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Dynamic Correlations Between Oil Prices And The Stock Prices Of Food Sector Firms: Evidence From Oil Exporting-Importing Countries

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Abstract

The paper aims to investigate the dynamic correlations between oil prices and the stock prices of food sector firms among oil-importing - exporting countries. It employs the daily data of oil prices and food sector stock indexes of 6 countries, three from the oil-importing sector, namely China, India and United States and three from the oil-exporting sector, namely Saudi Arabia, Canada and Kuwait, for the period ranging from Jan 1, 2010 to December 31, 2019. DCC-ADCC models were applied to check the time-varying nature of oil and food sector indexes. The results reveal the time-varying nature of conditional correlation. Moreover, the presence of asymmetric behavior among different countries was also found.

Keywords: DCC, ADCC and Oil Exporting and Oil Importing Countries.

1. Introduction

The global economy is influenced through a rise in oil prices, a change in resources takes place among the oil importing and exporting countries, rise in cost accruing on creating products as well as enterprises, financial markets, growth as well as buyer certainty.

Before this, the significant downward curve indicated a rise in oil costs following World War II (Hamilton, 1983). These outcomes provided support to many research studies that apprised variations in oil value reflect impact through monetary indicators (Gisser and Goodwin, 1986). Earlier, an extensive range of studies was conducted to find the correlation between oil costs on a larger scale and financial markets in the UK (Bruno and Sachs, 1982).

Recently, the food price hike reflected may be attributed to high energy prices that push the food prices upward because energy has a valuable input in food activities. A feedback mechanism may expose that hike in food prices may drive the energy prices. The connection between energy and food markets may look extra complicated. There is a need to understand the link between food items and the oil price market and look for a feasible method that could disclose the black box in this dynamic relationship as required under Agricultural Trade Policy.

It was found that the rise in prices is due to increasing response for maize employed in the production of ethanol as well as the same response for rapeseed utilized in the production of biodiesel. Statement of Chief Economist of the USDA emphasizes that abundant hike in farm prices relating to maize as well as

soybeans seeks its attribution with a production of bio-fuel (Glauber, 2008a).

Minten and Kyle, (2000) challenged that a rise in consumer prices is associated with a rise in prices of crude oil. It was pointed that if the industrial production increases; it is likely that oil prices may see a boom in oil prices. It was proved that despite the tremendous rise in oil prices, it does not affect the demand for commodities despite the low elasticity. This means that the rise in oil price is not going to affect the demand for food commodities.

Small-scale variations in the oil prices emerge as an elementary factor in creating processes, influencing financial implementation or income stimulation as well as value costs (Huang, Masulis, and Stoll, 1996). Similarly many theories, for example, oil costs emphatically partner with stock costs, if oil value shocks replicate variance, however defiantly configured with stock costs, reproduce variations. In summary, stock costs cause variations in oil costs, it might be said that higher oil costs are related to lower stock costs, while lower oil costs are not related to maximum stock costs. (Yurtsever and Zahor, 2007)

In an endeavor to examine the impact of oil-value variation in assets worth, for example, stock prices or stock earnings. Market participants need a structure that distinguishes how oil-value variations influence stock prices. On the theoretical level, oil-price shocks influence securities revenues or prices through impact on predicted outcomes (Jones et al., 2004). Before this, volatility of fuel price was found to negatively impacting stock returns (Sadorsky, 1999). Jones and Kaul (1996) found that worldwide stock values correspond to shocks in fuel charges. Huang et al. (1996) contributed that causation has a role to play in future oil prices regarding revenue rates. Faff and Brailsford (2000) assessed that risk associated with oil-value was found correlated with financial market hazard, in the Australian stock exchange.

Following the major oil crisis in 1973, a book published in 1978 indicated the reliance of food supply on petroleum derivatives (Green, 1978). It was revealed that the food system is relying on raw petroleum as an asset that is for a limited and exhausting stage.

The current research tends to explore the association between oil price and food sector in oil-importing - exporting nations. As per the research theme, the study needs to answer the following questions:

- Does a correlation exist between different sectors time-varying?
- Does the correlation between different sectors indicate asymmetric behavior?

