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Article

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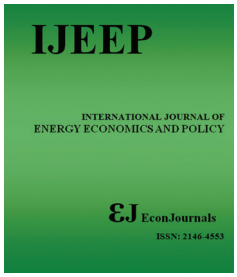

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Diaspora of Energy: A Case of Oil Production and Consumption

Muzammil Khurshid[1], Muhammad Azeem[2]*, Nisar Ahmad[3], Jamshaid Ur Rehman[4], Sajjad Umar[5]

[1]Department of Banking and Finance, University of the Punjab, Gujranwala Campus, Pakistan, [2]Department of Management Sciences, University of Central Punjab, Gujranwala Campus, Pakistan, [3]Hailey College of Commerce, University of the Punjab, Lahore, Pakistan, [4]Department of Economics, Government College University Lahore, Pakistan, [5]University of the Punjab, Gujranwala Campus, Pakistan. *Email: azeem.grw@ucp.edu.pk

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ABSTRACT

The study evaluates the nexus among oil prices, macro-economic indicators and stock returns of three Asian emerging oil-importing and three Asian emerging oil-exporting economies over a period from 2014 to 2019 on monthly observations. The study has made use of measure of association by applying VAR methodology. The results of the study indicate that oil prices movements have substantial impact on stock market trends whereas, the said impact varies depending upon the inherited macroeconomic condition of county. As regarding the oil-exporting countries the movement of oil prices is also equally important for the stock market behavior.

Keywords: Oil Prices, OPEC Countries, Capital Market
JEL Classifications: G30, M26, H16

1. INTRODUCTION

Investment in the stock exchange is a critical decision for many investors due to the involvement of massive risk. The stock prices are functions of multiple factors which may turn the court into any direction (Patil and Bagodi, 2021). A developing country mostly feels the heat of unbalanced balance of payment due to massive prevalence of energy imports particularly in the form of coal, gas and mainly crude oil (Diercks et al., 2008). For instance, most of the Asian countries spend about one fourth of total imports bill on curd oil.

In recent past the industrialized economies faced the issue of stagnation in their businesses as a result of oil price crisis in the year of 1973. As the figure 1 shows the consumption and production of oil pattern in Asian countries The said phenomena became the main exploring area for research scholars for many years after the event. Precisely, Vo and Ding (2011) established that a surge in oil prices leads to inflation by rising in cost of production. Furthermore, petroleum may be considered as one of most important component of developing economies because the entire economy may absorb the heat of said component. According to Noor and Dutta (2017) oil prices are a crucial component of an economy, their fluctuations and volatility can have a direct link with capital market performance. However, the effect of variations differs across different industries and countries as well (Al-salman and Herrera, 2015). The Shanghai stock exchange's market returns are negatively impacted by rising oil prices in both the long run and the short term (Khan et al., 2019; Masood et al., 2019). Hence, it has been probed that stock market performance is also a function of oil prices.

There are other factors that might affect market ups and downs, such as political news and commercial profits, but macroeconomic variables like inflation, GDP, interest rates, and currency rates have the greatest impact on long-term stock prices.One of the most important economic and financial elements of determining the value and cash flows of stock market is the exchange rate of respective

country. Since the discontinuation of fixed exchange system just right after the breach of Breton-wood agreement in the 1970s, the sparking area of currency movements began after. The tremendous increase in global trade and the implementation of floating exchange rate regimes by many countries have increased exchange rate volatility a lot. The importance of exchange rates lies in their ability to be regularly modified in relation to the market forces driving foreign currency in a certain country. It enables a government to pursue fiscal system with flexibility without worrying about how it may affect the balance of payments (Khan, 2019). Numerous researches have been conducted on exchange rate volatility, and the majority of them have come to the same conclusion that the: changes in stock returns seem to be directly correlated with changes in exchange rates. As Fama (1970), indicated that the yields of stock market are perceived in terms of market efficiency. Stock market efficiency depends on accuracy of macroeconomic variable information that derives the stock market returns. There is also another significant economic indicator that is, "industrial production" refers to the output of businesses engaged in manufacturing, electricity, gas, condensation, and other energy-related activities. This indicator shows variation in the volume of production output by a measurement of an index based on a time span.

According to Tainer (2006), the industrial production index is unsustainable, increases during periods of economic boom and decreases during periods of recession. Usually, it serves for the intensity of genuine economic activity, that is, an increase in industrial production might indicate a strengthening of the economy. As Fama (1990) suggested that a positive correlation between industrial production and projected future cash flows of firms. In fact, the growth in industrial production directly affects an economy's ability to provide goods and services, which in turn affects firms' capacity to produce cash flows indeed. Global economic growth is boosted by international trade, which can also play a significant role in a nation's economic expansion. International trade encourages effective resource allocation, enables a nation to achieve economies of scale, facilitates the dissemination of knowledge, fosters technological advancement, and encourages competition in both local and foreign markets, which results in the efficiency of production methods and the creation of novel products (Blavasciunaite et al., 2020). The worth of a currency is never constant in the global economy but the cost of products and services, however, is more likely to rise due to inflation factor.

The economy will suffer from an increase in inflation, which will have an influence on a company's declining profits resulting adverse effects on stock returns. The local currency's depreciation may result in inexpensive exports, which would raise demand for commodities, which would enhance profits and cash flow owing to higher sales, and hence the share price respectively (Flannery and Protopapadakis, 2002). Depreciation may also result in higher interest rates on loans, which would decrease cash flows and, in turn, the demand for shares. A rise in the stock index will entice global investors to consolidate their holdings there, which will improve investor sentiment and aid in currency appreciation. Besides, the inflation rate, industrial production, exchange rate and trade balance (macroeconomic variables) and direct impact on the performance of stock market. There is a new horizon that defines how stock prices may be influenced by international oil prices precisely, the current study has focused on the aforesaid issue thoroughly. However, it is the uniqueness of the said study it has considered both oil importing (Pakistan, India, and China) and exporting (Russian, Indonesia, and Turkey) countries collectively to understand how the said factors may affect the oil exporting and importing countries differently.

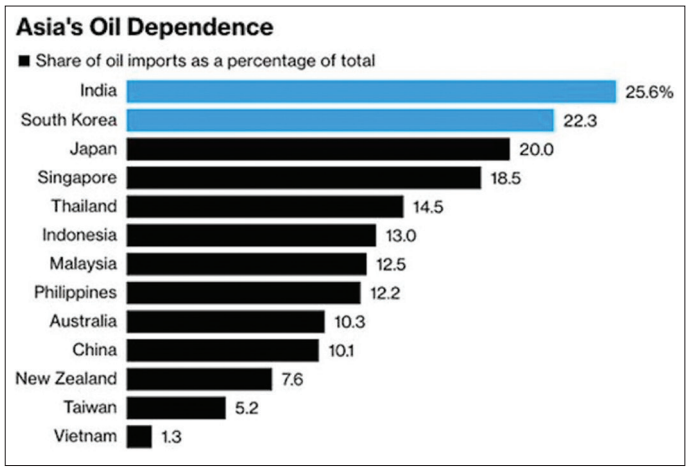
It is a worth mentioning fact that every country needs oil to run its normal business operations however, with each passing day the dependence of countries' on oil in increasing meanwhile, the researchers also in a race to find the alternative of said. Oil production and consumption are main side issues each oil importing country has up to some extent inherited oil but its self-sufficiency hurts as consumption peaks. The ever widening gap between production and consumption demonstrate that particularly, Pakistan, India and China are importing more oil as the time in running forward as showed in figures 3,4 and 7 respectively. Moreover, as in Figure 2 the same trend is also explained by the Indonesian trends also. Consequently, the major economic stakeholders of said counters definitely by influenced by the international movements of oil prices and its fast reflection may have appeared in the line of capital markets indices of respective country.

