in 2008. This decrease has been demonstrated for the first time since 1983. Economic deterioration in most OECD countries and many non-OECD countries continued due to the financial crisis, which inevitably reduced World Oil Consumption (1.6) per cent in 2009. After the global crisis, oil consumption gradually increased to around 99.3 m.b /d in 2018.

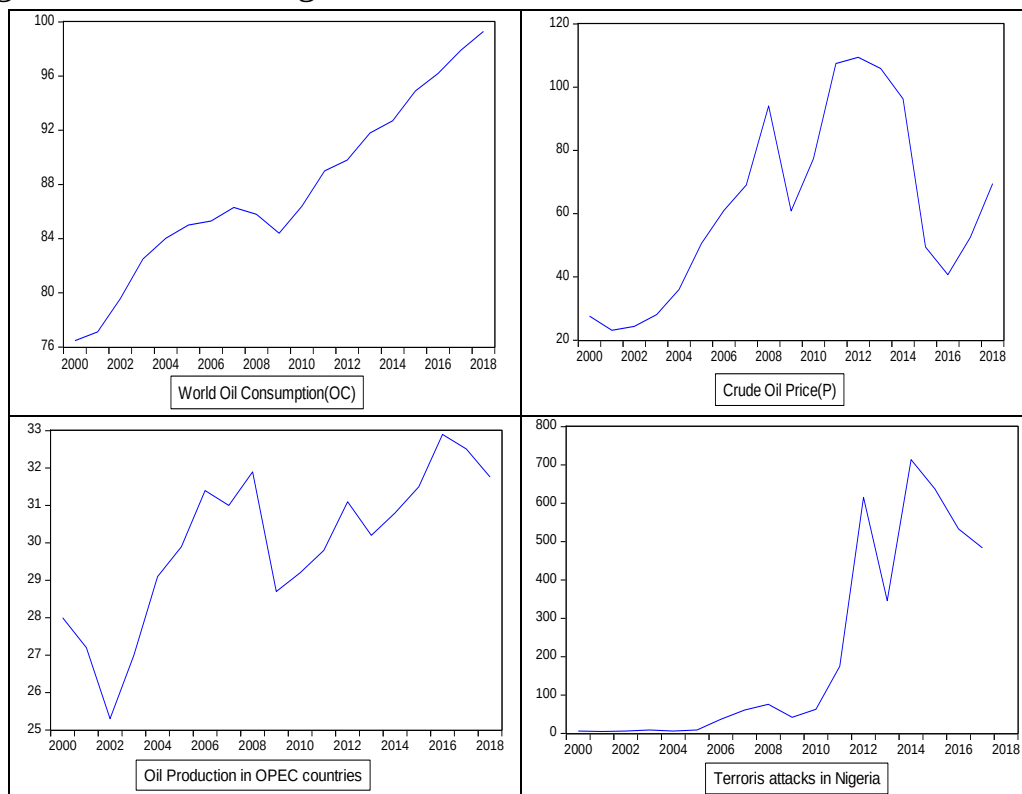
3-3. Crude Oil Products from OPEC Member Countries: Since 2000, the production of OPEC oil has increased by more than 50%. Recent increases in OPEC countries. This is the result of the increase in global demand for oil, changes in the price of crude oil, and the policy of OPEC to control the global energy market. Figure (1) shows the average change in oil production in OPEC countries.

3-4. Terrorist Attacks: Over the past decade, the average annual death toll has been 21,000. However, there can be a significant change from year to year. The global death toll during this decade ranged from the lowest level of 7,827 in 2010 to the highest year of 44,490 in 2014; according to (Institute for Economics & Peace, 2019), Iraq ranks 1st, Afghanistan ranks 2nd, and Nigeria ranks 3rd in terrorism incidence. In 2014, ten countries were greatly affected by terrorism. There were 30.4% deaths in Iraq, 23% in Nigeria, 13.8% in Afghanistan. As has been shown, terrorist attacks have a negative impact on economic performance in the world, so this paper seeks to understand how terrorist attacks affect the countries selected, for example:

- ❖ Iraq's economy faced a near-total financial and commercial collapse during the 1990s. The economy was further devastated by a near-total embargo until 2003, and the U.S. occupation after that year contributed to the destruction of infrastructure, exacerbating sectarian and religious conflicts, as well as political rivalries (Faraj &karim,2020). This significantly impacted Iraq's security and political stability. Terrorist attacks steadily increased from 2003

to 2014, reaching their peak in 2014 due to the Islamic State of Iraq and the Levant (ISIS) assault on various regions in Iraq. These attacks led to a 40% rise in civilian deaths and injuries