1.1. Objectives

The following objectives are set for the study to achieve:

- To review the possibility of dynamic conditional correlation among both oil and food sectors across the oil-exporting and importing countries?
- To review the asymmetric behavior of conditional correlation among both oil and food sectors across oil exporting and importing countries?

1.2. Contribution of the Study

This study presents significant suggestions to investors, scholars, and stakeholders in the wake of the existence of linkage between oil price and the food sector. For this purpose, the conclusions are driven by our experimental investigation that amply predict the financial market volatility can be utilized. This study could develop a progressively common prospect for international investors that may bring a change in their priorities about stock markets replying to oil price variation as international shocks.

2. Literature Review

2.1. Efficient market hypothesis (EMH)

The theory based on the efficient market hypothesis (EMH) takes the position that share prices are capable to reproduce all information. The EMH theorizes that stocks trading at the

fair market value prevailing on stock exchanges. Followers of EMH postulate that investors seek financial advantage by investing in a cost-effective and reflexive portfolio. The 'efficient market hypothesis assumes that with the influx of novel information in the market, it immediately gives a reflection on stock prices, thus excess returns are hard to generate either through any technical or fundamental analysis. This adds to the validity of the efficient market hypothesis.

This hypothesis carries three key versions as "weak," "semi-strong," and "strong". According to the weak-form, prices encaged on trade assets like bonds, stocks, and property reflect historical information. For instance, that is why you sometimes face difficulty in seeking car parking that is (i) free, (ii) near the work, and (iii) the place you park whole the day. Despite the EMH has proved wrong yet proponents of The EMH claim that it is not possible to overcome the market consistently since all information is available in form of price but the gain acquired, this market will prove temporary. Based on this reasoning, it would be difficult to overcome the market in the long run.

Boyer and Filion (2007) identified the variables that enlighten the stock outcomes of the Canadian oil and gas organization. It was specifically investigated whether stock returns of Canadian oil and gas organizations are dedicated to five showcases along with five potential components. The market-based variables incorporate market return, loan fees, the swapping scale, oil costs, and gaseous petrol costs. The five essential factors are variances in demonstrated stores, the capacity of generation, operative incomes, and above all, a milestone achieved. Generally, it was found that the stock returns of Canadian oil and gas organizations are related to the market return, valuation for unrefined petroleum and flammable gas costs, development in inner money streams, and demonstrated stores. In other words, it was traced that an expansion in loan costs, generation capacity, and devaluation of the Canadian dollar against the US dollar give negatively impacts stock returns.

Driesprong, Jacobsen, and Maat (2008) found that a rise in fuel costs brings down upcoming stock revenues significantly on a month-to-month basis and slacked month-to-month oil value changes reinforces further if extra slacked estimations of the oil value variations are utilized. Through the macroeconomic indicators, the oil value impact on financial exchanges gives an indirect link. Bjørnland (2009) confirmed that oil price growth reflects a beneficial outcome for a fuel trading nation, as the nation's revenue will rise. Subsequent of the rise in the revenue increment results in a rise in consumption and tasks, which eventually causes more productivity and low unemployment. Financial exchanges generally react vigorously to such events.

Similarly, Hong, Torous, and Valkanov (2002) found a significant negative relationship between oil-value returns and financial exchange returns. Driesprong et al. (2008) and Pollet (2005) found that oil-price variations anticipate financial exchange revenues on a worldwide premise. Moreover, Hammoudeh and Li (2004) found oil as a significant determinant to determine stock prices in oil-exporting countries. Chittedi (2012) examined the association between oil prices and stock returns in Pakistan, with the results of the rise in fuel prices prompted a rise in inflation.

However, the variety in oil prices increases vulnerability in the economic development of a nation for explaining the oil significantly affect generative factors, since expansion in price prompts inflation with the rise in high unit price. Dutta and Noor (2017) showed that a rise in oil prices impacts pretty much every segment of our routine items because of its impact on the securities exchange of that country. Stock return influences in two different ways: the normal income expected cash flow and discount rate used to equity value get influenced because of rising in oil prices.

