

The Risk and Return, in 5 Crypto Currencies that have the Highest Transaction Volume and Market Capitalization

Sadegh Rezaei

Istanbul Aydyn University

sadeghrezai@stu.aydin.edu.tr

Abstract: *The main purpose of this study is to investigate risk and return, in 5 crypto currencies (BTC, ETH, BNB, XRP, DOGE) that have the highest transaction volume and market capitalization. Needless to say, there are now a large number of digital currencies on the market that some coins have a futuristic and practical whitepaper that shows they have the potential to grow day by day in the future, which has made them very significant elements for investment. An extensive empirical study was performed using ten consecutive years of crypto currency data by using the closing and return prices on a monthly basis between 2010 and 2020. Those were examined and tested using various such as single root test, co-integration test, and using regression analyses. Our findings cast doubt on explanations that the behavior of crypto currencies in the future of block chain technology is similar to stocks. At the same time, the returns of crypto currency can be predicted by two factors specific to its markets – momentum and investors' attention.*

Keywords: Cryptocurrencies, risk and return, Bitcoin, Ethereum, Ripple

1. Introduction

In recent years, new and rapid computational developments have led to the widespread development of technology that has led to the profitability of productive and economic sectors around the world and has made the computer sector one of the pillars of economic growth. This economic sector, which has led to a huge transformation and transformation of industries into the main engines of new employment, has created the motivation to create a great variety among new products, goods, and services based on technology (Ros, 2015).

The concept of virtual money, meaning encrypted money, was introduced by individuals in the community to facilitate financial operations and to create money without the presence of intermediaries (banks). The first spark for the concept of virtual money, meaning cryptocurrency, was introduced in 1998 by Wei Dai to facilitate finance and bridge bridges without the presence of intermediaries. Virtual money has no central server or financial institution to control transfers. Because everything is based on peer-to-peer communication. Virtual money has a decentralized nature, according to which the whole process of publishing, processing, and validating transactions is done by the network of users without any intermediaries.

Advantages: Freedom of payment and international access, High speed in international and cross-border transfers, Not creating uncontrolled money in the economy and controlling inflation, use of virtual currency in the face of sanctions, Possibility of interception and transparency, The comparative advantage of bitcoin mining, Possibility of lifting sanctions by removing the dollar, Digital currency and attracting foreign investors, Low transaction costs

Challenges and Disadvantages: It caused ransom ware, there is no place for monetary policy and there is no control over daily transactions because the intermediary has been

removed, Security problems, Jurisprudential Challenge, Ambiguity in the nature of virtual currencies, Lack of value preservation, Irrevocability of money, Threat of competitors, Lack of legal documents, Financing of terrorist groups and political dissidents, Low liquidity in the economy, Impossibility of equipping and specializing resources to economic actors, High transaction confirmation time for domestic exchanges, The outflow of currency from some countries, Security problems, Threats to the real economy, Money laundering and tax evasion through cybercrime, Lack of identification, Instability of virtual currency and the possibility of devaluation, Technical complexity, and public luck, Closure of the virtual currency network, Price fluctuations and instability and the risk of falling virtual currency

2. Review of Literature

2.1 Foundations of factor investing

Factor investment is the investment process that aims to capture these risk forecasts through exposure to factors. We now identify six main risk factors for equity: value, low size, low volatility, high returns, quality, and momentum.

2.1.1 Value

The value factor shows a positive link between stocks that have a lower price than their core value and returns above the weighted standard of capital

2.1.2 Low Size

The size factor shows the excess returns of smaller firms (based on market capitalization) relative to their larger counterparts even after adjusting for beta and other factors such as Value.

2.1.3 Momentum

The momentum factor shows the additional future return of the stock with stronger past performance. In other words,

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stock prices tend to trend on certain horizons. Winners continue to win and losers continue to lose.

2.1.4 Low Volatility

The low volatility coefficient distinguishes excess stock returns from lower-than-average volatility, beta, and/or specific risk. Empirical evidence for this factor is a mystery because it clearly contradicts one of the most fundamental principles in finance, with more volatility being associated with higher returns.

2.1.5 Quality

The purpose of the quality factor is to attract the surplus returns of "high quality" companies to the market. This has been a broad concept in fundamental analysis (stock selection), but it is a relatively new phenomenon in small investments.

2.1.6 Yield

The rate of return is used as a factor weakening the performance of stocks with high dividends. Usually, this index, which is based on the price-to-office ratio and the price-to-profit ratio, is used as a valuation tool

2.2 Is it an investment instrument or an alternative payment method?

Virtual currency is a type of payment instrument that is created and stored electronically (Dibrova, 2016). In other words, virtual currency refers to a type of exchange intermediary that acts as a currency, but is created by computer programs and is controlled (Trautman, 2018).

