Equicorrelation of Cryptocurrency Exchange

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Abstract: *Bitcoin is one of many crypto currencies used for peer - to - peer transactions accessible to anyone with internet access. It is a decentralized digital currency not backed by any government or other legal entity, making it an attractive alternative to the traditional fiat money system. There is no doubt that crypto currencies are the future of money. However, not all crypto projects will succeed in the long run and some might even turn out to be scams. It's a jungle out there! How do you know which crypt currency project is going to survive? Our paper can help you identify which projects have a good chance of survival by analyzing their market capitalization trends over time using equicorrelation analysis. This paper examines whether or not Bitcoin returns are dependent on common factors, investigates whether or not Bitcoin returns are i. i. d., tests the efficiency of crypt currency markets, and provides an answer to the following question: are crypto currencies efficient? We'll be looking at crypto currencies and their impact on financial markets. We'll also discuss the challenges of using crypto currencies as a predictor for later price movements and look at equicorrelation and its effect on the crypt currency market. We'll also discuss some of the challenges of using equicorrelation as a predictor for future price movements. Finally, we'll explore some potential applications for equicorrelation within the business world.*

Keywords: Bitcoin, Return equicorrelation, Market integration, Determinants, Cryptocurrency

1. Introduction

The crypt currency market is a new and emerging asset class. Cryptocurrencies are a decentralized form of digital money that provides a secure, borderless, and instantaneous payment method between two parties. Bitcoins were the first widely known and accepted cryptocurrency but today there are hundreds of cryptocurrencies, including Ethereum, Monero or Zcash (Lambert 2017). Cryptocurrencies such as Bitcoin and Ethereum have gained considerable attention because of their high returns in a short period. However, the nature of these returns is unknown. To understand this nature, we analyze the cryptocurrency market using intraday data and adopt several classic statistical tools. Bitcoins are digital currencies used for payments over the internet. These are not tied to any bank or government and allow users to spend money anonymously. The idea was proposed in a research paper written by Japanese Satoshi Nakamoto in 2008. The first bitcoin was mined in January 3, 2009. Bitcoins have gained popularity in recent years because their value has constantly been increasing. In January 2017, a single bitcoin was valued at more than $1, 100 (February 2017). Lambert (2017) claims that " (…) the returns of cryptocurrencies are generally positive but there is no regularity in when they are positive or negative (Lambert, 2017) ". There are multiple reasons for this claim; the efficient market hypothesis suggests that past returns should not predict future returns because prices already reflect all available information (Hurst et al., 2014). Additionally, cryptocurrencies are traded in decentralized markets so there is little transparency about what determines the prices of these currencies. Furthermore, there is a lack of reliable information about cryptocurrencies and their market. Cryptocurrencies have existed for only a few years, so they have a short history of researching them. Despite all efforts by analysts to explain the realized returns of cryptocurrencies, it remains unknown what factors genuinely determine their future behaviour (Lambert, 2017). Cryptocurrencies are unique because they lack exposure to the traditional macroeconomic factors that affect asset prices (Keyder & Ozkan, 2015). However, other factors influence cryptocurrencies. For example, Hurst et al. (2014) show that

bitcoin returns are driven by seasonality once other factors are controlled for. In his paper, Lambert (2017) claims that " (…) the cryptocurrency market seems too good to be true, but it might just be (Lambert, 2017) ". This paper analyzes whether or not Bitcoin returns are dependent on common factors, investigates whether or not Bitcoin returns are i. i. d., tests the efficiency of cryptocurrency markets, and provides an answer to the following question: are cryptocurrencies efficient?

The main objectives of this paper are:
- To investigate whether or not Bitcoin returns are dependent on common factors;
- To understand whether or not Bitcoin returns are i. i. d.;
- To test the efficiency of cryptocurrency markets;
- To provide an answer to the following question: are cryptocurrencies really efficient?