Ciner, Gurdgiev and Lucey (2013) confirmed that nonlinear linkage varies

between stock returns and fuel prices. In the first-round investigation conducted on the influence of fuel rates on stock rates, a significant influence was identified in oil prices on cumulative real stock returns, counting a lagged influence, during the period 1947-1991. The work was recognized at the macroeconomic level where the magazine data and manufacturer Price Index was applied instead of the oil price index. Perry Sadorsky, (1999) used an unrestricted vector autoregression model, the association among oil price instability, stock market returns and the economic paradigm drive was examined.

Some studies analyzed the link between oil prices and the Chinese financial exchange like Broadstock, Cao and Zhang, (2012) examine the connection between worldwide oil prices and vitality related stocks in China by applying the BEKK strategy, they found that worldwide oil prices changes are connected with vitality related stock returns with regards to China. Wen, Wei, and Huang. (2012) utilized the GJR model and time-changing copulas to examine the contagion impact between raw petroleum and the US/Chinese securities exchanges, and they found that the reliance between raw petroleum and securities exchanges essentially increments after the disappointment of Lehman Brothers. Despite, that the US/Chinese securities exchanges are the first and second-biggest securities exchanges on the planet, hardly any inquiry has inspected the asymmetrical volatility spillover among oil and the US/Chinese financial exchange.

2.2. Oil Importing and Exporting Countries

Numerous studies were conducted to investigate the relationship between variation in oil prices and stock market outcomes. Many of them reported a negative correlation between oil values and securities exchange like Basher, Haug, and Sadorsky, (2012) and Kilian and Park, (2009). Although many studies explored that the insignificant effect of oil price changes on financial exchanges (Huang et al., 1996; Miller and Ratti, 2009; Apergis and Miller, 2009).

Regarding the oil-exporting countries, a utilized bootstrap test was applied for analyzing causation fitting of non-ordinary monetary information with time-shifting instability and inferred that GCC financial exchanges are educationally proficient concerning oil quantities, for instance, oil prices in general, don't affect the securities exchanges and due to which oil prices can't be utilized as indicators for the GCC securities exchanges (Al Janabi, Hatemi-J, and Irandoust, 2010). Conversely, Al-Fayoumi, (2009) confirmed no indication that oil price shocks influence the financial exchanges for oil-importing countries. Moreover, the US, the biggest oil trader, comparing with some fuel-exporting nations. A potential concern is that the effect of oil price shakes on the nationwide trading of oil-exporting countries cannot be quite the same as that of oil-importing countries.

Regarding oil-importing economies, high oil prices may boost a firm's prices and inflation ratio, just to decrease the usage of non-fuel products (Barsky and Kilian, 2004). They must create extra profit for oil-exporting countries because of the low price flexibility of raw petroleum demand (Jung and Park, 2011). Given this heterogeneity, the reaction of securities exchange comes back to oil price shocks in oil-exporting nations can be controlled by the comparative necessity of positive and negative effects on these economies.

Mohammadi and Su (2010) divulged that the conditional volatility of oil prices shown time-varying behavior. Similarly, Filis, Degiannakis, and Floros. (2011) inspected the time-changing relationships between financial exchange costs and oil prices (Brent) for three oil-importing nations (USA, Germany, and the Netherlands) and three oil-exporting nations (Canada, Mexico, and Brazil). Filis et al. (2011) executed a DCC-GARCH system in their research and revealed a more significant negative linkage for oil-securities exchange.

Malik and Hammoudeh (2007) find the significant transmission of instability and shocks among US value, Gulf value, and worldwide raw petroleum markets through utilizing a multivariate GARCH model. Similarly, the significant transmission of shocks between oil costs and US value part returns (Malik and Ewing, 2009). Arouri, Jouini, and Nguyen (2011) applied VAR-GARCH to deal with volatility transmission between oil prices and financial exchanges in Europe and the United States

2.3. Hypotheses

- There exists a dynamic conditional correlation among the oil and food sector across oil exporting and importing countries
- There exists an asymmetric behavior of conditional correlation among the oil and food sector across oil exporting and importing countries.

