“Does COVID-19 drive the US corporate-government bonds yield correlations? Local and global reporting”

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DOES COVID-19 DRIVE THE US CORPORATE-GOVERNMENT BONDS YIELD CORRELATIONS? LOCAL AND GLOBAL REPORTING

Abstract

This paper investigates whether the COVID-19 cases and death rates affect the dynamic correlation of corporate-government bond yields. Therefore, this study uses the daily corporate bond data with different ratings of bonds along with the COVID-19 data at both the US and global levels. Using the quantile regression approach, it produces the following results. First, the impact of daily cases differs from that of death rates both locally and globally. Second, the impact of local cases and death cases on the government-AAA yields correlation at a given quantile tends to reverse when the BBB bonds are used in the analysis. Third, global death rates significantly affect the correlation series the most at the higher quantiles. Lastly, AAA-rated bonds show higher sensitivity to COVID-19 cases and death rates than BBB-rated bonds. This finding indicates that relatively high-quality bonds are more susceptible to the pandemic period and thus calls for careful evaluation of assets included in investors' portfolios. This study assumes that local COVID-19 data provide a better implication for constructing bond portfolios than global data. That is, their economic impact depends on the rating of the bond and tends to vary more across correlation quantiles.

Keywords COVID-19, US, corporate bonds, government bonds, correlations, quantiles

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INTRODUCTION

The outbreak of COVID-19 was declared a global pandemic by the World Health Organization (WHO) on March 11, 2020. As of September 9, the number of confirmed cases worldwide was 28,102,852, and reported deaths were 907,434 (WHO, 2020). This unprecedented pandemic has sent countries around the world into chaos, leading to economic instability represented by falling economic figures and industry performance (for example, transportation, retail, and tourism), which has resulted in high fluctuation in financial markets. Several studies have investigated the impact of COVID-19 on the performance of stock markets (Baek et al., 2020; Cepoi, 2020; Salisu & Vo, 2020; Topcu & Gulal, 2020; Ramelli et al., 2021; Ashraf, 2020; Rehman et al., 2021; Rehman et al., 2022), concluding that these abnormal circumstances have been translated into a fear signal by investors. However, using data for 26 markets, Schell et al. (2020) found little evidence for the influence of diseases on a global scale except in the coronavirus period.

Although periods of high uncertainty are associated with flight-to-quality, the COVID-19 pandemic, accompanied by rating agencies' news and the lack of trust in government decisions, has raised concerns among investors about whether to invest in government or corporate bonds. More recently, several studies started examining the impact of the news relating to the pandemic on investments in the bond markets.

For instance, Cui et al. (2022) found a strong spillover effect of the Infectious Disease Equity Market Volatility Tracker on green bonds, treasury, and other equities. The tracker is used since it comprises data on the COVID-19 pandemic. Their study reveals substantial spillover impacts over the medium and long-term investment horizons, only indicating that the reaction to the infectious diseases might vary across the periods. Concerning the term spread, Zaremba et al. (2021) found that the increase in COVID-19 cases maximizes the term spread of government bonds in both emerging and developed countries. Andries et al. (2021) uncovered that investors in European government bonds are becoming much more uncertain due to an increase in instances, deaths, and public health containment measures associated with the COVID-19 pandemic.

On the other hand, studying flight-to-safety in the bond market during the pandemic has received very little attention from researchers. The conducted research in this area is small but growing. For instance, Arif et al. (2022) indicated that a period comprising the pandemic shows a solid short- and medium-term lead-lag association between the green bond index and conventional investment returns. A contradictory finding is, however, reached by Elsayed et al. (2022), where green bonds and other financial markets are found to be more integrated over the long-run horizon. Yarovaya et al. (2022) also uncovered various reactions of assets to the pandemic with government bonds. Slight declines in the value of COVID-19, in addition to high persistence, were found. Their finding triggers the need to examine flight-to-safety between the government and corporate bonds during the pandemic. Another recent indication of the need to examine flight-to-safety is reached by Hacıömeroğlu et al. (2022), who found more decline in the green bond yields relative to that of the conventional bonds during the pandemic. These limited examinations by the abovementioned studies show the way for more comprehensive research on flight-to-safety in the bond market during the pandemic. The government and private sector bonds should provide a specific recommendation to investors on portfolio diversification and rebalancing strategies in the bond markets.

1. LITERATURE REVIEW

It is documented in the literature that significant occurrences such as natural disasters (Kowalewski & Śpiewanowski, 2020), environmental catastrophes (Guo et al., 2020), unexpected news (Li, 2018), political events (Shanaev & Ghimire, 2019), and unexpected sports results all have an impact on the returns achieved by financial markets (Buhagiar et al., 2018). The literature has also noted the vulnerability of the world equity markets to news of infectious disease outbreaks. For instance, Alfaro et al. (2020) researched the effects of the SARS outbreak, while Barro et al. (2020) examined the effects of the Great Influenza Pandemic of 1918–1919. Building on this line of inquiry, it has been determined that COVID-19 will have a substantial impact on both monetary and financial instruments.

