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RESEARCH ARTICLE

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The Effect of the COVID-19 Crisis on the Risk and Return Relationship in the Stock Markets of Emerging Countries

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Abstract

When the crises experienced throughout history are examined, it is seen that although the crises have common aspects in economic and financial terms, they are not the same. Unlike all previous crises, however, instead of economic and financial considerations, we are faced with the COVID-19 crisis, which is an epidemic disease. Examining the effects of financial crises on financial markets is very important for both investors and countries. Therefore, in the study, the risk-return relationship between the stock markets of India, Brazil, Indonesia, Turkey and South African countries were analyzed with the GARCH-M method in Pre-COVID-19 crisis term and COVID-19 crisis term. As a result of the analysis, it was observed that the response to the COVID-19 crisis occurred mostly in the Turkish stock market, while the reason for the volatility in other stock markets was the previous period. During the COVID-19 crisis, it has been obtained that they provide additional returns to their investors in response to the increased risk in the Indonesian and Turkish stock markets.

Keywords: *Risk, Return, Volatility, COVID-19 Crisis.*

Öz

Tarih boyunca yaşanan krizler incelendiğinde krizlerin ekonomik ve finansal açıdan ortak yönlerinin olmasına rağmen birbirinin aynı olmadığı görülmektedir. Ancak günümüzde diğer bütün krizlerden tamamen farklı olarak, temel sebebi salgın hastalık olan COVID-19 krizi yaşanmaktadır. Finansal krizlerin finansal piyasalara etkilerinin incelenmesi hem yatırımcılar hem de ülkeler açısından oldukça önemlidir. Bu nedenle çalışmada hem cari açık ve enflasyon oranlarının yüksekliğinden hem de dış yatırımlara duydukları ihtiyaçtan dolayı Morgan Stanley tarafından kırılgan ekonomiye sahip ülkeler olarak ilan edilen Hindistan, Brezilya, Endonezya, Türkiye ve Güney Afrika borsaların risk getiri ilişkisi COVID-19 krizi öncesi (Mayıs 2018-Aralık 2019) ve COVID-19 krizi süreci (Ocak 2020-Mayıs 2022) dönemlerinde GARCH-M yöntemi ile analiz edilmiştir. Analiz sonucunda COVID-19 krizine verilen tepki en fazla Türkiye borsasında gerçekleşirken, diğer borsalarda oynaklığın nedeni bir önceki dönem olduğu gözlemlenmiştir. COVID-19 krizi sürecinde Endonezya ve Türkiye borsalarında artan riske karşılık yatırımcılarına ek getiri sağladıkları elde edilmiştir.

Anahtar Kelimeler: *Risk, Getiri, Volatilite, COVID-19 Krizi.*

Introduction

The COVID-19 virus epidemic, which occurred in Wuhan, China on December 31, 2019, became effective all over the world and was declared a pandemic by the World Health Organization-WHO on March 11, 2020. The sudden and large-scale population losses caused by the COVID-19 virus, as well as the disruption of daily life as a result of the measures taken, the disruption of production and activities, have paved the way for the economic crisis by negatively impacting the country's economies and financial markets (Saban and Trabzon, 2021; Duran and Acar, 2020). When the crises in the world are examined, it is seen that although the crises are not exactly the same, they have common aspects in economic and financial terms (Perelman, 2008). However, the current COVID-19 crisis is different from all other crises in history, as the main cause is an epidemic. A virus that threatens human health is the major cause of economic and financial problems in the COVID-19 crisis. The following three factors, according to the IMF, are the causes that separate the COVID-19 crisis from other financial crises (IMF, 2020).

1. The economic and financial shock is greater (because the production losses as a result of the quarantines and restrictions applied in the name of the virus that threatens human life are much more than other global crises).
2. The duration and intensity of the crisis are unknown, similar to a war or political crisis.
3. It is difficult to make regulations to manage the economy during the pandemic.

