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Impact of Covid-19 on the Finacial Markets and the Economy: Evidence from India

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Abstract
The COVID-19 pandemic has affected different sectors of the economy and also the financial markets around the world. In this study, we examine the economic and financial market effect of the outbreak in India. We have used normal raw data to check the movement of equity, bond, gold, GDP, inflation, and exchange rate. The study also used VAR and impulse response function to check the inter-dependence impact between financial markets. The study found that the Indian economy and the financial sector have experienced a volatile environment due to the Covid-19 outbreak. We finally conclude the article by mentioning a few policy recommendations for the Indian economy.

Keywords: *Covid-19, Stock Market, Gold, Bond, Macroeconomics*
JEL classification: *G01, G10, G11*

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I. Introduction

In December 2019, a new respiratory illness known as Covid-19, caused by a novel coronavirus disrupted the economy in the following years. It has caused the worst recession since the great depression of the 1930s. To date, the world has recorded 18.3 crore Covid-19 cases with 39.6 lakh fatalities, and we are still counting. The count for India is 3.05 crore Covid-19 cases and 4 lakh fatalities. Covid-19 has impacted all the advanced as well as developing nations adversely. Services like airlines, hotels, etc. are not generating much revenue, unlike IT and Medical services. The poorer countries like India that cannot provide monetary and fiscal support unlike developed countries are suffering. Covid-19 has affected the components of aggregate demand. The declining consumption has caused a drop in the value of assets and the declining investment indicates the uncertainty of future profitability. The economic recession has shifted the global balance of power. Usually, in situations like these, the United States of America plays an essential role in galvanizing the world. But it did not do so. It threatened to withdraw from the WHO (World Health Organization). Global trade has fallen between 13% to 32% causing disruptions in the movement and flow of goods. The economic effects are largely dependent on the medical effects. As of the time of writing this paper, the second wave of Covid-19 has struck India. It has caused a lockdown which has led the economy to deteriorate further.

The Indian economy is battling two wars, one is against Covid-19, the other is the economic crisis. Most credit rating agencies like Moody's have drastically cut India's GDP forecast compared to earlier projections due to deteriorating macroeconomics variables such as forex reserves, export, and industrial activity. India's financial position has been worsening for several quarters now and the pandemic has only made it worse. The country remains virtually shut since March 25, 2020, and businesses face an uncertain future. Among the worst-hit sectors are airlines, hotels, real estate, automobiles, etc. RBI is warning of a painful and slow recovery in every sector. India has become the hot spot of coronavirus due to the increase in the number of confirmed cases because of the 1st, 2nd wave, and 3rd wave all due to the emergence of new strains. The effect of Coronavirus is most devastating for India out of SARS CoV, Bird Flu, HIV-AIDS to name a few viruses.

India has been in partial lockdown since March 2020 and has restricted their economic agent's movement from one state to another state and even within the state due to the infectious Covid-19. Covid-19 is having a growing impact on the Indian economy and the financial market. Unfortunately, the Indian health crisis becomes an Indian economic crisis due to the cancelation of flights, restriction on labour mobility and volatility in stock markets, fall in oil prices, and so on. For vulnerable families, loss of income due to an outbreak can translate to spikes in poverty, missed meals for children, and reduced access to healthcare beyond Covid-19.

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This study is important because India is one of the fastest-growing economies and the fifth largest economy in the world (Economic Survey 2019-20, 2020). This article will help, policymakers, government bodies, and financial markets participants to be better informed about the impact of Covid-19 on the Indian economy and financial markets. It will help them with better policy and financial decisions. Hence, we develop two main objectives of our study, firstly, we check the impact of Covid-19 on financial markets. Secondly, we also examine the impact of Covid-19 on the Indian macroeconomic scenario.

The remainder of the paper is organized as follows. Section 2 presents the literature review. Section 3 discusses the data and methodology used. Section 4 presents the results and analyses. Finally, in Section 4 we conclude the study.