The proxy to measure the intensity of the COVID-19 pandemic using the affected cases and death rates in any given economy gives an accurate magnitude of its severity. The higher the statistics, the greater the consequences of this pandemic. Since the rise in cases of the COVID-19 pandemic witnesses an increasing global pattern, the global cases and death rates also serve as a proxy to determine the expected adverse effects on US financial market mainly due to two reasons. The first reason is attributed to the linkage of global cases and death rates to the cases and casualties in the US since the US is the worst affected country due to this pandemic. The second reason is the integration of the global financial system, due to which any change in the international investment pattern tends to spill over toward the US economy. The COVID-19 effects were first witnessed in the first quarter of 2021 following the COVID-19 emergency announcement by the World Health Organization. Among a wide range of assets, prices of investment-grade corporate bonds also moved in an unusual way. Rather than the typical flight-to-safety, equity and treasury prices also fell. Unconventionally, the spread in investment grade bonds rose proportionally more than the high yield bonds, which are considered more sensitive to deteriorating economic conditions (Liang, 2020). While yields have recently increased as a

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reward for bearing this market (systematic) risk, lower-rating bonds displayed less sensitivity than high-rating bonds during the pandemic, leaving investors with a choice of which debt instrument is mostly appropriate (government bonds and high/low corporate bonds) during the pandemic in order to reach the optimal portfolio.

The linkage between spread and uncertainty dates back to Keynes (1936) in the Keynesian liquidity preference theory. Most recently, fresh evidence on this linkage between local and global shocks, economic uncertainty and bond spread, is reported by Beber et al. (2009) and Augustin (2018). Furthermore, according to Rudebusch and Wu (2008) and Favero and Missale (2012), the term "spread" encompasses information regarding future economic conditions, i.e., growth and output. This is mounting evidence that the presence of financial uncertainty causes an unstable business environment that results in the volatile behavior of the bond market (Asgharian et al., 2015; Ulrich, 2013) though such risks can be reduced through government interventions (Kizys et al., 2021; Amengual & Xiu, 2018).

The recent wave of COVID-19 injected significant uncertainty into the global financial markets, which is reported in numerous studies like Baker et al. (2020a) and Sharif et al. (2020). Though COVID-19 has been widely discussed in the capital markets, its effect on fixed-income securities remains untapped. Only a few studies document the effect of COVID-19 on bond yield, most notably of which include Zaremba et al. (2020), who studied the effect of COVID-19 on interest rates. Other studies include Sène et al. (2021) and Arellano et al. (2020), which examined Eurobond yields in the emerging market. Another recent work is done by He et al. (2022), who examined shifts in the term structure yields of the US treasury.

The relationship between COVID-19 and its effect on spread can be explained through various channels. The first one is the ability of COVID-19 to worsen any country's financial condition, which results in increased default risk (Arellano et al., 2020). According to Altig et al. (2020), economic uncertainty attributable to COVID-19 steepened this curve further. Therefore, in countries with more intense COVID-19 situations or reactions to pandemic-related news, investors require a high-risk premium on bonds in the sovereign bond markets (Sène et al., 2021). The second channel is the liquidity risk through which investors in the bond markets require a rebalancing of their fixed income portfolios by investing more in liquid and short-term treasury securities (Krishnamurthy & Vissing-Jorgensen, 2011). According to Helwege & Wang (2021), buying pressure also pushes down yields on short-term securities. However, a similar argument can be drawn for liquidity-induced sales of long-term securities. This increases the supply of long-run government bonds, creating gaps in the spread.

According to Zaremba et al. (2022), if bond market investors anticipate an unusual monetary policy expansion due to the recession induced by COVID-19, these investors may increase their inflationary expectations and invest in long-run treasury securities if offered sufficiently high yields. However, in such cases, when the investors expect an expansion in the monetary policy due to the COVID-19-induced business cycle recession, the premium on treasury securities can decline through two channels. First, according to Bauer and Rudebusch (2013), the premium on the long-run bonds should decrease following the signaling theory, according to which asset purchases on a large scale affect rates of medium- and long-run securities by signaling lower future monetary policy rates. However, according to Christensen and Krogstrup (2019), the portfolio balance channel arising from the decrease in the relative supply of assets purchased implies that large-scale asset purchases result in higher prices and, after that, low funding costs for the sovereign borrower.

The proposition and implementation of an effective policy response can lower the uncertainty resulting from COVID-19, which can reduce bond volatility. Therefore, if government interventions are able to decrease the uncertainty by improving business expectations, investments in fixed income securities should appear less risky (Viceira, 2012), given that the bond market yields are sensitive to macroeconomic news (Jones et al., 1998).