World stock markets were quickly affected by the COVID-19 crisis. The uncertainty created by both the lack of drugs and vaccines for the COVİD-19 virus for a long time and the rapid spread of the epidemic all over the world led to the formation of strong sales waves in the stock markets, and historical declines were experienced in the world stock markets (Loayza and Pennings, 2020; Şenol, 2020; Göçmen Yağcılar, 2021). Since the beginning of 2020, the financial markets of developed countries such as the United States, Italy and Spain have been heavily damaged (Pandey and Kumari, 2021). The S&P500 and NASDAQ composite indices had the worst day of the century on March 16, 2020, with 12% depreciation (Baek, Mohanty and Glambosky, 2020). The collapse in the US stock markets contagioned Asian and European stock markets. The UK FTSE index depreciated by more than 10% on March 12, while the Japanese stock market depreciated by 20% (Zhang, Hu and Ji, 2020). In Turkey, the BIST-100 index depreciated by approximately 16.75% throughout March. The CBOE-Volatility index (VIX), which fell to 12.10 in January 2020, reached 82.69 after the COVID-19 outbreak was declared as a pandemic. This value is above the maximum level of 80.86 seen during the 2008 global crisis and clearly reveals the reflection of the crisis caused by the COVID-19 pandemic on the financial markets (Şenol, 2020; Göçmen Yağcılar, 2021).

It is undeniable that COVID-19, which is seen as an epidemic, has shocked financial markets. In this direction, it is aimed at examining and evaluating the effect of the COVID-19 crisis on the risk-return relationship in the stock markets of emerging countries. Since the first day of the pandemic, many studies have been conducted based on the financial markets of countries. However, this study is unique in that it reveals the effects of the pandemic on financial markets in the relatively long term.

This research is divided into four sections. In the first section, general information about the COVID-19 crisis and financial performance evaluation are given. The literature on the effects of the COVID-19 crisis was examined in the second section. In the third section, the risk-return relationship between the stock markets of India, Brazil, Indonesia, Turkey and South African countries, which were declared to have fragile economies by Morgan Stanley, before the COVID-19 crisis (May 2018-December 2019) and during the COVID-19 crisis (January 2020-May 2022), was analyzed with the GARCH-M method during the process periods. Finally, in the fourth section, the findings are interpreted.

Literature

The fact that the uncertainty created by the pandemic caused strong sales waves in the stock markets has directed the attention of the

researchers to the effects of the COVID-19 virus on the financial markets. For this reason, many studies have been carried out to examine the impact of the COVID-19 crisis on the economy. When the studies in the field of economy and finance are examined, it is seen that the effects of the COVID-19 crisis on monetary policy (Kuzucu, 2022), labor supply, risk premium of countries, production by sectors, consumption demand, government expenditures, tourism and travel, oil prices (Arezki and Nguyen, 2020), supply and demand in trade (Baldwin and Weder di Mauro, 2020), banks bankalar (Yurttadur, 2022; Çoşkun, Öncü, Çömlekçi and Hiçyılmaz, 2022; Çöllü, 2021; Demirel, 2021; Arabacı and Yücel, 2020; Ersoy, Gürbüz and Doğan, 2020; Cecchetti and Schoenholtz, 2020), GDP loss (McKibbin and Fernando, 2020), economic crises (Fetzer, Hensel, Hemle and Roth, 2020) and financial markets (Yıldız, Dağıdır and Altınışık, 2022; Göçmen Yağcılar, 2021; Rahman, Amin and Al Mamun, 2021; Sun, Wu, Zeng and Peng, 2020; Acar, 2020; Şenol, 2020; Heyden and Heyden, 2020; Zeren and Hizarci, 2020; Goodell and Huyn, 2020; Zhang, Hu and Ji, 2020; Keleş, 2020; Kılıç, 2020; Aydın and Gökçe, 2022; Feng, Bao, Wang, Meng, Xia and Zhang, 2020) are examined.

Studies investigating the impact of COVID-19 on financial markets are spreading rapidly in the literature. The effect of the virus in the markets of different countries is analyzed on stock market indices and stock returns using several methods. Eren, Göker and Karaca (2021), who examined the effect of COVID-19 on stock markets, examined the effect of the pandemic on the leading stock market index returns of 22 developed countries by using the event study method. They concluded that the stock markets of developed countries were not efficient in a semi-strong form at the time of the declaration of the global epidemic of COVID-19 and in the period around it. Ölmez and Ekinci (2020) examined the effects of the COVID-19 pandemic on BIST100 using the GARCH method. According to the results of the analysis, they obtained that all sectors (service, industrial, financial, technology) were adversely affected during the epidemic period, according to the sector index returns used in the analysis. In their investigations, Yan, Tu, Stuart and Zhang (2020) found that during epidemic periods, markets reacted quickly to the outbreak and fell in the short term, but then corrected and rose in the long run. They argued that investments made in the travel, entertainment, technology sectors and gold in particular have great return potential.

