Journal of Advanced Medical and Dental Sciences Research

@Society of Scientific Research and Studies NLM ID: 101716117

Journal home page: www.jamdsr.com doi: 10.21276/jamdsr Indian Citation Index (ICI) Index Copernicus value = 100

(e) ISSN Online: 2321-9599;

(p) ISSN Print: 2348-6805

Original Research

Oil prices and agricultural commodity markets: Pre and during COVID-19 outbreak

Shweta Sood

PHD Economics India

ABSTRACT:

Background: COVID-19 pandemic has had a devastating effect on the global food production system. Large-scale food producing countries restricted exports for food sovereignty, while small and import-dependent countries are at risk. After COVID-19 pandemic, integrated and planned action is necessary to overcome this global stalemate. **Materials & methods:** The whole sample was divided into two subsamples in order to shed light on the difference of the connectedness between crude oil and commodity prices in the pre and during Covid-19 periods. The first subsample spans the pre-Covid-19 period and the second one is for the Covid-19 period. **Results:** The critical substantive figure is the total spillover index which indicates an average of 10.1% in the pre-Covid-19 period and 48.6% during the Covid-19 period for return forecast error variance results.

Conclusion: The Covid-19 outbreak has had a remarkable impact on the global economic cycle, financial and commodity markets.

Keywords: Agricultural commodity, Covid- 19, Oil prices.

Received: 19 November, 2022

Accepted: 24 December, 2022

Corresponding author: Shweta Sood, PHD Economics India

This article may be cited as: Sood S. Oil prices and agricultural commodity markets: Pre and during COVID-19 outbreak. J Adv Med Dent Scie Res 2023;11(1):97-99.

INTRODUCTION

The Covid-19 outbreak pandemics is a human tragedy, and the global economy faced unprecedented shock caused by the rapid spread of the deadly Covid-19. It has a growing influence on high scale disruption to businesses and the lives of millions of people. Covid-19 has created remarkable uncertainty, which has impacted tourism, travel, hospitality, supply chains, consumption, production, operations financial stress and product prices. ¹The financial markets stand out as one of the more apparent channels reacting the effects of the pandemic on the economy. ²The community of finance and economics scholars instantly reacted to the urgent need for research on the impacts of the Covid-19 outbreak. ³Furthermore, the novel coronavirus has started to impact the real economy already, creating a crash on financial and commodity markets. It is challenging to forecast the scale of the economic consequences of the Covid-19 crisis, and we believe that existing literature already consists of several answers and methodologies that are able to employ to capture the economic effects of the current crisis.³

The economic impacts of COVID-19 disturbances on and agricultural workforce-dependent farms households, agribusiness firms, and rural and urban buyers were severe, according to Boughton et al. ⁴who conducted research across Myanmar's agri-food system. Several crises have impacted the agri-food industry, including internal and overseas demand shocks, supply disruptions owing to movement limitations, and financial constraints. In India, Cariappa et al.⁵ found that movement restrictions, transportation issues, and reverse worker migration affected internal distribution networks, resulting in wholesale and retail price increases for several goods such as pulses, wheat, flour, milk, and vegetables. Economic distortions in key rice exporters such as Thailand and Vietnam, pushed up world prices, hurting African countries that rely heavily on imported food. 6The empirical evidence on the impact of the pandemic on food and agricultural markets is still emerging. For instance, Mahajan and Tomar find that there was a drop of 10% in the online availability of various foods (with no impact on retail prices) in the immediate aftermath of the first lockdown. ⁷There was also a drop of nearly 20% in market arrivals of

vegetables and fruits in a few cities between March and April. They attribute these largely to supply-chain disruptions. Narayanan and Saha, analysing retail and wholesale prices through the end of April, find that for many commodities, including pulses and edible oils, among others, prices witnessed a sharp spike immediately after the lockdown.⁸ Hence, this study was conducted to analyse pre and during covid-19 on oil prices and agricultural commodity markets.

MATERIALS & METHODS

The daily data of crude oil price (WTI) and three agriculture grain commodities: Soybean (SOYBEAN), wheat (WHEAT) and sugar (SUGAR) is employed to examine the impacts of oil price shocks on agricultural commodity prices before and after WHO announces Covid-19 outbreak 30 January 2020 (Covid-19). The whole sample was divided into **Table 1: Total directional return spillovers**

two subsamples in order to shed light on the difference of the connectedness between crude oil and commodity prices in the pre and during Covid-19 periods. The first subsample spans the pre-Covid-19 period and the second one is for the Covid-19 period. Calculating the directional spillovers transmitted by market i to all other markets j as:

Sgi.(H)= \sum Nj=1,i \neq j θ ^{*}gji(H) \sum Nj=1 θ ^{*}gji(H)×100= \sum Ni,j =1,i \neq j θ ^{*}gji(H)N×100

RESULTS

The description of the static spillover index for returns of the three agriculture commodity markets and WTI crude oil prices. The critical substantive figure is the total spillover index which indicates an average of 10.1% in the pre-Covid-19 period and 48.6% during the Covid-19 period for return forecast error variance results.

