



EXAMINING THE BEHAVIORAL DYNAMICS OF THE DEVELOPED STOCK
MARKET IN ITALY: A CASE STUDY FOR THE SAMPLE PERIOD 2006 - 2022

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Abstract

The major objective of this research paper is to investigate the behavioral dynamics of the developed stock market in Italy based on an empirical case. Moreover, the empirical analysis is focused on FTSE MIB index for the long-time sample period 2006 - 2022. The econometric framework includes descriptive statistics, Unit Root Test, Augmented Dickey-Fuller stationary test, BDS test, Hodrick-Prescott (HP) filter and others.

Index Terms – developed stock market, stock returns, volatility, heteroscedasticity, extreme events, COVID-19 pandemic, long-term behavior

Classification JEL: C5, D53

I. INTRODUCTION

FTSE Russell have recently released its newest report on FTSE Equity Country Classification, on September, 2022 and argued that stock markets are divided according to the following major categories, i.e.: developed, advanced emerging, secondary emerging and frontier. Moreover, Italian stock market is included in the category of developed stock markets.

According to Keliuotyte-Staniuleniene and Kviklis (2022), the impact of COVID-19 pandemic was devastating and with extreme consequences at the level of countries all over the globe such as “paralyzing daily economic and social life”. Shahzad et al. (2021) also suggested that COVID-19 pandemic generated a “paralysis of economic activity” but also determined a downward trend and the accumulation of instability regarding the stock markets.



II. LITERATURE REVIEW

Cucinotta and Vanelli (2020) highlighted that on March 2020, the World Health Organization (WHO) has decided that COVID-19 determined by the novel coronavirus SARS-CoV-2 constitutes a global pandemic. Keliuotyte-Staniuleniene and Kviklis (2022) conducted a comparative empirical study between the stock markets in Italy and Spain regarding the impact of the COVID-19 pandemic. Spulbar et al. (2022) investigated the behavior of developed stock market of Japan based on GARCH models in the context of COVID-19 pandemic.

Birau et al. (2021) examined the volatility patterns on two selected developed stock markets of Spain and Hong Kong using GARCH models for the sample period from January 2015 to September 2021. Kumar et al. (2021) argued that in order to provide a prediction model of increased accuracy. Pierni et al. (2022) examined the behaviour of Italian stock market in relation with the correlation between family ownership aspects and firm performance, even considering the significant percentage of family - owned firms in Italy.

III. RESEARCH METHODOLOGY AND EMPIRICAL ANALYSIS

In order to conduct the empirical analysis we have collected the daily closing prices of the Italian stock market index such as FTSE MIB index for the selected time period January 2006 until November 2022.

In order to conduct the empirical analysis, the continuously compounded daily returns are used based on log-difference of stock markets selected index, i.e. FTSE MIB stock index, as following:

$$r_t = \ln\left(\frac{p_t}{p_{t-1}}\right) = \ln(p_t) - \ln(p_{t-1})$$

where p represents the daily closing price for FTSE MIB stock index, except for legal holidays or other events when stock markets have not performed transactions.

The econometric approach is based on the following: descriptive statistics, Unit Root Test, Augmented Dickey-Fuller stationary test, BDS test, Hodrick-Prescott (HP) filter and other statistical tools.