Furthermore, case of oil exporting countries is bit different they are either self-sufficient in oil production or they export the rest and earn handsome amount of foreign exchange reserves as showed in figures 5 and 7. Moreover, as in Figure 6 the same trend is also explained by the Turkish trends also. The major economic stakeholders of oil exporting countries are also be influenced by the international movements of oil prices and its fast reflection may appeared in the line of capital markets indices of respective country. Therefore, the said study is designed is such a way to cope up the probable impact of international oil prices movements on the capital market of oil producing and consuming countries.

2. LITERATURE REVIEW

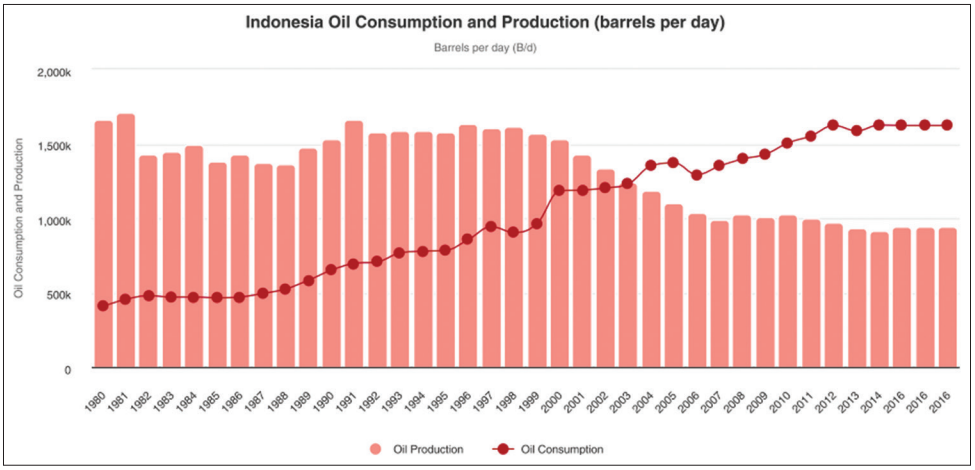
Bhattacharya and Mukherjee (2002) investigated the impact of macroeconomic indicators on Bombay stock exchange and they

Figure 1: Oil dependence by countries



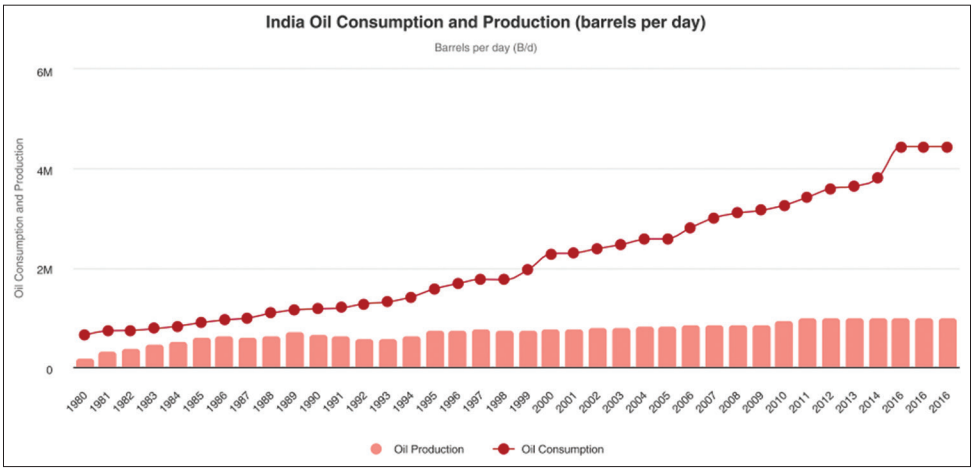
Source: Bloomberg, 2022

Figure 2: Indonesian oil production and consumption.



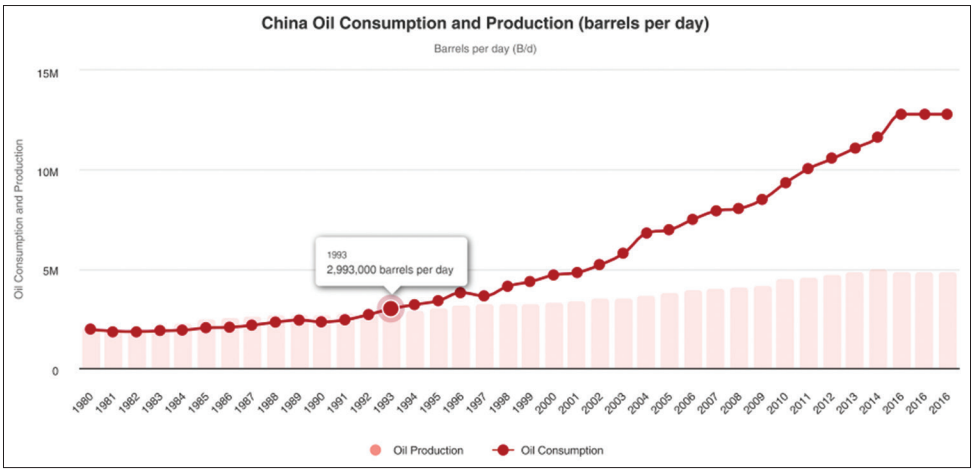
Source: Worldometer, 2023

Figure 3: India oil production and consumption.



Source: Worldometer, 2023

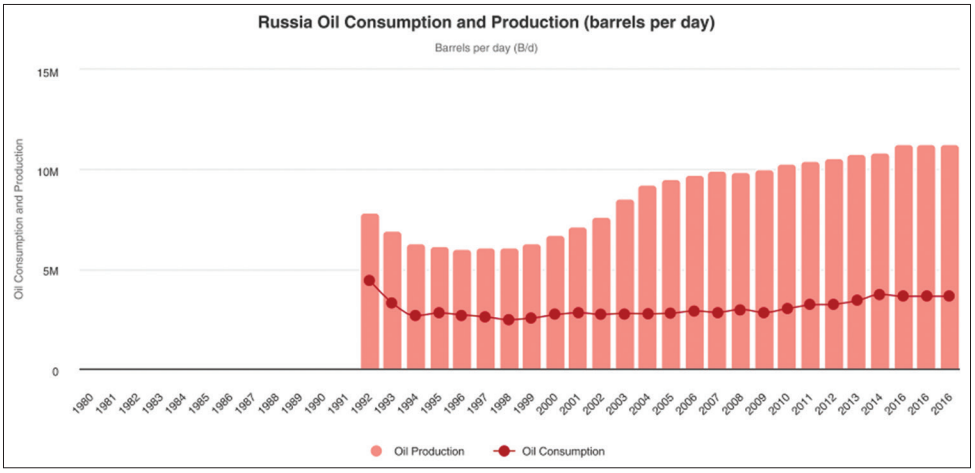
Figure 4: China oil production and consumption.