This study is among the first studies investigating the impact of COVID-19 (local and global) on the correlation between government and corporate bonds, allowing investors to make better investment decisions while constructing their portfolios. The analysis contributes to and even builds upon the growing yet very limited research in this area. It extends explicitly the scope of Kargar et al. (2020), who focused solely on the effect of the COVID-19 period on the US corporate bond volatility. They found that at the maximum level of crisis, the liquidity level in the corporate bond market deteriorates, and dealers become unwilling to grip the corporate debt on their balance sheets. In another study, He et al. (2020) also documented a significant decrease in the US treasury holdings on March 2020 following the apparent emergence of COVID-19 cases in the US. The abovementioned studies are concerned with the effect of the pandemic on either corporate or government bonds. However, this paper examines the direct influence on the interaction of these two bonds using the appropriate data and estimation strategy.

To sum up, reviewing the literature reveals that studies examining the impact of COVID-19 on the financial markets concentrate mainly on the stock markets. However, some of the abovementioned studies seem to perform their analyses in individual asset settings. This triggers the need for a new study on the impact of infectious diseases on portfolio correlation. Considering this point, the purpose of this paper is to examine the impact of COVID-19 as a proxy for infectious diseases on the government-corporate bonds correlation. Thus, this study takes the news of death rates and infection cases from the pandemic as inputs for the US bonds portfolios and examines their impacts across different market conditions.

2. DATA AND METHODOLOGY

This paper considers the daily 10-year government bond yields and Moody's corporate AAA and BBB bond yields. These two private sector-based bonds are used to proxy for corporate investments with different default risk levels. The data for these bonds are collected from the Federal Reserve Bank of St. Louis economic database. The COVID-19 data comprise the daily new cases and deaths in the US and globally and are obtained from the 'Our World in Data' database (Ritchie et al., 2020). Before starting the analysis, this paper takes the log difference in the COVID-19 variables and matches these with the bond yield data. The sample period starts on March 3, 2020, and ends on September 9, 2020, totaling 138 observations. The starting date of the sample is restricted by diagnosing the first death case in the US.

Table 1 shows the summary statistics of the variables in the study. It is found that the normality test is rejected for all the series except the COVID-19 global cases and deaths in the US. The distribution of all variables except the new global cases shows excess Kurtosis, i.e., leptokurtic. Therefore, as Naifar (2016) indicated, with considerable evidence of non-normality, quantile regression (QR) can be a better econometric method.

The analysis in this study starts with estimating the correlation between corporate bond yields and government bond yields. For that purpose, the dynamic conditional correlation GARCH (Hereafter, DCC) model of Engle (2002) is used. Briefly, the model can be estimated as follows. First, estimating the conditional variance series from the variables in the study involves using

Table 1. Descriptive statistics for the bond yield and the COVID-19 data

	AAA–Bond	BBB–Bond	10–Year Gov. bond	New cases–US	New cases–global	Death US	Death global
Mean	0.0000	–0.0007	0.0049	0.0524	0.0336	0.0688	0.0540
Std. Dev.	0.0385	0.0219	0.0907	0.2645	0.1329	0.5519	0.3112
Skewness	0.7511	1.6760	0.9588	2.4558	0.0609	0.1114	–0.7842
Kurtosis	7.0118	8.4242	10.6419	19.5416	2.9422	3.0694	8.5333
Jarque–Bera	105.5198***	233.7828***	356.9353***	1712.0620***	0.1044	0.3131	190.1987***
Prob.	0.0000	0.0000	0.0000	0.0000	0.9491	0.8551	0.0000
ADF test Prob.	0.0081	0.0081	0.0084	0.0097	0.0069	0.0094	0.008
PP test Prob.	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Note: *** denotes significance at a 1% confidence level.

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one of the univariate ARCH family models. For this estimation, the paper employs the EGARCH model of Nelson (1991) to allow for news' asymmetric effect on the series' volatility. Second, the DCC model is then introduced by setting the conditional covariance matrix such as:

$$D_t P_t D_t, \tag{1}$$

where D_t represents the $(n \times n)$ diagonal matrix of time-varying volatility from the GARCH model on a i-th diagonal. The term P_t denotes the produced conditional correlation matrix from the standardized residuals and can be given by:

$$P_t = Q_t^{*-1} Q_t Q_t^{*-1}. \tag{2}$$

The estimation $Q_t^* = \{\mathrm{diag}[Q_t]\}^{-1}$ represents the diagonal matrix with the main components of Q_t. Finally, the off-diagonal-based dynamic correlation of

$$\rho_{ij,t} = \frac{q_{ij,t}}{\sqrt{q_{ii,t} q_{jj,t}}}, \tag{3}$$

is obtained by estimating the following GARCH specification:

$$q_{ij,t} = \tilde{\rho}_{ij} + \alpha(\varepsilon_{i,t-1}\varepsilon_{j,t-1} - \tilde{\rho}_{ij}) + \\ + \beta(q_{ij,t-1} - \tilde{\rho}_{ij}), \tag{4}$$

where $\tilde{\rho}_{ij}$ denotes the unconditional correlation of the standardized residuals. To examine the effect of COVID-19 cases and deaths on the individual series, this study employs the quantile regression (QR) approach[1]:

$$Q\tau(y_t \mid F_{t-1}, COV_{c,t}, COV^*_{c,t}, COV_{d,t}, \\ COV^*_{d,t}) = \alpha_t(\tau) + \sum_{j=1}^{p} \beta_t 0(\tau) y_{t-j} + \\ + \beta_t 1COV_{c,t} + \beta_t 2COV^*_{c,t} + \beta_t 3COV_{d,t} + \\ + \beta_t 4COV^*_{d,t} + e_t, \tag{5}$$

