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RESEARCH PAPER

Oil Price Shocks and their Implications for Stock Market in the United States

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ABSTRACT

The current study calculated the asymmetric effect of Oil Price on the Stocks Market of the USA from 1996 to 2009 by applying the asymmetric Autoregressive Distributed Lag (ARDL) co-integration technique. The generated results proved the long-term asymmetries between Oil price and Stock Market Index. Oil Price shocks affect the stock market of the USA significantly and positively. Both negative and positive Oil Price shocks have a positive effect on the stock market index of the USA. By applying the Phillips and Peron (PP) Unit root Test it is concluded that data is stationer at mixture which allowed to apply the ARDL technique. After applying the Bound test study move towards NARDL to verify the long-term relationship between Oil Price and Stock Market Index. The dependent variable is Stock Market Index, the Main independent variable is Oil Price and other related independent variables are the Exchange rate and Foreign Direct Investment. In this way, positive and negative prices of oil shock waves are advantageous for the oil exporters like the USA. The effect of FDINI is also favorable since once foreign investors finance in the host country then job opportunities, employment, income and purchasing power increase and then economic development and export also increase

Introduction

Oil is the main part of economic growth and is considered the world's list lifeblood of countries. Because Economics development of a lot of counties depends on it. The costs of oil is playing an important role in the growth of any economy. The variation of oil costs may put its effect the firm money movement by way of lubricant is an important contribution, that rummage-sale in the procedure of manufacture and as a result, it can put its effects the growth of the stock exchange (Miller & Ratti, 2009). The accessibility due to its low and easy availability the variation in oil costs has a notable effect on the stock markets index. The high prices can badly put the effects well as future money in hand flows of its firms. Oil costs put positive and important as well as valuable results on the stock market index of growth of the economy.

Some variables affect the stock market index directly and indirectly. Such as the Price of oil, Rate of exchange, foreign direct investment inflows and remittances. When due to any difficulty or adversity the variables change then the stock market is automatically affected. This study explains all values of the oil process as well as economic growth which affects the ERR, private allowance and the inflow as well as other countries' direct effects on the growth

of the USA Stock Exchange. This experimental revision makes some assistance and is an effort to explore how the growth of these countries' stock exchanges is affected by the variations in the price of oils. This study shows that the rise in the price of oils does not make weak the presentation of the stock market but the positive effects on the growth of the stock marketing. This study explains the rules of collection of performance of stock market's well to increase the understanding between the connection of prices of oil and the rate of exchange as private allowance and the foreign development investment with the stock exchange indexes. Finally, the research takes the part of the literature which defined the effect of the price of oils by investigating the connection between economics and growth development expected with the stock market.

Literature Review

This study comprised a summary of different research papers which proved the relationship between the stock market index and the price of oil. This relation is expressed in a lot of papers in different ways and with mixed results with the help of VAR and nonlinear ADRL models. It examined that there may be the price of oil, personal remittances and FDI (inflows) had a positive relationship with the stock market index and negative relation between the stock market and the rate of exchange in the USA from 1996 to 2019 by handling the Nonlinear Auto Regressive distributed lagged (ARDL) model. Concisely this study examined the impact of oil price on the stock market index of the USA. The data is time series from 1996 to 2009. By analyzing with the help of the NARDL technique, the asymmetrical relationship between the price of oil and the stock market index this study contributes to the literature.