	Soybean	Wheat	Sugar	WTI
Pre-Covid-19				
period				
Soybean	62.5	1.0	0.0	0.2
Wheat	0.1	58.2	0.4	1.0
Sugar	1.1	0.0	94.5	0.1
WTI	0.2	0.6	0.3	92.5
Covid- 19 period				
Soybean	33.7	6.0	5.0	2.1
Wheat	7.8	37.2	8.6	2.5
Sugar	4.5	1.0	60.3	3.6
WTI	8.0	14.2	8.2	40.5

DISCUSSION

The causal relationship between crude oil prices and agricultural commodity markets has become a muchdebated issue among academics. 9There are mixed results in the prior papers. For example, examine the causal associations between agricultural products and oil markets. The study finds that the crude oil prices play a prominent role in explaining variations in the prices and volatility of agricultural commodities.10 At the same time, Taghizadeh-Hesary et al. ¹¹confirm that agricultural food prices respond positively to any innovations from the crude oil market. Shiferaw ¹² supports the findings of Vo et al. ¹⁰, but the author notices that the relationship between the agricultural commodity and energy prices is time-varying, which means that the prices of agricultural commodities and crude oil prices experience strong co-movement. In a similar fashion, Su et al.⁹ uncover that the dynamic, positive bidirectional causality exists between crude oil and agricultural prices and provide evidence that price spillover between two variables happens to agricultural commodities. Pal and Mitra 13 find a strong relationship between returns of crude oil and agricultural commodity markets. Hence, this study was conducted to analyse pre and during covid-19 on oil prices and agricultural commodity markets.

In the present study, the description of the static spillover index for returns of the three agriculture commodity markets and WTI crude oil prices. A study by Hung NT et al, an analysis of the spillover effects and time-frequency connectedness between crude oil prices and agricultural commodity markets using both the spillover index of Diebold and Yilmaz (2012) and the wavelet coherence model to evaluate whether the time-varying return spillover index exhibited the intensity and direction of transmission during the Covid-19 outbreak. Overall, the current results shed light on that in comparison with the pre-Covid-19 period, and the return spillover is more apparent during the Covid-19 crisis. More importantly, there exist significant dependent patterns about the information spillovers across the crude oil and agriculture commodity markets might provide prominent implications for portfolio managers, investors, and government agencies.¹⁴

In the present study, the critical substantive figure is the total spillover index which indicates an average of 10.1% in the pre-Covid-19 period and 48.6% during the Covid-19 period for return forecast error variance results. Another study by Borgards O et al, a dynamic and non-parametric approach is applied on intraday data for four different frequencies (from 1 min to 1 h) and two different sub-periods (pre-Covid-19 pandemic and during Covid-19 pandemic) in order to detect overreaction behavior which is defined as a large change of prices followed by proportional price reversals. Furthermore, both the number and the amplitude of overreactions is higher during the Covid-19 pandemic. In particular, crude oil futures exhibit a different overreaction behavior compared to other commodities since it has a higher number of negative than positive overreactions during the Covid-19 pandemic. They also find that the data frequency is independent of the overreacting behavior in both periods as the results continuously improve when having more observations due to higher frequencies. Finally, we find that extreme overreactions during the Covid-19 pandemic provide a great potential for profitable trading returns, which can be exploited by traders.¹⁵Existing literature has confirmed that there exist the price spillover mechanisms between crude oil prices and agricultural commodity markets. Lu et al.¹⁶ investigate the nature and dynamics of volatility spillovers between crude oil prices and agricultural commodity markets during the global financial crisis, and the results show that there is a bidirectional volatility spillover between crude oil and agriculture commodity markets in the crisis period. Specifically, the results indicate that crude oil and agricultural commodity markets become less integrated after the global financial crisis, the results in line with Peersman et al.¹⁷ Fasanya and Akinbowale ¹⁸ demonstrate evidence of cross-market spillovers between the crude oil price and the main agricultural commodity markets in Nigeria, which implies that agricultural commodities render significant volatility spillovers. More importantly, the directional spillover between oil prices and agricultural commodities is weak in comparison with the directional spillover that happens across agricultural commodity markets. Similarly, Guhathakurta et al. examine the influence of crude oil price on the commodity markets, and the results show the significance of connectivity between oil and commodity markets demonstrating the nature and extent of such interrelations.¹⁹ Kang et al. indicate a bidirectional and asymmetric relationship between crude oil and agricultural commodity markets at all various frequency bands.²⁰In the same vein, the comovement and asymmetric associations between crude oil and agriculture commodity prices have been examined by Chen et al.21

