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## Article

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*Reference:* Baek, Chung/Jackman, Thomas (2021). Safe-haven assets for U.S. equities during the 2020 COVID-19 bear market. In: Economics and Business Letters 10 (3), S. 331 - 335.  
<https://reunido.uniovi.es/index.php/EBL/article/download/15335/14012/45002>.  
doi:10.17811/eb1.10.3.2021.331-335.

This Version is available at:  
<http://hdl.handle.net/11159/6034>

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## **Safe-haven assets for U.S. equities during the 2020 COVID-19 bear market**

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*Received: 29 July 2020*

*Revised: 16 December 2020*

*Accepted: 14 February 2021*

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### **Abstract**

The recent stock market downturn is differentiated from previous ones as it is due to an economic (the COVID-19 Pandemic), rather than a financial occurrence. Our paper examines gold, bitcoin, and U.S. Treasury bonds as a safe haven during the COVID-19 bear market. While previous studies support gold as a traditional safe haven for stocks, our study finds that bitcoin and Treasury bonds perform better as a safe haven than gold during the recent COVID-19 bear market.

**Keywords:** COVID-19 Pandemic; Safe Haven; Bear Market; Extreme Stock Returns

**JEL Classification Codes:** G01, G11

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### **1. Introduction**

The recent collapse of the U.S. stock market triggered by the COVID-19 Pandemic is different from previous stock market crashes that were primarily caused by imperfections or structural defects in financial markets. This motivates us to examine whether investors might respond differently than in previous market corrections when seeking a safe haven for their stock portfolios. The purpose of our study is to identify which specific assets performed the best as a safe haven for stocks during the 2020 COVID-19 bear market.

A lot of research has investigated which assets perform best as a safe haven for equities including precious metals, commodities, bonds, and even cryptocurrencies. In this study, we examine three popular assets (gold, bitcoin, and U.S. Treasury bonds) and their performance as a safe haven against extreme stock returns during the COVID-19 bear market. Historically, Gold is the most extensively studied asset as a safe haven for stocks. Many previous studies support gold's role as a safe haven including Baur and Lucey (2010), Baur and McDermott (2010), Coudert and Raymond-Feingold (2011), Hood and Malik (2013), Gurgun and Unalmis (2014), Flavin et al. (2014), Beckmann et al. (2015), Bredin et al. (2015), Lucey and Li (2015), Li and Lucey (2017), Chkili (2017), Wen and Cheng (2018), Baek (2019), and Ji et al. (2020). Some of these studies also show that gold's safe-haven property differs across international

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Citation: Baek, C., and Jackman, T. (2021) Safe-haven assets for U.S. equities during the 2020 COVID-19 bear market, *Economics and Business Letters*, 10(3), 331-335.

DOI: 10.17811/eb1.10.3.2021.331-335

equity markets and varies over time. The more recent studies focus on bitcoin as a safe haven for equity markets and most of them conclude that bitcoin's role as a safe haven is at best weak or varies over time (Klein et al., 2018; Shahzad et al., 2019; Bouri et al., 2017; Smales, 2019; Conlon et al., 2020; Conlon and McGee, 2020; and Corbert et al., 2020). U.S. Treasuries are also typically regarded as another flight-to-quality asset for equities (Stivers and Sun, 2002; Connolly et al., 2005; and Flavin et al., 2014).

To evaluate whether an asset performs well as a safe haven for another asset we use the definitions and statistical tests provided by Baur and Lucey (2010) and Baur and McDermott (2010). If an asset is negatively correlated (uncorrelated) with another asset under extreme market conditions, the asset is considered a strong (weak) safe haven.

## 2. Data and methods

According to Conlon and McGee (2019), the bitcoin market has become substantially efficient since 2016. We collect daily data for bitcoin, gold, S&P 500 index, and Treasury bonds from January 4, 2016, to May 26, 2020. The bitcoin and S&P 500 index data are downloaded from the Federal Reserve Bank of St. Louis and the SPDR gold ETF and iShare 7-10 year Treasury bond (T-bonds) ETF data are obtained from investing.com. The stock market index (S&P 500 index) started declining from its highest level (3386.15) on February 19, 2020, reaching its lowest level (2237.40) on March 23, 2020, and thereafter, recovering (V-shape). Therefore, in order to consider extreme returns that reflect the pure effect of the COVID-19 pandemic, we define the COVID-19 bear market test period from February 19, 2020, to the end point of our data, May 26, 2020 (approximately 3 months). Table 1 shows descriptive statistics.