- ❖ Nigeria is a politically and economically unstable country due to corruption and religious and ethnic conflicts. According to (Ugoani, 2017), Nigeria is one of the largest suppliers of oil to the United States, making foreigners in the Niger Delta region frequent targets of terrorist attacks. In 2014, Nigeria experienced 714 terrorist attacks, making it the fourth highest-ranked country in terms of terrorism-related deaths in 2018 ((Global Terrorism Index 2018)). During this period, both the frequency of attacks and the number of casualties increased dramatically.
- ❖ Afghanistan became the first battleground in the War on Terror when the Taliban government refused to hand over Osama Bin Laden and other al-Qaeda members (Williamson, 2016). Following the events of September 11, the number of terrorist attacks surged dramatically, reaching a peak of 1,468 incidents in 2012. Although there have been more than 80 terrorist attacks in the world, the number of deaths and victims of terrorist operations in Afghanistan was the highest.



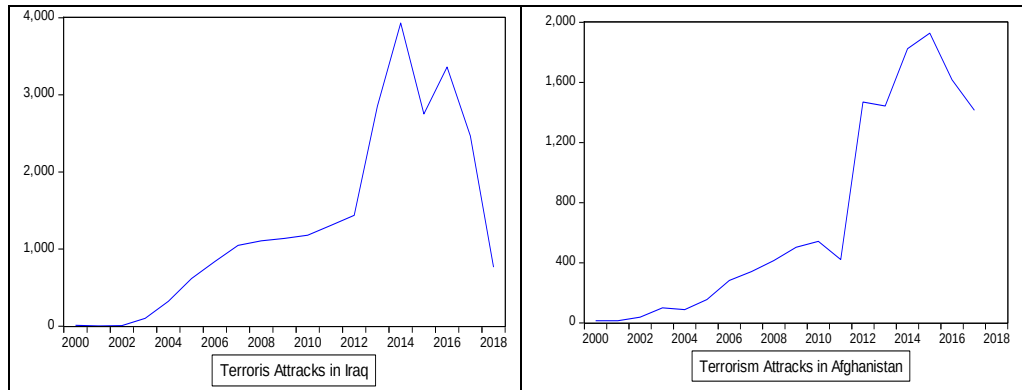


Figure (1): The frequency distribution of data during 2000-2020

<https://www.start.umd.edu/gtd/>

https://www.opec.org/opec_web/en/publications/337.htm

[:https://www.statista.com/statistics/262858/change-in-opec-crude-oil-prices-since-1960/](https://www.statista.com/statistics/262858/change-in-opec-crude-oil-prices-since-1960/)

4. Discussion of Results

4-1. Stationary Test: The literature shows that (Im et al., 2003) and (Maddala & Wu, 1999) panel unit root tests are the majorly used unit root tests in a set of heterogeneous panels. However, panel data is one of the important data used in applied studies, especially for those that rely on building regression models to estimate economic relationships. These studies assume that the time series used are stationary, as the absence of stationarity can lead to standard economic problems, such as the spurious regression problem (Faraj, 2021: 525).

This study used the unit root test (Levin-Lin-Chu, Im-Pesaran-Shin ADF, Dickey-Fuller augmented; PP. Fisher). The results of these tests are presented in Table (2).

Table (2): Results of cross-sectional dependence and panel unit root test

Test: Variable	P		T		OC		OP	
	Level	1 st Difference	Level	1 st Difference	Level	1 st Difference	Level	1 st Difference
LLC	-2.19	-3.18*	-1.76*	-2.47*	-1.02	-3.97*	-0.53	-1.445**
IPS	-1.20	-1.921*	-0.011	-2.51*	1.06	-2.21*	-0.38	-3.38*
ADF	9.208	13.17*	4.994	16.76*	1.63	14.92*	5.47	22.24*
PP-Fisher	4.443	18.86*	7.180	26.30*	0.91	17.88*	3.71	29.03*

Note: Null hypothesis: Panels are stationary; Levels of significance: * $p < 0.01$, ** $p < 0.05$, LLC, Levin-Lin-Chu test; IPS, Im-Pesaran-Shin test; ADF, augmented Dickey-Fuller; PP fisher

Reference: from processed data Eviews 12

The result shows that all the variables used in this study have rejected the null hypothesis of no cross-sectional dependence (correlation) at 1% level of significance

4-2. Testing for co-integration and estimating the long-run relationship

After confirming the order of integration, cointegration tests were implemented to ascertain the existence of long-run equilibrium relationships between OPEC Basket prices and the independent variables. Given the panel data structure and period, two tests were utilized: the panel Johansen-Fisher test and the Kao test.