Figure no.1 The trend of selected stock market daily closing prices

Source : Author's own computation

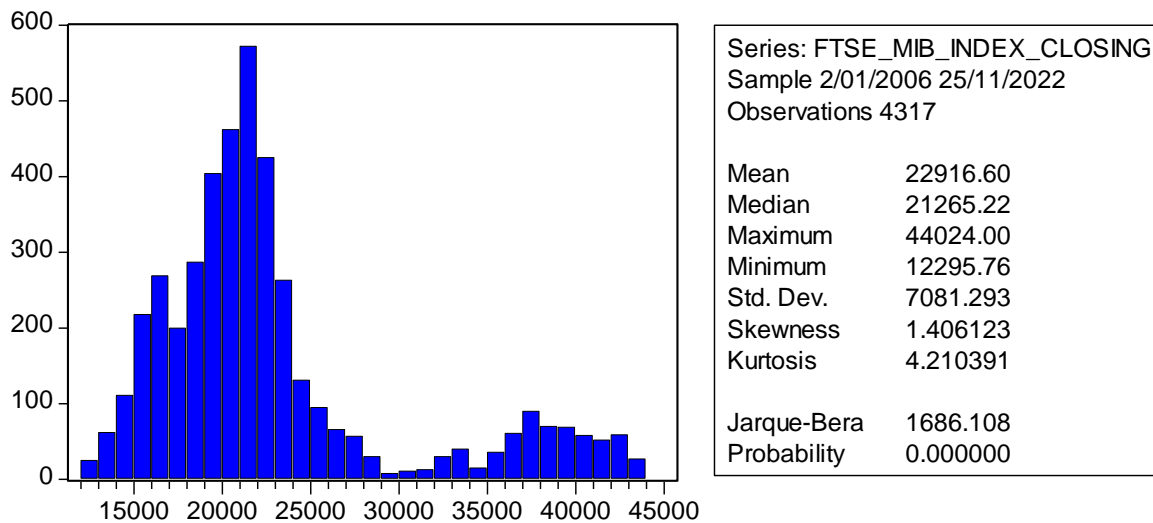


Figure no.2: Basic statistical characteristics of FTSE MIB index - daily closing prices