II. Literature Review

The Indian economy was still recovering from the demonetization shock and the implementation of the GST. Covid-19 is a new challenge that has halted economic progress and could have effects lasting for decades. The Indian government's response to Covid-19 was a lockdown, restricting people's movement and business activities. The government imposed lockdown, which made 1.3 billion people of India under restrictions (Das, 2020), and took stringent action against people violating the rules and regulations. The government decreased the interest rates and announced massive relief packages so that the growth is not hampered. The financial markets have been volatile and unpredictable at times due to uncertainty that looms over Covid-19. Indian economy is struggling with macroeconomic indicators and financial markets have also been volatile since the pandemic began in December 2019. Some sectors are expected to do well during the Covid-19 outbreak for example information technology, pharma, and healthcare (Singh and Shaik, 2020). Online retail is also expected to do well by 30 percent in 2020 (National Investment Promotion and Facilitation Agency, 2020). However, sectors like the hotel and leisure industry, aviation, automobile, housing, etc. for which demand can be postponed will face most of the burden.

Covid-19 has impacted the entire nation, resulting in lower economic activity due to lower supply and demand shocks. It is difficult to predict the exact magnitude of India's economic loss due to a prolonged period of economic slowdown (Dev and Sengupta 2020). The effect of Coronavirus on the global economy is predicted to be dramatic. According to UNCTAD estimates, the loss occurs to India's trade as a result of the Covid-19 pandemic would stand around US$348 million. The outbreak of the Covid-19 pandemic is an unprecedented shock to the Indian economy. With the prolonged country-wide lockdown, global economic downturn, and associated disruption of demand and supply chains, the economy is likely to face a protracted period of slowdown. The magnitude of the economic impact will depend upon the duration and severity of the health crisis, the duration of the lockdown, and how the situation unfolds once the lockdown is lifted.

The travel and lockdown restriction will affect the hotels, restaurants, and aviation industry. World Tourism Organization (UNWTO) (2020) estimates that international visitor arrivals will decline by 20-30 percent. However, the decline could be bigger and prolong for a long period.

III. Data And Methodology

The study is done using secondary data. To check the impact of Covid-19 on the financial market we have looked at three financial instruments equity, bond, and gold. To check the impact of Covid-19 on the economy we have used GDP, inflation, and exchange rate as the macroeconomic indicator. Data on the daily closing prices of all these three financial instruments was taken from Bloomberg. The data for the macroeconomic indicators were taken from trading economics. Data is collected from January 2017 to June 2021 including both the period before and during Covid-19. The period from January 2017 to January 2020 is considered as pre-Covid-19 and from February 2020 to June 2021 as the post-Covid-19 phase. To study the effect of Covid-19 on financial markets, we need to look at returns instead of prices. Hence, we calculated the log-returns using the formula:

$$R_{i,t} = ln\left(\frac{P_{i,t}}{P_{i,t-1}}\right) \quad \text{……. (1)}$$

$P_{i,t}$: is the closing price of the asset on day *t* of security *i*

$P_{i,t-1}$: is the closing price of the asset on day *t -1* of security *i*

$R_{i,t}$: is the return on asset *i* on day *t*

To analyze the Covid-19 impact on economic and financial markets we will adopt very basic econometrics methodology like VAR and Impulse response function. Vector Autoregressive (VAR) models were introduced by Sims (1980). The term AR is the appearance of the lagged values of the dependent variable on the right-hand side of equation 1. Vector represents the notion that we are dealing with two or more variables. In the VAR system of equation, each variable depends not only on its past values but also on the past values of other variables. A basic plan VAR model takes the following form:

$$Y_t = C + A_1 Y_{t-1} + A_2 Y_{t-2} + \ldots\ldots\ldots + A_p Y_{t-p} + u_t \quad \text{…..… (2)}$$

Here, is a (vector of an endogenous variable at a time 't'; is a (vector of constant; is a time-invariant (matrix and is the error term in the equation which is also called the impulse or innovation in the model. In this study, we have AIC (Akaike Information Criterion) to select the optimal number of lags. We have got the optimal lag length as two, selecting a lag length greater than two will lead to an increase in mean square error, and selecting a lag length less than two will lead to an increase in auto-correlation error. In this study, we have also performed the impulse response function which is done after the VAR analysis. The impulse response function (IRF) shows the response of the dependent variable to a shock or impulse that happens in the independent variable. To analyze the impulse response function, it's important to understand the notation for shock and response. For example, AB represents the response of A on B during the time path. AA represents an autocorrelation plot for variable A.