Source: Worldometer, 2023

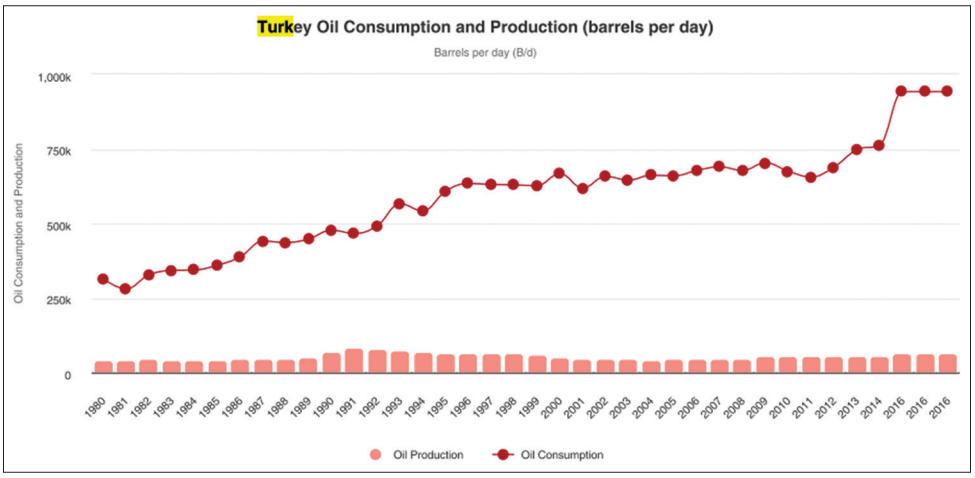
found that there is no effect of trade balance on stock return, their all results were insignificant showing no effect of these variables on stock return. Quadir (2012) made research on Dhaka stock exchange by taking data from time period 2000-2007 monthly data to find the impact of industrial production and interest rate on DSE return by using "Autoregressive Integrated Moving Average model. The results obtained from research indicated that both economic indicators interest rate and industrial production

Figure 5: Russia oil production and consumption.



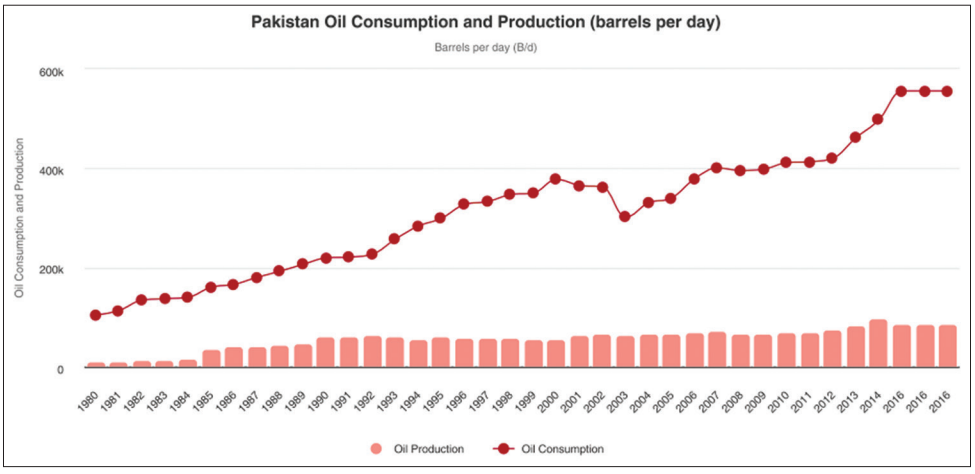
Source: Worldometer, 2023

Figure 6: Turkey oil production and consumption.



Source: Worldometer, 2023

Figure 7: Pakiatan oil production and consumption.



Source: Worldometer, 2023

had no impact on DSE firms because results obtained were insignificant and positive. Ouma and Muriu (2014) explored the effect of macroeconomic indicators on stock returns of Kenya by using the time period 2003 to 2013 with independent variables like money supply exchange rates, and inflation rate and applied the" Ordinary Least Square (OLS) technique" to check the model validity. The results show that inflation and money supply are significant effect on the returns at Nairobi stock exchange

(NSE). The result also shows reverse effect on exchange rates and stock returns, while interest rate has no any effect on return of NSE. Zaighum (2014) checked the impact of macroeconomic indicators (industrial production index, consumer price index, risk free return, market returns, and money supply on stock returns of non-financial sectors listed in Karachi stock exchange (KSE) by using time interval period from 2001 to 2011. The research used panel analysis with "pooled Ordinary Lease Square (OLS)." The results indicate that except industrial production which shows direct association between stock return all other variables has negative impact on stock return. Sarwar et al. (2014) investigated the impact of macroeconomic indicators including industry index, CPI, crude oil and exchange rate by taking data from year 1997 to year 2003 of KSE 100 index firms, their results show negative relation of trade balance and exchange rate with stock return and positive relation with oil price with stock return.

Nijam et al.(2015) explored the relationship between macroeconomic indicators and returns of stock markets of Sri Lanka. Independent variables were, balance of payment, GDP, inflation, exchange rate and interest rate by taking time period 1980-2012 with the help of "Ordinary Lease Square (OLS)" regression model. The results indicate that, exchange rate GDP and interest rate have positive and significant impact with stock performance in Sri Lanka, whereas inflation has reverse and significant impact on stock returns of Sri Lanka. Amtiran et al. (2017) investigated the impact of GDP, inflation rate interest rate and exchange rate on stock returns of Indonesia stock exchange (ISE) manufacturing companies with time frame of year 2007-2014 with the help of ordinary least square. The results indicate that exchange rates, interest rate and GDP have positive impact on stock returns, whereas inflation has a negative impact with manufacturing companies listed in ISE. Andika et al. (2019) find the relationship of trade balance on Indonesia stock exchange with others macroeconomic indicators consumer price index and interest rates, their findings show that trade balance has positive effects on stock return of Indonesia stock exchange.

The return on the stock market was considered the dependent variable, while the real interest rate, inflation rate, GDP growth rate, growth rate of the foreign exchange reserves, fiscal deficit, FDI to GDP ratio, and exchange rate were considered the independent factors. The data set included information for Bangladesh, India, Pakistan, Sri Lanka, and Nepal from 1993 to 2019. It was discovered that there are some associations between the stock market returns and these independent factors after observing the macroeconomic and stock market patterns of these countries (Alam, 2020).

3. METHODOLOGY

The study intends to investigate the impact of international oil prices on the stock market performance oil exporting and importing countries[1] as well on monthly date from 2014 to 2019. The stock markets return for the proxies of market performance, Brent oil prices, and selected macroeconomic variables as exchange rate, inflation, industrial production, and trade balance are used in this study as showed in table 1. However, in order to address the issues of currency abnormalities and varying exchange rate equalities and making them generalize all dollar denominated data has been used. All the data is extracted from the valid sources like stock exchanges and central banks of respective countries

For multivariate time series, the model used for analysis in this study is the VAR model. Basic equations of VAR Model are given below.

$$x_t=\alpha_0+\alpha_1 x_{t-1}+\alpha_2 y_{t-1}+u_t$$

$$y_t=\beta_0+\beta_1 x_{t-1}+\beta_2 y_{t-1}+v_t$$

By using the above discussed VAR basic equation, the basic vector autoregressive equations used in this study are given below:

$$SR_t=\alpha_0+\alpha_1 OIL_{t-1}+\cdots+\alpha_n OIL_{t-n}+\alpha_2 ER_{t-1}+\cdots+\alpha_{2n} ER_{t-n}+\alpha_3 IN_{t-1}+\cdots+\alpha_{3n} IN_{t-n}+\alpha_4 TB_{t-1}+\cdots+\alpha_{4n} TB_{t-n}+\alpha_5 IP_{t-1}+\cdots+\alpha_{5n} IP_{t-n}+u_t$$

$$OIL_t=\alpha_0+\alpha_1 SR_{t-1}+\cdots+\alpha_n SR_{t-n}+\alpha_2 ER_{t-1}+\cdots+\alpha_{2n} ER_{t-n}+\alpha_3 IN_{t-1}+\cdots+\alpha_{3n} IN_{t-n}+\alpha_4 TB_{t-1}+\cdots+\alpha_{4n} TB_{t-n}+\alpha_5 IP_{t-1}+\cdots+\alpha_{5n} IP_{t-n}+u_t$$

