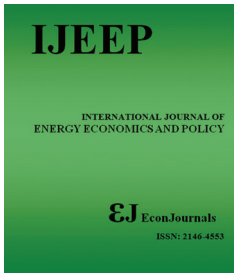

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Links between Oil Prices and Emerging Stock Markets: Evidence from Oil-importing versus Oil-exporting Countries

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ABSTRACT

This paper investigates the short- and long-term dynamics between oil prices and stock market indices in several emerging markets, distinguishing between oil-importing and oil-exporting countries. We use daily oil price data and thirteen stock market indices, covering the period from January 04, 2010 to December 31, 2019. The results of the Granger causality test reveal a significant short-term relationship, with stock indices influencing oil prices in exporting countries, while the reverse is true for importers. Long-term cointegration approaches confirm a stable relationship for both groups, with a consistent impact of stock markets on oil prices in exporting countries. However, for importing countries, the results remain heterogeneous, reflecting varied dynamics.

Keywords: Stock Market, Oil Prices, Cointegration, Causality
JEL Classifications: C22, G15, Q43

1. INTRODUCTION

The evolution of oil prices has become a major concern for global financial markets. The relationship between oil price fluctuations and stock market performance has garnered increasing attention from both researchers and investors. The economic impact of oil price variations has been underscored and marked by several pioneering studies, notably the work of Hamilton (1983). In his study, Hamilton demonstrated how fluctuations in oil prices played a crucial role in triggering economic recessions. These recessions, in turn, had significant repercussions on financial markets. This conclusion has prompted subsequent research to further explore the dynamics between oil shocks and stock markets.

However, the interactions between oil prices and stock markets can occur in both directions. For instance, during the oil shocks of the 1970s, rising oil prices led to a decline in stock indices in importing countries, due to higher production costs and economic slowdown. Conversely, during the 2008 financial crisis, the collapse of stock markets reduced global oil demand, leading to a drastic drop in oil prices.

This study stands out for its innovative approach. Based on a diverse sample of developing countries, it contributes to a deeper understanding of the relationship between the oil market and stock markets in the context of developing countries. The purpose of this study is to compare the interaction between oil prices and stock returns in oil-importing versus oil-exporting countries. Additionally, both short- and long-term interactions are analyzed. To do this, we first perform the Granger causality test and then proceed with cointegration analysis for time series (Engle and Granger, 1987), as well as for panel data (Pedroni, 1999).

In the short run, the results reveal a significant relationship between oil prices and stock market indices, with distinct dynamics depending on whether countries are oil exporters or importers. This relationship is more pronounced for exporting countries, where stock market returns influence oil prices. In contrast, for

importers, the causality runs in the opposite direction. The results also highlight a more limited influence for the group of importers. Cointegration tests reveal a long-term relationship between indices and oil prices for both groups of countries. For exporting countries, this relationship is consistent with short-term results, with stock market indices influencing oil prices. However, for importing countries, the results are more heterogeneous, preventing the identification of a uniform long-term dynamic.

The contribution of this paper is threefold. First, the results of previous studies are mixed, a variation that can be attributed to the economic dependence of countries on this natural resource. In our study, we distinguish between oil-importing and oil-exporting countries, to better understand the differentiated impact of this dependence on their respective economies. Second, this paper makes a significant contribution by relying on a large sample of developing countries, including some that are rarely studied. Additionally, our analysis benefits from a considerably larger number of observations, thanks to the use of daily data covering the period 2010-2019. Finally, we analyzed the long-term interactions for time series as well as for panel data, a field that has been scarcely studied (Lescaroux and Mignon, 2008; Am and Shanmugasundaram, 2017).

The remainder of this paper is structured as follows. Section 2 presents the literature review. Section 3 describes the data and explains the econometric methodology. Section 4 discusses the results, and finally, Section 5 concludes the paper and presents policy implications.

2. LITERATURE REVIEW

A large body of research has examined the links between oil prices and stock returns. Chen et al. (1986) were the first to investigate the impact of several macroeconomic variables, including oil prices, on stock returns. Their study found no compensation for oil price risk by the stock market. However, financial literature has shown a growing interest in this relationship, and the subject has become increasingly attractive.