The Kao test, a well-established method for homogeneous panels, was employed to evaluate the null hypothesis of no cointegration, as outlined in the seminal work of (Kao et al., 1999) the results are presented in Table 3.

Table (3): Results of panel cointegration test

Johansen Fisher Panel Cointegration Test				
Hypothesized	Fisher Stat.*		Fisher Stat.*	
No. of CE(s)	(trace test)	Prob.	(max-eigen test)	Prob.
None	55.11	0.0000*	45.46	0.0000**
At most 1	18.55	0.0050*	20.03	0.0027*
At most 2	5.236	0.5139	5.847	0.4406
At most 3	3.092	0.7973	3.092	0.7973
* Probabilities are computed using asymptotic Chi-square distribution				
- Trace test indicates 2 cointegration eqn(s) at the 0.05 level				
- Max-eigenvalue test indicates 2 cointegration eqn(s) at the 0.05 level				

Kao Residual Cointegration Test		
cointegration test	t-statistic	prob
ADF	-2.6393	0.0014*
Kao residual	0.061655	
Null Hypothesis: No cointegration		
* Automatic lag length selection based on SIC with a max lag of 2		
Reference: from processed data Eviews 12		

4-3. Estimating panel data models (PRM, REM, FEM): After completing the test of stability and integration of the data used, three models were estimated: the pooled regression model, the fixed effects model, and the random effects model. The results of these estimations are presented in Table 4.

Table (4): Result of Panel Regression Models

	Pooled Regression Model		Random Effects Model		Fixed Effects Model	
Variable	Coefficient	Prob	Coefficient	Prob	Coefficient	Prob
LT	0.300	0.00	0.354	0.07	0.283	0.021
LOC	-4.45	0.00	-11.02	0.00	-3.041	0.000
LOP	1.75	0.14	3.24	0.00	1.963	0.032
Constant	16.33	0.01	-	-	9.065	0.502
R ² *	0.61		0.72		0.914	
Adj.R ² *	0.57		0.65		0.892	
F-Statistic						
Prob (F-statistic)						
- The constant was not used in the model. *R ² : R-squared Adj.R ² : Adjusted R-squared						

The Hausman Test is a statistical test used to determine whether there is a relationship between explanatory variables and unobserved effects in panel data. This test helps in choosing the most appropriate model for economic analysis, especially in cross-sectional data models. The Hausman Test aims to determine whether a fixed effects model or a random effects model should be used.

If there are associations between the explanatory variables and the unobserved effects, the fixed effects model is most appropriate. If there are no associations between the explanatory variables and the unobserved effects, the random effects model is best.

As shown in the results of Table No. (5), and based on the Hausman test statistic, where the calculated value of the statistic was greater than the tabular value, the null hypothesis was rejected and the alternative hypothesis was accepted, which means that the fixed effects model is the most appropriate for the estimation process.

Table (5): Housman Test Result

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f	Prob.
Cross-section random	31.3403678	3	0.000

From the results of Table (5), we have reached the fixed effects model as the appropriate model, and accordingly the model can be formulated as follows:

$$LPit = \alpha_i + \beta_0 + \beta_1 LTit + \beta_2 LOCit + \beta_3 LOPit + \epsilon_{it} \dots \dots \text{Eq(3)}$$

$$LPit = \text{fix}_{\text{effect}} + 9.065 + 0.28Tit - 3.041OCit + 1.963OPit \dots \text{Eq (4)}$$

- It is clear from Equation No. (4) and Table (4) that the value of the coefficient of terrorist attacks reach (0.28) which is positive and statistically significant, this implies that a 1% increase in terrorist attacks is associated with a 0.28 rise in the volatility of the OPEC basket price, this aligns with economic realities in oil-producing regions, where terrorist attacks have disrupted oil facilities and supply chains. These findings corroborate previous research by Blomberg et al. (2009), which highlighted the impact of the American wars in Afghanistan and Iraq on OPEC Basket prices. The ongoing instability and uncertainty in the region have contributed to the elevated OPEC Basket Price. In other words, Terrorist attacks had a dual impact on global crude oil markets: spreading uncertainty and directly damaging oil infrastructure. Studies like (Orbaneja et al., 2018) (Tichý, 2018), and (Looney, 2003) linked the 2003 OPEC Basket prices surge to the US-Iraq conflict. This conflict damaged oil fields, pipelines, and export terminals in Iraq and neighboring Gulf countries, Steinhäusler et al. (2008) documented 374 attacks on Iraqi pipelines and related facilities between June 2003 and November 2006, averaging ten attacks per month. (Ditté et al., 2006) emphasized that oil prices are not solely driven by supply and demand but are also significantly influenced by psychological factors. Market reactions to the news, both positive and negative, can dramatically affect OPEC Basket Price. The September 11, 2001, attacks on the World Trade Center triggered sharp fluctuations in financial markets due to widespread shock and uncertainty. This volatility extended to OPEC Basket Price, fueled by fears of regional conflicts, particularly in the Oil Production countries. Furthermore, the escalation of global security concerns and economic turmoil increased the demand for oil as a risk-hedging asset.
- World oil consumption was also found to hurt OPEC basket prices over the period from 2000 to 2020. This suggests that increasing world oil consumption results in lower OPEC basket prices. This outcome can be explained by fundamental supply and demand dynamics, international economic shifts, and the global transition toward renewable energy.