The purpose of our study is to investigate whether gold, bitcoin, or T-bonds serve as a safe haven during the bear market triggered by the 2020 COVID-19 Pandemic. We adopt the following econometric model proposed by Baur and Lucey (2010) and Baur and McDermott (2010).

$$R_{i,t} = \alpha + \beta_t R_{stock,t} + \varepsilon_t \quad (1)$$

$$\beta_t = \gamma_0 + \gamma_1 D_{stock,q10} + \gamma_2 D_{stock,q5} + \gamma_3 D_{stock,q1} \quad (2)$$

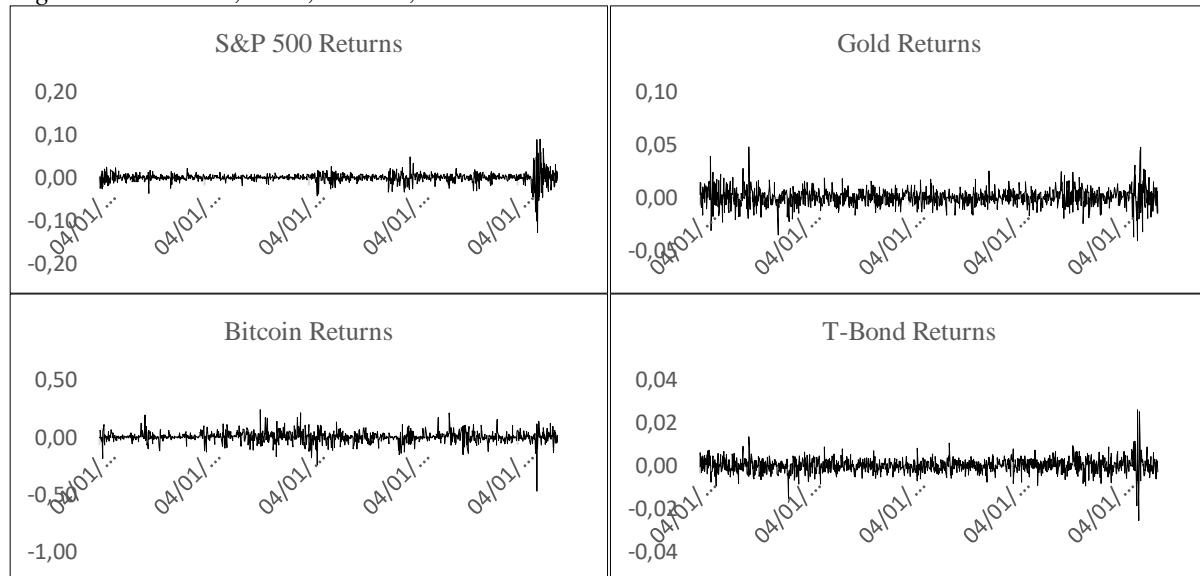
$$\sigma_t^2 = \pi + \sum_{i=1}^k \theta_i \varepsilon_{t-i}^2 + \sum_{j=1}^l \omega_j \sigma_{t-j}^2 \quad (3)$$

where  $R_{i,t}$  is gold, bitcoin, or T-bonds return at time  $t$ ,  $R_{stock,t}$  is the stock market return at time  $t$ , and  $D_{stock,qx}$  is the dummy variable for  $x\%$  quantile of the stock return distribution. All returns are log returns. The dummy variables are equal to one if stock returns are less than or equal to  $x^{\text{th}}$  percentile ( $q_x$ ) and zero otherwise. The error term in Equation (1) is assumed to follow the GARCH (1,1) in Equation (3) to consider time-varying volatilities shown in Figure 1. All coefficients are jointly estimated.

Table 1. Descriptive statistics.

	S&P 500 Returns	Gold Returns	Bitcoin Returns	T-Bonds Returns
<b>Panel A – Whole Data Period (January 4, 2016 – May 26, 2020)</b>				
Mean	0.000359	0.000405	0.002728	0.000124
Median	0.000602	0.000618	0.003281	0.000189
Standard Dev.	0.012215	0.008419	0.048684	0.003519
Skewness	-1.097039	0.210099	-0.738105	0.221355
Kurtosis	24.287942	4.178930	10.741658	8.336716
<b>Panel B – Bear Market Period (February 19, 2020 – May 26, 2020)</b>				
Mean	-0.001848	0.000869	-0.001223	0.001029
Median	-0.001604	0.003499	0.004746	0.000657
Standard Dev.	0.038272	0.016726	0.076643	0.007636
Skewness	-0.345805	0.041272	-3.469983	0.110863
Kurtosis	1.655923	0.853759	20.715326	4.210384

Figure 1. S&amp;P 500, Gold, Bitcoin, and T-bonds Returns.