Early research focused on sectoral analyses of the relationship between oil prices and stock returns. Most studies have been conducted for developed countries, concluding that the impact of higher oil prices depends on the sector's dependence on oil. For instance, Sadorsky (2001) analyzed the relationship between oil prices and the value of assets in Canada's "Gas and Oil" sector. Using a multifactor market model, he found that a 1% change in oil prices increases the revenues of oil and gas companies by 0.305%, thereby raising their stock market value. Sadorsky's (2001) results align with those of El-Sharif et al. (2005), who identified a consistently positive and highly significant relationship between crude oil prices and stock returns in the British "Gas and Oil" sector. However, sensitivity to oil prices in non-oil sectors is very low. In this context, Huang et al. (1996), using a VAR model, demonstrated the influence of future oil prices on the stock returns of U.S. oil companies. However, this impact was not significant for the stocks that make up the market index. In addition, Faff and Brailsford (1999) found that Australia's "Oil and Gas" and "Diversified Resources" industries are positively sensitive to oil prices, while "Paper and Packaging" industries, banks, and the transport sector exhibit negative sensitivity. Nandha and Faff (2008) reached a similar conclusion, observing that oil price increases generally reduce stock returns across most sectors, except for mining, and oil and gas industries. More recently, Ozkan Haykir et al. (2022) found that price explosivity leads to excess returns for oil-related companies, while negatively affecting oil-substitute and oil-user firms. These findings underscore that the impact depends on whether oil serves as an input or output for a given industry.

Other research has focused on analyzing the nexus between oil price variations and the aggregate stock index, assessing the degree of dependence of a country's financial activity on this natural resource and its capacity to absorb oil price shocks. Sadorsky (1999) applied a VAR model to U.S. data, showing that oil price volatility significantly influences real stock returns. Similarly, Papapetrou (2001), using a multivariate VAR model, revealed the impact of oil prices on Greek stock returns, where positive oil price shocks lead to a decline in stock returns. Using Granger causality tests, Coronado et al. (2018) found bidirectional causality between crude oil and stock market returns in the U.S. In parallel, Diaz et al. (2016) explored this relationship in the G7 countries, they found that an increase in oil price volatility is associated with a negative response in stock markets. Shen et al. (2024) exemined the impact of crude oil price on the DSEX broad index of the Dhaka stock exchange using the Vector Error Correction Model (VECM) for the study period 2013:01-2022:12. It has decomposed the oil price shock into supply side and demand side oil shock. The empirical result shows that the stock price decreases significantly with crude oil prices driven by the shock in oil production.

Few studies have focused on emerging or transition markets. Basher and Sadorsky (2006) used an international multifactor model, to study twenty-one emerging markets. Their results, based on daily data, highlight the significant role of oil prices. Elian and Kisswani (2018) analyzed the impact of oil prices on stock market returns in Kuwait from 2000 to 2015. Using the autoregressive distributed lag (ARDL) bounds testing approach, their findings reveal that fluctuations in oil prices negatively affect stock returns in both the short- and long-term. Wei et al. (2019) adopted a nonlinear threshold cointegration method, finding that Chinese stock returns and oil prices are cointegrated in the long run. Furthermore, their study reveals the significant impact of the oil market on the Chinese stock market through various macroeconomic channels, mainly the exchange rate. In the context of South Asia, Alamgir and Amin (2021) applied a nonlinear autoregressive distributed lag (NARDL) model. Their findings show a positive relationship, indicating that rising oil prices stimulate stock market returns. Akbulaev et al. (2022) investigated the impact of energy prices on stock market indices during the COVID-19 pandemic, focusing on four emerging economies: Russia, Turkey, Brazil, and India. Similarly, Kotsompolis et al. (2024) focused on the Chinese stock market and examined several financial variables, including stock and bond returns, exchange rates, and WTI crude oil prices. Conducted in the context of the COVID-19 pandemic, this research highlights, through Impulse

Response Functions (IRFs), an increased vulnerability of stock markets to oil price shocks, particularly during periods of economic uncertainty. Lou et al. (2024) found strong correlations between oil price fluctuations, fiscal policies, and stock market dynamics, highlighting the complex interdependence of these variables in GCC countries. Dong et al. (2024) analyzed the relationship between oil prices, country risks, and stock returns using a PVAR model on a sample of 29 economies from 2005 to 2020. Their study revealed significant differences between developed and developing countries in terms of sensitivity to country risks. Indeed, developing countries, being more vulnerable, experience a more pronounced impact of country risks on their stock markets.