$$ER_t=\alpha_0+\alpha_1 SR_{t-1}+\cdots+\alpha_n SR_{t-n}+\alpha_2 OIL_{t-1}+\cdots+\alpha_{2n} OIL_{t-n}+\alpha_3 IN_{t-1}+\cdots+\alpha_{3n} IN_{t-n}+\alpha_4 TB_{t-1}+\cdots+\alpha_{4n} TB_{t-n}+\alpha_5 IP_{t-1}+\cdots+\alpha_{5n} IP_{t-n}+u_t$$

$$IN_t=\alpha_0+\alpha_1 SR_{t-1}+\cdots+\alpha_n SR_{t-n}+\alpha_2 OIL_{t-1}+\cdots+\alpha_{2n} OIL_{t-n}+\alpha_3 ER_{t-1}+\cdots+\alpha_{3n} ER_{t-n}+\alpha_4 TB_{t-1}+\cdots+\alpha_{4n} TB_{t-n}+\alpha_5 IP_{t-1}+\cdots+\alpha_{5n} IP_{t-n}+u_t$$

$$TB_t=\alpha_0+\alpha_1 SR_{t-1}+\cdots+\alpha_n SR_{t-n}+\alpha_2 OIL_{t-1}+\cdots+\alpha_{2n} OIL_{t-n}+\alpha_3 ER_{t-1}+\cdots+\alpha_{3n} ER_{t-n}+\alpha_4 IN_{t-1}+\cdots+\alpha_{4n} IN_{t-n}+\alpha_5 IP_{t-1}+\cdots+\alpha_{5n} IP_{t-n}+u_t$$

$$IP_t=\alpha_0+\alpha_1 SR_{t-1}+\cdots+\alpha_n SR_{t-n}+\alpha_2 OIL_{t-1}+\cdots+\alpha_{2n} OIL_{t-n}+\alpha_3 ER_{t-1}+\cdots+\alpha_{3n} ER_{t-n}+\alpha_4 IN_{t-1}+\cdots+\alpha_{4n} IN_{t-n}+\alpha_5 TB_{t-1}+\cdots+\alpha_{5n} IP_{t-n}+u_t$$

Where SR=Stock returns, OIL=Oil prices, ER=Exchange rate, IN=Inflation, TB=Trade balance IP=Industrial production

4. RESULTS

The study intends to investigate the impact of international oil prices on the stock market performance of oil importing and exporting countries from the period of July 2014 to December

Table 1: Details of indices

S. No.	Country	Data courses
1.	Pakistan	1. State bank of Pakistan and Pakistan Bureau of Statistics, Government of Pakistan 2. Pakistan Stock Exchange (PSX).
2.	India	1. Central bank of India and the Indian Ministry of Commerce 2. Bombay Stock Exchange (BSX).
3.	Russia	1. The Central Bank of Russian Federation 2. Moscow Stock Exchange (MSX).
4.	Indonesia	1. Bank Indonesia 2. Indonesia Stock Exchange (ISX).
5.	Turkey	1. The Central Bank of the Republic of Turkey 2. Borza Istanbul Stock Exchange (BIST).
6.	China	1. National Bureau of Statistics of China 2. Shanghai Stock Exchange (SSE).

2019. It is the de-facto prelim to reinsure the suitability of raw data for analysis and inferences by insuring the normality of the data first. It is pre assumption that the mean and variance of the time series must be constant over the period of time. Therefore, the normality of the data has been assured by using "Augmented Dickey-Fuller Test (ADF)". After making all variables stationary "Vector Auto-regression (VAR)" model is applied.

The Table 2 indicates that the oil prices have not the substantial impact on the performance of stock market particularly, with respect to the case of China. It is not the abnormal finding of the current study as of most of the existing studies have proved the so, the aforesaid effect may be a reason of China's attraction for foreign investments (Mughal and Hamza, 2022).

The above mentioned table indicates that the oil prices have substantial impact on the performance of stock market particularly, with respect to the case of Pakistan. It is worth mentioning fact that Pakistan is an oil dependent country and most of its economy and foreign exchange usage depends on oil consumption and imports (Sarwar et al., 2014). The results of "Vector Auto-Regressive Model" also confirm the effect of oil prices on stock returns on the 1st and 3rd lags. It means that oil prices have a direct relation with stock returns (Huang et al., 1996; Sadorsky, 1999; Papapetrou, 2001; Basher and Sadorsky, 2006; Jiranyakul, 2006; Park, 2008).

The results of Indian context is not much variant from the other counterparts as stated in Table 3. As India also imports substantial high crude oil from the world therefore, the trajectory of oil prices defiantly effects the economic progression and the performance of stock market as whole (Amtiran et al., 2017).

In case of India the results of Table 4, show that oil prices have no impact on Indian stock returns.

The results mentioned in Table 5 indicate that there is a relationship between oil prices and stock market performance of Indonesian stock market. However, the aforesaid relationship is not so much pronounced as the oil exports quota of Indonesia is not so much higher (Siddiqui and Muhammad, 2014).

With respect to Indonesia and Turkey, the results show the negative effects of oil prices on stock returns at the first lag as also established by previous scholars (Tweneboah and Adam, 2008; Ramos and Veiga, 2013; Siddiqui and Muhammad, 2014). The reason behind the negative effect of oil prices on stock returns may be the inflation. As all the sectors which are oil-based such as: chemical, agriculture, transportation, and production are suffered from inflation, and maybe, this inflation results in a high cost in all aspects. The negative effect in Turkey is not in the long run, and it shows a positive effect on the 2nd lags with the same results of the Russian economy where the effect of oil prices is also positive on 2nd lags.

Overall the results of Table 6 and 7, in a comparison with countries indulged in either export or import of oil, Pakistan,

Table 2: China VAR outcomes (oil importing country)

Variables	CSR	COIL	CIN	CER	CTB	CIP
L.CSR	0.267**	8.026	−0.225	0.00153	−37.65	0.115
	(0.127)	(10.08)	(0.935)	(0.00303)	(24.46)	(0.913)
L2.CSR	−0.134	0.395	1.717*	−0.00309	51.26**	1.300
	(0.125)	(9.927)	(0.921)	(0.00298)	(24.10)	(0.899)
L.COIL	0.00298*	0.930***	−0.00993	−5.06e-05	−0.819***	0.0140
	(0.00161)	(0.127)	(0.0118)	(3.83e-05)	(0.309)	(0.0115)
L2.COIL	−0.00166	−0.178	0.00958	2.92e-05	0.609**	−0.0149
	(0.00137)	(0.109)	(0.0101)	(3.28e-05)	(0.265)	(0.00988)
L.CIN	−0.0215	2.465	0.0462	0.000654	−5.761	0.0973
	(0.0200)	(1.585)	(0.147)	(0.000476)	(3.846)	(0.144)
L2.CIN	0.0130	1.331	−0.136	0.000749*	−11.09***	0.216*
	(0.0166)	(1.321)	(0.123)	(0.000397)	(3.207)	(0.120)
L.CER	3.425	246.4	−1.154	0.484***	549.7	3.349
	(5.332)	(423.3)	(39.29)	(0.127)	(1,027)	(38.34)
L2.CER	−1.026	−245.6	−97.83**	−0.0827	−2,540**	−47.20
	(5.351)	(424.8)	(39.42)	(0.128)	(1,031)	(38.47)
L.CTB	0.000521	−0.143***	0.00607	−5.47e-06	0.310***	0.00111
	(0.000575)	(0.0456)	(0.00423)	(1.37e-05)	(0.111)	(0.00413)
L2.CTB	0.00110*	−0.0226	0.00196	−1.74e-05	0.0450	−0.00262
	(0.000576)	(0.0457)	(0.00424)	(1.37e-05)	(0.111)	(0.00414)
L.CIP	0.00389	−1.129	−0.163	−0.000374	12.85***	0.692***
	(0.0204)	(1.623)	(0.151)	(0.000488)	(3.938)	(0.147)
L2.CIP	−0.0220	2.903	0.237	0.000125	−12.53***	0.131
	(0.0230)	(1.827)	(0.170)	(0.000549)	(4.436)	(0.166)
Constant	−0.100	16.76***	−0.283	0.00219	39.03***	0.425
	(0.0673)	(5.342)	(0.496)	(0.00161)	(12.97)	(0.484)