The dynamic correlation then replaces the yields series to provide:

$$Q\tau(\rho_t \mid F_{t-1}, COV_{c,t}, COV^*_{c,t}, COV_{d,t}, \\ COV^*_{d,t}) = \alpha_t(\tau) + \sum_{j=1}^{p} \beta_t 0(\tau) \rho_{t-j} + \\ + \beta_t 1COV_{c,t} + \beta_t 2COV^*_{c,t} + \beta_t 3COV_{d,t} + \\ + \beta_t 4COV^*_{d,t} + e_t. \tag{6}$$

In both equations, y_t denotes the daily bond yields at time t, and ρ_t denotes the corporate AAA (or BBB) bond-government bond correlation series. $COV_{c,t}$, $COV^*_{c,t}$, $COV_{d,t}$, $COV^*_{d,t}$, are the US daily cases, global cases, the US and global deaths, respectively[2]. The lagged yields and correlations at lag j are given by y_{t-j} and ρ_{t-j}, respectively. Akaike Information Criterion (AIC) is used to determine the optimal lag order of the dependent variables. The coefficients $\beta_t 1$ to $\beta_t 4$ are used to account for the degree of dependence between the yields (or) correlations and the COVID-19 predictors described at the τth quantile. Lastly, $\beta_t 0$ accounts for the serial correlation in the dependent variable. Investigating the effect of COVID-19 variables on the quantiles allows for the asymmetry in the relation where the lower (higher) quantiles should be associated with the lower (higher) distributions of the correlation.

Figure 1 displays the yield series along with the changes in the COVID-19 cases and deaths. The top three panels plot the yields series. Clearly, the bond yields, either of corporate or government bonds, exhibit a sudden decrease in March following the increase in COVID-19 cases in the US and globally. This pattern appears in April before reversing to its average level until the end of the sample period. This variation seems to be reflected in the correlation series, specifically panels d and e. However, the government bond-AAA bond correlation is negative in March and tends to be more positive over time. BBB bond results in a positive correlation over time with an increasing pattern at the end of the sample period.

1 The same is done by Guo et al. (2018) and Kannadhasan and Das (2020) to account for the serial autocorrelation in the dependent variable. These results from equation 4 are reported in Appendix A.

2 The alternative analysis involves estimating the model with only one predictor at a time. However, the results are qualitatively and quantitatively similar to those currently presented.