3. Methodology

3.1. Sample of Study.

In the present study, use the daily data based on oil prices and food sector stock market indices from 01 January 2010 to 31 December 2019. The sample containing only 3 oil-exporting states (Canada, Saudia Arabia, and Kuwait) and three oil-importing countries (US, China, and India). The sample period is selected on the availability of data for all necessary series.

Regarding oil-exporting countries, Saudi Arabia is the top oil distributor in the world and having the highest oil reserves. In the 1932 era, the kingdom was accountable for 16.1% oil exporter globally in 2018, which amount to $182.5 billion, and Canada comes under number four with the export of oil in the world. the country exported $66.9 billion costs of the commodity or 5.9% in 2018. As a small unit, it is remarkable that Kuwait comes in the sixth number to export oil and reserves to the world. The country situated in the Arabian Peninsula exported $51.7 billion volume of oil in 2018, such as 4.6% of the world's total part of oil trading from other countries.

Regarding oil-importing countries, China imports US$239.2 billion which is about 20.2% of crude oil imports). Then, United States imports $163.1 billion (13.8% of total world imports), India imports $114.5 billion (9.7% of total world imports).

	Countries
Oil Importing Countries	China
	India
	US
Oil Exporting Countries	Saudi Arabia
	Canada
	Kuwait

3.2. Description of Variables

3.2.1. Food Sector Stock Prices

The following equation can be used to estimate the food sector stock prices return:

$$\mathbf{R_{j,p} = \ln (P_{j,p}/ P_{j,p-1})}$$

Where Rj,p denotes the current day return p; and Pj,p and Pj,p-1 are closing prices for current day p and previous day p-1 respectively.

Oil Prices

The below equations can be taken to estimate the oil market return:

$$\mathbf{Rk, t = \ln(Ok,t/ Ok,t-1)}$$

Where R k;t is the current day return t; and Ok,t and Ok, t-1are closing prices for current day t and previous day t-1 respectively.

3.3. Econometric Model

The methodology of this study time-fluctuating conditional correlations among different countries i.e. oil-importing and oil-exporting states are measured by using Dynamic Conditional Correlation (DCC) and Asymmetric-DCC (ADCC).

3.3.1. Time-Varying Conditional Correlation - DCC and ADCC

DCC-GARCH (Engle, 2002) technique was functional to analyze the time-varying correlations among oil value shocks and stock returns. This particular DCC-GARCH is measured as the speculation of consistent restrictive relationship GARCH model projected (Bollerslev, 1990). The above framework adopts the correlation is persistent throughout the time but that correlation may be time-varying, in this regard, dynamic conditional correlation DCC GARCH model was used. If the correlation possesses asymmetrical behavior, then the ADCC GARCH model was used. Dynamic Conditional Correlation model or DCC models the volatilities and correlations in two steps. The DCC furnishes a joint thickness work with tail dependence more prominent than the ordinary. This is investigated both by simulation and experimentally. The time aggregated DCC is exhibited as a valuable copula for financial decision-making.

When two stocks move the same way, the correlation is extended. On the opposite side, when similar two stocks move inverse way, this correlation decreases. DCC model gives the highest tail dependence for both upper and lower bound while an asymmetric DCC (ADCC) provide higher tail dependence only in the lower bound.

- Dynamic Conditional Correlation DCC

DCC is defined as ...

$$\mathbf{Q_t = \bar{R} + \sum_{i=1}^{m} \pi_I (\epsilon_{t-i} \acute{\epsilon}_{t-i} - \bar{\bar{R}}) + \sum_{i=1}^{m} \epsilon_i (Q_{t-1} - \bar{R})}$$

For most of the data sets used in the research, DCC (1,1) is proved to be an adequate model.

- Diagonal Generalized GDCC

For the estimation of Diagonal Generalized DCC, the following steps are followed.