Several studies differentiate between oil-importing and oil-exporting countries. Lescaroux and Mignon (2008) studied the influence of oil prices on economic activity for a large set of countries. They found a strong causality from oil prices to stock returns in three oil-importing countries: Belgium, France, and Italy. For European oil-importing countries, Cunado and de Gracia (2014) employed Vector Autoregressive (VAR) and Vector Error Correction Models (VECM). They observed a negative impact of oil price changes on most stock markets. On the other hand, Basher et al. (2018) studied eight oil-exporting countries using a Markov-switching model. They identified a significant impact of oil-supply shocks on stock returns in Kuwait, the UK, and the UAE, while oil-demand shocks were significant for Norway, Canada, Kuwait, Russia, Saudi Arabia, and the UAE. Youssef and Mokni (2019) investigated oil price dynamics in oil-exporting (Norway, Canada, and Russia) and oil-importing countries (U.S., Japan, and China) using a DCC-FIGARCH model. They found that oil shocks had a greater impact on exporting countries. Joo and Park (2021) used quantile regression techniques to analyze ten oil-importing countries. Their results revealed that oil price volatility negatively affects stock returns when both volatility and returns are low, while a positive effect emerges when returns are high and volatility is low. Using a VAR model, Banerjee et al. (2023) provided evidence of long-term integration between oil prices and the stock market in the UAE, showing a positive impact of oil prices on the ADX index. The Granger causality test confirmed a bidirectional relationship between the ADX index and oil prices. More recently, Olayungbo et al. (2024) explored oil prices and stock market interactions during the COVID-19 pandemic and Russia-Ukraine war using GARCH and Markov Switching models. During the COVID-19 crisis, stock returns reacted positively to oil price changes in Italy, Germany, and the US. Whereas, during the Russia-Ukraine war, this effect was limited to the U.S. Using the DCC-GARCH methodology, Behera and Rath (2024) reported strong interconnectedness between stock indices and oil prices, with significant shock transmission for oil-importing countries. These varied findings suggest that the nature of this relationship may depend on several factors, such as whether a country is an oil-importer or an oil-exporter nation. Thilaga and Rajkumar (2024) examined the dynamic comovements between two global risk factors and commodity futures returns. The study considers the daily futures price of nine commodities spanning from January 4th, 2012 to September 29th, 2023. The study results show a strong comovement between the US economic policy uncertainty (USEPU) and commodity futures return except for silver and mentha oil. On the other hand, the geopolitical risk (GPR) exhibits a weak relationship with gold, lead, zinc, and energy commodities across all-time frequencies.

Although significant efforts have been made to analyze the relationship between the oil price movements and the stock market, the existing literature presents mixed findings on the impact of oil price shocks on stock returns. This suggests that the connection between oil prices and stock returns requires further investigation. In this study, we aim to consolidate these findings using cointegration and causality approaches to determine the links between oil prices and stock markets.

3. DATA AND METHODOLOGY

3.1. Data

We consider a daily oil price series and thirteen daily stock index series during the period, from January 4, 2010, to December 31, 2019. The sample is divided into two groups. The first group comprises stock market indices for eight net oil-exporting countries: Argentina, Colombia, Ecuador, Egypt, Indonesia, Kuwait, Malaysia, and Mexico. The second group includes indices for five net oil-importing countries: Bangladesh, Brazil, Chile, China, and India. The data are sourced from the Datastream database. For the oil series, we use the price of West Texas Intermediate (WTI) crude, the benchmark for the American market. The data are obtained from the Energy Information Administration (EIA) website.

3.2. Descriptive Statistics

Table 1 below presents the descriptive statistics for daily stock index returns, as well as for oil price returns. Among oil-exporting countries, the highest average return is observed in the Colombian stock market (0.1461%), while the lowest is recorded in Malaysia (0.0252%). Among oil-importing countries, Bangladesh has the highest average returns (0.081%), while the lowest corresponds to Chile's stock market (0.0483%). In terms of risk, the Chilean stock market exhibits the lowest volatility (0.50%), while the highest risk is found in the Bangladesh Stock market, with a standard deviation of 2.4%. The kurtosis statistics indicate that the stock index series exhibit a leptokurtic distribution. The Skewness coefficients are close to zero, indicating a low asymmetry in the series. Consequently, the Jarque-Bera test confirms these results, significantly rejecting the normality assumption for stock index returns across all markets in the sample. This is a typical characteristic of financial time series.

Regarding the descriptive statistics for the oil price returns, the oil price shows the highest volatility in the whole sample, at 3.6%. As with the stock index series, the Skewness and Kurtosis coefficients confirm the rejection of the normality hypothesis for the oil series.

3.3. Methodology

We examine the relationship between oil prices and stock market indices in various emerging markets, analyzing both short- and long-term interactions. To achieve this, we employ causality and cointegration tests.