CONCLUSION

The Covid-19 outbreak has had a remarkable impact on the global economic cycle, financial and commodity markets.

REFERENCES

- Chang C.L., McAleer M., Wong W.K. Risk and financial management of COVID-19 in business, economics and finance. J. Risk Financ. Manag. 2020;13:102.
- Sharif A., Aloui C., Yarovaya L. COVID-19 pandemic, oil prices, stock market, geopolitical risk and policy uncertainty nexus in the US economy: fresh evidence from the wavelet-based approach. Int. Rev. Financ. Anal. 2020:101496

- 3. Goodell J.W. COVID-19 and finance: agendas for future research. Finance Res. Lett. 2020:101512.
- 4. Boughton D, Goeb J, Lambrecht I, et al. Impacts of COVID-19 on agricultural production and food systems in late transforming Southeast Asia: the case of Myanmar. Agric Syst. 2021;188:103026.
- Cariappa AA, Acharya KK, Adhav CA, et al. Impact of COVID-19 on the Indian agricultural system: a 10point strategy for post-pandemic recovery. Outlook Agric. 2021;50:26–33.
- Sers CF, Mughal M. Covid-19 outbreak and the need for rice self-sufficiency in West Africa. World Dev. 2020;135:105071.
- Mahajan, K., & Tomar, S. (2020). Here today, gone tomorrow: COVID-19 and supply chain disruption. Working Paper No. 28, Ashoka University, Department of Economics.
- Narayanan, S., & Saha, S. (2020). Urban food markets and the lockdown in India. Working Paper No. 2020-017, Indira Gandhi Institute of Development Research.
- Su C.W., Wang X.Q., Tao R., Oana-Ramona L. Do oil prices drive agricultural commodity prices? Further evidence in a global bio-energy context. Energy. 2019;172:691–701.
- 10. Vo D.H., Vu T.N., McAleer M. Modeling the relationship between crude oil and agricultural commodity prices. Energies. 2019;12(7):1344.
- Taghizadeh-Hesary F., Rasoulinezhad E., Yoshino N. Energy and food security: linkages through price volatility. Energy Pol. 2019;128:796–806
- 12. Shiferaw Y.A. Time-varying correlation between agricultural commodity and energy price dynamics with Bayesian multivariate DCC-GARCH models. Phys. Stat. Mech. Appl. 2019;526:120807.
- Pal D., Mitra S.K. Correlation dynamics of crude oil with agricultural commodities: a comparison between energy and food crops. Econ. Modell. 2019;82:453– 466.
- Hung NT. Oil prices and agricultural commodity markets: Evidence from pre and during COVID-19 outbreak. Resour Policy. 2021 Oct;73:102236.
- Borgards O, Czudaj RL, Hoang THV. Price overreactions in the commodity futures market: An intraday analysis of the Covid-19 pandemic impact. Resour Policy. 2021 Jun;71:101966.
- 16. Lu Y., Yang L., Liu L. Volatility spillovers between crude oil and agricultural commodity markets since the financial crisis. Sustainability. 2019;11(2):396.
- Peersman G., Rüth S., Van der Veken W. CESifo Working Paper. 2019. The interplay between oil and food commodity prices: has it changed over time? (No. 7826.
- Fasanya I., Akinbowale S. Modelling the return and volatility spillovers of crude oil and food prices in Nigeria. Energy. 2019;169:186–205.
- Guhathakurta K., Dash S.R., Maitra D. Period specific volatility spillover based connectedness between oil and other commodity prices and their portfolio implications. Energy Econ. 2020;85:104566.
- Kang S.H., Uddin G.S., Troster V., Yoon S.M. Directional spillover effects between ASEAN and world stock markets. J. Multinatl. Financ. Manag. 2019;52:100592.
- 21. Chen Z.M., Wang L., Zhang X.B., Zheng X. The comovement and asymmetry between energy and grain prices: evidence from the crude oil and corn markets. Energies. 2019;12(7):1373.