### 3. Empirical results

Table 2 and Table 3 show whether gold, bitcoin, or T-bonds perform well as a safe haven for stocks. As shown in Baur and McDermott (2010),  $R_{(qx)}$  is the total effect for the  $x\%$  quantile as the sum of coefficients of the dummy variables defined in Equation (2). If  $R_{(qx)}$  is significantly negative (insignificant or not different from zero), the dependent variable is regarded as a strong (weak) safe haven.

In Table 2, gold acts as a strong safe haven at the 10% quantile ( $R_{(q10)}$ ) and a weak safe haven at the 5% quantile ( $R_{(q5)}$ ) but it is not a safe haven at all for the most extreme stock returns (1% quantile). Bitcoin acts as a weak safe haven at the 10% and 5% quantiles but not at all for the most extreme stock returns. T-bonds act as a strong safe haven at the 10% quantile but are weak as a safe haven at the 5% and 1% quantiles. Overall, although T-bonds appear to be slightly better as a safe haven than gold and bitcoin for the whole data period, it is not significant evidence.

On the other hand, Table 3 shows results for the COVID-19 bear market (February 19, 2020, to May 26, 2020). While gold is a weak safe haven at all quantiles, bitcoin is a strong safe haven at the 1% quantile and T-bonds are a strong safe haven at both 5% and 1% quantiles. This means that bitcoin and T-bonds perform better than gold as a safe haven for the most extreme stock returns during the 2020 COVID-19 bear market. In fact, this is evidence counter to the traditional studies that support gold as a safe haven for stocks.

Table 2. Results – Whole Data Period (January 4, 2016 – May 26, 2020).

Coefficient	Gold (t-ratio)	Bitcoin (t-ratio)	T-bonds (t-ratio)
Constant	-0.0001 (-0.26)	0.0026** (1.98)	0.0002* (1.67)
$R_{Stock,t}$	-0.0371 (-1.09)	0.1640 (0.89)	-0.1234*** (-9.91)
$R_{(q10)}$	-0.1708* (-1.90)	-0.2914 (-0.58)	-0.0762** (-2.30)
$R_{(q5)}$	-0.0231 (-0.25)	0.2777 (0.54)	0.0525 (1.54)
$R_{(q1)}$	0.2189*** (3.08)	1.9334*** (5.27)	-0.0205 (-0.71)
<i>GARCH (1,1)</i>			
$\pi$	0.0000** (2.42)	0.0001*** (4.24)	0.0000*** (3.60)
$\theta_1$	0.0472*** (4.06)	0.1211*** (5.84)	0.1616*** (4.28)
$\omega_1$	0.9342*** (57.63)	0.8382*** (33.03)	0.5912*** (6.61)

Note: \*, \*\*, and \*\*\* are the 10%, 5%, and 1% significance levels respectively.

Table 3. Results – COVID-19 Bear Market (February 19, 2020 – May 26, 2020).

Coefficient	Gold (t-ratio)	Bitcoin (t-ratio)	T-bonds (t-ratio)
$\alpha$	0.0019 (0.95)	0.0076 (1.12)	0.0017*** (2.59)
$R_{stock,t}$	0.0220 (0.32)	0.5379** (2.31)	-0.1513*** (-6.99)
$R_{(q10)}$	-0.1922 (-0.09)	-0.7715 (-1.10)	0.2111*** (2.96)
$R_{(q5)}$	0.2837 (1.21)	3.3404*** (4.59)	-0.0396** (-0.50)
$R_{(q1)}$	-0.1810 (-0.98)	-2.2850*** (-4.17)	-0.2110*** (-3.44)
$GARCH(1,1)$			
$\pi$	0.0002 (0.86)	0.0025 (1.01)	0.0000* (1.85)
$\theta_1$	0.1083 (0.73)	0.1037 (0.75)	0.2489 (1.26)
$\omega_1$	0.0000 (0.00)	0.0000 (0.00)	0.0000 (0.00)

Note: \*, \*\*, and \*\*\* are the 10%, 5%, and 1% significance levels respectively.

#### 4. Conclusion

The recent stock market turmoil triggered by the COVID-19 Pandemic is essentially different from previous stock market crashes in terms of the magnitude and speed of the collapse. We examine gold, bitcoin, and T-bonds and how they perform as a safe haven against extreme stock returns during the recent COVID-19 bear market and find that bitcoin and T-bonds serve as a better safe haven than gold which is typically regarded as a traditional safe haven for stocks. Conclusively, while gold can be regarded as a traditional safe haven for stocks under typical stock market crashes caused by imperfections or structural defects in the financial markets, bitcoin or T-bonds may play a critical role as a safe haven for stocks under an atypical market crash such as the COVID-19 bear market.

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