- Choose a parameterization for P and Q as

$$\mathbf{P \propto\acute{\propto} = \beta\grave{\beta}}$$

- So that for any Z,

$$\mathbf{A.Z = diag}(\propto).\mathbf{Zdiag}\ (\propto)$$

- Hence for any i and j,

$$\mathbf{Q_{i,j,\,t+1} = \bar{\vartheta}_{i,j} + \alpha_i\ \alpha_j\ (\varepsilon_{i,t} - \bar{\vartheta}_{i,j}) + \beta_i\ \beta_j\ (Q_{i,j,\,t} - \bar{\vartheta}_{i,j})}$$

- Asymmetric Dynamic Conditional Correlation ADCC

ADCC is defined as,

$$\mathbf{\sigma_t = min(\varepsilon_t,0), \bar{N} = 1/T \sum_{t=1}^{t} \sigma_t \acute{\sigma}_t}$$

- Asymmetry can be explained with terms that are zero excepting when both returns are negative such as,

$$\mathbf{\mu_{i,t}\sigma_{i,t}}$$

- Or more generally (and averaging to zero),

$$\mathbf{G(\sigma\acute{\sigma} - N)}$$

- Asymmetric Generalized DCC AGDCC

The Asymmetric Generalized DCC can be expressed as,

$$\mathbf{Q_t = \bar{R} + A.(\varepsilon_{t-1}\acute{\epsilon}_{t-1} - \bar{R}) + B.\ (Q_{t-1} - \bar{R}) + G.(\sigma_t\acute{\sigma}_t - N)}$$

And assuming a diagonal structure for A, B, and G, the typical equation becomes,

$$\mathbf{Q_{i,j,t+1} = \bar{\vartheta}_{i,j} + \alpha_i\ \alpha_j\ (\varepsilon_{i,t}\varepsilon_{j,t} - \bar{\vartheta}_{i,j}) + \beta_i\ \beta_j\ (Q_{i,j,\,t} - \bar{\vartheta}_{i,j}) + \gamma_i\gamma_j\ (\sigma_{i,t\,t}\sigma_{j,t} - N_{i,j})}$$

4. Data Analysis and Discussion

4.1. Descriptive Statistics

The first step is to examine the behavior of data, through descriptive statistics of each series including Independent and dependent

variables. In this study, oil prices are independent and all countries' food sector stock indexes are taken as dependent variables as shown in Table 4.1.

Table 4.1 includes the first 4 important statistics i.e. Mean, Standard Deviation, Skewness, and Kurtosis. Moreover, the data is also measured by Maximum and Minimum average replies. The sample period is occupied of 10 years starting from 01/01/2010 to 31/12/2019. The study employs the daily oil prices and 6 countries' food sector stock indices.

Table 4.1: Descriptive Statistics

	Mean(%)	Maximum(%)	Minimum(%)	SD(%)	Skewness(%)	Kurtosis(%)	Obs
OP	0.0490	19.2255	-17.7335	3.0258	0.324434	6.716657	3645
FCH	0.0259	80.2399	-42.8566	2.3202	9.982826	429.4716	3645
FCA	-0.0045	6.6049	-4.06	0.8505	0.389556	7.751237	3645
FUS	-0.0099	9.142	-7.7038	1.2788	0.251095	7.549276	3645
FSA	0.0158	19.3771	-11.2279	1.7578	0.765695	14.43923	3645
FK	0.0662	23.9319	-22.3519	3.6499	0.536936	8.552656	3645
FIND	0.0365	13.985	-16.2397	2.6205	-0.002718	5.954525	3645

The average mean return measures the performance of the stock indices of different countries. The study reports that the mean returns of all countries are positive except Canada-CA and United States-US. The maximum value of Kuwait-FK is 0.0662% and the minimum value of United States-FUS is -0.0099%. In addition, all countries have a positive standard deviation. Therefore, Kuwait-K exhibits the higher volatility (3.6499%) while Canada-CA exhibits the lowest volatility (0.8505%). Maximum and minimum statistics show the max and min return produced/day for each country. For instance, the average return/day for China-CH is (0.0259%), maximum return earned /day is (80.2399%) and minimum return earned or max loss earned/day is (-42.8566%).

Skewness shows that the asymmetric conduct of data. Skewness value of India – FIND examines that distribution of return is negatively skewed which means long left tail and lower values than the sample means and remaining all shows positively. Skewed which means long right tail, more high values than the sample mean. Kurtosis depicts the tiredness of the probability circulation. This kurtosis shows positive values and greater than 3 which indicates, all series are leptokurtic and become extremely influenced by the bubbles of the stock market.