Source : Author's own computation

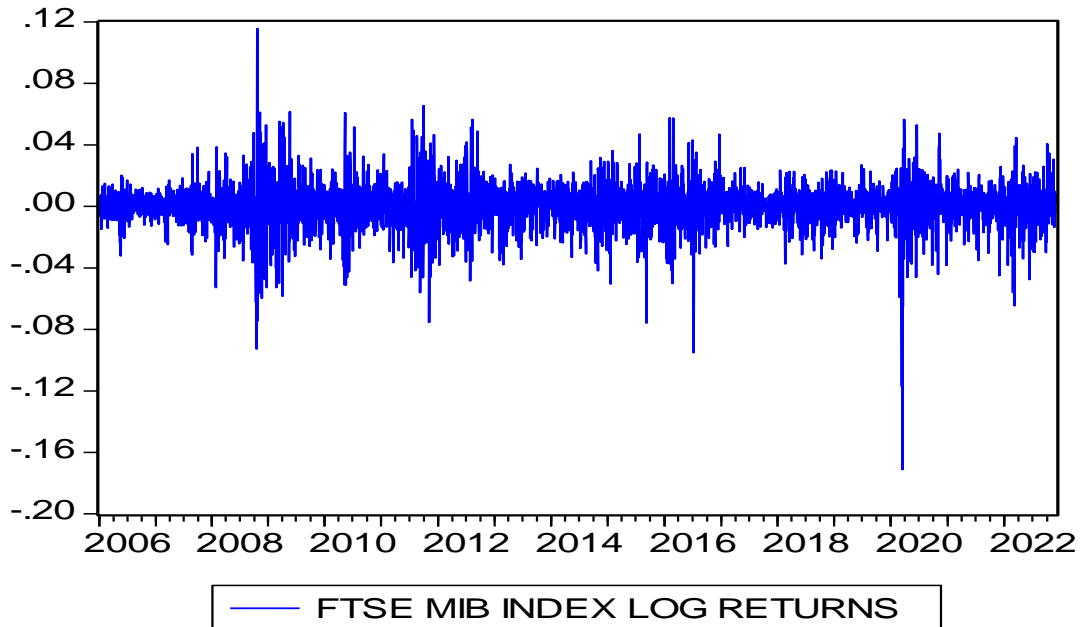


Figure no.3 Volatility pattern of selected stock market index

Source : Author's own computation

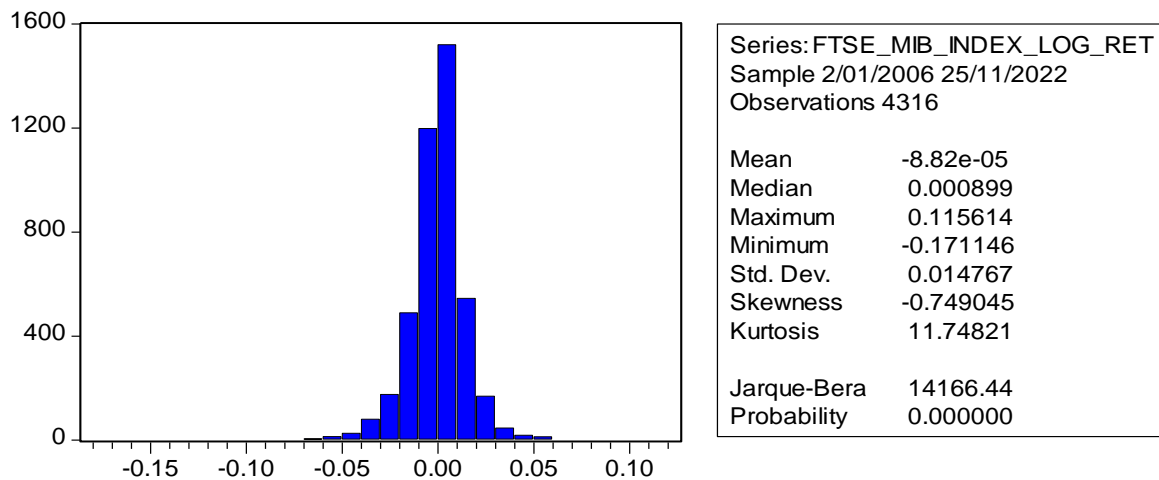


Figure no.4: Basic statistical characteristics of FTSE MIB index - log returns

Source : Author's own computation

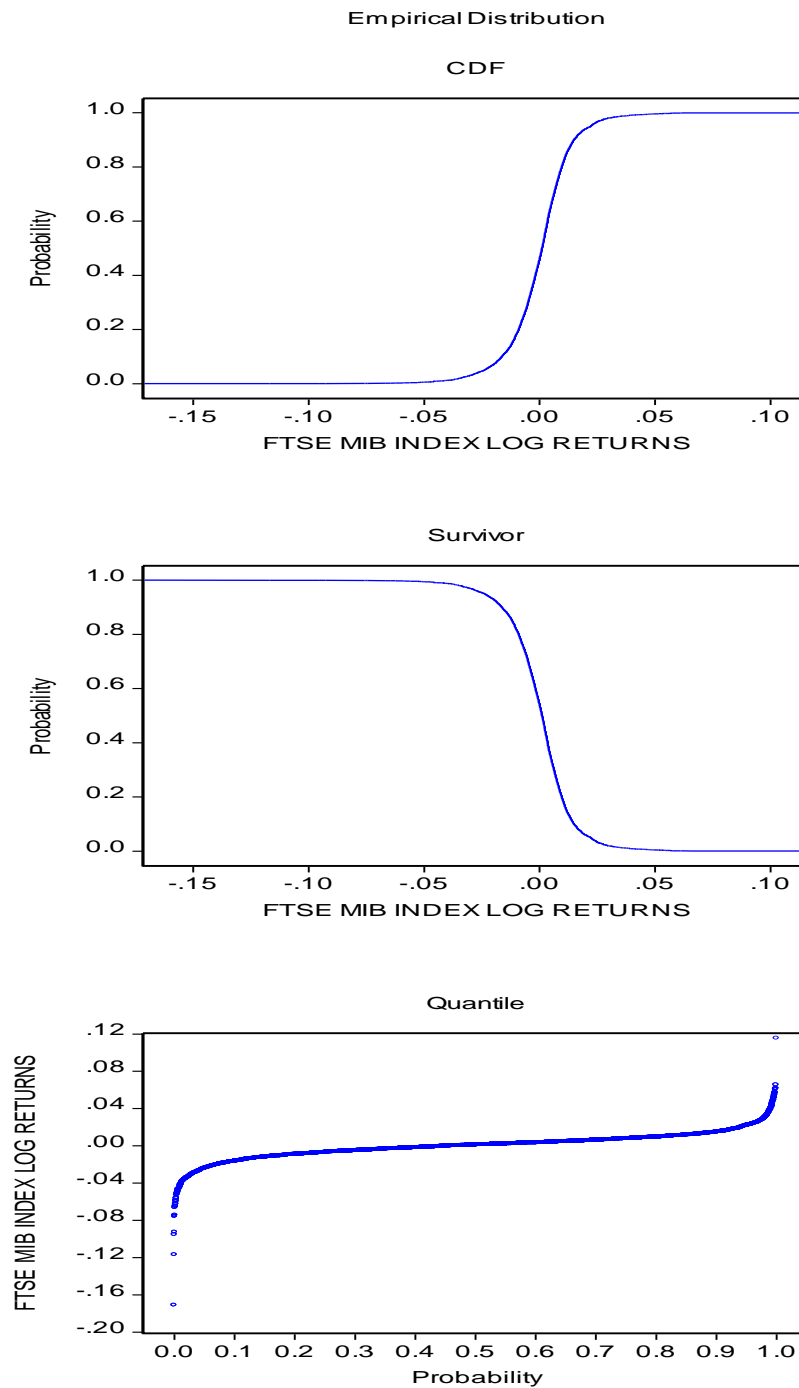


Figure no.5: Distribution graphics CDF - SURVIVOR - QUANTILE

Source: Own computations based on selected financial data series

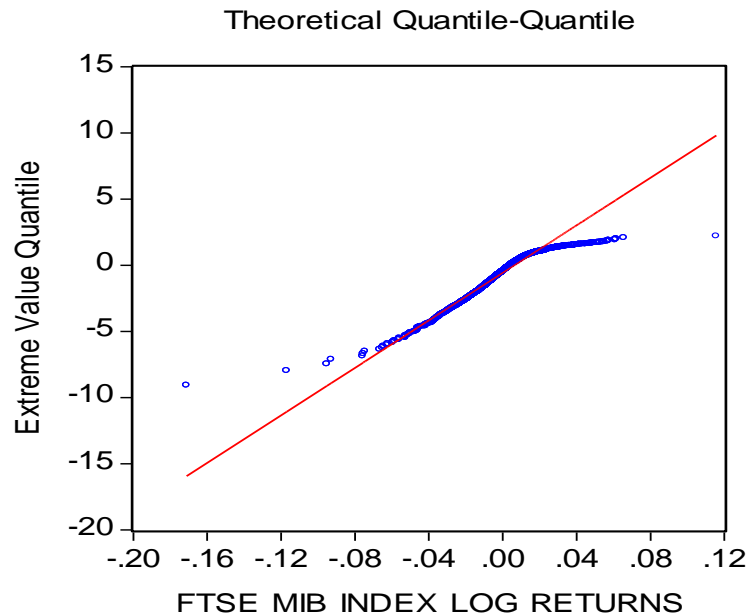


Figure no.6: Theoretical Quantile-Quantile Plots (Extreme values)

Source: Own computations based on selected financial data series

The Augmented Dickey-Fuller test also known as ADF test is applied to ascertain whether the non-stationarity or the integration are identified in the case of selected financial time series. In other words, Augmented Dickey-Fuller test is used to determine the stationarity of the sample time series.

Table 1: Augmented Dickey-Fuller Test

Null Hypothesis: FTSE_MIB_INDEX_LOG_RETUR has a unit root

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-24.30886	0.0000
Test critical values:		
1% level	-3.431684	
5% level	-2.862014	
10% level	-2.567066	

*MacKinnon (1996) one-sided p-values.