Cunado and Gracia (2005) studied the economy of Asia countries Japan, Singapore, South Korea, Malaysia, Thailand and the Philippines to verify the effects of the price of oil shockwave on economic growth, Inflation rate and consumer price index with the help of PP test and Granger Causality tests by collecting the data from 1975 to 2002. The concluded results revealed that a valid effect of the price of oil fluctuations exists on economic growth, Inflation and CPI but this effect is strong when the price of oils is measured in local currency. Jiménez-Rodríguez and Sánchez (2005) tested the relation between the price of oil shockwaves and real GDP growth by collecting the data of main industrialized OECD states with the help of multivariate VAR analysis in linear and non-linear methods. The main three methods are applied in this study namely asymmetric, scaled and net specifications. It resulted in that in oil importer states an increase in the price of oil decreased the economic activities. Negative effects exist between the price of oil and GDP growth in oil importer states but positive effect of the price of oil shockwave in oil exporting states. Cologni & Manera (2008) studied both long and short term relations between the price of oil, inflation and rate of interest in the G-7 countries with the help of the co-integration VAR model by collecting the data of the last 20 years. The effect of the price of oil shockwaves on oil exporters is positive. It also concluded that there is a positive effect on real GDP in UK and Canada but negative in the US, Italy and France but a direct effect on inflation in nearly all the countries. Findings also confirmed that the reduction in the rate of interest had a positive effect on GDP growth. The outcomes of the test recommended that in most countries due to the unexpected price of oil shockwaves inflation increases and output growth declines. In such a situation to control the inflation and enhance output growth, the monetary authorities raise the rate of interest by applying the contractionary monetary policy and the central bank reducing the rate of interest respectively.

Basher and Sadorsky (2006) did work on the effects of price of oil fluctuations on stock market returns by using the International Multi-Factor Model and International capital asset Pricing (CAPM) Model to generate significant results in Asia Pacific. The results of the price of oil beta have positive and significant on a broad set of emerging stock market

returns. The multi-factor model covered both conditional and unconditional risk factors to find out the relationship between the risk of the price of oil fluctuations and emerging stock market returns. The results proved that there is generally significant but negative unconditional relation between market beta and the emerging stock market. By handling daily and monthly data the results showed that in the up markets significant and positive relationships exist between market betas and returns but significant and negative in the down markets. Industrialists, Institutional investors, Managers and policymakers can also get informative guidelines from these results.

Lee et al. (2001) annotated the relation between the central bank's monetarist policy and the price of oil fluctuations in the Economy of Japan with the help of the VAR model. The results proved that real economic activities in Japan are affected by the variations in the price of oil and currency rate. A rise in the price of oil brought an increase in the currency rate which is about 2.0 in the mid of 1970 and become 2.5 percent after the main oil shockwave in 1970-1980. Similarly, the economic activities are also affected by the 30percent and 50percent negative variation in the price of oil in Japan. The results showed the extensive portion of negative effect on output is positive price oil shockwave and its reason is brought monetary tightening policy.

According to Kilian (2008), exogenous oil supply shock waves in the US state are measured in this paper. The paper examined the effect of the price of oil shock waves on the real GDP growth during the price oil crisis in 1970. Exogenous oil production failure during this crisis period could be attached to this crisis. These shock waves became the reason for the fast drop in US real GDP growth and a sharp rise in CPI inflation after three quarters. Finally, it is concluded that since the 1970's tough period these exogenous oil supply shock waves made a curious small asymmetry for the estimation of the US state.

Park and Ratti (2008) investigated the effects of the price of oil shock waves on the US and 13 European countries' stock markets by using the Multivariate VAR analysis. After analyzing the data of the US and other 13 European countries from 1986-to 2005, the results showed the statistically significant effect of the price of oil shock waves on real stock return in selected countries. The World real price of oil is measured by the Linear and scaled procedure. In the case of Norway which is an oil exporter, significant and positive relations exist between the price of oil shock waves and real stock returns. Cong et al. (2008) studied the price of oil's effect on the stock market of China with the help of the VAR procedure. A lot of researchers called the stock market the benchmark of any economy which showed the closed relation of the stock market. But there is controversy in China's economy. Two main views about China are: It is stated that there is a weak positive correlation between the stock market and macroeconomy and the objective of the Chines economy is speculation, not investment.

Since 1970 the effects of the price of oil shockwaves on the macroeconomy grab more attention. Lwayemi & Fowowe (2011) also cover this area by conducting the empirical test for oil exporting country Nigeria. Arouri et al. (2010) continued the acknowledgment of GCC countries' stock markets to the price of oil shockwaves. GCC (Gulf Cooperation Council) countries play an important and major role as the energy market player therefore its stock market responds sensitively when the price of oil fluctuates. This study used linear and non-linear procedures to find out the positive relationship between the price of oil and stock return. The results with the help of a non-linear model explained that In Qatar, Oman, Saudi Arabia and UAE fluctuations in the price of oil have a statistically significant effect on stock market returns. But there is no effective price of oil fluctuations on stock market returns in Bahrain and Kuwait. The study suggested that the researchers, investors and regulators should study the effect of the price of oil shockwaves on stock market returns in GCC countries and OPEC for the best results of research and investment.