Standard errors in parentheses ***P<0.01, **P<0.05, *P<0.1. Where CSR: China stock returns, COIL: China oil prices, CER: China exchange rate, CTB: China trade balance, CIP: China industrial production , CIN: China inflation rate

Table 3: Pakistan VAR outcomes (oil importing country)

Variables	PSR	POIL	PIN	PER	PTB	PIP
L.PSR	−0.751***	7.129	−1.286	0.000342	878.0	−18.03*
	(0.117)	(12.75)	(1.301)	(0.000228)	(13,616)	(9.927)
L2.PSR	−0.593***	3.091	−0.733	0.000198	−1,659	15.69
	(0.155)	(16.90)	(1.724)	(0.000302)	(18,044)	(13.15)
L3.PSR	−0.481***	−7.252	2.424	−0.000155	−20,235	20.42
	(0.168)	(18.38)	(1.875)	(0.000328)	(19,622)	(14.31)
L4.PSR	−0.248*	0.0491	0.0344	−0.0008***	−43,464***	8.101
	(0.132)	(14.37)	(1.466)	(0.000257)	(15,342)	(11.18)
L.POIL	0.00309***	1.026***	0.0221*	−2.78e-06	−366.7***	0.216**
	(0.00120)	(0.131)	(0.0133)	(2.34e-06)	(139.6)	(0.102)
L2.POIL	−0.0043***	−0.256	−0.00565	−4.91e-06	322.1*	−0.266*
	(0.00166)	(0.182)	(0.0186)	(3.25e-06)	(194.1)	(0.142)
L3.POIL	0.00537***	0.129	−0.0312	3.91e-06	136.5	0.0952
	(0.00174)	(0.190)	(0.0194)	(3.40e-06)	(203.2)	(0.148)
L4.POIL	−0.0038***	−0.0970	0.00353	7.26e-07	−152.0	−0.0179
	(0.00123)	(0.134)	(0.0137)	(2.40e-06)	(143.3)	(0.104)
L.PIN	−8.70e-05	0.977	−0.0916	5.93e-05***	599.8	0.257
	(0.0108)	(1.183)	(0.121)	(2.11e-05)	(1,264)	(0.921)
L2.PIN	−0.0187*	−2.074*	−0.180	−2.01e-05	−2,678**	−1.296
	(0.0106)	(1.158)	(0.118)	(2.07e-05)	(1,237)	(0.902)
L3.PIN	0.0179*	−1.807*	0.0288	9.39e-06	2,841**	−0.435
	(0.00964)	(1.053)	(0.107)	(1.88e-05)	(1,124)	(0.819)
L4.PIN	0.0122	0.221	−0.127	−2.92e-05	1,733	2.530***
	(0.0101)	(1.102)	(0.112)	(1.97e-05)	(1,177)	(0.858)
L.PER	157.2***	−3,827	−691.6	0.423***	1.523e+06	3,012
	(57.36)	(6,264)	(639.2)	(0.112)	(6.689e+06)	(4,876)
L2.PER	−97.55*	5,423	341.5	−0.313***	2.943e+06	8,377*
	(58.32)	(6,369)	(649.9)	(0.114)	(6.800e+06)	(4,958)
L3.PER	98.05*	−4,874	−1,629**	0.161	7.508e+06	1,177
	(57.84)	(6,316)	(644.5)	(0.113)	(6.744e+06)	(4,917)
L4.PER	−169.1***	6,359	−665.4	−0.129	4.329e+06	10,429**
	(56.96)	(6,220)	(634.7)	(0.111)	(6.642e+06)	(4,842)
L.PTB	1.09e-06	−0.00026**	−1.03e-05	6.20e-09***	0.572***	−0.000169*
	(1.02e-06)	(0.000111)	(1.14e-05)	(1.99e-09)	(0.119)	(8.68e-05)
L2.PTB	−4.47e-07	0.000321**	−9.38e-06	−3.30e-09	0.0655	0.000256**
	(1.19e-06)	(0.000130)	(1.32e-05)	(2.32e-09)	(0.138)	(0.000101)
L3.PTB	8.79e-07	−0.000214	7.18e-06	−1.42e-09	−0.145	−0.000136
	(1.20e-06)	(0.000131)	(1.34e-05)	(2.35e-09)	(0.140)	(0.000102)
L4.PTB	1.98e-06*	−0.000188	−3.11e-05**	2.86e-09	−0.159	5.19e-05
	(1.09e-06)	(0.000119)	(1.21e-05)	(2.12e-09)	(0.127)	(9.23e-05)
L.PIP	0.00193	−0.202	−0.00478	5.89e-07	53.41	0.231*
	(0.00150)	(0.164)	(0.0167)	(2.92e-06)	(174.6)	(0.127)
L2.PIP	−0.00295**	−0.250	0.00292	1.97e-06	29.77	0.187
	(0.00148)	(0.162)	(0.0165)	(2.89e-06)	(172.6)	(0.126)
L3.PIP	0.000764	0.242	−0.0181	−5.16e-06*	−255.4	0.275**
	(0.00141)	(0.153)	(0.0157)	(2.74e-06)	(163.9)	(0.119)
L4.PIP	−0.00139	−0.0357	−0.0392**	5.45e-06*	157.7	0.0317
	(0.00146)	(0.159)	(0.0163)	(2.85e-06)	(170.1)	(0.124)
Constant	0.0309	8.675**	0.734**	0.000162**	−5,496	0.0595
	(0.0329)	(3.587)	(0.366)	(6.41e-05)	(3,831)	(2.793)

Standard errors in parentheses***P<0.01, **P<0.05, *P<0.1. Where PSR: Pakistan Stock Returns, POIL: Pakistan Oil prices, PER: Pakistan exchange rate, PTB: Pakistan trade balance, PIP: Pakistan industrial production, PIN: Pakistan inflation rate

and China in oil-importing countries whereas, Turkey and Russia in oil-exporting countries have positive relation of oil prices on stock returns on different lags in each economy. It implies that a surges in oil prices lead towards profit hiking for corporations dealing in oil business. Indonesia and Turkey also have negative impacts on different lags along with their impacts on oil prices on stock returns. By comparing the results of oil-importing and oil-exporting countries, the results show that in Pakistan, from the oil-importing economy and Russia from the oil-exporting economy, both have a positive impact on stock returns where Turkey has negative effects on different levels of lags from oil-exporting countries. China and India from oil-importing and Indonesia from oil-exporting countries have no effect of inflation on stock returns of their economies.