Table 1: Descriptive statistics on oil price and stock index returns

Markets	Mean10^{-3}	Max	Min	Stdev	Skewness	Kurtosis	J-B (Prob)	Obs
Oil price								
WTI	0.609	0.194	−0.271	0.036	−0.56	7.310	4310 (0)	2523
Oil exporting countries								
Argentina	0.665	0.182	−0.109	0.023	0.197	8.412	6400 (0)	2523
Colombia	1.461	0.171	−0.110	0.017	−0.071	17.900	48263 (0)	2523
Ecuador	0.631	0.291	−0.179	0.018	1.976	55.689	606856 (0)	2523
Egypt	0.808	0.146	−0.125	0.015	0.185	10.876	13513 (0)	2523
Indonesia	0.664	0.072	−0.101	0.013	−0.711	8.050	5983 (0)	2523
Kuwait	0.850	0.261	−0.241	0.012	0.345	228.021	11006767 (0)	2523
Malaysia	0.252	0.041	−0.061	0.008	−0.582	9.482	9427 (0)	2523
Mexico	0.679	0.077	−0.092	0.014	−0.117	3.251	1904 (0)	2523
Oil importing countries								
Bangladesh	0.810	0.008	−0.087	0.024	31.768	1316.470	3.75^{E}+08 (0)	2523
Brazil	0.611	0.083	−0.091	0.018	−0.261	4.134	338 (0)	2523
Chile	0.483	0.028	−0.036	0.005	−0.450	6.456	2772 (0)	2523
China	0.608	0.092	−0.091	0.014	0.068	8.436	6427 (0)	2523
India	0.626	0.081	−0.112	0.016	−0.765	7.345	4612 (0)	2523

The first step involves studying the stationarity of the stock index and oil price series. We apply stationarity and cointegration tests to both time series and panel data. The panel data approach allows us to detect patterns common to several groups of countries. Our analysis is based on standard tests for time series, which are the augmented Dickey-Fuller (ADF) test (Dickey and Fuller, 1979) and the Phillips-Perron (PP) test (Philips and Perron, 1988). For panel data, we use the IPS (Im et al., 2003) test and the MW test (Maddala and Wu, 1999) to assess stationarity.

In the second step, we apply Granger causality tests to examine the relationship and uncover the short-term dynamics between oil prices and stock market indices across different financial markets.

In the third step, we proceed with the long-term analysis. The Engle and Granger (1987) cointegration test is applied to time series, followed by the application of the Vector Error Correction Model (VECM) to capture the short- and long-term relationships between the variables. Additionally, we employ Pedroni's (1999) tests to investigate cointegration in panel data. These tests are relatively robust in the presence of heterogeneity among panel individuals, which is often the case in economic studies.

4. RESULTS AND DISCUSSION

4.1. Stationarity Tests

4.1.1. Stationarity tests on time series

We analyze the statistical characteristics of the individual series by applying the ADF and PP unit root tests to the logarithmic time series. The results are presented in Table 2. The unit root tests on the level series of the stock market indices and the oil price indicate that all series are non-stationary. Specifically, the values of the ADF and PP statistics exceed their critical values at various significance thresholds. However, when considering the first differences, all these values become lower than the critical threshold at the 1% significance level (Table 2), confirming the stationarity of all the data series in first differences. Consequently, all series are integrated of order one, I(1).

Table 2: Unit root tests on time series

Markets	Level		First difference	
	ADF	PP	ADF	PP
Oil price				
WTI	−0.695	−0.564	−46.921*** (1)	−45.632*** (1)
Oil exporting countries				
Argentina	−0.361	0.321	−41.832*** (1)	−41.873*** (1)
Colombia	−0.962	−0.985	−32.823*** (2)	−33.657*** (2)
Ecuador	−1.265	−3.472	−21.101*** (2)	−53.423*** (1)
Egypt	1.283	1.369	−41.637*** (2)	−41.834*** (2)
Indonesia	1.359	1.364	−41.378*** (2)	−41.387*** (2)
Kuwait	−0.253	−3.463	−37.381*** (2)	−55.189*** (2)
Malaysia	0.049	0.052	−36.764*** (1)	−36.816*** (1)
Mexico	0.516	0.971	−33.936*** (2)	−41.529*** (2)
Oil importing countries				
Bangladesh	−0.115	0.126	−46.125*** (1)	−46.186*** (1)
Brazil	−0.249	−0.251	−45.592*** (1)	−45.832*** (1)
Chile	−1.524	−1.674	−34.253*** (2)	−35.682*** (2)
China	0.832	0.829	−43.827*** (1)	−43.587*** (1)
India	1.248	1.251	−41.955*** (1)	−41.982*** (1)