2.3 Cryptocurrency market

2.3.1 Comparison between crypto currency and stock market characteristics

Crypto currencies are a global phenomenon that is often highlighted by the media, venture capitalists, financial institutions, and governments. With the development of digital currencies, a new opportunity has opened up to explore several as yet undiscovered aspects of digital currencies. This has attracted the attention of many academics, the media, government agencies, and the financial industry, and an understanding of the significant role of digital currency markets in recent years.

2.3.2 Market capitalization and market share among all of the existing instruments

This section examines the distinction between market value and the stock market. In a general definition, market value means the stock market and other trading venues for various financial products to determine the wide range of marketable assets. But the stock market allows investors and banking institutions to trade their shares privately or publicly. Market value includes primary and secondary markets in which securities include bonds, derivatives such as options, various loans, futures contracts, and other debt instruments (Omodero, 2020).

2.3.3 Fundamental and Technical analysis in the crypto market

In general, there are two main approaches to crypto market analysis same as traditional stock. First, the fundamental analysis determines the real value from economic factors such as interest rates, inflation rates, and producer price index (PPI). Along with its stock bases such as company revenue and potential growth. Second, technical analysis focuses on the price pattern or trend of stocks, assuming that the price movement has already been influenced by key factors. Its purpose is to make a profit from stock trading at the right time, not long-term savings (Eiamkanitchat, 2017).

2.4 Crypto currency investment types

There are several types of investing methods using digital crypto currencies in the EOS platform. In general, there are about 1348 types of currency codes that are available on the Internet. Although this is not entirely because it is still growing (Ibrahim, 2018). The most important types are Bitcoin and Ethereum. No one owns or controls the Bitcoin network; this system has an open system code so everyone can participate. Unlike Bitcoin, Ethereum aimed to develop a smart contract platform. The network was launched in 2015, with the main feature being open source, suitable for developing decentralized third-party applications. Atrium is one of the pioneers in the development of blockchain-based smart contracts. When launched on a blockchain, a smart contract acts like a computer program that automatically executes if certain conditions are met. Open-source code allows developers to implement this system in their business processes, which brings a strong competitive advantage (Mikhaylov, 2020).

2.5 Bubbles, Crashes, and Crises in the cryptocurrency market

Throughout human history, speculation and financial crises have always been commonplace. Bubbles usually occur when the price of an asset rises rapidly, doing so far from assessing the true intrinsic value of the asset. This means that such a dramatic rise in prices will create asset prices for the next fall. Kinde Berger and Alibar (2005) describe bubbles as a sharp rise in asset prices. With the initial increase, expectations of further increase and attracting new buyers are absorbed through a process commonly called the irrational opposite. However, beyond these definitions, and the real economic suffering, both the theoretical existence of bubbles and the issues of their empirical detection are still debated.

2.6 Potential risks of crypto currencies

In recent years, the crypto currency market has grown rapidly. This market allows companies to raise money without trading with venture capitalists and to trade without being listed on stock exchanges. The whole set of coins in the crypto currency market varies from well-known currencies such as Bitcoin, Ripple, and Ethereum to very obscure coins. There are two perspectives on the crypto currency market. The first is that most and perhaps all coins represent bubbles and scams. The second is that block chain technology embodied in coins may become an important

innovation, and at least some coins are assets that show their share in the future of this technology. So, crypto currency Market Surplus (CMKT) is defined as the difference between the crypto currency market index return and the risk-free rate as the one-month rate of Treasury bills. (Liu et al, 2019).

2.7 Risk and return exposures

With the advent of crypto currencies (crypto currencies) and the challenge of the world's monetary system, many opportunities and ideas came to policymakers, economists, and entrepreneurs. The pressure of the contract to reconsider the fundamental idea of the deal. Introduced, it can be considered a window to diversify the investment portfolio of governments, legal entities, individuals, and legal entities in different countries. In recent years, due to the increasing development of crypto currency trading, especially bitcoin, and the focus of news and media on this new innovation Human, the attention of governments, people, policymakers, legislators, and economists has also been strongly influenced by this issue (Dyhrberg, 2016). Therefore, the issue that is also considered in relation to this new stock market is the study of the risk-return relationship.

3. Practice and Analysis

3.1 Dataset

The scope of the study will be risk and return to the five crypto currencies that have the largest trading volume and market capitalization, according to www.coinmarketmap.com. The sources of this study are the longest period of the history of crypto currencies (from the initial stage to the date of reporting from reliable websites in the world like www.tradingview.com)

3.2 Methodology

This research consists of five stages.

In the first stage, the theoretical aspects are examined; the mechanism of crypto currencies and how to invest in this financial market are determined, and then the market is compared as an instrument with other existing instruments.

In the second stage, the types of risks available and possible in this market and important variables in creating these risks, and effectiveness in the rate of return are examined.

The third stage is preparing the closing price and return of these currencies on a monthly basis between 2010 and 2020 (create a dataset from these websites www.coinmarketmap.com, and www.tradingview.com).