4.2. Time-Varying Conditional Correlation-DCC and ADCC

If the correlation is time-varying, then the Dynamic Condition Correlation (DCC) model is used in this analysis. Moreover, the effects of any asymmetry are also captured by using Asymmetric Dynamic Conditional Correlation (ADCC).

4.2.1. DCC MV - GARCH Models and Estimates Between Oil prices and food sector stock indices

Tables 4.2 and 4.3 show the suitable uni-variate DCC models and estimates from oil prices to food sector stock indices among oil-importing-

exporting countries, respectively. The appropriate model is preferred on the source of lowest possible Akaike Evidence Criteria - AIC.

Table 4.2: DCC MV – GARCH Models B/W Oil Prices and Food Sector Stock Indices

S.No	Countries	Model
1	FUS	EGARCH
2	FCA	EGARCH
3	FCH	EGARCH
4	FSA	GJR/TARCH
5	FK	EGARCH
6	FIND	EGARCH

Table 4.3 summarizes the results of the DCC GARCH model among oil prices and food segment stock guides of oil-importing and oil-exporting countries. This table reports the influence of the past residual shocks (θ_1) and lagged dynamic conditional association (θ_2) with their particular p-values. The criteria to check stability conditions for the DCC model should be $\theta_1 + \theta_2 < 1$. All countries effectively met the compulsory constancy condition. It means the DCC model must be used for evaluating the time fluctuating conditional association. For θ_1 all the significant variations imply that there exists the impact of past residual shocks on correlation. The Parameters of θ_1 is significant for India (FIND) which indicates that there exists the lagged dynamic conditional correlation in this country while, the same parameters of θ_2 are found significant for United States (FUS), Canada (FCA), China (FCH), and India (FIND) which indicated the impact of partial lagged dynamic conditional correlation exists, and it is not found significant for any other country which indicates the impact of partial lagged dynamic conditional correlation doesn't exist.

Table 4.3: DCC MV - GARCH Estimates B/W Oil Prices and Food Sector Stock Indices

Countries	Oil Prices	
	θ_1	θ_2
FUS	0.007445	0.960915
	(0.2235)	(0.0000)
FCA	-0.006119	0.861043
	(0.4862)	(0.0000)
FCH	0.005235	0.935198
	(0.3785)	(0.0000)
FSA	0.000299	0.786627
	(0.9713)	(0.7772)
FK	0.019229	0.104509
	(0.2744)	(0.8292)
FIND	-0.015506	0.785771
	(0.0000)	(0.0000)

4.4 ADCC MV-GARCH Models and Estimates between Oil Prices and Food Sector Stock Indices.

Tables 4.4 and 4.5 show the suitable uni-variate DCC models and estimates from oil prices to food sector stock indices, respectively.

Table 4.4: ADCC MV - GARCH Models B/W Oil Prices and Food Sector Stock Indices

S.No	Countries	Model
1	FUS	EGARCH
2	FCA	EGARCH
3	FCH	GARCH
4	FSA	GJR/TARCH
5	FK	EGARCH
6	FIND	EGARCH

Table 4.5 covers the estimates of ADCC GARCH model oil prices and food sector stock indices. The first two parameters of this table are the same as that of DCC GARCH models, i.e. the influence of the past residual shocks ($\boldsymbol{\theta}_1$) and lagged dynamic conditional correlation ($\boldsymbol{\theta}_2$). An additional parameter of ($\boldsymbol{\theta}_3$) is used in this model that provides the information about the shocks of positive and negative news on dynamic conditional correlation. Like the previous model of DCC, the first condition that is the stability of the model is also met in all countries (i.e. $\boldsymbol{\theta}_1 + \boldsymbol{\theta}_2 < 1$). It means the model is stable.