On the other hand, the BDS test is applied in order to determine whether the residuals are independent and identically distributed.

Table 2 : BDS Test

BDS Test for FTSE_MIB_INDEX_LOG_RETUR
Sample: 2/01/2006 25/11/2022
Included observations: 4317

<u>Dimension</u>	<u>BDS Statistic</u>	<u>Std. Error</u>	<u>z-Statistic</u>	<u>Prob.</u>
2	0.019625	0.001424	13.78138	0.0000
3	0.039594	0.002259	17.52485	0.0000
4	0.054595	0.002686	20.32397	0.0000
5	0.064171	0.002796	22.95330	0.0000
6	0.068379	0.002692	25.39778	0.0000

The Hodrick-Prescott (HP) filter represents a specialized filter for trend and business cycle estimation, which includes both a trend component and a residual component with a wide range of applicability in financial economics.

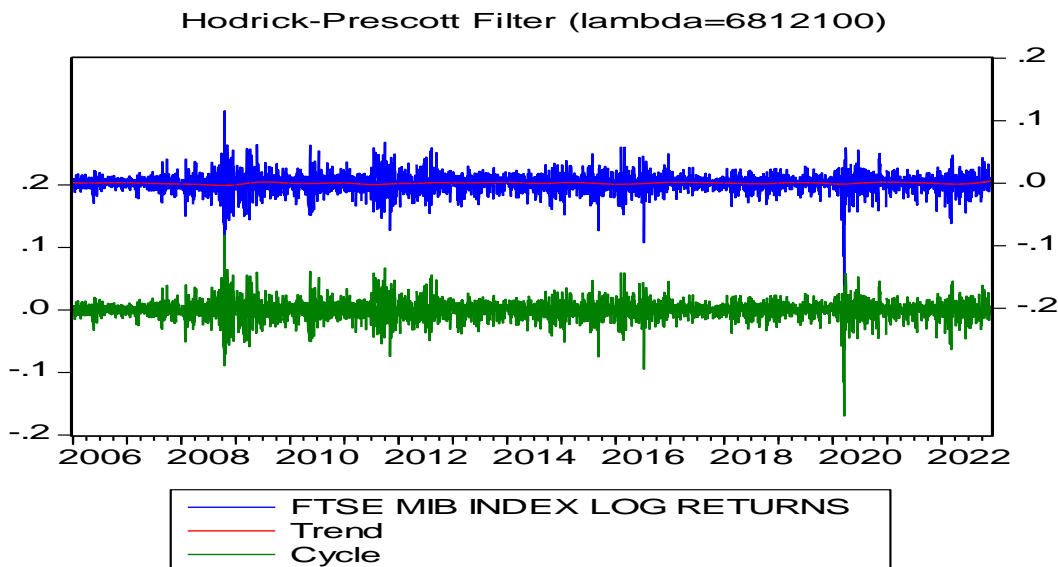


Figure no.7: Hodrick - Prescott filter

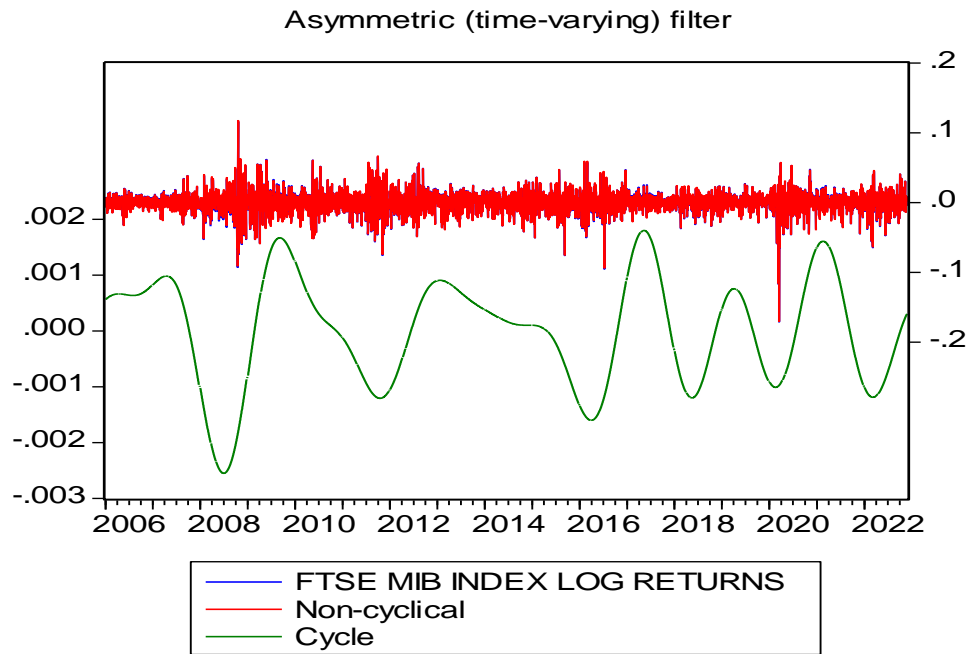


Figure no.8: Asymmetric filter

IV. CONCLUSIONS

The COVID-19 pandemic had major implications in affecting the wide majority of economies all around the world, but also the dynamics of stock markets (Spulbar et al., 2022). Moreover, the impact of the global financial crisis (GFC) is revealed by the empirical results. This empirical study contributes to the existing literature on the long-term behavior of the Italian stock market.



REFERENCES

1. Birau, R., Spulbar, C., Trivedi, J., Florescu, I. (2021) Modeling volatility in the stock markets of Spain and Hong Kong using GARCH family models in the context of COVID - 19 pandemic, *Revista de Științe Politice. Revue des Sciences Politiques*, 72, 3 - 21.