Table 1: Summary Statistic of the Financial Instruments taken in the study

	Equity	Bond	Gold
count	1111.000	1111.000	1111.000
mean	11264.162	5.673	3341.726
std	1698.402	1.282	723.437
min	7610.250	3.313	2546.000
25%	10224.850	4.062	2737.550
50%	10922.750	6.255	2907.850
75%	11843.925	6.563	4167.925
max	15879.650	7.980	5027.250
Skewness	1.008	-0.506	0.637
Kurtosis	0.678	-1.127	-1.205

IV. Result and Analysis

The first table highlights some descriptive statistics using both closing prices for equity, gold, and bond (see Table 1). Looking at Figure A, we find that GDP fell drastically after May 2020, and still, it is well below the pre-pandemic level. Inflation seems to be in control for the time being because of demand and supply constraints. The demand for goods and services has decreased because people are spending less which is evident by the increase in saving rate[2]. The supply also has reduced due to various supply chain constraints[3] which is keeping the inflation within range. However, inflation will most likely increase in the future because of the low interest rate, massive stimulus package, and excessive money supply. The exchange rate indicator shows that the currency has depreciated.

The impact on the equity market was severe during the initial phase of the pandemic but there has been a sharp reversal and surprisingly the equity market is at an all-time high. The yield for bond markets has fallen which is also one of the reasons for the rally in equity markets because they are viewed as alternative investments. Gold which always acts as a haven in times of crisis has gone up by more than 50 percent. Looking at Table 2 which reports the VAR model for equity bond and gold, we find that pre-covid the past values of equity and gold were significantly affecting the current values of the equity market. For the bond equation, only the past values of the bond are affecting the current bond yield and the same is observed for the gold equation. Table 2, reports the VAR model for post-covid. Interestingly, the equity markets have become less significant to past values of gold and only the last time period value affects the current value of the equity market. The bond market seems to be affected by the past values of equity and bond. Gold is unaffected by both equity and bond, only the lagged one-period gold value affects the current prices of gold.

Figure A shows the pre-covid impulse response function for the equity market, bond, and gold. We find equity has a positive effect on both gold and bond over the long run. Any shock or impulse in the bond leads to a negative effect on equity and a stronger negative effect on gold. Equity reacts positively to gold over the long run and bond reacts negatively to an impulse or shock that happens in gold. Figure B shows the post-Covid-19 impulse response function for the equity market, bond, and gold. The shock to the equity markets negatively affects the bond market till the 15th lag but becomes positive over the long run. The shock to the equity markets

[2] https://timesofindia.indiatimes.com/business/india-business/pandemic-has-household-savings-jumping-to-22-5-of-gdp-report/articleshow/82276051.cms

[3] https://www.frontiersin.org/articles/10.3389/ffutr.2021.660116/full

positively affects gold till the 6th lag but becomes negative over the long run. The effect of bonds on equity and gold is negative in the long run. Gold has a positive effect on equity and a negative effect on bonds.
We cannot perform similar VAR and IRF analysis for the macroeconomic variable because of the rarity of data. For example, GDP is reported quarterly thereby providing us with little scope to analyze the effect of covid-19 on the macro-economic indicator.

V. Conclusion

We know that Covid-19 has disrupted the financial and economic sector of the Indian economy. In this study, we extend the growing literature on the effect of covid-19 on the Indian economy and the financial markets. We find that covid-19 has decreased GDP, inflation is well above the RBI inflation targeting zone, and the exchange rate has also depreciated. The financial sector saw massive wealth-getting wiped out in the first phase of the pandemic journey, but they have recovered well and given good returns to investors. The gold and equity have done well compared to bonds which are offering a low yield. The VAR and IRF further suggest that the interdependence between financial market have changed post-covid-19 outbreak.

The government should provide financial support to sectors that are worst hit due to Covid-19. A large number of employees in these sectors are expected to experience job losses. This sector needs quick assistance and support from the government to weather the never-ending Covid-19 storm. The government should also allocate a significant portion of funds to the healthcare sector. The macroeconomic variable like inflation needs to be closely monitored so that appropriate monetary policy decisions can be taken.