Table 4.5. ADCC MV - GARCH Estimates B/W Oil Prices and Food Sector Stock Indices

Countries	Oil Prices		
	$\boldsymbol{\theta}_1$	$\boldsymbol{\theta}_2$	$\boldsymbol{\theta}_3$
FUS	0.007420	0.958724	0.000840
	(0.2180)	(0.0000)	(0.8698)
FCA	-0.005107	0.830498	-0.004704
	(0.5995)	(0.0003)	(0.7795)
FCH	-0.000152	0.910401	0.006401
	(0.9503)	(0.0000)	(0.2493)
FSA	0.001977	0.882207	-0.006790
	(0.8457)	(0.0000)	(0.6351)
FK	0.010033	0.312701	0.034325
	(0.5868)	(0.4403)	(0.3213)
FIND	-0.015483	0.779955	-0.002778
	(0.0000)	(0.0000)	(0.8359)

The parameters of $\boldsymbol{\theta}_1$ show a highly significant positive influence of previous residual shocks on correlation for India (FIND). The parameters of $\boldsymbol{\theta}_2$ are found to be highly significant for United States (FUS), Canada (FCA), China (FCH), Saudi Arabia (FSA), and India (FIND) which indicates that there exists the lagged dynamic conditional correlation in these countries. The parametric values of $\boldsymbol{\theta}_3$ are not significant for any country that indicates, the correlation is not increased with the effect of negative news while it means all countries show variations concerning asymmetric effect. In short, any good or bad news that arises in the

market will affect the correlation. From both tables reported above, it is clear that the ADCC model provides more reliable and authentic results as compared to DCC because it is also capturing the asymmetric effect between the series. Hence, most of the countries in this study show significant time variation in their conditional correlations, and few of them show asymmetric behavior.

5. Discussion and Conclusion

This study examines the dynamic conditional correlation between the oil prices and food sector prices of oil exporting and importing countries. Engle's (2002) DCC-GARCH model, including all the conditional variances, was considered for purpose of evaluation (Glosten, Jagannathan, and Runkle, 1993). As the correlation between the variables is dynamic, so Dynamic Condition Correlation (DCC) model was used while asymmetric behavior is assessed through Asymmetric Dynamic Conditional Correlation (ADCC).

Results from both models are found significantly positive for most of the targeted countries. Mostly the significant variations and stability of models show that the correlation is not continuous so the dynamic conditional correlation model is strongly suggested. While, in some countries, the stability of the model is not met that indicates, correlation in these countries is not time-bound so DCC and ADCC models are not applied. The implications of DCC and ADCC models provide the strong conceptual understanding that countries are interconnected to each other and over time, correlation also develops time fluctuating.

The study can get evidence that the time-fluctuating relationship of oil price shock undertakes no variation in oil-importing as well as oil-exporting economies. This feature can be clarified with the help of two realities. First, the total return perspective because of the means that are carried by uncertainty in the international business cycle relied upon to influence every single securities exchange in a consequent manner. Second, a preliminary perspective that oil price shocks will impact oil-importing, as well as oil exporting nations, is the equivalent source creditable that oil field of oil-importing nations is somewhat minor which impact of the vulnerability of any supply deficiencies of raw petroleum, and demand of crude oil, are found fundamentally fewer.

The commodity markets present an avenue of attractive investment as alternate financial markets. As seen as alternate investment areas, commodity prices are required to show response to similar factors as financial prices of assets.

Countries, where commodity trade is more relied upon, are more susceptible to risk and implausibility about commodity prices. Price instability upsets producers, financial intermediaries, investors, and policy framers besides inflicting negative effects on growth as well as income distribution. Volatility is seen as a key basis behind price instability while its significance still holds ground owing to taking measures on account of liberalization, reducing barricades to trade, as well as globalization.

As a whole, our results designate only a concomitant linkage among oil and food products reflecting risk-reducing benefits based on two price indexes relating to portfolio formation. Moreover, policy framers could hardly make use of developments occurring around the global oil market for improving in their forecasts relating to the food prices as well as volatilities. Our results, however, could not get the support of the claim that the inflation occurring in food prices is due to hikes in oil prices.

5.1. Recommendations

- Variations in oil price affect food sector stock indices of oil-importing and exporting nations since the oil should be taken as a key input variable to the economy.
- Strategy developers and investors should consistently watch the fluctuations in oil prices to detect the change in oil instability with the goal that it may adversely influence the growth in stock records.

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