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How Did Financial Markets Respond to COVID-19 and Governmental Policies During the Different Waves of the Pandemic?

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This study investigates the impact of COVID-19 and the policies implemented by the authorities on financial markets during the different waves of the pandemic. We found significant correlations between COVID-19 new cases and the volatility of financial markets in most of the studied samples during the three studied waves. We also found that financial markets in developed countries present a significant positive market vision, and those of emerging economies present mixed results.

I. Introduction

COVID-19 has forced authorities to implement rounds of economically damaging lockdowns resulting in high socio-economic costs and triggering a sharp liquidity squeeze across the financial markets. Meanwhile, the unconventional fiscal and monetary policy responses worldwide produced a striking disconnection between financial markets' valuations and the underperformance of the real economies.

This decoupling between financial and real spheres pushed researchers to analyze the dynamics of this phenomenon both from asset and modelling perspectives. We notably cite the work of Gherghina et al. (2021); Shaikh et al. (2021); Salisu et al. (2020); Salman et al. (2021); Kartal et al. (2021); Benzid et al. (2020), and Iyke (2020).

In this article, we present a comparative study of a larger number of countries from different types of economies and wider data samples than the ones previously used in the literature by Hai Le et al. (2020); Iyke (2020) and Feng et al. (2021). We are also the first to investigate the impact of the COVID-19 pandemic on the local market sentiment regarding the policies implemented by domestic authorities. Furthermore, we chose the foreign exchange market as a proxy for financial markets due to its superior informational efficiency during uncertain periods (Shmilovici et al., 2008) and its high liquidity compared to the other financial instruments (Makovský, 2014).

This article provides up-to-date results regarding the impacts of the COVID-19 on financial markets. It presents a market vision regarding the efficiency of domestic authorities' remediation policies during the different waves of the pandemic.

II. Data

Building up an appropriate sample of countries was a priority to capture the maximum impacts and avoid biases. Our selection comprises the most important countries in both developed and emerging economies over the period 31 December 2019 to 30 June 2021. For the case of the United States, we used the CBOE Volatility Index (VIX), commonly known in the financial market literature as the fear index, to gauge the U.S. market sentiment. Also, we choose the gold price as a proxy to assess the global effect of the daily COVID-19 new cases on the market's behaviour. The daily closing exchange rates against the USD were taken from the different central banks' official websites, the daily data of the VIX index from the CBOE website, and the daily COVID-19 new cases data from the European Centre for Disease Prevention and Control (ECDC) database.

III. Methodology

We use the DCC-GARCH model introduced by Engle (2002), a multivariate GARCH model widely used in financial econometrics during the last decade due to its high flexibility and efficiency in modeling several variables with fewer elements to define. In this study, we use the DCC-GARCH (1,1) model that can be expressed as follows:

$$H_t = \begin{pmatrix} h_{11,t} & h_{12,t} \\ h_{21,t} & h_{22,t} \end{pmatrix} \quad (1)$$

Where

$$h_{11,t} = \alpha_{01} + \alpha_{11}\,\epsilon^2{}_{1,t-1} + \beta_{1,1} h_{11,t-1} \quad (2)$$

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$$h_{22,t} = \alpha_{02} + \alpha_{21}\,\epsilon^2_{2,t-1} + \beta_{2,1} h_{22,t-1} \quad (3)$$

To use heteroscedastic models, we test the stationarity of the times-series using the Dickey-Fuller test. The results exhibit the stationarity of the data at 1st difference.