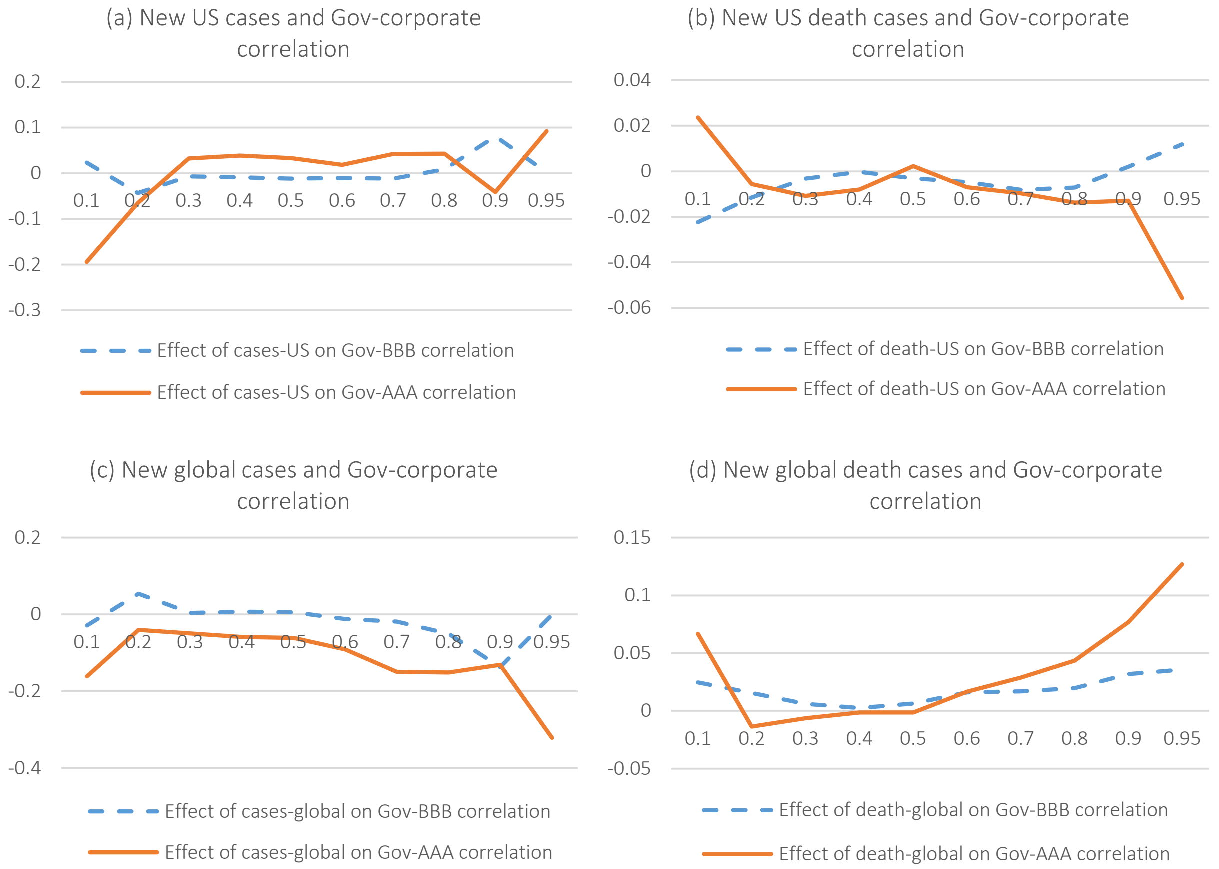

Figure 1. Bond yields, correlations series, and COVID-19 variables

Interestingly, a break can be observed in the government bond-BBB bond correlation around May, when the change in the daily global death cases reaches its maximum level (see panels e and i). Noticeably, considering the COVID-19 variables reveals the most difference between the changes in the daily death cases in the US and worldwide. This observation triggers the need to contrast the influence of the local figures with their global counterparts.

3. RESULTS AND DISCUSSION

Table 2 presents the results from equation 5 while considering the effects of all the COVID-19 variables. Several interesting observations arise. First, the magnitudes of the impacts of both the local and global predictors vary across quantiles. Unambiguously, higher quantiles (with higher means) appear to be associated with higher absolute values of influences. This can be explained by the willingness of investors to absorb the information arriving in the market in the long-run. In other words, as time passes by, investors in the market perceive the systematic-coronavirus-related information as the main contributor to the uncertainty in the bond markets. Hence, investors tend to deal with this issue by adopting the flight-to-safety strategy. The second observation concerns the sign of the coefficients. Here, consistency in the impact of new global cases on the government-AAA bond correlations across quantiles was noticed. The same is also true once one considers the influence of the global death cases on the government bond -BBB correlation.

Third, a distinct difference is observed between the regression-based results of the local cases and deaths regardless of the release source. Lastly and most interestingly, deaths at the global level are found to exhibit a significant impact on the higher quantiles of the two correlation series. However, this evidence becomes economically stronger when the AAA bond is considered in the bond portfolio. This result might indicate the high uncertainty in

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Table 2. Summary of QR estimates

	Quantile	New cases–US			New cases–Global			Death–US			Death–Global		
		Coef.	t–Stat.	Prob.	Coef.	t–Stat.	Prob.	Coef.	t–Stat.	Prob.	Coef.	t–Stat.	Prob.
Gov. Bond–AAA Bond corr.	0.1	–0.194	–1.503	0.135	–0.161	–0.858	0.393	–0.024	0.944	0.347	0.067	1.197	0.233
	0.2	–0.065	–0.816	0.416	–0.040	–0.442	0.659	–0.006	–0.195	0.846	–0.014	–0.415	0.679
	0.3	0.032	0.630	0.530	–0.049	–0.547	0.585	–0.011	–0.703	0.483	–0.006	–0.396	0.693
	0.4	0.039	0.803	0.423	–0.059	–0.793	0.429	–0.008	–0.545	0.587	–0.001	–0.094	0.926
	0.5	0.033	0.811	0.419	–0.061	–0.930	0.354	0.002	0.202	0.841	–0.002	–0.096	0.924
	0.6	0.018	0.441	0.660	–0.091	–1.326	0.187	–0.007	–0.584	0.560	0.017	0.797	0.427
	0.7	0.042	0.818	0.415	–0.149*	–1.725	0.087	–0.010	–0.767	0.444	0.029	1.212	0.228
	0.8	0.043	0.605	0.546	–0.151	–1.268	0.207	–0.014	–0.945	0.346	0.044*	1.668	0.094
	0.9	–0.041	–0.394	0.695	–0.131	–0.477	0.634	–0.013	–0.412	0.681	0.077***	2.821	0.006
	0.95	0.092	0.865	0.388	–0.321	–1.429	0.155	–0.056	–1.641	0.103	0.127***	2.720	0.007
Gov. Bond–BBB Bond corr.	0.1	0.023	0.816	0.416	–0.029	–0.383	0.702	–0.022	–2.666	0.009	0.025**	2.101	0.038
	0.2	–0.044	–1.656	0.100	0.054	1.476	0.142	–0.011	–1.061	0.291	0.015	1.103	0.272
	0.3	–0.007	–0.399	0.690	0.004	0.163	0.871	–0.003	–0.517	0.606	0.006	0.674	0.501
	0.4	–0.009	–0.585	0.560	0.007	0.310	0.757	0.000	–0.059	0.953	0.003	0.331	0.742
	0.5	–0.012	–0.723	0.471	0.005	0.242	0.809	–0.003	–0.484	0.629	0.006	0.781	0.436
	0.6	–0.011	–0.607	0.545	–0.012	–0.484	0.629	–0.005	–0.606	0.546	0.016	1.285	0.201
	0.7	–0.012	–0.701	0.484	–0.019	–0.791	0.431	–0.008	–1.181	0.240	0.017*	1.727	0.086
	0.8	0.009	0.426	0.671	–0.050	–1.619	0.108	–0.007	–0.995	0.322	0.020**	1.993	0.048
	0.9	0.081***	3.277	0.001	–0.137**	–2.423	0.017	0.002	0.152	0.879	0.032***	3.006	0.003
	0.95	0.002	0.030	0.976	–0.001	–0.006	0.995	0.012	0.386	0.700	0.036*	1.777	0.078