ADF: Augmented Dickey–Fuller test. PP: Phillips–Perron test. (1): Model without constant, or deterministic trend. (2): Model with constant, without deterministic trend. (3): Model with constant and deterministic trend. ***: Rejection of the null hypothesis at the 1% significance level

4.1.2. Stationarity tests on panel data

To test for the presence of a unit root in the panel data, we apply the tests of Im et al. (2003) and Maddala and Wu (1999). These tests are selected for their flexibility and ability to account for heterogeneity between series in a panel. They are widely used in empirical studies, particularly in comparative macroeconomic analyses (Lescaroux and Mignon, 2008; Am and Shanmugasundaram, 2017). Table 3 shows that all the series are integrated of order 1. Specifically, the unit root hypothesis is not rejected for the logarithmic series at level; but it is rejected when the logarithmic series are in first differences. For the two groups considered, our results confirm that all the series are integrated of order 1, consistent with findings for the time series.

4.2. Short Term Analysis

To examine the short-term relationship between oil prices and stock market returns, we apply the Granger causality test, which

allows us to determine the direction of causality between the variables. Since our series are integrated of order 1, the test is conducted on the first differenced series. The results are summarized in Tables 4 and 5.

According to Fisher statistics, we observe the existence of causality between stock markets of exporters and oil prices at the 10% significance level. Specifically, the probabilities associated with the Fisher statistic are below the 10% threshold for three countries: Argentina, Egypt, and Malaysia (Table 4). This indicates the presence of unidirectional causal relationships from stock markets to oil prices. This result is consistent with Barsky and Kilian (2004), who demonstrate that macroeconomic variables cause oil price movements. However, most studies examining the relationship between oil prices and various macroeconomic and financial variables have considered oil prices as an exogenous factor.

For oil-importing countries, Table 5 reveals a single causal relationship, running from oil prices to the Indian market index, with a probability below the 10% significance threshold. The results align with the findings of Bildirici and Badur (2018), who also identified a unidirectional causality from oil prices to stock returns in India.

From these results, we concluded that, in the short term, there is indeed a relationship between oil prices and stock market indices. Our findings corroborate the existing literature, which states the interdependence between these two variables. We also find that the results are more limited for oil-importing countries.

Additionally, we note that the direction of the short-term relationship differs depending on the country's oil regime. For oil-exporting countries, the causality runs from the stock markets to oil prices, whereas for oil-importing countries, it flows in the opposite direction. This suggests that the short-term dynamics are heavily influenced by whether a country is an oil exporter or importer.

Table 3: Unit root tests on panel data

Markets	Level		First difference	
	IPS	MW	IPS	MW
Exporting countries	−1.053	24.308	−67.468***	2717.792***
Importing countries	3.051	13.291	−92.310***	4169.045***

***: Rejection of the null hypothesis at the 1% significance level

Table 4: Granger causality test, oil exporting countries

Causal direction	Fisher	P-value
Argentina/Oil price	2.772*	0.061
Oil price/Argentina	0.075	0.926
Colombia/Oil price	0.181	0.829
Oil price/Colombia	0.642	0.570
Ecuador/Oil price	0.424	0.645
Oil price/Ecuador	2.029	0.119
Egypt/Oil price	2.593*	0.073
Oil price/Egypt	1.214	0.297
Indonesia/Oil price	1.213	0.234
Oil price/Indonesia	1.461	0.208
Kuwait/Oil price	1.823	0.156
Oil price/Kuwait	0.524	0.621
Malaysia/Oil price	2.607*	0.074
Oil price/Malaysia	0.957	0.383
Mexico/Oil price	0.802	0.469
Oil price/Mexico	0.251	0.856

*(res.**,***): Reject the null hypothesis of absence of causality for a significance threshold of 10% (res. 5%, 1%)

4.3. Long Term Analysis

In order to determine the long-term relationship between oil prices and stock market returns, we first apply the Engle and Granger (1987) cointegration test to individual time series. To enhance the robustness of our results, we then use the Pedroni cointegration tests on panel data.

4.3.1. Cointegration tests on time series

The Engle-Granger test requires all series to be integrated of order 1. The test proceeds in two steps: first, estimating the statistical relationship between the two variables, and second, testing the stationarity of the residuals. If the series are cointegrated, the direction of causality is investigated using the Error Correction Model (VECM). The presence of a cointegration relationship between two variables implies that one variable contains predictive information about the other.

Table 6 presents the results of the cointegration tests and the causality direction, revealing the presence of ten long-term relationships and demonstrating the strong connection between oil prices and emerging stock markets.