Chitiga et.al (2012) explained the effects of the high price of oils in South Africa by applying the energy Focus Micro-Macro CGE approach. The results revealed that when an increase in the Global price of oils came then it affected the users of oil consuming products but the government did not change its subsidy/tax, or government expenditure so poverty increased. The study suggested that poverty can be reduced by subsidizing the household's income. When the price of oil and oil consuming products price increased by 50 and 25 percent then the poverty ratio increased by 1.2 percent. The severely affected part of society is dead poor households, low skilled labor and rural female workers and in this way, poverty and inequality (Income distribution) increased.

Eryigit (2012) included in this study the interest rate, stock market index, and exchange of the Turkish economy which is affected by the price of oils by using the unit root, co-integration test, Vector Autoregressive Model and Vector Error Correct Method VECM. Data of all variables (Stock market index, crude price of oil, technological stock price, interest rate, rate of exchange) is collected from 2005 to 2008. The ups and downs in the price of oils positively affect the stock exchange market index of Istanbul which is studied by Cong et.al in 2008. Because Turkey is an oil exporting state, therefore, fluctuations in the price of oil affect the rate of exchange directly or indirectly.

Nazarian and Amiri (2014) explained the relationship between the price of oil and inflation in Iran by using the Crouching Error Co-integration (CECM) Model on which this study is based. The results showed that there is non-linear relation between CPI and the price of oil fluctuations in both the short and long term and positive but asymmetrical relations exist between the price of oil and inflation. Oil exporting states are positively affected by an increase in the price of oils but oil importer states have to face crises and a lot of financial problems during such situations (Creti, Ftiti & Guesmi 2014).

Khan and Ahmad (2014) studied the effect of the price of oil fluctuations on important macro-economic variables such as money demand, output, the real rate of exchange, rate of interest and inflation by collecting monthly data from Pakistan from 1990 to 2011 with the help of SVAR procedure. The analysis resulted in that price of oil shockwaves affected inflation positively but negatively the industrial production and ERR too. A negative relationship exists between oil price shocks and stock market return. When negative shocks take place then the stock market is affected by it negatively because the study included the data of oil importing countries of Europe (Al-hajj et al. 2018).

Badeed and Lean (2016) investigated the links between the price of oil and Islamic stocks price in Malaysia with month wise data for the period of 2007-2015 in long term and short term by using Linear and Nonlinear ARDL Procedure. After testing both linear symmetric and nonlinear asymmetric studies concluded that the symmetric liner method provided more misleading results than the asymmetric ARDL. The study found that there is a significant relationship between the price of oil and the Islamic stock market in Malaysia. The study concluded that Islamic stocks react more positively when the price of oil rises than when the price of oil declines. Rostin et al. (2019) contemplated the effect of the crude price of oils on inflation, rate of interest and Economic development in Indonesia. The researchers checked the effect of the price of oil on GDP and the consumer price index. by using time series data and ARDL equations system. The role of Dubai's crude price of oil, inflation and Indonesia's economic growth is studied in this study. The study examined that the crude price of oils affects Inflation in both the short and long term but did not affect the economic growth in the short and long term.

Malhotra and Krishna (2019) examined the effects of the crude price of oil on inflation and the rate of interest in India which are major macro-economic variables. Monthly Data was handled in this study, collected in the period from 2004 to 2014 and

applied to the DCC-GARCH model. The results of the DCC-GARCH model verified that there is a positive correlation between wholesale price index (proxy of Inflation) and crude price of oil and it is most near to one except crises period 2007-09 when it became negatively correlated due to lush fluctuations in the rate of exchange of Indian currency during crises period.

Qasim et al., (2021) investigated links between the price of oils, ERR and the Islamic stock market of Malaysia with the help of the Vector Autoregressive (VAR) Model. After testing the collected data of Malaysia by using the Vector Autoregressive Model VAR model and Vector Error correct Method, it concluded that there are positive and significant relationships between the crude price of oil and Islamic stock return but the negative and meaningless link with foreign ERR.