IV. Empirical Results

To evaluate the output of the DCC-GARCH model, we adopt the following convention:

$$\begin{cases} \beta_{dcc} \leq 0.4 : Insignificant\ correlations \\ 0.4 < \beta_{dcc} \leq 0.6; Weak\ correlations \\ 0.6 < \beta_{dcc} \leq 0.8 : Moderate\ correlations \\ 0.8 < \beta_{dcc} : Strong\ correlations \end{cases} \quad (4)$$

The results reported in Table 1 exhibit a mixed degree of correlation for countries from similar economies during the pandemic waves. It also shows a strong correlation between the gold price volatility and the COVID-19 new cases worldwide due to the investors' interest in gold, considered a safe-haven asset during uncertainty. Similar correlations are observed during all the pandemic waves in the case of the United States, Russia, South Africa, China, India, and Turkey, which were heavily impacted by the pandemic and failed to implement strict sanitary measures to stop the COVID-19 pandemic.

We also noticed moderate correlations in Switzerland, South Korea, and Japan during the first wave that could be related to the strict sanitary measures adopted by those countries in the early stage of the pandemic. Our finding corroborates and extends those of Hoshikawa et al. (2021) for the Korean market and Narayan et al. (2020) for the Japanese market but contradicts those of Choi et al. (2021) and Pyo (2021) concerning the Korean financial market.

Another observation is the weak correlations for the Eurozone and the U.K. during the first wave that may be attributed to three significant factors. First, the effective lockdown measures imposed by the leading European countries and the U.K., which helped bend the curve of the first wave. The second one is the accommodative monetary policies adopted by the European Central Bank and the Bank of England to face the havoc of the economic impact of the pandemic. The third is the optimism observed in the financial markets following the news related to the COVID-19 vaccination campaign in the U.K. This final factor may have caused a significant drop in dynamic correlations in many studied countries, such as the U.K., South Korea, Japan and China, where the vaccination campaigns were very influential during the following waves. These results contradict Benzid et al. (2020) and Arif et al. (2021) regarding the strong impact of the COVID-19 pandemic on the USD/GBP and USD/EUR.

That said, we noticed a sharp rise in the correlation in the case of Switzerland, Europe, Russia, and India during the second and third waves. We can explain this growing impact by shifting market actors' behaviours. They turned towards other financial assets, such as the Swiss Franc, U.S. Dollar, and even cryptocurrencies, to avoid the custody fees related to gold while relatively hedging against uncertainty. The second factor is the disturbance in worldwide supply chains coupled with the impressive spike in oil prices during the successive waves of the pandemic, which may have impacted economies like India and Russia heavily dependent on services and oil exports.

To further explore the impact of COVID-19 on financial markets, we introduced an index labelled "Market vision". This metric reflects the market sentiment and market actors' perceptions of the measures implemented by the authorities. The gauge of market sentiment has been exhibited through various studies, especially after the crisis in the 1990s. We cite some recent studies by Blasco et al. (2011); Paraboni et al. (2018) and Ryu et al. (2019), regarding the role of market actors' sentiment and perception in shaping global and domestic market behaviour.

We define this index as follows:

$$\begin{cases} For\ a\ county\ i, MV = \dfrac{\beta_{dccWORLWIDE}}{\beta_{\mathrm{dcc}}\, Country\ i} - 1 \\ If\ MV > 0.1 = Positive\ market\ vision\ of\ the\ measures\ implemented \\ If -0.1 \leq MV \leq 0.1 = Neutral\ market\ vision\ of\ the\ measures\ implemented \\ If\ MV < -0.1 = Negative\ market\ vision\ of\ the\ measures\ implemented \end{cases} \quad (5)$$

The results in Table 1 display a significant positive market vision for all the developed markets during the pandemic except for the United States (1st, 2nd, and 3rd waves) and Switzerland (2nd and 3rd waves). This observation may result from the rapid rise of new cases in the U.S. and the contrasted sanitary measures adopted by the different states. For Switzerland, this may be caused by the pressure on the Swiss franc during this period. These results corroborate those of Sun et al. (2021).

We discern mixed results for the emerging markets through the pandemic. South Africa and Turkey presented a positive market vision, Russia and India showed a pessimistic market vision, and China switched from optimistic to gloomy after the first wave. These contrasting results are perhaps related to the different policies implemented in those countries. Furthermore, the degree of the population's trust in their institutions may also have affected the market vision. Our finding is in line with El-Khatib et al. (2020) for the first and second waves but contradicts those of Topcu et al. (2020) , who only focused on the first wave of the pandemic.

