



## Investigating factors affecting the price fluctuations of cryptocurrencies with an emphasis on monetary and fiscal policies of the United States

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### Abstract

As an emerging phenomenon, cryptocurrencies have attracted a lot of attention. Fluctuations in the price of cryptocurrencies have doubled the importance of identifying and influencing factors affecting price changes in financial markets. In this research, the factors affecting the price fluctuations of cryptocurrencies have been investigated with an emphasis on the monetary and financial policies of the United States. In this research, 26 factors affecting the price fluctuations of cryptocurrencies have been evaluated. The present research is practical. Monthly data has been used in the period from 2010 to 2022. The approach of Garch and random fluctuation models has been used to extract the price fluctuation of digital currencies and TVPDMA, TVPDMS and BMA have been used to identify the most important variables affecting the fluctuation. SV models are more accurate than GARCH models in extracting fluctuations. Among TVPDMA, TVPDMS and BMA models, BMA model had higher accuracy. USD-EUR exchange rate variables, market leader tweets, number of trades, network hardness, US liquidity growth, opening price and trading volume; The most important variables affecting the fluctuation of the price of cryptocurrencies are. Based on the results of the monetary policies of the United States, it has a significant effect on the volatility of the cryptocurrency market; But this significant effect was not observed in financial policies.

**Keywords:** Digital Currency, Cryptocurrencies, Price Volatility, Bayesian Averaging Model, TVPFAVAR.

**JEL Classification:** G18, C45, C61, E37.

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## 1. Introduction

In the current global and economic environment, blockchain technology has transformed individual interactions and financial operations such as investment, trade, and online payments (Casino et al., 2019; Patsakis, 2019). Cryptocurrencies and the process of their price changes have attracted the attention of many researchers (Al Guindy, 2021). Despite all the studies conducted, relatively few studies have been carried out on identifying the factors affecting cryptocurrency price volatility. For this reason, this research seeks to model the factors affecting digital currency price volatility.

## 2. Theoretical Framework

Bitcoin, having a high share of about 70% of the cryptocurrency market value, is an electronic digital currency designed based on blockchain technology (Troster et al, 2019). It has the characteristics of decentralization, anonymity, and traceability. Investors treat Bitcoin as a speculative financial asset (Tong et al, 2022).

The growth of social networks and the emergence of emotional behaviors played an important role in the sudden increase in the price of cryptocurrencies since 2013 (Corradi & Höfner, 2018). As this market has grown, the number of factors affecting volatility in this market has increased (Tropina, 2014). Sharp price changes and high trading volume in this market have increased the tendency to invest in it (Urquhart, 2018); on the other hand, increased volatility has raised academic interest in this field among researchers (Cheah & Fry, 2015). Central banks in the Eurozone and the United States have also put monitoring of the situation in this market on their agenda in recent years (Vandezande, 2017).

## 3. Methodology

Multivariate GARCH and stochastic volatility (SV) approaches were used to extract the volatility of digital currency prices, and the TVPDMA, TVPDMS, and BMA models were employed to identify the most important variables affecting volatility.

## 4. Discussion

The large trading volume and lack of limits on volatility have made cryptocurrency trading more susceptible to volatility than other assets. These fluctuations have presented numerous challenges to predicting cryptocurrency prices. Accordingly, various statistical and mathematical approaches have been used by various researchers to predict cryptocurrency volatility; however, none of them has provided a general model suitable for all conditions. This has provided the importance of using the Bayesian and time-varying parameter models approach, which have the ability to adapt to changing conditions.

Based on the results, stochastic volatility (SV) models are more accurate than GARCH models in extracting volatility. Among the TVPDMA, TVPDMS, and BMA models, the BMA model showed higher accuracy in identifying the most important variables affecting cryptocurrency price volatility. The results indicated that the US dollar–euro exchange rate, tweets by traders and market leaders, daily number of cryptocurrency transactions, daily network difficulty, growth in US liquidity, cryptocurrency opening price, and trading volume are the most important determinants of cryptocurrency price volatility. Furthermore, the findings indicate that US monetary policies significantly affect cryptocurrency market volatility, whereas fiscal policies do not have a statistically significant impact.

## 5. Conclusion and Suggestions

Cryptocurrencies, as a global phenomenon, have attracted considerable attention. They usually have greater price fluctuations than gold or shares, due to market structure, liquidity and trading times. In this study, the different methods have been used to predict cryptocurrency volatility. The results indicated that the SV models are more accurate than GARCH models in extracting volatility. The most important variables affecting cryptocurrency price volatility are the exchange rate of the US dollar to the euro, tweets by market leaders, number of transactions, network difficulty, and growth in US liquidity, opening price, and trading volume. Moreover, the monetary policies of the United States have a significant effect on cryptocurrency market volatility, but such a significant effect was not observed for fiscal policies.

Given that the United States' monetary policies have caused bubbles and fluctuations in asset prices, especially in the cryptocurrency market, it is suggested that the Federal Reserve commit to conducting monetary policies based on the Friedman monetary growth rate rule so that the increase in liquidity in this country has the least negative spillover effect globally.

## 6. Ethical Considerations

### 6.1. Compliance with ethical guidelines

The present study has followed the scientific principles of research.

### 6.2. Funding

This paper has no financial support.

### 6.3. Authors' Contribution

The authors contribute equally in writing this paper.

#### **6.4. Conflict of Interest**

The authors declare no conflicts of interests.

#### **6.5. Acknowledgments**

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