When looking at the literature as a whole, it's difficult to get a clear picture of the broad framework of the link between COVID-19 and financial markets. The COVID-19 pandemic is expected to have a negative impact on financial markets. Despite this, gains are made in some markets or units. In some studies, it has been concluded that there are sectors that are claimed to be positively affected by COVID-19 (Kılıç, 2020; Aydın and Gökçe, 2022).

Examining the effects of financial crises on national economies is essential for both investors and countries to identify potential opportunities and threats ahead of time. For this reason, it is aimed at examining and evaluating the effect of the COVID-19 crisis, which has more effect and uncertainty than other economic and financial crises, on the risk-return relationship in the stock markets of emerging countries.

Model and Findings

The literature review on the impact of the COVID-19 crisis on the country's economies and financial markets has been presented in the previous sections. In this section, the effect of the COVID-19 crisis on the risk-return relationship in the stock markets of emerging countries is examined. The period of May 2018-May 2022 was taken into account in the analysis and data were divided into two parts as pre-COVID-19 crisis term (May 2018-December 2019) and COVID-19 crisis term (January 2020-May 2022). India, Brazil, Indonesia, Turkey and South African countries, which were declared as fragile economies by Morgan Stanley due to their high current account deficits and inflation rates and their need for foreign investments, were taken into account in the determination of emerging countries. The price series of the stock exchanges of the countries were obtained from the MSCI database in dollars at daily frequency (MSCI, 2022). GARCH in Mean (GARCH-M) model, which was developed by

Engle at al. (1987) and expressed with equations (1)-(2), was used in the analysis.

$$r_t = v + \xi\sigma_t^2 + a_t \qquad a_t = \sigma\epsilon_t \qquad (1)$$

$$\sigma_t^2 = \omega + \theta a_{t-1}^2 + \beta\sigma_{t-1}^2 \qquad (2)$$

In the GARCH-M model, θ represents the magnitude of the response to shocks and β the latency of volatility. The series reacts to crises in direct proportion to the parameter calculated from the equation. The larger the value of the β parameter, the greater the impact of the crises on the series. v and ξ parameters are constant. ξ is called the risk premium. If ξ is positive, it indicates the existence of a linear relationship between expected return and risk (Glosten, Jagannathan and Runkle, 1993; Hatipoğlu and Uçkun, 2017; Kılıç and Ayrıçay, 2020: Varlık and Varlık, 2017).

When the unit root tests of the countries' time series were evaluated, it was revealed that they were stationary. Table 1 includes descriptive statistics for India, Brazil, Indonesia, Turkey, and South Africa during the pre-COVID-19 crisis term (May 2018-December 2019) and the COVID-19 crisis term (January 2020-May 2022).

Table 1. Descriptive Statistics of Countries Before and During the COVID-19 Crisis*

		Mean	Std. Deviation	Skewness	Kurtosis
Pre-COVID-19 Crisis Term	India	565.86	26.47	-0.52	2.74
	Brazil	2022.45	203.74	-0.56	2.46
	Indonesia	803.87	50.94	-0.54	2.25
	Turkey	244.06	26.51	0.29	3.36
	South Africa	468.20	32.72	0.60	3.02
COVID-19 Crisis Term	India	679.90	139.06	-0.36	1.96
	Brazil	1672.24	269.71	0.30	3.03
	Indonesia	724.89	92.81	-0.53	2.93
	Turkey	195.05	26.98	1.19	3.85
	South Africa	441.04	66.03	-0.75	2.79

**The values are obtained from the daily price series of the stock exchanges of the countries announced in the MSCI database.*

When the descriptive statistics values of the return time series of the stock markets of the countries before the COVID-19 crisis are examined in Table 1, it is seen that the skewness coefficients of India, Brazil and Indonesia have negative values. This means that negative returns are greater than positive returns. The extreme kurtosis observed in the Turkey and South Africa return series (the kurtosis coefficient being greater than 3) indicates that there is a cluster of volatility in the stock markets of these countries.

When the descriptive statistics values of the return time series of the countries' stock markets during the COVID-19 crisis term are examined in Table 1, it is seen that the skewness coefficients of Brazil and South Africa have changed sign. The extreme kurtosis observed in the Brazilian and Turkish return series indicates that there is a cluster of volatility in the stock markets of these countries. The extreme kurtosis in the yield series of South Africa before the COVID-19 crisis draws attention, where it decreased to acceptable values during the COVID-19 crisis.