V. Conclusion

This article investigated the impact of COVID-19 and the policy responses on financial markets during the pandemic. The findings illustrate moderate to strong correlations between financial markets and the COVID-19 pandemic in most studied countries except for the Eurozone and the U.K. during the first wave. However, this impact rises significantly during the second and third waves due to the high demand for the safe-haven assets or the soaring COVID-19 new cases in countries like Russia and India.

We also found that most developed markets in our sample presented a solid positive market vision concerning

Table 1. Empirical Results from DCC-GARCH Model

		Index		β_{dcc} 1st wave 31/12/2019 31/08/2020	β_{dcc} 2nd + 3rd Wave 01/09/2020 30/06/2021	Evolution of β_{dcc}	Market vision 1st wave	Market vision 2nd + 3rd Wave	Evolution of Market vision
Developed Markets	Worldwide	GOLD/USD	Value	0.8177	0.8297	1,47%	-	-	-
			Probability	0.0001	0.0001				
	United States	EUR/USD	Value	0.8204	0.8280	0,93%	-0.33%	+0.25%	+162.39%
			Probability	0.0245	0.0000				
	Eurozone	EUR/USD	Value	0.4882	0.8266	69,32%	+67.48%	+0.38%	-99.44%
			Probability	0.0409	0.0000				
	Switzerland	USD/CHF	Value	0.7548	0.8523	12,92%	+8.34%	-2.65%	-131.82%
			Probability	0.0045	0.0600				
	United Kingdom	GBP/USD	Value	0.4829	0.3624	-24,95%	+69.31%	+128.95%	+85.99%
			Probability	0.0019	0.0038				
	South Korea	USD/KRW	Value	0.7549	0.6006	-20,44%	+8.31%	+38.15%	+358.53%
			Probability	0.0021	0.0005				
	Japan	USD/JPY	Value	0.7855	0.7625	-2,93%	+4.10%	+8.81%	+114.99%
			Probability	0.0000	0.0879				
Emerging Markets	Russia	USD/RUB	Value	0.8275	0.9489	14,67%	-1.18%	-12.56%	-960.71%
			Probability	0.0108	0.0000				
	South Africa	USD/ZAR	Value	0.8072	0.7360	-8,82%	+1.30%	+12.73%	+878.71%
			Probability	0.0369	0.0000				
	China	USD/CNY	Value	0.8720	0.8303	-4,78%	+6.23%	-0.07%	98.84%
			Probability	0.0126	0.0001				
	India	USD/INR	Value	0.8318	0.9134	9,81%	-1.70%	-9.16%	-440.39%
			Probability	0.0000	0.0000				
	Turkey	USD/TRY	Value	0.8155	0.8122	-0,40%	+0.27%	+2.15%	+698.69%
			Probability	0.0164	0.0101				

This table reports results obtained from the DCC-GARCH (1,1) model between the daily closing rates and the COVID-19 new cases for the studied waves. The software used for the DCC-GARCH (1,1) simulation is Ox Metrics, and the authors calculated the Market Vision (MV) variable and its evolution.

their authorities' crisis management during the pandemic. However, Europe and Switzerland suffered significant setbacks due to pressures on USD/EUR and USD/CHF. Meanwhile, we saw that market visions are mixed in emerging and developed markets. These results show that vaccination and testing may be the best actions to fight pandemics instead of lockdowns. For example, we notice a lower COVID-19 impact on the financial market and a significantly better market vision in countries like South Korea and the U.K. than in Europe or the United States. Another policy recommendation is that the monetary and governmental authorities in emerging countries must promote transparency on both the domestic and international levels to promote market actors' trust in the implemented policies and improve their market vision.

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