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Figure A: This figure represents the performance of GDP, Inflation and Exchange Rate in India from 2016 to 2021.

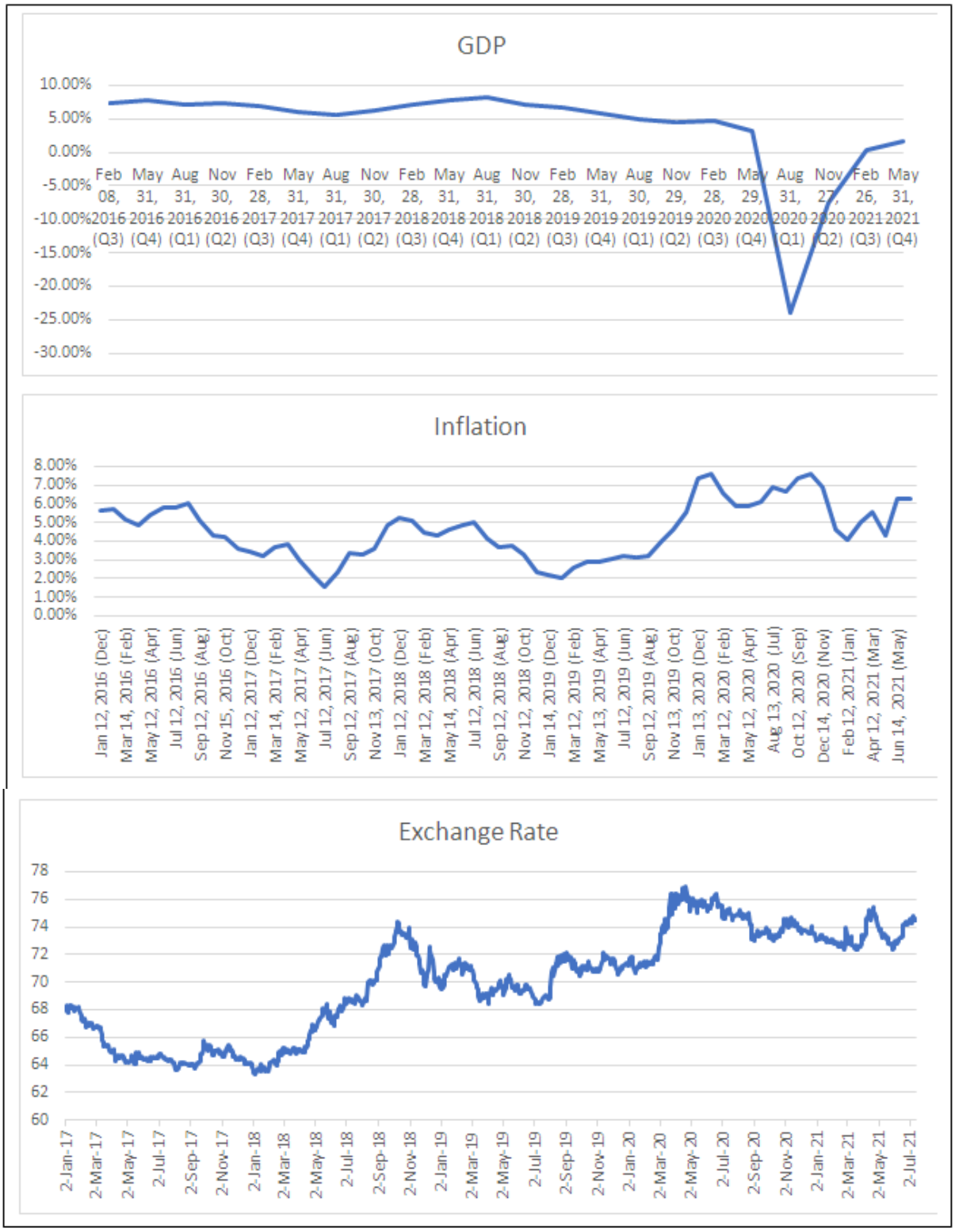


Figure B: This figure represents the performance of Equity, Gold and Bond in India from 2016 to 2021.