The fourth stage is to test these data through using different tests: using the unit root test to find out if these time series are stationary or not, use co-integration test to check the convergence between these time series in different periods, and using regression analysis to find the most important factors and relationship in the short term and in the long run. The final stage is to write the final result for the amount of risk and return for these five currencies.

Hypothesis:

The time-series analyses with two main sections will do: The first analysis is ARDL and the second is causality test. Through the scope of time series analysis, the stationarity of the series is conducted by using ADF and PP unit root tests, analysis of the cointegration relations will test by using Bound Test, long and short-term analyses will perform by using ARDL method and causality test perform by using Toda-Yamamoto method.

Unit root test: The being stationarity will investigate with the Augmented Dickey-Fuller (ADF) (Dickey and Fuller, 1981) and Phillips and Perron (PP) (1988) unit root tests.

H0: "Series is not stationary"

H1: "Series are stationary"

The PP test is considered to be more powerful than the ADF test, especially in testing the stationarity of the series that includes trends. (Mustafa Özyeşil 2020) consequently, two methods are used together in the research. The series that is stationary at the original level value is called I (0) but the series that becomes stationary when the first difference is taken is called I (1) (Enders, 2014)

Cointegration test: When the series is stationary at different degrees, the cointegration relations between them can be examined by the Boundary Test method developed by Pesaran, Shin, and Smith (2001). The model is used to test the existence of the cointegration relationship between the series in the models based on (Polat, 2018). The hypothesis of the Bound Test will use in this research:

H0: $\beta_1 = \beta_2 = 0$ "There is no cointegration relationship between series"

H0: $\beta_1 \neq \beta_2 \neq 0$ "There is no cointegration relationship between series"

3.4 Test Results

This section first examines the data set used for each of the 5 crypto currencies. This data set has been collected daily from 3/18/2016 to 3/18/2021. Also, the indicators considered to determine the risk and return of all 5 crypto currencies are:

1. Open 2. High 3. Low 4. Close 5. Adj 6. Close 7. Volume
the statistics of 5 crypto currencies, Bitcoin, Ethereum, Dogecoin, Binance, and Ripple at the daily, weekly, and monthly frequencies. Both the returns and their volatility are very high. At the daily frequency, the mean return of BTC, ETH, DOGE, BNB, and XRP are 55.4193, 60.5772, 50.3831, 38.1562, and 45.7 and the standard deviation is 3.1521, 6.1448, 3.1717, 4.5134, and 3.1695 respectively; at the weekly frequency, the mean return is 58.7281, 59.7874, 52.5425, 42.4109 and 44.4926 and the standard deviation is 3.5541, 6.6357, 4.3649, 5.6271, 2.5833 respectively; at the monthly frequency, the mean return is 57.9334, 58.0241, 50.4473, 37.0272, 45.8592 respectively and the standard deviation is 3.5478, 6.2368, 3.5254, 4.6501 and 2.9024 respectively. Both the means and the standard deviations are an order of magnitude higher than those for traditional asset classes. These facts are broadly known.

Table 3.1: Risk Summary Statistics

	σ	w_{eq}	Π	$R_{Squared}$
BTC	2.55	0.59%	25.68 %	0.02
ETH	3.97	0.47%	49.15%	0.01
DOGE	2.42	0.52%	21.14 %	0.04
BNB	2.12	0.67%	14.13%	0.09
XRP	2.36	0.61%	18.79%	0.07

4. Conclusion and Recommendation

4.1 Conclusion

Digital currency or crypto currencies are a type of virtual currency that uses cryptographic technology in its design and is usually managed decentrally. Crypto currencies, like other Fiat currencies (without backup), can be exchanged, traded, bought online, and so on. Bitcoin, Ethereum, LightCoin, BitcoinCoit, BitcoinCash, Ripple, Monroe, Stellar, Verge, and other Altcoins are all types of currency tokens. Although Bitcoin and Ethereum are the most popular of all crypto currencies, in total, the five cryptocurrencies Bitcoin, Ethereum, Dogecoin, Ripple, and Binance Coin perform better in the digital investment market than the rest of the crypto currencies. One of the most important challenges in the field of price and efficiency of crypto currencies is their sharp fluctuations due to their non-pervasive nature in the capital market and trade developments. On the other hand, many capitalists are less likely to use it because of the volatile nature of its market value. Therefore, efforts to estimate the price of these crypto currencies in the capital market continue to be able to control these fluctuations with high accuracy and according to the history of price changes, with high confidence and accuracy, determine their returns and risk.

4.2 Recommendation

In this section, according to the results and studies conducted in this research, which has been done on 5 popular crypto currencies, we will provide the following suggestions:

- Predicting the optimal portfolio including the ciphers under study
- Using the neural network to estimate the efficiency and risk of each crypto currency

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