We begin with the results of oil exporting countries, summarized in Table 6, which indicate the presence of long-term relationships in seven countries: Argentina, Colombia, Egypt, Indonesia, Kuwait, Malaysia, and Mexico. Regarding the direction of causality, the analysis reveals that causality always runs from stock markets to oil prices in all seven countries. This finding supports the short-term results but deviates from many studies, which predominantly focus on the influence of oil prices on financial markets (Lescaroux

Table 5: Granger causality test, oil importing countries

Causal direction	Fisher	P-value
Bangladesh/Oil price	0.387	0.682
Oil price/Bangladesh	0.043	0.951
Brazil/Oil price	0.989	0.359
Oil price/Brazil	0.873	0.367
Chile/Oil price	2.042	0.128
Oil price/Chile	0.519	0.593
China/Oil price	0.544	0.539
Oil price/China	0.051	0.951
India/Oil price	0.438	0.638
Oil price/India	2.462*	0.084

*(res.**,***): reject the null hypothesis of absence of causality for a significance threshold of 10% (res. 5%, 1%)

Table 6: Cointegration tests and causality

Causal direction	Oil exporting countries	Oil importing countries
Index → Oil price	Argentina, Colombia, Egypt, Indonesia, Kuwait, Malaysia and Mexico	Brazil
Index ← Oil price		
Index ←→ Oil price		Chile and India

Table 7: Pedroni panel cointegration tests

Markets	Panel cointegration tests				Group mean cointegration tests		
	v-stat	rho-stat	PP-stat	ADF-stat	rho-stat	PP-stat	ADF-stat
Oil exporting countries	3.876*	−2.986*	−1.754	−1.741	−2.565*	−1.996	−1.941
	0	0	(0.07)	(0.08)	(0.01)	(0.06)	(0.06)
Oil importing countries	4.726*	−4.214*	−2.588*	−2.364*	−3.758*	−2.623*	−2.675*
	0	0	(0.01)	(0.02)	0	(0.01)	(0.01)

Null Hypothesis: No cointegration. *Indicates rejection at 5% or lower

and Mignon, 2008; Wei et al., 2019; Akbulaev et al., 2022). Indeed, the results suggest a consistently positive relationship between stock market indices and oil prices. For example, in Argentina, à 10% increase in the index leads to a 5.9% rise in oil prices. However, contrasting findings exist in the literature. For example, Bani and Ramli (2019) reported a negative long-run relationship, where higher oil prices were associated with declining stock returns in Malaysia.

For oil-importing countries, the findings reveal a long-term relationship between stock markets and oil prices for three countries: Brazil, Chile, and India (Table 6). As with exporting countries, this relationship is positive. This result aligns with De Jesus et al. (2020) findings, which also identified a positive relationship between oil prices and stock markets in oil-importing emerging economies, likely due to the influence of the economic cycle.

Indeed, the causality is unidirectional and operates from the stock market to the oil prices in the case of Brazil, while it is bidirectional for India and Chile. These results align with Sahu et al. (2014), Sharma et al. (2018), and Akbulaev et al. (2022). To complete our results, we will apply cointegration tests on panel data.

4.3.2. Cointegration tests on panel data

Pedroni cointegration tests consider both intra-group and inter-group interactions. This test provides several statistics to evaluate cointegration within a multidimensional framework, offering a more complete understanding of the relationship between variables. Pedroni (1999) proposed a set of seven statistics based on the null hypothesis of no cointegration. These are divided into two categories: the first includes four tests based on the within dimension (intra-individual), focusing on the alternative hypothesis of cointegration within individual groups. The second category consists of three tests based on the between dimension (inter-individual), which are more general as they account for heterogeneity between individuals under the alternative hypothesis.

The results of Pedroni's test are presented in Table 7. The calculated statistics are well below the critical values for a significance level of 5% or lower for the two groups of countries. This implies the rejection of the null hypothesis of no cointegration. Consequently, the results of Pedroni's tests confirm the existence of a long-term equilibrium relationship between oil price fluctuations and stock indices movements.

The result reveals a strong dependence between oil prices and financial activity. Notably, the result of the panel cointegration test aligns with those obtained from individual time series analyses. This finding is particularly important as it highlights the long-term connections between the oil market and financial markets, offering valuable insights for diversification and risk management strategies.

5. CONCLUSION

The purpose of our work is to analyze the short- and long-term relationship between oil price fluctuations and stock index movements in emerging markets. In addition, we determine the interactions between the two variables studied during the period from 2010 to 2019. This analysis is conducted on both oil-importing and oil-exporting countries to assess whether this relationship depends on a country's import or export regime.