Material and Methods

Data Sources

This study is examined the effect of the price of oils and shock waves on the original stock marketplace and uses the data in this study from 1996 to 2019. The Price of oils is the important independent variable related to such rate of exchange, and the interest rate, of FDI as well as loans, is also included for a better and more accurate result.

The data on oil and the index of the stock market were collected by the DJI but on the other hand, the above mentioned variables and their data are taken from the official website of the WDI (world development indicators). The sources contain the 1600 plus indictors for information and 217 economies all over the world. Hence, to maintain the precise data this study collects the official site provides the latest global development data which includes the national and local global estimates for upsurge the excellence of analysis.

Model Specification

The model speciation was used for described the just independent variables. According to the model specification, we will be able to select the independent variable like our variables in this study is the price of oil, rate of exchange, and (FDI) FDI. In this study, we take the different combinations with the help of these variables for the USA. The objective of this study is to check out the long term run relation between dependent or independent variables. For this purpose, the model specification is compulsory and finding the relation between variables by using the model. This study follows Khan et al. (2020) in organizing the models.

Exchange stock Market = F (Price of oil, Rate exchange, inflow, FDI)

These are our general models which study used for analysis with the minor variation regarded by the USA.

Econometric form of Model

This model is used for the analysis of the effect of the price of oil, the real effective rate of exchange and FDI on the stock market of the USA. Here Stock market index is a dependent variable and the price of oil, the real effective rate of exchange and FDI inflow are the independent variables. The model is log-linear and it selected 1-1 lag of dependent and independent variables.

Model

$$DJIUSt = \beta 0 + \beta 1 OILPRt + \beta 2 REEXRt + \beta 3 FDINI + \varepsilon t \qquad (1)$$

DJIUS= Stock Market Index of USA OILPR= Price of oil

REEXR= Real effective Rate of exchange FDINI= FDI Net Inflows

β0 =Constant (Intercept)

β1 to β3 = Regressors εt = Error Term

Autoregressive Distributed Lag Model

To check out the existence of Long term relation ARDL Bound test was applied. The Model applied was:

$$\Delta DJIUS_t = \varphi 0 + \varphi 1\ DJIUS_{t-1} + \varphi 2 OILPR_{t-1} + \varphi 3 REEXR_{t-1} + \varphi 4 FDINI_{t-1} + \sum \beta 1 i \Delta DJIUS_{t-i} + \sum \beta 2 i \Delta OILPR_{t-i} + \sum \beta 3 i \Delta REEXR_{t-i} + \sum \beta 4 i \Delta FDINI_{t-I} + \varepsilon t \quad (2)$$

In the above equation:

Δ = the first difference

t- i =Optimal lag selections established on Akaike information criterion. In the above Equation ϕ and β = Long term relations of the variables.

The study applies the ARDL model due to the long-term and short-term relationship. The ARDL model has many weaknesses compared to the time series model. During the analysis of the data, the researchers studied the different intervals of independent and dependent variables in the study. According to the results of the ARDL bound test, the study found that there is a common integration between the variables. To investigate the long-term relationship of the variables, we applied the following ARDL model.

$$DJIUS_t = \alpha 0 + \sum \sigma 1 DJIUS_{t-i} + \sum \sigma 2 OILPR_{t-i} + \sum \sigma 3 REEXR_{t-i} + \sum \sigma 4 FDINI_{t-I} + \varepsilon t \quad (3)$$

In the given equation

σ =the long term variation of variables

In this study Akaike information was used to select optimal lags. Given error correction model was applied for short term ARDL model which provides the evidence of the long term relation. NARDL was applied to check the asymmetric effects of the price of oil o the stock market of the USA.

$$\Delta LnDJIUS_t = \alpha 0 + \sum \beta 1 i \Delta DJIUS_{t-i} + \sum \beta 2 i \Delta OILPR_{t-i} + \sum \beta 3 i \Delta REEXR_{t-i} + \sum \beta 4 i \Delta FDINI_{t-I} + \varphi ECT_{t-1} + \varepsilon t \quad (4)$$

Statistical Analysis

This section is about the descriptive analysis of the selected variables of the USA model and then the correlation matrix was applied. So, this section covered these two parts.