Additionally, ongoing political and security instability in key oil-producing regions could lead to structural shifts in the market, with countries reducing their reliance on oil from volatile regions. This decrease in demand for OPEC oil can contribute to a long-term price decline.

- As regards the link between the price of crude oil and the production of crude oil in the OPEC countries, this result is consistent with the economic theory, in particular, the theory of production and consumer behavior; OPEC countries also affect OPEC Basket Prices through production: for example, if the price of crude oil falls, OPEC countries seek to restrict crude oil production through negotiations and agreements between OPEC and OPEC Plus countries, which means that OPEC decisions are effectively integrated into the oil markets.
- The regression results indicate that all variables in the model, except for the constant term, are statistically significant at the 0.5 level. This suggests that these variables have a meaningful relationship with the dependent variable.
- The Fixed Effects Model exhibits strong explanatory power, with an R-squared exceeding 90%. This indicates that the independent variables included in the model explain a substantial portion of the variance in the dependent variable. Furthermore, the adjusted R-squared, which accounts for the number of predictors, remains high at 89%, suggesting a robust model fit. These findings collectively demonstrate that the model effectively captures the variability within the data.

4-4. Diagnostic Test and Statistical Indicators: Diagnostic testing is fundamental when testing the model to ensure that there are no regression problems. The results of the diagnostic tests and statistical indicators are presented in the table below:

Table (5): Diagnostic tests for Models estimation

Test static / countries	LM test F-statistic	ARCH F-statistic	Ramsey Test F-statistic	VIF)	Jarque–Bera
Afghanistan	0.583264 0.5731	0.399223 0.5370**	0.22450 0.6435***	Less than (10)	3.21193 0.20****
Iraq	8.692603 0.4426	0.729622 0.4056**	0.624259 0.4426***	Less than(10)	0.756613 0.685****
Nigeria	3.418504 (0.0946)	0.201395 0.6600**	0.402843 0.5366***	Less than(10)	1.252 (0.535)****

Null Hypothesis the econometrics model does not exist

* Breusch-Godfrey Serial Correlation LM Test: F. probability, number of lag(2) except Iraq country

** Heteroscedasticity Test: ARCH, Number of lag (1)

*** Probability –Number of fitted terms equal (1)

**** Probability

Table (5) shows that all the tests that used LM, ARCH, the Variance Inflation Factor, and Ramsey test all the countries. The results of the all-test show that the null hypothesis (H0): the econometrics model does not exist is accepted across their model for all countries.

Additionally, the study used CUSUM and CUSUMQ for checking the problem of structural change. There is no evidence for this problem, and it involves the existence of a stable relationship between the variables. The relationship between the Crude OPEC Basket prices and Terrorist attacks is as follows::