The first step involves applying the Granger causality test to discern the short-term dynamics. We find that the existence of a causal relationship is significant and always operates from stock markets to oil prices in three exporting countries: Argentina, Egypt, and Malaysia. Conversely, for the importing countries, we identify only one significant relationship, in the case of India, where the causality flows in the opposite direction. In the second step, we apply cointegration tests for time series (Engle and Granger, 1987) as well as panel data (Pedroni, 1999). Consistent with the findings of Lescaroux and Mignon (2008) and Youssef and Mokni (2019), the long-term cointegration results confirm a stable relationship for both groups of countries, with a consistent impact of stock markets on oil prices in exporting countries. However, for importing countries, results remain heterogeneous, reflecting varied dynamics.

The results of this study support the idea that the relationship between oil prices and stock market indices is dependent on the country's position in the global oil trade (exporter vs. importer), as well as on the economic characteristics of developing countries. Oil exporters in our sample appear to be more responsive to changes in global economic conditions, with a relationship where stock market indices influence oil prices. In contrast, for oil importers, oil prices seem to have a direct impact on stock markets, reflecting their vulnerability to fluctuations in energy prices. Our study highlights the distinct dynamics between these two groups of countries, which could have important implications for economic policies, especially in developing countries that often face challenges in managing external shocks, such as oil price fluctuations. Moreover, our findings are relevant to international portfolio management since they allow investors to better understand the factors to consider during periods of oil price increases or decreases.

REFERENCES

Akbulaev, N., Mammadli, E., Bayramli, G. (2022), The effect of energy prices on stock indices in the period of COVID-19: Evidence from Russia, Turkey, Brazil, and India. International Journal of Energy Economics and Policy, 12(3), 262-269.

Alamgir, F., Amin, S. (2021), The nexus between oil price and stock market: Evidence from South Asia. Energy Reports, 7, 693-703.

Am, M.A., Shanmugasundaram, G. (2017), Nexus between crude oil price, exchange rate and stock market: Evidence from oil exporting and importing economies. International Journal of Humanities and Management Sciences, 5(1), 2320-4044.

Banerjee, R., Majumdar, S., Mohammed, Z. (2023), Oil price changes and stock market performance in UAE: Evidence of cointegration persists in economic diversification era. International Journal of Energy Economics and Policy, 13(1), 552-561.

Bani, Y., Ramli, S.N. (2019), Does oil price matter for the Malaysian stock market? International Journal of Economics, Management and Accounting, 27(2), 315-329.

Barsky, R., Kilian, L. (2004), Oil and the macroeconomy since the 1970s. Journal of Economic Perspectives, 18(4), 115-134.

Basher, S., Haug, A., Sadorsky, P. (2018), The impact of oil-market shocks on stock returns in major oil-exporting countries. Journal of International Money and Finance, 86, 264-280.

Basher, S.A., Sadorsky, P. (2006), Oil price risk and emerging stock markets. Global Finance Journal, 17, 224-251.

Behera, C., Rath, B.N. (2024), The interconnectedness between crude oil prices and stock returns in G20 countries. Resources Policy, 91, 104950.

Bildirici, M.E., Badur, M.M. (2018), The effects of oil prices on confidence and stock return in China, India and Russia. Quantitative Finance and Economics, 3(1), 46-52.

Chen, N.F., Roll, R., Ross, S.A. (1986), Economic forces and the stock market. Journal of Business, 59, 383-403.

Coronado, S., Jiménez-Rodrguez, R., Rojas, O. (2018), An empirical analysis of the relationships between crude oil, gold and stock markets. The Energy Journal, 39, 193-208.

Cunado, J., de Gracia, F.P. (2014), Oil price shocks and stock market returns: Evidence for some European countries. Energy Economics, 42, 365-377.

De Jesus, D.P., Bezerra, B.F.L.S., Besarria, C.N. (2020), The non-linear relationship between oil prices and stock prices: Evidence from oil-importing and oil-exporting countries. Research in International Business and Finance, 54, 1-14.

Diaz, E.M., Molero, J.C., de Gracia, F.P. (2016), Oil price volatility and stock returns in the G7 economies. Energy Economics, 54, 417-430.

Dickey, D., Fuller, W. (1979), Distribution of the estimators for autoregressive time series with a unit root. Journal of the American Association, 74, 427-431.

Dong, Q., Du, Q., Du, A.M. (2024), Interplay between oil prices, country risks, and stock returns in the context of global conflict: A PVAR approach. Research in International Business and Finance, 72, 102545.