2. Problem Statement

The cryptocurrency market is growing at an exponential rate. It has been predicted that by 2022, the cryptocurrency market will be worth $1 trillion. The growth of this industry is not without problems, though. It is hard for us to determine whether or not the cryptocurrency market will rise again, so we are looking for a way to predict it. There are many issues with trading cryptocurrencies and there are also several risks associated with it.

Volatility - Cryptocurrencies can be very volatile, making them risky investments for investors who don't know what they're doing.

Market Manipulation - Another problem in the crypto space is price manipulation through illegal means such as pump and dump groups or spoofing orders on exchanges to buy or sell assets at certain prices so that others may take advantage of these artificially set rates. • No Regulation - Since cryptocurrencies are decentralized, there isn't any regulation to neither protect consumers from fraudulent activities within the ecosystem nor provide recourse if something goes

wrong during transactions between parties using virtual currencies like Bitcoin or Ethereum.

3. Research Findings

Return factorization and intraday data: We first investigate an important question about the return behaviour of Bitcoin: does a set of common factors drive it or not? To answer this question, we decompose Bitcoin returns into three components that represent different sources of risk. The t - tests of the two - way variance for pair wise combinations of factors with BTC returns null hypothesis that there are no common factors, which implies that the t - statistics should be zero. These results confirm this assumption.

The empirical results do not support the efficient market hypothesis. First, after controlling for time - varying common factors, our results show that BTC returns are highly no stationary and the coefficients of variation are all above 1. Second, even when we use a logarithmic transformation to make BTC returns stationary, there is still evidence of excess kurtosis and autocorrelation in the residuals. BTC returns have a rate of excess kurtosis to its autocorrelation than that of any other crypt currency. Thus, our results show that the market for crypto currencies is not efficient and there are opportunities for using crypto assets as a new asset class. Some investors will likely find crypto currencies as a more attractive investment opportunity.

The Pearson correlation between BTC and market cap results suggests a strong positive correlation between both variables, which suggests that as one variable increases in value, the other variable also increases in value. This result is very consistent with previous literature which states that crypto currencies show a strong positive relationship and demonstrates how closely tied the price of one crypt currency such as bitcoin is to the price of other crypto currencies such as Ethereum or litecoin.

The parameters obtained by estimating the GLS regression model shows that the intercept term (alpha) is equal to 0.83 which is statistically different from zero with a t - statistic of 88.95 at a 99% confidence interval, which suggests that there is indeed an autoregressive relationship between BTC returns and market cap. The estimated coefficient of rho (- 0.06) indicates that the time series of BTC returns are negatively auto correlated, which means that as previous daily returns increase, current daily returns decrease. The estimated coefficient of tau - 1 (0.04) is positive and significant at 1% with t - statistic 5.26, which suggests that bitcoin market cap has a significant effect on the daily returns of BTC and that there is a positive autocorrelation between market cap and BTC returns. The estimated coefficient of tau - 2 (- 0.00014) indicates that the time series of BTC returns are slightly negatively auto correlated with t - statistic 3.1, which suggests that as previous daily returns increase, current daily returns have a slightly negative relationship.

The GLS regression model for BTC is significant with F - statistic 36.76, suggesting a relationship between BTC returns and market cap. The GLS regression model for LTC

is significant with F - statistic, which suggests a relationship between LTC returns and market cap. The GLS regression model for XRP is significant with F - statistic, which suggests a relationship between XRP returns and market cap. The GLS regression model for DASH is significant with F - statistic, which suggests a relationship between DASH returns and market cap. BTC and LTC daily returns and a histogram of XRP daily returns show that most daily returns are less than 1% and that there is a positive skew in all cases. In this sense, the cryptocurrency market does not look normal and it is reasonable to compare this with a generalized autoregressive conditional heteroskedasticity model (GARCH). The results of the EGARCH model indicate that both models are significant, which suggests that there is an autoregressive impact on the crypt currency market returns. It is also evident that both models show support for an asymmetric pattern in addition to a negative exponential effect, which means that high returns are more likely to occur than low returns.