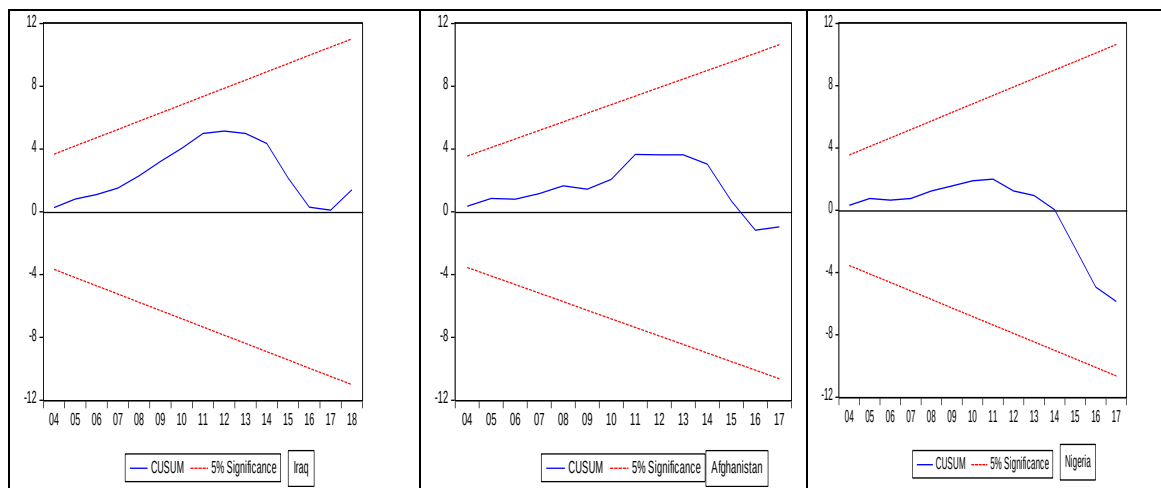


Figure (2): CUSUM and CUSUMQ test result

5. Conclusion: This study analyzes the relationship between terrorist attacks and OPEC Basket Prices in selected countries (Afghanistan, Iraq, and Nigeria) by combining cross-sectional and time series data from 2000 to 2020. Terrorist attacks, OPEC crude oil production, and world oil consumption were used as independent variables to explain changes in the OPEC Basket Price. A second-generation panel unit root test was employed to account for cross-sectional dependence. The long-run parameters were estimated using the Pooled Regression Model, Random Effects Model, and Fixed Effects Model.

The study revealed the existence of a long-term co-integration relationship between terrorist attacks and the price of crude oil in the selected countries. The result of this study, after applying the FEM model, shows that there is a positive and strong relationship between changes OPEC basket price and terrorist attacks, as the elasticity of terrorist attacks was positive, which means that the instability or increase in terrorist attacks in (Iraq, Nigeria and Afghanistan) affects the trend of OPEC Basket Price towards an increase. This result is consistent with the current reality, as OPEC Basket Price rose from (23.13) in 2002 due to the war in Afghanistan, and the increase in terrorist attacks in both Iraq and Nigeria during the period (2002-2008) affected the continuous rise in OPEC Basket Price to reach (94.1) in (2008). It is worth noting here that changes in OPEC Basket Price are not directly related to terrorist attacks. For example, the increase in terrorist attacks during the period (2014-2016) did not contribute to the rise in OPEC Basket prices, but on the contrary, OPEC Basket Price recorded a sharp decline during the period (2014-2016), which confirms the study (Urbanija et al., 2018) that the relationship between OPEC Basket prices and instability is related to the size and location of the terrorist operation.

Increased World oil consumption did not necessarily lead to higher OPEC basket prices, a counterintuitive outcome driven by several factors. Fundamental supply and demand dynamics play a significant role, as fluctuations in supply, inventory levels, and production costs greatly influence prices beyond mere consumption. Additionally, global economic shifts, particularly in major oil-consuming countries, can weaken demand and exert downward pressure on prices. The growing transition to renewable energy further reduces reliance on fossil fuels, diminishing demand for OPEC oil. Moreover, political and security instability in key oil-producing regions can disrupt production and supply chains, prompting countries to seek alternative energy sources and decreasing long-term demand for OPEC oil, ultimately contributing to lower prices. The relationship between OPEC Basket Price and OPEC crude oil production was positive. This is because OPEC controls more than 80% of the world's proven crude oil reserves, or nearly 40% of the global supply, and due to their high levels of reserves and production, OPEC member states have tried to balance their production with changes in OPEC Basket Price.

The results of the study indicate to mitigate the negative impact of terrorist attacks on OPEC Basket prices and stabilize their economies, Afghanistan, Iraq, and Nigeria must prioritize several key strategies. Firstly, enhanced security around oil infrastructure is crucial, achieved through advanced surveillance systems, robust cybersecurity measures, and dedicated security forces. Secondly, fostering regional and international cooperation through intelligence sharing and joint security operations is vital for combating terrorism effectively. Thirdly, diversifying their economies away from sole reliance on oil is essential. Investments in agriculture, manufacturing, and renewable energy sectors will enhance economic resilience.

Furthermore, stabilizing oil markets requires implementing flexible production policies aligned with global demand. Investing in renewable energy and expanding related infrastructure will support energy diversification. Establishing and maintaining strategic petroleum reserves can provide a buffer against supply disruptions. Finally, addressing the root causes of terrorist attacks through economic development, poverty reduction, and job creation initiatives is crucial for long-term stability. Strengthening governance and combating corruption in the oil sector will ensure that resources are managed effectively and contribute to sustainable economic growth. By implementing these strategies, these countries can reduce economic risks, stabilize oil production, and protect their economies from the volatility of OPEC Basket prices.

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