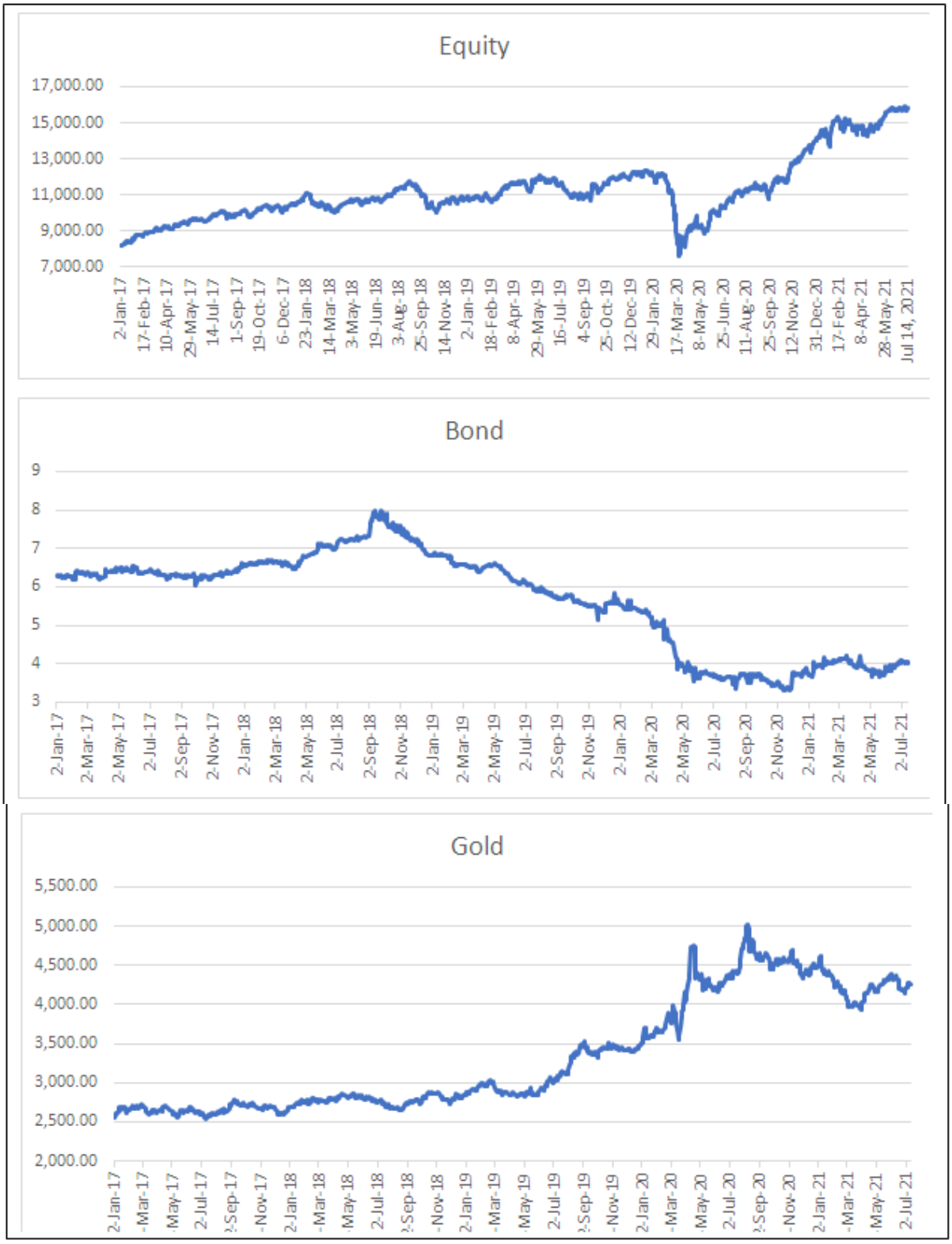


Table 2: VAR Model for Pre-Covid-19 Daily Closing Price of Equity, Bond and Gold

Results for equation Equity

	coefficient	std. error	t-stat	prob
const	71.052967	75.047413	0.947	0.344
L1.Equity	1.052144	0.037190	28.291***	0.000
L1.Bond	-26.349839	60.558308	-0.435	0.663
L1.Gold	0.309802	0.158724	1.952**	0.051
L2.Equity	-0.064219	0.037073	-1.732*	0.083
L2.Bond	24.564284	60.457986	0.406	0.685
L2.Gold	-0.284113	0.159437	-1.782*	0.075