Note: ***, **, and * denote significance at 1%, 5%, and 10% levels, respectively.

Table 3. Symmetric test for the coefficients

	Quantile	New cases–US		New cases–Global		Death–US		Death–Global	
		Restr. Value	Prob.	Restr. Value	Prob.	Restr. Value	Prob.	Restr. Value	Prob.
Gov. Bond–AAA Bond correlation	0.05, 0.95	0.012	0.877	0.105	0.669	–0.002	0.962	–0.013	0.659
	0.25, 0.75	–0.006	0.811	–0.008	0.813	–0.003	0.768	0.009	0.530
Gov. Bond–BBB Bond correlation	0.05, 0.95	–0.463**	0.044	0.020	0.961	–0.072*	0.094	0.248***	0.001
	0.25, 0.75	0.018	0.786	–0.152	0.163	–0.018	0.330	0.026	0.376

Note: ***, **, and * denote significance at 1%, 5%, and 10% levels, respectively. Restr. value denotes the individual coefficient restriction test values.

the AAA-bond market during the COVID-19 period. On the other hand, the new local (global) cases bring positive (negative) effects on the Government bond-BBB correlation series at the 90% quantile. Table 3 presents the results of the Wald test, highlighting that COVID-19 variables have a significant asymmetric relationship with the bond yield correlations under different combinations of lower, intermediate, and higher quantile distributions. Precisely, it reports evidence of asymmetric impacts on the BBB-government yields correlation between the lower and the higher quantile for both the local and global death cases. However, this evidence appears statistically the most with the global observations. This finding can also be seen again within the same quantile level and on the exact correlation series for the influence of the new cases in the US.

Figure 2 presents a graphical depiction of the COVID-19-related estimated coefficients only. Interestingly, the effect of either of the daily US COVID-19 news on the AAA-bond included portfolio seems to be reversed entirely once considering the government-BBB yield portfolio. For example, panel a shows that the impact of the new cases in the US is negative at the lower quantiles and positive at the higher quantiles.

This relation moves in the opposite direction with the BBB bond yields. Panel b confirms that the ef-

