Extended Abstract

Introduction

Crypto currencies have become more important and widely used in recent years with the development of technology. Even though, there are many crypto currencies such as Ripple, litecoin or Ethereum, Bitcoin is the most known of these currencies that are not connected to a central authority and secured with cryptographic systems. It is a first decentralized digital and virtual currency that was developed by Satoshi Nakamoto in 2008. Bitcoin is highly popular currency especially in last few years due to the increase in the knowledge and interest about crypto currencies by the investors. There are some key concepts to understand the Bitcoin process such as transactions, block chain, mining and digital wallet. Bitcoin transfer or transaction is a system in which transfer information is signed between the sender and the recipient via e-signature over P2P (Peer to Peer) network without the need for a central authority or brokerage. The block chain is a system with high security features and encryption methods that keeps track of encrypted transactions, keeps a record of all money exchanges. Digital wallet, is the place where all relevant information is stored for Bitcoins, which operates similarly to a bank account, allowing Bitcoins to be retrieved, stored and sent to other people. Mining is a process to solve the proof of work from a transaction block and it confirms the transactions and increase the security. Since it is a virtual currency, it has potential drawbacks and advantages. There are also certain differences between crypto currencies and traditional currency system. The main motivation of this study is to provide the process and key concepts of crypto currencies, specifically Bitcoin. In addition, we also provide valuable insights through using financial variables with time series methods to explain the long term association with Bitcoin prices.

Methods

Studies mostly examine the crypto currencies with regards to the association between macro economic and financial indicators. Interest rates, currencies, commodity markets or stock markets are the examples of these indicators. On the other hand, some studies focus on the relation between crypto currencies and other fields through revealing the crypto currency concept. In this study, we examine Bitcoin and its relation to foreign exchange, gold, stocks and interest markets through using time series methods. We also give some information about other crypto currencies and Bitcoin and its operating process. The frequency of the data set is monthly and covers March 2012 to May-2018 period that is retrieved from Central Bank of the Republic of Turkey and Yahoo Finance website. The variables are Bitcoin prices, Dollar/TL, Gold prices, Borsa İstanbul (BIST100) stock market values and interest rates.

We first investigate the unit root with the Augmented Dickey Fuller (ADF) and Phillips-Perron (PP) tests to apply the time series methods. Akaike, Schwarz, Hannan-Quinn and other criterias are used to determine the appropriate lag and according to the majority of criterias, 2 is the appropriate lag. We also use Johansen Cointegration test and Granger Causality test to display the association between Bitcoin prices and other financial indicators.

Results

This study is one of the first studies to explore the relationship between financial indicators and Bitcoin prices through using specific variables to Turkey. According to the time series analysis results, Bitcoin prices have an increasing trend and high volatility. The specific and idiosyncratic dynamics of bitcoin prices are more determinative in the formation and movement of prices. In other words, Bitcoin is not influenced by other financial indicators. Long-term divergence was obtained among variables in the model where the interest variable is a dependent variable. The highest response to Bitcoin is the interest rate and the explanatory power of Bitcoin on interest rate has a very high percentage. Granger Causality test also offers the same relation between the interest rates and Bitcoin prices. Therefore, there is as statistically significant relationship between the Bitcoin prices and interest rates. This study has various limitations because it examines a relation only in terms of certain variables. Future work can achieve more general results using different financial and macro variables.