2. Cucinotta, D., Vanelli, M. (2020). WHO Declares COVID-19 a Pandemic, *Acta Biomedica Atenei Parmensis*, 91(1), 157-160. <https://doi.org/10.23750/abm.v91i1.9397>.
3. FTSE Russell (2021) FTSE Equity Country Classification, September 2022, Annual Announcement, 2022 https://research.ftserussell.com/products/downloads/FTSE-Country-Classification-Update_latest.pdf, Published: 29 September.
4. Keliuotyte-Staniuleniene, G., Kviklis, J. (2022) Stock Market Reactions during Different Phases of the COVID-19 Pandemic: Cases of Italy and Spain, *Economies*, 10(1):3, <https://doi.org/10.3390/economies10010003>.
5. Kumar, K.A., Pinto, P., Hawaldar, I.T., Spulbar, C., Birau, R. (2021) Crude oil futures to manage the price risk of natural rubber: Empirical evidence from India, *Agricultural Economics*, 67: 423-434, <https://doi.org/10.17221/28/2021-AGRICECON>, ISSN 0139-570X (Print), ISSN 1805-9295 (On-line).
6. Pierni, P., Montagna, D.M., Maggi, M. (2022) Founding Family Ownership and Firm Performance: Some Evidence from the Italian Stock Market. *Journal of Risk and Financial Management*, 15(5):231. <https://doi.org/10.3390/jrfm15050231>.
7. Shahzad, S., Naeem, M., Peng, Z., Bouri, E. (2021) Asymmetric volatility spillover among Chinese sectors during COVID-19. *International Review of Financial Analysis* 75: 101754, <https://doi.org/10.1016/j.irfa.2021.101754>.
8. Spulbar, C., Birau, R., Trivedi, J., Hawaldar, I.T., Minea, E.L. (2022) Testing volatility spillovers using GARCH models in the Japanese stock market during COVID-19, *Investment Management and Financial Innovations*, 19(1), 262-273. [doi:10.21511/imfi.19\(1\).2022.20](https://doi.org/10.21511/imfi.19(1).2022.20).