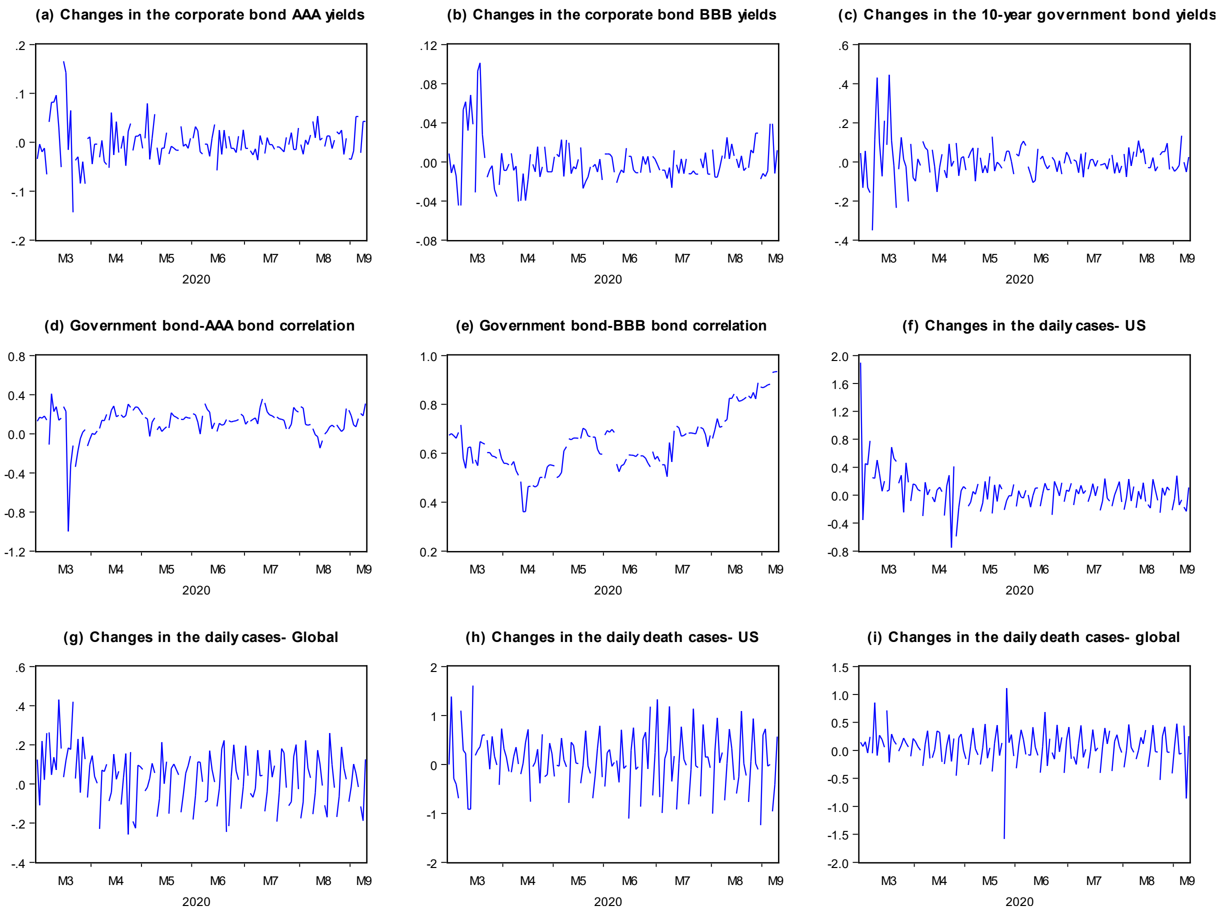

Figure 2. QR estimates

fect of the local death cases differs from that of the local cases. That is, the new death cases now leave a positive (negative) impact on the government-(AAA) BBB bonds correlations at the lower quantile. This relationship tends to move in the opposite direction at the higher quantiles.

Panels c and d are associated with the patterns of the resulting relationships from the global COVID-19 information. The general finding contradicts that of the local coronavirus figures. The results assume that the impact on both of the correlation series follows almost the same pattern as the global coronavirus variables used in the analysis. However, the global cases' impact varies more across quantiles, with a positive impact at the 20% lower and the intermediate quantiles before turning positive at the higher quantiles of more than 50%.

To sum up, the graphical results from Figure 2 complement those observed before regarding the clear difference between the impacts of the cases and deaths either locally or their global counterparts. They also indicate a stronger and more consistent impact of the global COVID-19 information on the bond yields correlation across quantiles. Henceforth, these findings contribute to the previous studies that examined the impact of the COVID-19 pandemic on the individual bond markets (Kargar et al., 2020; He et al., 2020). The variation in the COVID-19 impact on quantiles also seems to support the argument made by Sharif et al. (2020) for the differences in risk perception over time scales during the pandemic. The study supplements their findings since the quantiles themselves show different market conditions with an unequal level of risks across these quantiles. More importantly, these findings suggest using the COVID-19-related news as a new risk factor for bond portfolios. Finally, the analysis emphasizes the importance of considering more local COVID-19 data than global data while constructing corporate-government bond portfolios. Explicitly, the impact of the local information on the government-BBB yields contraries to those with the AAA at the same quantile.

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CONCLUSION

This study investigates whether the COVID-19 pandemic drives the government-corporate yields correlation. It addresses the research question using the AAA and BBB Moody's corporate bond data along with the 10-year government bond yields. This study also contrasts the effect of the daily cases and death cases on both the US and the global levels. Estimates of the quantile regression reveal the following interesting results. First, the daily cases leave a different impact than death cases at both levels of analysis. Second, the impacts of local cases and deaths on the government-AAA yields correlation contrarian to those with the BBB yields. Lastly, global death cases significantly affect the correlation series the most at the higher quantiles distributions. The takeaway results indicate that local COVID-19 is more relevant for investors and portfolio managers in the bond market. They also uncover switching in both the sign and the magnitude of the impact of daily COVID-19 data across the bonds correlation quantiles.

The results carry implications for the fixed income (both government- and rated corporate-bonds) investment community. The correlation between the rated corporate and government bonds highlights some interesting results, which do not appear homogeneous for the COVID-19 cases and death rates. Investors can use this information in reshuffling their portfolios in case of higher sensitivity of death cases to the correlation between rated corporate and government bonds. The sensitivity of corporate-treasury bonds correlation also suggests that the COVID-19 death rates are more influential on the bonds correlation compared with the COVID-19 affected rates. Such results can help investors in rebalancing their portfolios comprising fixed income securities during periods of crisis.