Descriptive Analysis

Descriptive analysis enlightened the structure and overview of the data that is untaken with the provision of mean, median, standard deviation, skewness and kurtosis values of all those variables displayed in the selected model of USA. The mean value presented the sum of all values divided by the total number of values, it is also called the average of the variables. Variations in the data showed by the standard deviation and

peakness of the data by kurtosis. The concluded results of the descriptive analysis are given below:

Table 1
Descriptive Analysis

	Mean	Median	Maximum	Minimum	Std. Dev.	Skewness	Kurtosis
DJIUS	0.8363	0.8350	0.9200	0.7300	0.049	-0.0734	2.6730
OILPR	56.344	53.7427	110.6803	12.5061	31.82	0.3539	1.9128
REEXR	109.76	110.383	126.2242	95.0095	8.791	0.0552	2.1744
FDINI	1.8501	1.7059	3.4053	1.0154	0.674	0.7895	2.8264

Source: The researcher calculated this table own by using E-Views

To check the effect of the price of oil on the stock market of the USA table 1 displayed the descriptive analysis with the help of mean, Median, Maximum, Minimum, standard deviation, skewness and kurtosis of selected variables in the model. The stock market index which showed by DJIUS is selected as the dependent variable and its mean value is 0.84. Independent variables of this model are PRICE OF OIL, REEXR and FDINI. The mean value of all these selected variables is 56.34, 109.76, 1.85 mentioned above in table 1 respectively and their Maximum values are 110.6803, 126.2242 3.4053, Minimum values are displayed as 12.50612, 95.00953, 1.01546, Standard deviation values are 31.82, 8.79, 0.67. Standard deviation displayed the scattered of the data and low values of standard deviation are more reliable. With the help of skewness, we check the symmetry of the data. The skewness for a systematic scattering is 0, and any symmetric data should have a skewness near 0. Negative values of the skewness displayed that data are skewed left and positive sign values of the skewness exhibited that data are skewed right. The skewed left means that the left tail is long compared to the right tail. Likewise, when skewed right showed that the right tail is long as compared to the left tail. The value of the OILPR, REEXR FDINI is near zero which showed that this data is symmetric and all the variable's value is positive. Kurtoses' values showed the peakness and flatness of the data. The rule of thumb is 3. If the kurtoses value is greater than 3 it means that exceedingly peaked which is called leptokurtic kurtoses and lower than 3 and near to zero showed that data is mesokurtic kurtoses. In the given table 1 all the variables are mesokurtic.

Correlation Matrix

To check out the positive or negative correlation between two or more two variables study applied the correlation matrix. The rule of thumb of correlation is that its values lie between -1 and +1. When the value will be +1 it showed the perfect positive correlation similarly if the value is -1 then it showed the perfect negative correlation. Zero value means no correlation. The sloping composition correlation of variables is given below with the name of table 2.

Table 2
Correlation Matrix

	DJIUS	OILPR	REEXR	FDINI
DJIUS	1			
OILPR	0.4325	1		
REEXR	0.3036	-0.7900	1	
FDINI	0.2825	-0.1391	0.1144	1

Source: Consequences determined by using E-Views 9

The correlation between the variables in the sloping form is exhibited in table 2. In the given table 2 the values of DJIUS displayed that the stock market index has a normal

correlation with PRICE OF OIL, REEXR, and FDINI with the values 0.433, 0.3036, 0.283. The observations showed that OILPR and DJIUS are more correlated with the value of 0.433 as compared to REEXR and FDINI. Other findings proved that PRICE OF OIL is negatively correlated with REEXR and FDINIF while REEXR is positively correlated with FDINI.

Econometric Analysis

Applying the econometric technique to the time series data from 1996 to 2019 is the central step of the analysis. The stock market is affected by the price of oil shock waves. When the positive or negative price of oil shock waves comes then the stock market of the USA enjoys benefits because the USA is an oil exporting country. The negative price of oil shock waves also affects positively. When the positive price of oil shock waves comes then the USA stock market improves. To check these concepts study applies empirical analysis with the following steps.