4.1. Granger Causality Wald Tests Estimation Output

It is very crucial in econometric to establish the impact between the variables in long run or short run, therefore, different economic models have been used to segregate the said effects. Granger

Table 4: India VAR outcomes (oil importing country)

Variables	ISR	IOIL	IIN	IER	ITB	IIP
L.ISR	−0.627***	2.108	1.344	−0.00167**	−2.883	−5.560
	(0.131)	(20.25)	(1.671)	(0.000769)	(7.052)	(10.39)
L2.ISR	−0.263**	−8.015	−0.310	−0.000432	23.02***	14.05
	(0.119)	(18.30)	(1.510)	(0.000695)	(6.374)	(9.390)
L.IOIL	0.000609	1.155***	0.0205**	−2.78e-07	−0.0428	0.0453
	(0.000763)	(0.118)	(0.00971)	(4.47e-06)	(0.0410)	(0.0604)
L2.IOIL	−0.000898	−0.355***	−0.0202**	−1.45e-06	−0.0659*	−0.0610
	(0.000739)	(0.114)	(0.00941)	(4.33e-06)	(0.0397)	(0.0585)
L.IIN	−0.00309	1.138	0.449***	−5.14e-06	−1.009**	0.468
	(0.00935)	(1.442)	(0.119)	(5.48e-05)	(0.502)	(0.740)
L2.IIN	−0.00402	0.143	−0.0639	−5.09e-05	−0.161	−0.671
	(0.00888)	(1.370)	(0.113)	(5.20e-05)	(0.477)	(0.703)
L.IER	9.578	−259.4	−354.5	0.316**	257.8	851.4
	(25.51)	(3.934)	(324.6)	(0.149)	(1,370)	(2,018)
L2.IER	−65.39***	4.526	10.67	−0.251*	−3.925***	−3.310*
	(25.34)	(3.908)	(322.4)	(0.148)	(1,361)	(2,005)
L.ITB	0.00163	0.286	0.0292	6.94e-06	0.464***	−0.0436
	(0.00197)	(0.304)	(0.0251)	(1.16e-05)	(0.106)	(0.156)
L2.ITB	−0.00131	−0.779***	−0.0136	−1.70e−06	0.0663	0.114
	(0.00188)	(0.290)	(0.0239)	(1.10e-05)	(0.101)	(0.149)
L.IIP	−0.00445***	−0.323	−0.0531***	−1.33e-05	−0.124	0.287**
	(0.00154)	(0.238)	(0.0196)	(9.04e-06)	(0.0829)	(0.122)
L2.IIP	0.00289*	0.267	−0.00486	4.31e-06	0.0158	0.288**
	(0.00161)	(0.248)	(0.0205)	(9.42e-06)	(0.0864)	(0.127)
Constant	0.0268	5.540*	0.605**	0.000180	1.459	3.195*
	(0.0218)	(3.366)	(0.278)	(0.000128)	(1.172)	(1.727)

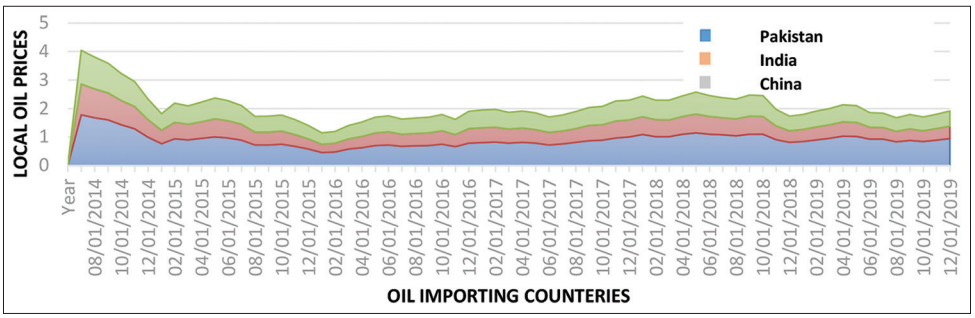
Standard errors in parentheses ***P<0.01, **P<0.05, *P<0.1. Where ISR: India stock returns, IOIL: India oil prices, IER: India exchange rate, ITB: India trade balance, IIP: India industrial production.

Table 5: Indonesia VAR outcomes (oil exporting country)

Variables	IOSR	IOOIL	IOIN	IOER	IOTB	IOIP
L.IOSR	0.349**	−0.124	−0.0417	−3.08e-08	0.0252	0.318**
	(0.138)	(0.246)	(0.0256)	(5.46e-08)	(0.0439)	(0.135)
L.IOOIL	−0.0605**	0.869***	0.00820	−3.70e-08***	−0.0264***	0.0333
	(0.0272)	(0.0483)	(0.00504)	(1.07e-08)	(0.00863)	(0.0266)
L.IOIN	0.535	−4.251***	−0.138	2.90e-07	0.0169	0.389
	(0.650)	(1.154)	(0.120)	(2.56e-07)	(0.206)	(0.636)
L.IOER	−427.098	103.254	99,789	−0.00433	−147,312	−514,339
	(350.770)	(622.530)	(64.923)	(0.138)	(111.173)	(343.361)
L.IOTB	−0.729*	0.000598	0.0776	−3.75e-07**	0.233*	0.493
	(0.380)	(0.675)	(0.0704)	(1.50e-07)	(0.121)	(0.372)
L.IOIP	0.165	−0.173	0.00635	9.27e-08*	−0.0741*	−0.0525
	(0.129)	(0.229)	(0.0239)	(5.10e-08)	(0.0410)	(0.127)
Constant	3.148*	7.993***	−0.500*	1.66e-06**	2.025***	2.391
	(1.637)	(2.906)	(0.303)	(6.46e-07)	(0.519)	(1.603)

Standard errors in parentheses ***P<0.01, **P<0.05, *P<0.1. Where IOSR: Indonesia stock returns, IOOIL: Indonesia oil prices, IOER: Indonesia, IOTB: Indonesia trade balance, IOIP: Indonesia industrial production

Figure 8: Oil importing countries



causality is very widely used technique to establish short run relationship between the variables.

Granger causality results in Tables 8 and 9 also support the VAR results, describing there is no Granger causality of

Table 6: Russia VAR outcomes (oil exporting country)

Variables	RSR	ROIL	RIN	RER	RTB	RIP
L.RSR	−0.184	−9.285	2.222*	−0.00285	−9.772	2.545
	(0.130)	(21.48)	(1.341)	(0.00236)	(6.494)	(7.668)
L2.RSR	−0.123	−15.56	2.642**	−0.00171	−3.564	−12.63*
	(0.124)	(20.42)	(1.274)	(0.00225)	(6.172)	(7.287)
L.ROIL	−0.000932	1.052***	−0.00677	1.04e-05	0.0692	0.00970
	(0.00103)	(0.169)	(0.0106)	(1.87e-05)	(0.0512)	(0.0605)
L2.ROIL	0.00196*	−0.138	0.000932	4.51e-06	0.0885	0.0471
	(0.00109)	(0.180)	(0.0112)	(1.98e-05)	(0.0545)	(0.0643)
L.RIN	0.0240**	−1.500	0.771***	−0.000454**	2.020***	−0.600
	(0.0113)	(1.868)	(0.117)	(0.000206)	(0.565)	(0.667)
L2.RIN	−0.00913	1.684	−0.286**	0.000834***	−0.335	0.249
	(0.0114)	(1.887)	(0.118)	(0.000208)	(0.570)	(0.673)
L.RER	−2.895	190.1	−168.3**	1.258***	699.2**	−94.39
	(6.349)	(1,050)	(65.51)	(0.116)	(317.3)	(374.6)
L2.RER	−2.585	−633.4	221.0***	−0.459***	−1,120***	−130.1
	(6.059)	(1,002)	(62.52)	(0.110)	(302.8)	(357.5)
L.RTB	−0.00483**	−0.128	0.0239	−4.30e-05	0.460***	−0.141
	(0.00225)	(0.372)	(0.0232)	(4.10e-05)	(0.113)	(0.133)
L2.RTB	0.00173	0.152	−0.00872	−1.75e-05	0.0250	0.118
	(0.00189)	(0.312)	(0.0195)	(3.43e-05)	(0.0942)	(0.111)
L.RIP	−0.00283	−0.292	0.0252	2.13e-05	−0.0651	0.0422
	(0.00210)	(0.348)	(0.0217)	(3.83e-05)	(0.105)	(0.124)
L2.RIP	−0.000490	0.234	−0.0233	−3.71e-05	0.151	0.104
	(0.00208)	(0.345)	(0.0215)	(3.79e-05)	(0.104)	(0.123)
Constant	0.0818**	12.14**	−0.551*	0.00298***	3.039*	2.759
	(0.0319)	(5.270)	(0.329)	(0.000580)	(1.593)	(1.881)