Furthermore, these effects are more pronounced during the extreme positive market returns, which may be attributed to the different packages that government announces as a result of recessions induced by COVID-19. Though the significance of results across extreme positive market returns eliminates the risk of contagion, it can eventually result in equilibrium adjustments later, resulting in a drop in yields. Finally, AAA-rated bonds highlight higher sensitivity to COVID-19 cases and death rates than the BBB-rated bonds suggesting that comparatively high-quality bonds are more sensitive to the pandemic period. Therefore, this calls for careful evaluation of securities combined in investors' portfolios.

AUTHOR CONTRIBUTIONS

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APPENDIX A

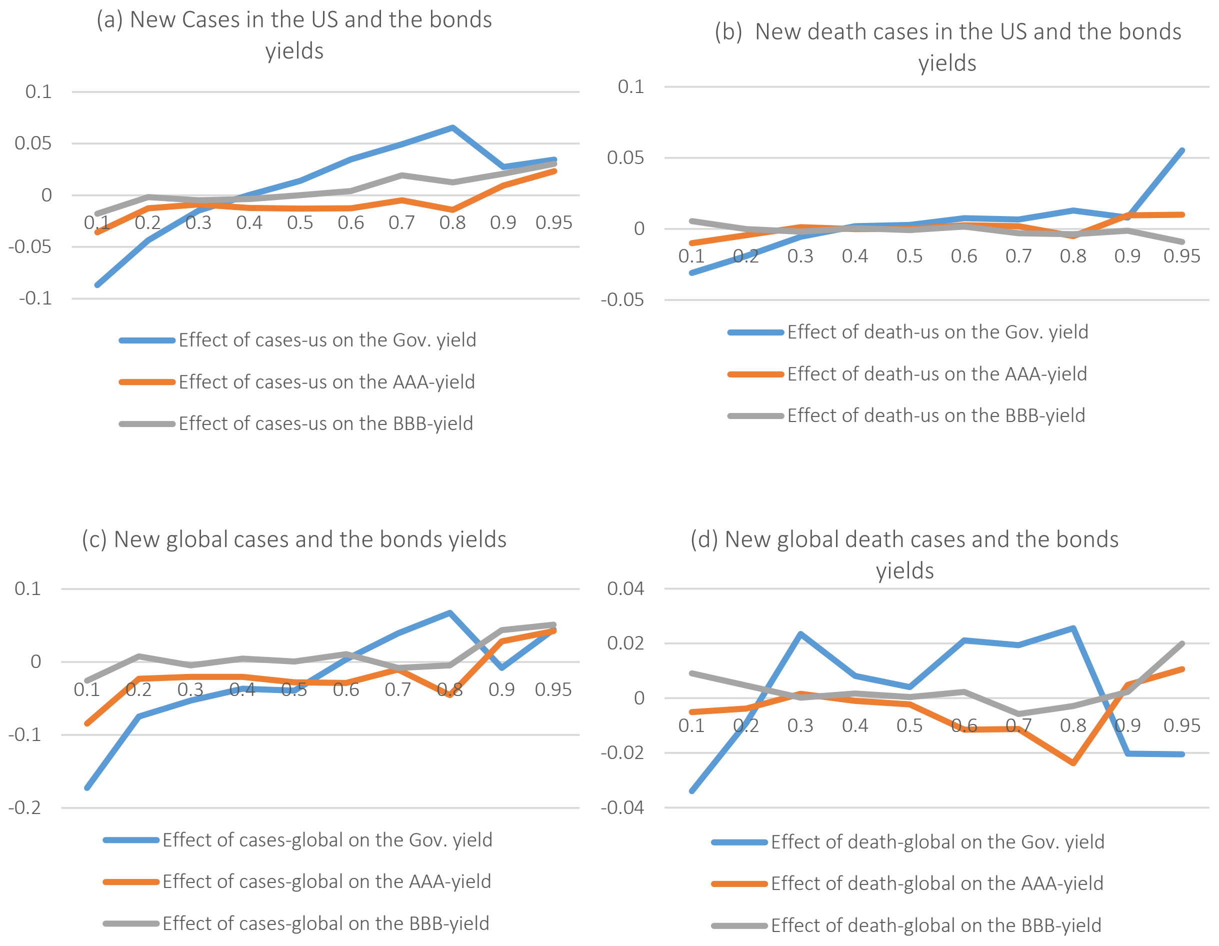

Figure A1. COVID-19 and bond yields

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Table A1. Estimating the DCC-GARCH model

	Coefficient	Std. Error	Prob.
Panel A: Gov. Bond–AAA Bond correlation			
α	–0.0758***	0.0000	0.0000
β	0.7807***	0.0000	0.0000
Constant	0.1331*	0.0800	0.0961
Log Likelihood	566.7239		
Panel B: Gov. Bond–BBB Bond correlation			
α	0.0705***	0.0218	0.0013
β	0.9436***	0.0277	0.0000
Constant	0.6875***	0.0540	0.0000
Log Likelihood	594.1607		

Note: The estimates are from the 2-step DCC (1,1) model with univariate EGARCH fitted in the first step. ***, **, and * denote significance at 10%, 5%, and 1% significance levels, respectively. For more details about the model, see equation 3.