Results for equation Bond

	coefficient	std. error	t-stat	prob
const	0.095255	0.044914	2.121	0.034
L1.Equity	-0.000004	0.000022	-0.182	0.856
L1.Bond	0.755938	0.036243	20.858***	0.000
L1.Gold	0.000057	0.000095	0.600	0.549
L2.Equity	0.000008	0.000022	0.371	0.711
L2.Bond	0.236066	0.036183	6.524***	0.000
L2.Gold	-0.000088	0.000095	-0.924	0.356

Results for equation Gold

	coefficient	std. error	t-stat	prob
const	6.422727	17.552827	0.366	0.714
L1.Equity	-0.004813	0.008698	-0.553	0.580
L1.Bond	7.714221	14.163973	0.545	0.586
L1.Gold	0.916114	0.037124	24.677***	0.000
L2.Equity	0.006170	0.008671	0.712	0.477
L2.Bond	-9.383012	14.140509	-0.664	0.507
L2.Gold	0.080821	0.037291	2.167**	0.030

Note: ***, **, * represents 1%, 5%, and 10% level of significance respectively. To check normality, we conduct Jarque Bera normality test.

Figure C. Impulse Response Function for Pre-Covid-19 Closing Prices of Equity, Bond and Gold

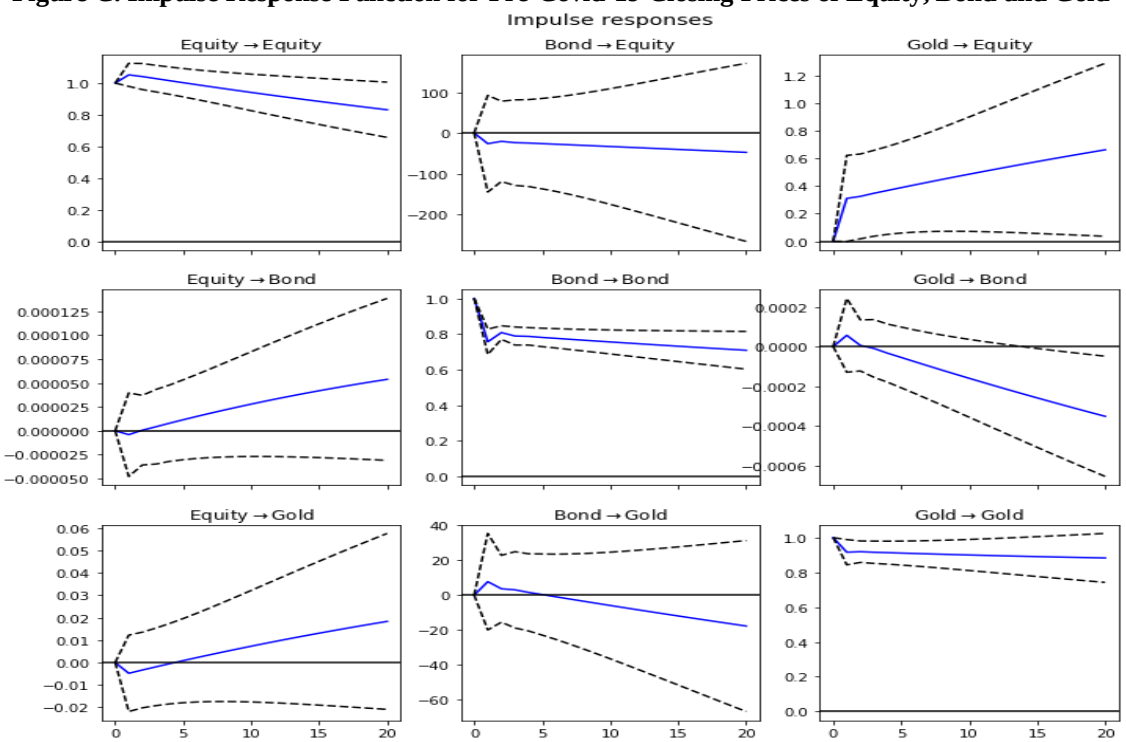


Table 3: VAR Model for Post-Covid-19 Daily Closing Price of Equity, Bond and Gold