1. The study applied the Phillips and Peron Unit root test to check out the stationary.
2. The bound test to examine the short and long term connection.
3. The CUSUM and USUMSQ inspect the strength of parameters.

Phillips and Peron (PP) Unit Root Test

Through PP unit root test study determined the dynamic relation between variables and verified the stationary of the selected variables. Table 3 is given below which shows the results of the PP unit root test.

Table 3
Phillips and Peron (PP) Unit Root Test

Variable Name	Level		1st Difference		Decision
	Intercept	Trend and Intercept	Intercept	Trend and intercept	
DJIUS	-1.9353	-2.8303	-4.4027		I(1)
	0.3113	0.2014	0.0024		
OILPR	-1.6013	-1.5584	-4.2358		I(1)
	0.4659	0.7778	0.0035		
FDINI	-3.2002	-3.1141	-4.7672		I(0)
	0.0331	0.1265	0.0011		
REEXR	-1.4811	-1.5770	-3.1485		I(1)
	0.5249	0.7705	0.0374		

Source: Results evaluated by using E-Views 9

Table 3 displays the results of the Phillips and Peron Unit root test. For further assessments for this model, it is required that data must be stationary at level, 1st difference, or on both (mixture). The determined results approve that variables are stationer at the level and first difference I (1). Stock market index of USA, oil price and the real effective exchange rate is stationer at 1sst difference and foreign direct investment data is stationer at the level.

These generated results confirm that data is suitable to apply the bound test in addition to a co-integration assessment of the short-run as well as long term.

Asymmetric Auto Regressive Distributed Lag Bound Test

The result table of Non-linear Auto regressive distributed lag bound test table 4 is given below.

Table 4
Bound Test

Test Statistic	Value	K
F-statistic	3.927394	4
	Critical Value Bounds	
Significance	I0 Bound	I1 Bound
10percent	2.45	3.52
5percent	2.86	4.01
2.5percent	3.25	4.49
1percent	3.74	5.06

Source: Results are generated by using EViews.9

The results of the Bound test in table 4 show that the F-statistics value is 3.93 and at 10 percent critical values of upper and lower bound are 2.45 and 3.52. Because the F-statistic value is greater than the upper and lower bound value at 10 percent. To study predict the long term relationship that exists between dependent and selected independent variables in the model. So applying the N0n-linear ARDL study will conclude the result.

Evaluation of Long term Coefficient Form

The estimation of long term co integration is given below in table 5.5 which explained the long term relation between endogenous and exogenous variables.

Table 5
Long term Coefficient Form

Variable	Coefficient	Std. Error	t-Statistic	Prob.
OILPR_POS	0.0157	0.0027	6.5432	0.0020
OILPR_NEG	0.0738	0.0012	2.5185	0.0038
REEXR	0.0045	0.0006	7.3307	0.0740
FDINI	0.0274	0.0046	5.8645	0.0090
C	-0.8146	0.0721	-11.2915	0.0000

Source: Results generated by E-views.

In the given table 5 created results of non-linear auto regressive distributed lag model estimations are proficient such a decomposing our main variable which handles it in both ways positively and negatively and reveals its results which proved that price of oil has a positive effect on the stock market index in both ways. In the given table 5 positive price of oil shock waves affects the stock market index positively which proves that there is a significant and positive relationship between the price of oil and the stock market index with a probability of 0.0020. It proves that a 1 unit increase in the price of oil will bring a 0.0158 percent increase in the stock market index of the USA under 0.0020 probability. And 1 unit extension in the negative price of oil will extend the 0.0739 percent in the stock market index under 0.0038 significant probability value. So it concluded that the positive price of oil shockwave affects positively and significantly and the negative price of oil shock waves effect is also positive and significant.

A lot of other researchers also support the concept that positive and negative price of oil shock waves has a positive and significant effect on the stock market index. Park and Ratti (2008). Especially the Oil exporters get benefits from this positive and negative price of oil shock waves. Because when the world price of oil increases then oil exporters have a chance to enlarge their exports, get more and more profit and improve their stock market index. In this way, positive and negative prices of oil shock waves are favorable for the oil exporters like the USA and this study also proved it with empirical results. Similarly, Aurori et.al (2010) also supported this result. Their paper also explained that positive and negative oil price shocks affect the oil exporter countries positively. Arouri handled the data of 6 GCC countries which are oil exporting countries and our concern is with the USA which is the largest oil producer and importer country in 2019 with the production of 19.5 million barrels per day.