El-Sharif, I., Brown, D., Burton, B., Nixon, B., Russell, A. (2005), Evidence on the nature and extent of the relationship between oil prices and equity values in the UK. Energy Economics, 27, 819-830.

Elian, M.I., Kisswani, K.M. (2018), Oil price changes and stock market returns: Cointegration evidence from emerging market. Economic Change and Restructuring, 51, 317-337.

Engle, R.F., Granger, C.W.J. (1987), Cointegration and error-correction: Representation, estimation and testing. Econometrica, 64, 813-836.

Faff, R.W., Brailsford, T.J. (1999), Oil price risk and the Australian stock market. Journal of Business, 59, 383-403.

Hamilton, J.D. (1983), Oil and the macroeconomy since World War II. Journal of Political Economy, 91, 228-248.

Huang, R.D., Musulis, R.W., Stoll, H.R. (1996), Energy shocks and financial markets. Journal of Futures Markets, 16, 1-27.

Im, K.S., Pesaran, M.H., Shin, Y. (2003), Testing for unit roots in heterogeneous panels. Journal of Econometrics, 115, 53-74.

Joo, Y.C., Park, S.Y. (2021), The impact of oil price volatility on stock markets: Evidences from oil-importing countries. Energy Economics, 101, 105413.

Kotsompolis, G., Konstantakis, K.N., Stamos, D.L., Michaelides, P.G. (2024), Oil prices and developing stock markets: Evidence from East Asia. Development and Sustainability in Economics and Finance, 1, 100006.

Lescaroux, F., Mignon, V. (2008), On the influence of oil prices on economic activity and other macroeconomic and financial variables. OPEC Energy Review, 32(4), 343-380.

Lou, Q., Iqbal, N., Alraey, Y. (2024), Sensitivity to changes in oil prices, tax returns and the cross-section of stock returns: The present situation for net-oil exporting economies. Heliyon, 13, e33119.

Maddala, G., Wu, S. (1999), A comparative study of unit root tests and a new simple test. Oxford Bulletin of Economics and Statistics, 61, 631-652.

Nandha, M., Faff, R. (2008), Does oil move equity prices? A global view. Energy Economics, 30(3), 986-997.

Olayungbo, D.O., Zhuparova A., Al-Faryan M.A.S., Ojo M.S. (2024), Global oil price and stock markets in oil exporting and European countries: Evidence during the COVID-19 and the Russia-Ukraine war. Research in Globalization, 8, 100199.

Ozkan Haykir, O., Yagli, I., Gok, E.D.A., Budak, H. (2022), Oil price explosivity and stock return: Do sector and firm size matter? Resources Policy, 78, 102892.

Papapetrou, E. (2001), Oil price shocks, stock market, economic activity and employment in Greece. Energy Economics, 23, 511-532.

Pedroni, P. (1999), Critical values for cointegration tests in heterogeneous panels with multiple regressors. Oxford Bulletin of Economics and Statistics, 61(Suppl 1), 653-670.

Philips, P.C., Perron, P. (1988), Testing for a unit root in time series regression. Biometrika, 57, 335-346.

Sahu, T.N., Bandopadhyay, K., Mondal, D. (2014), An empirical study on the dynamic relationship between oil prices and Indian stock market. Managerial Finance, 4, 200-215.

Sadorsky, P. (1999), Oil prices shocks and stock market activity. Energy Economics, 21, 449-469.

Sadorsky, P. (2001), Risk factors in stock returns of Canadian oil and gas companies. Energy Economics, 23, 17-28.

Sharma, A., Giri, S., Vardhan, H., Surange, S., Shetty, R., Shetty, V. (2018), Relationship between crude oil prices and stock market: Evidence from India. International Journal of Energy Economics and Policy, 8(4), 331-337.

Shen, Q., Khandoker, M.S.H., Saha, J., Bhuyan, R. (2024), The impact of crude oil price shock: Evidence from Bangladesh. International Journal of Economics and Financial Issues, 14(6), 257-266.

Thilaga, M., Rajkumar, K.P. (2024), Dynamic comovement between Indian commodity futures, economic policy uncertainty and geopolitical risk: Evidence from wavelet analysis. International Journal of Economics and Financial Issues, 15(1), 397-411.

Wei, Y., Qin, S., Li, X., Zhu, S., Wei, G. (2019), Oil price fluctuation, stock market and macroeconomic fundamentals: Evidence from China before and after the financial crisis. Finance Research Letters, 30, 23-29.

Youssef, M., Mokni, K. (2019), Do crude oil prices drive the relationship between stock markets of oil-importing and oil-exporting countries? Economies, 7(3), 70.