Results for equation Equity

	coefficient	std. error	t-stat	prob
const	282.552160	371.909130	0.760	0.447
L1.Equity	0.926561	0.051612	17.952***	0.000
L1.Bond	48.265503	111.072125	0.435	0.664
L1.Gold	-0.085797	0.187370	-0.458	0.647
L2.Equity	0.070049	0.051691	1.355	0.175
L2.Bond	-97.762371	109.352375	-0.894	0.371
L2.Gold	0.079364	0.189026	0.420	0.675

Results for equation Bond

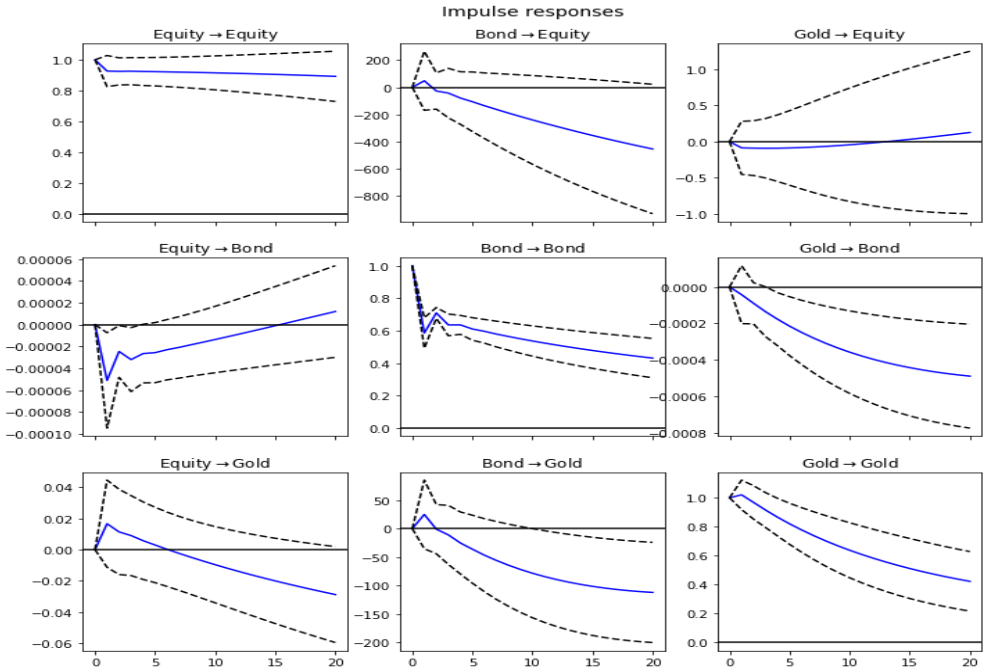
	coefficient	std. error	t-stat	prob
const	0.440374	0.160319	2.747	0.006
L1.Equity	-0.000051	0.000022	-2.294**	0.022
L1.Bond	0.585570	0.047880	12.230***	0.000
L1.Gold	-0.000042	0.000081	-0.524	0.600
L2.Equity	0.000053	0.000022	2.392**	0.017
L2.Bond	0.369990	0.047138	7.849**	0.000
L2.Gold	-0.000026	0.000081	-0.321	0.748

Results for equation Gold

	coefficient	std. error	t-stat	prob
const	325.143578	102.862747	3.161	0.002
L1.Equity	0.016655	0.014275	1.167	0.243
L1.Bond	24.900408	30.720364	0.811	0.418
L1.Gold	1.020618	0.051823	19.694***	0.000
L2.Equity	-0.019777	0.014297	-1.383	0.167
L2.Bond	-41.782835	30.244715	-1.381	0.167
L2.Gold	-0.071138	0.052281	-1.361	0.174

Note: ***, **, * represents 1%, 5%, and 10% level of significance respectively. To check normality, we conduct Jarque Bera normality test.

Figure D. Impulse Response Function for Post-Covid-19 Closing Prices of Equity, Bond and Gold



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