The concluded results show that the real effective rate of exchange has a positive and significant effect on the stock market index with a 0.0740 probability. So 1 unit increase in the REEXR brings the 0.0045percent increase in the stock market index. REEXR is favorable for the economy. Because when REEXR increases then oil exporters get more profit by exporting oil and their stock market index will be improved.

The given table below also shows the relation between FDINI and the stock market index. This relation is also positive and significant under the 0.0090 probability value which shows that it is significant. The study explains that a 1 unit increase in the FDINI brings a 0.0274 percent increase in the stock market index and if one unit decreases the FDINIF then the stock market index demotes 0.0274 percent. Because once foreign investors invest in the host country then job occasions, employment, income and purchasing power increase and then economic development and export also increase, in this way FDI inflows affect the stock market index positively and significantly. This concept is also supported by empirical results in the given above table 5.

Evaluation of the Short Term

The short term analysis focus on the shock waves of exogenous variables on the endogenous variable in a short period. Short term analysis results are given in Table 6

Table 6
Short term Co-integration

Co-integrating Form				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(OILPR_POS)	0.0191	0.0042	4.4862	0.0014
D(OILPR_NEG)	0.0091	0.0030	2.8828	0.0108
D(REEXR)	0.0058	0.0014	4.0271	0.0010
D(FDINI)	0.0247	0.0051	4.7764	0.0002
CointEq(-1)	-1.0289	0.2283	-45374	0.0000

Source: Outcomes are created by using E-view 9

The short term co-integration results showed that negative and positive price of oil coefficient signs represented the positive relationship between the price of oil and the stock market index. One unit increase in the positive price of oil 0.019 percent increase the stock market index under the significant probability value of 0.0014. Similarly, when one unit increases the negative price of oil, 0.00914 percent increases the stock market index with the 0.0108 significant probability value. The results show that the effect of the positive price of oil shockwave is more powerful as compared to negative.

The effect of other exogenous variables is also important. In the given table 6 REEXR affects the stock market index positively under the significant probability value of 0.0010. So one unit increase in the REEXR brings the 0.0058 percent increase in the stock market index and vice versa. The effect of FDI inflows is positive and insignificant on the stock market index with a 0.0002 probability value. When an increase in the FDI inflows then 0.0247 percent increases the stock market index. In short, the study proved that positive, negative OILPR, REEXR and FDI have a positive and significant relationship with the stock market index.

Table 6 displays small lope estimations of variables that present Coint Eq (-1) value is - 1.028973 and the t.statics value is -4.5374. The coefficient sign considers the negative and significant Cointegration under the probability of 0.0000. The probability value widespread causality in between endogenous and exogenous variables.

Causality Test

The Granger causality test tells about the causality of the selected data. The study can examine how the variables cause one another. When one variable causes the other variables but not both on another this condition is called unidirectional causality. When both variables cause one another then is called by-directional and when no one causes one another then it is called non-directional causation. The results are given below in table 7.

Table 7
Granger Causality Test

Null Hypothesis:	Obs	F-Statistic	Prob.
OILPR do not Granger Cause DJIUS	22	3.2520	0.0311
DJIUS do not Granger Cause OILPR		1.0662	0.3662
REEXR do not Granger Cause DJIUS	22	2.6128	0.0553
DJIUS do not Granger Cause REEXR		6.1494	0.0098
FDINI do not Granger Cause DJIUS	22	3.8939	0.0427
DJIUS do not Granger Cause FDINI		0.3179	0.7319
REEXR do not Granger Cause OILPR	22	1.4866	0.2541
OILPR do not Granger Cause REEXR		1.5778	0.2352
FDINI do not Granger Cause OILPR	22	0.1434	0.8674
OILPR do not Granger Cause FDINI		1.2551	0.0310
FDINI do not Granger Cause REEXR	22	1.0902	0.3585
REEXR do not Granger Cause FDINI		1.3413	0.2878