Standard errors in parentheses ***P<0.01, **P<0.05, *P<0.1. Where RSR: Russia stock returns, ROIL: Russia oil prices, RER: Russia exchange rate, RTB: Russia trade balance, RIP: Russia industrial production, RIN: Russia inflation rate

Table 7: Turkey VAR outcomes (oil exporting country)

VARIABLES	TSR	TOIL	TIN	TER	TTB	TIP
L.TSR	−0.0415	−5.499	1.389	−0.0451	3.570	−3.908
	(0.120)	(15.30)	(2.801)	(0.0333)	(4.346)	(10.88)
L2.TSR	−0.00657	−16.28	0.542	−0.00551	2.497	−3.595
	(0.113)	(14.43)	(2.641)	(0.0314)	(4.097)	(10.26)
L.TOIL	−0.00255***	1.034***	0.0123	−2.67e-05	−0.122***	0.0875
	(0.000896)	(0.114)	(0.0209)	(0.000248)	(0.0324)	(0.0810)
L2.TOIL	0.00221***	−0.214**	−0.00417	−5.57e-05	0.0900***	−0.116
	(0.000810)	(0.103)	(0.0189)	(0.000224)	(0.0293)	(0.0733)
L.TIN	0.00855*	0.401	−0.0529	0.00321**	0.501***	0.266
	(0.00463)	(0.588)	(0.108)	(0.00128)	(0.167)	(0.418)
L2.TIN	−0.00768*	−1.876***	−0.359***	0.00111	0.367**	−0.191
	(0.00452)	(0.575)	(0.105)	(0.00125)	(0.163)	(0.409)
L.TER	0.144	−141.3**	−65.67***	1.402***	−17.33	43.46
	(0.475)	(60.43)	(11.06)	(0.131)	(17.16)	(42.96)
L2.TER	−0.210	107.8*	60.19***	−0.396***	11.93	−47.23
	(0.470)	(59.72)	(10.93)	(0.130)	(16.96)	(42.45)
L.TTB	−0.00187	0.0731	0.141*	7.47e-06	0.400***	−0.954***
	(0.00316)	(0.402)	(0.0736)	(0.000874)	(0.114)	(0.286)
L2.TTB	−0.00325	−1.000**	−0.104	0.000795	0.000117	−0.107
	(0.00339)	(0.431)	(0.0789)	(0.000936)	(0.122)	(0.306)
L.TIP	−0.00127	−0.293*	0.0284	−0.000206	−0.0678	0.188
	(0.00138)	(0.176)	(0.0322)	(0.000382)	(0.0499)	(0.125)
L2.TIP	−0.000151	0.182	0.0360	0.000129	−0.101**	0.313***
	(0.00124)	(0.158)	(0.0290)	(0.000344)	(0.0449)	(0.112)
Constant	0.0290	16.59***	2.139***	0.00119	−0.0256	−0.945
	(0.0241)	(3.059)	(0.560)	(0.00665)	(0.869)	(2.174)

Standard errors in parentheses ***P<0.01, **P<0.05, *P<0.1. Where TSR: Turkey stock returns, TOIL: Turkey oil prices, TER: Turkey exchange rate, TTB: Turkey trade balance, TIP: Turkey industrial production, TIN: Turkey inflation rate

inflation on stock returns for the short run in India and China. There is a short-run impact of inflation on stock returns in Pakistan, suggested by the Granger causality test. There is a Granger cause in the case of Turkey, which means in the short run, there is an effect of inflation on stock exchange returns. There is a different result of the Granger causality

Table 8: Granger causality wald tests estimation (Oil Importing Countries)

India					Pakistan					China				
Equ.	Excl.	Chi-square	df	Prob > chi-square	Equ.	Excl.	Chi-square	df	Prob >chi-square	Equ.	Excl.	Chi-square	df	Prob > chi-square
ISR	IOIL	1.793	2	0.408	PSR	POIL	18.01	4	0.001	CSR	COIL	4.845	2	0.089
ISR	IIN	0.547	2	0.761	PSR	PIN	10.23	4	0.037	CSR	CIN	1.891	2	0.389
ISR	IER	6.83	2	0.033	PSR	PER	16.06	4	0.003	CSR	CER	0.423	2	0.809
ISR	ITB	0.746	2	0.689	PSR	PTB	11.31	4	0.023	CSR	CTB	4.49	2	0.106
ISR	IIP	8.775	2	0.012	PSR	PIP	5.985	4	0.2	CSR	CIP	1.496	2	0.473
ISR	ALL	17.55	10	0.063	PSR	ALL	68.29	2	0	CSR	ALL	10.63	10	0.387

Table 9: Granger causality wald tests estimation (Oil Importing Countries)

Turkey					Russia					Indonesia				
Equ.	Excl.	Chi-square	df	Prob> Chi-square	Equ.	Excl.	Chi-square	df	Prob> Chi-square	Equ.	Excl.	Chi-square	df	Prob> Chi-square
TSR	TOIL	8.124	2	0.017	RSR	ROIL	4.51	2	0.105	IOSR	IOOIL	3.422	4	0.49
TSR	TIN	5.236	2	0.073	RSR	RIN	5.6	2	0.061	IOSR	IOIN	3.792	4	0.435
TSR	TER	1.451	2	0.484	RSR	RER	5.084	2	0.079	IOSR	IOER	1.355	4	0.852
TSR	TTB	1.891	2	0.389	RSR	RTB	4.851	2	0.088	IOSR	IOTB	7.481	4	0.113
TSR	TIP	1.098	2	0.577	RSR	RIP	1.856	2	0.395	IOSR	IOIP	14.231	4	0.007
TSR	ALL	17.34	10	0.067	RSR	ALL	24.46	10	0.007	IOSR	ALL	28.79	20	0.092

Figure 9: Oil importing countries

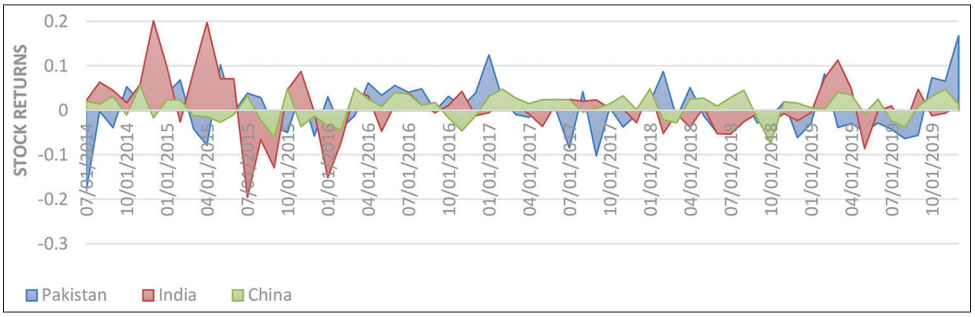
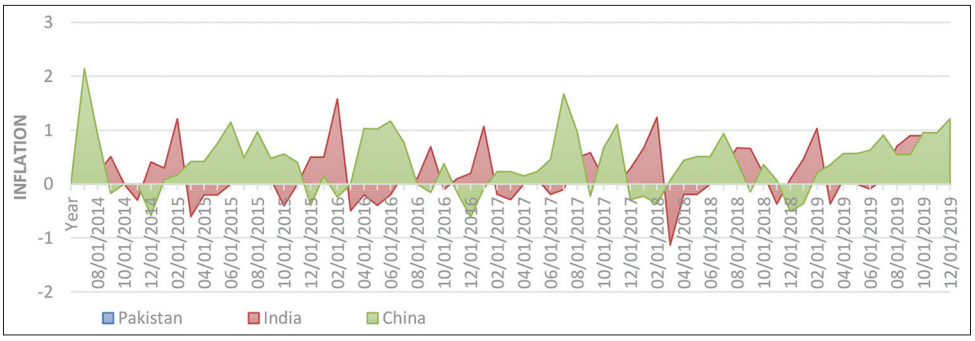