The GARCH-M model is very important for investors in terms of showing the risk and return relationship. According to the risk-return trade-off principle of finance, the sign of the ξ parameter should be positive, since high return brings high risk along with it. Table 2 shows the GARCH-M Model results for the pre-COVID-19 crisis term and the COVID-19 crisis term.

Table 2. GARCH-M Model Results

		ω	a	β	ξ	Arch(5)	$Q^2(1)$
Pre-COVID-19 Crisis Term	India	1.00**	0.97***	0.85***	0.95	1.00	-0.01
	Brazil	1.01***	0.47***	0.55***	0.72**	1.01	-0.01
	Indonesia	0.98***	0.97***	1.00***	0.96	0.98	-0.01
	Turkey	0.89*	0.99*	1.00*	0.96*	0.89	0.10
	South Africa	0.91**	0.99**	1.01***	0.93	0.91	-0.00
COVID-19 Crisis Term	India	1.00**	0.50***	0.54***	-1.00	1.24	0.99
	Brazil	0.89**	0.65***	0.54***	-0.43	0.89	0.14
	Indonesia	1.00**	0.99***	0.72***	0.98*	1.00	-0.00
	Turkey	0.89***	0.98***	0.80***	0.96**	1.02	-0.03
	South Africa	1.05***	0.98***	0.82***	-0.98	1.05	-0.05

*NOTE: 1%, 5%, and 10% significance levels are indicated by *, **, and ***, respectively.*

When the analysis results of the countries before the COVID-19 crisis are examined in Table 2, it is observed that the return increases as the risk increases in the Brazilian and Turkish stock markets. The risk-return relationship in India, Indonesia and South Africa stock markets was not found statistically significant. While the response to the COVID-19 crisis occurred mostly in the Turkish stock market, the reason for the volatility in other stock markets was the previous period.

When the analysis results of the countries during the COVID-19 crisis in Table 2 are examined, it is seen that only Indonesia and Turkey have a statistically significant risk-return relationship. Therefore, during the COVID-19 crisis period, investors in the stock markets of these

countries have become able to earn additional returns against the risk they undertake. It is noteworthy that the stock markets of India, Brazil and South Africa have a negative risk-return relationship during the COVID-19 crisis, although it is not statistically significant.

Conclusion

When the crises in the past are examined, it is known that the crises have common aspects in terms of economic and financial aspects. However, unlike all the crises seen in history, today, instead of economic and financial factors, we are faced with the COVID-19 crisis, which is an epidemic disease. In summary, according to the IMF, the COVID-19 crisis differs from other crises due to the fact that it has intense uncertainty, more severe economic and financial shocks, and that it is difficult to regulate the economy-regulating policies under pandemic conditions.

The COVID-19 crisis swiftly impacted global stock markets. Since the beginning of 2020, the financial markets of developed countries such as the United States, Italy and Spain have been heavily damaged. So much so that the CBOE-Volatility index (VIX), which fell to the level of 12.10 in January 2020, reached the level of 82.69 after the COVID-19 outbreak was declared as a pandemic. This value is higher than the peak of 80.86 during the global financial crisis of 2008, and clearly reveals the reflection of the crisis caused by the COVID-19 pandemic on the financial markets.

In the study, the risk-return relationship between the stock markets of India, Brazil, Indonesia, Turkey and South African countries (which were declared to have fragile economies by Morgan Stanley due to the high current account deficit and inflation rates and their need for foreign investments) were analyzed with the GARCH-M method in Pre-COVID-19 crisis term (May 2018-December 2019) and COVID-19 crisis term (January 2020-May 2022).

When the analysis findings in the Pre-COVID-19 crisis period are examined, it is observed that the return increases as the risk increases in the Brazilian and Turkish stock markets. The risk-return relationship in India, Indonesia and South Africa stock markets was not found statistically significant. While the response to the COVID-19 crisis occurred mostly in the Turkish stock market, the reason for the volatility in other stock markets was the previous period. When the analysis results during the COVID-19 crisis are examined, it is seen that a statistically significant risk-return relationship was obtained only in Indonesia and Turkey. Therefore, during the COVID-19 crisis period, investors in the stock markets of these countries have become able to earn additional returns against the risk they undertake. The significant and positive relationship between risk and return in Turkish stock markets before and during the COVID-19 crisis shows that the risk premium also changes over time in these countries, and that they provide additional returns to their investors in response to increased risk. Since all of these results are based on indices covering all sectors of the country, in order to make a more detailed interpretation of the volatility in the stock markets and to help investors more in portfolio management, it can be examined from which sectors the volatility originates in future studies.

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