Results are concluded by using E-View 9

The above table represents the causal relationship between variables, the price of oil does cause the stock market index of the USA and the stock market index do not granger cause the OILPR so there is uni-directional causality in between these variables as we reject the null hypothesis. In the case of the real effective exchange rate, it does cause stock market index and stock market index also do granger causes real effective exchange rate so the bi-directional causality exists in between real effective rate of exchange and stock market index. Foreign direct investment net inflows cause DJIUS and DJIUS does not granger cause FDINI so there is uni-directional causality in between these variables so we reject the null hypothesis. Real effective exchange rates do not cause the price of oil and OILPR also does not granger causes REEXR so non-directional causality exists between REEXR and OILPR. Foreign direct investment net inflows do not cause the Price of oil while OILPR does granger cause of FDINI so there is unidirectional causality between FDINI and OILPR. Foreign direct investment net inflow nor granger cause real effective exchange rate and REEXR neither granger cause FDINI so there is non-directional causality as we accept the null hypothesis.

Stability Test

The paper plots the Cusum and Cusum square test to verify the model reliability. These tests prove whether the selected model is stable or not.

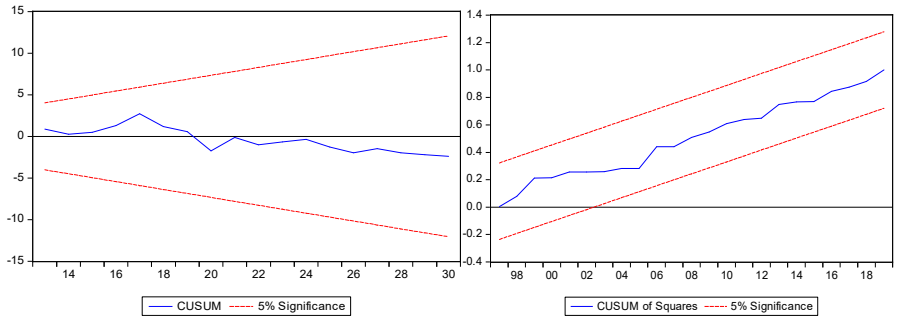

Figure 1: Cusum Test and Cusum Square Test
Source: Estimations are prepared by applying E-Views 9

The Cusum graph has two critical bounds which are signified by the dotted lines while the stability of the data is shown by the solid line. In this test, the solid line is our data line which must be in between these two critical dotted lines. Deviation of the solid line either above or below the dotted lines shows the instability of the data. Given figure5.1 shows that the solid line (data line) is in between the dotted lines, which means that the selected data is stable at 5 percent. The rule of thumb of the Cusum square is the same as the Cusum test. In the given figure data line lies in between critical bounds which confirmed that the selected data of the USA is also significant and stable at 5percent.

Conclusion

The data of this study is collected by the official website World Development indicators, DJ- Index and www.bp.com from 1996 to 2019. In the case of the USA, it concluded that positive and negative prices of oil shockwave affect positively and significantly in the long term particularly for the Oil exporters catch profits from this positive and negative price of oil shock waves. Because when the world price of oil rise then oil exporters have a chance to widen their exports, catch more and more profit and progress their stock market index. In this way, positive and negative prices of oil shock waves are advantageous for the oil exporters like the USA. The effect of FDINI is also favorable since once foreign investors finance in the host country then job opportunities, employment, income and purchasing power increase and then economic development and export also increase, in this way FDI inflows affect the stock market index positively and significantly.

Policy Implications

The stock market of every economy has great importance and plays an important role in the development of the economy. The findings proved that the price of oil has a great effect on the stock market of the USA. This study recommended that:

- The study suggested that by efficient use of natural resources, controlling the money demand and supply, improving exports, minimizing the imports, providing economic and political stability to foreign investors and promoting domestic industry, especially the refining oil industry the economy can improve the Stock market index.

- The economy should reduce imports by improving the domestic industry.
- Government should have control over the Foreign Direct Investment and Personal Remittances because too much involvement of the foreign investors in the business hub and Economy is harmful to any economy.
- Policymakers should also know and predict the relation between the price of oil and the stock market then apply any policy.

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