Figure 10: Oil Importing Countries (Local Oil Prices).



test in the case of Indonesia, showing no impact of inflation on the Indonesian stock exchange for the short run. Whereas, in case of Russia, the inflation has a positive effect on the Russian stock market. Granger causality test shows that the Russian exchange rate has effects on stock returns in the short run. There is no impact on the exchange rate in the short run in the case of Turkey and Indonesia. If oil-importing and oil-exporting countries are compared, it can be concluded that the exchange rate has no effect on stock returns of China from oil-importing countries and from exporting countries following are showing the same trend such as: Indonesia, Turkey, and Russia as shown in Figures 8-10. While Pakistan has a positive impact on different levels, the exchange rate has a negative effect on Indian stock returns. In comparative terms the graphs of macroeconomic variables of oil importing countries are showing the similar trends. Particularly, the trends of inflation are approximate similar in: Pakistan, India and china in study time period. However, the volatility of stock market movements in all oil importing countries is also similar. It is also worth mentioning fact that irrespective of individual countries' own exchange rate the prices of selling local oil in these countries is also trending the same. It implies that all the oil importing

Figure 11: Oil Exporting Countries (Local Oil Prices)

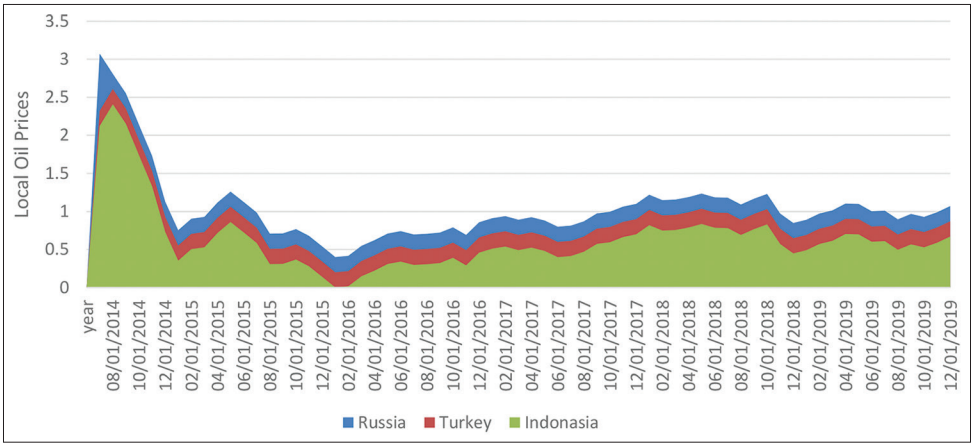


Figure 12: Oil Exporting Countries (Stock Returns)

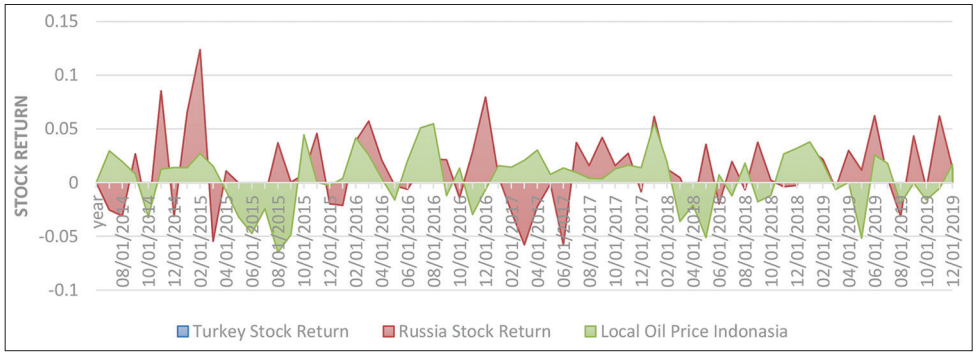
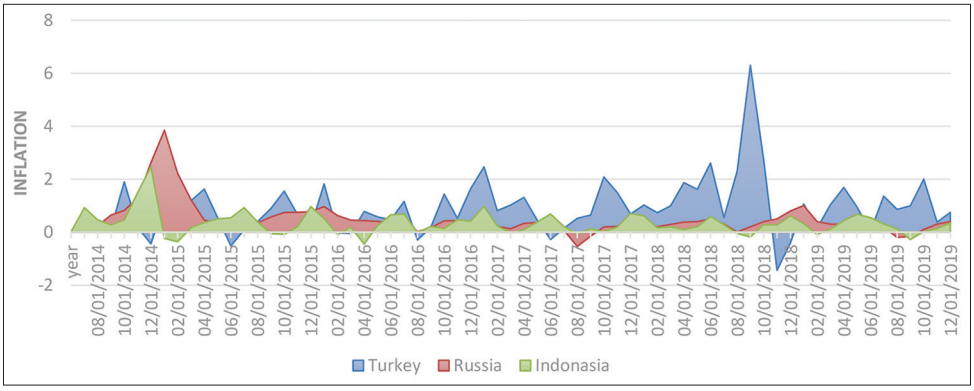


Figure 13: Oil exporting countries (Inflation)



countries are also following the similar oil selling pricing formula.

In comparative terms the graphs of macroeconomic variables of oil exporting countries are showing the similar trends in Figures 11-13. Particularly, the trends of inflation are approximate similar in: Turkey, Russia and Indonesia. However, the volatility of stock market movements in all oil exporting countries is also similar. It is also worth mentioning fact that irrespective of individual countries own exchange rates in oil exporting and importing countries the prices of oil in each local markets and similarly prevailing. It is iterating to conclude that it is the international phenomena that oil prices are similarly moving in either importing countries or importing countries it also implies that no single country can discount the price of oil by its own.

5. CONCLUSION

The study intends to investigate the impact of international oil prices on the stock market performance oil exporting and importing countries as well on monthly date from 2014 to 2019. The stock markets return for the proxies of market performance, Brent oil prices, and selected macroeconomic variables as exchange rate, inflation, industrial production, and trade balance are used in this

study. The results of the study indicate that the movement of oil prices have substantial impact on the stock price movements of either importing or exporting countries. The intensity of the impact may vary among the countries which is probed by Granger causality tests.

It is the worth mentioning fact that either oil importing countries or exporting countries the movements of major economic variables such as: Inflation, exchange rate, stock market movements and even oil prices remain in the same walk. It is normally, assumed that the oil exporting countries can substantially discount the oil for its local but the results proved the other side of the picture. It is the mare effect of globalization and intense integration of global trade and financial integration system that no country can move in the odd. However, the limited scope of the study may further open up the new horizons for upcoming researchers they may explore new endeavors by mapping new techniques, enhancing sample size and extending the theoretical modelling.

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