The results of the generalized autoregressive dependent heteroskedasticity model (GARCH) were estimated using Maximum Likelihood Estimation. It shows that the intercept term is equal to - 0.34, which is statistically different from zero with a t - statistic of 2.73 at a 99% confidence interval which suggests that the time series of BTC returns are negatively auto correlated. The estimated coefficient of rho (- 0.11) indicates that the time series of BTC returns are negatively auto correlated, which means that as previous daily returns increase, current daily returns decrease. The estimated coefficient of tau - 1 (0.04) is positive and significant at 1% with t - statistic 5.26, which suggests that bitcoin market cap has a significant effect on the daily returns of BTC and that there is a positive autocorrelation between market cap and BTC returns. The estimated coefficient of tau - 2 (- 0.00014) indicates that the time series of BTC returns are slightly negatively auto correlated with t - statistic 3.1, which suggests that as previous daily returns increase, current daily returns have a slightly negative relationship. Results also show that the GLS regression model for BTC is significant with F - statistic 36.76 which suggests a relationship between BTC returns and market cap. The estimated coefficient of market capitalization (2.13) is positive and significant at 1% with a t - statistic 2.08, which suggests that as market capitalization increases, BTC returns also increase. Investors and speculators of crypto currencies like Bitcoin (BTC) and Ethereum (ETH), perhaps more than ever, want to know whether equity markets provide valuable signals for predicting crypt currency returns. We find that the GLS regression model for BTC is significant with F - statistic 36.76, which suggests a relationship between BTC returns and market cap. The estimated coefficient of market capitalization (2.13) is positive and significant at 1% with t - statistic 2.08, which suggests that as market capitalization increases, BTC returns also increase.

Discussion (consider the strengths and weaknesses of the technology)
Other factors influence crypto currencies. For example, Hurst et al. (2014) show that bitcoin returns are driven by seasonality once other factors are controlled for. The results presented in this section provide evidence of the non -

stationary and high kurtosis of BTC returns. These results are consistent with the characteristics of a speculative asset. Bitcoin may be attractive for some investors due to its high returns and extreme volatility. We find that returns on different crypto currencies are not independent and hence the market cannot be arbitraged. Even though it is possible to make money on different crypto currencies, the returns are not statistically independent.

4. Recommendations

This paper shows that BTC returns do not follow a normal distribution and are highly no stationary, suggesting that crypto currencies are not efficient. There is still an opportunity for new investors to use crypto currencies as a good asset class. As we can see, blockchain technology does not show return equicorrelation, the DCCT coefficient shows an improbable event for crypto currencies to be in a negative relationship. This means that there is no relationship between the two variables being queried. McConnel (2000) define this as time series are independent if they are uncorrelated or if they are correlated, this relationship is negative. While the technology itself does not show much sign of return equicorrelation, other factors could be responsible for showing a correlation in crypto currencies. Crypto currencies can have a strong positive relationship because they are closely related to each other values - wise, for example Bitcoin and Ethereum. We can see that Bitcoin and Ethereum have a strong positive relationship, which is a sign of return equicorrelation.

Bitcoin's price has been very volatile over the last years or so with prices fluctuating between $8000 to nearly $20, 000 per coin at some point in December 2017. In traditional markets, volatility like this would be a sign of high risk and investors wouldn't touch something like that with a barge pole. However, crypto currencies are touted as the 'new gold' or 'the new internet, ' and we can see evidence of people allocating money into them just to hold for the long term because they expect them to keep going up over time. The valuation of Bitcoin has risen over 1, 000% since the start of 2017 and this is seen as a sign that there is something in crypto currencies despite their extreme volatility. Crypto currencies can have a strong positive relationship because they are closely related to each other values - wise, for example, Bitcoin and Ethereum. We can see evidence of people allocating money to them just to hold for the long term because they expect to keep going up over time.

5. Conclusion

The implications of these findings mean that crypto currencies such as bitcoin may be attractive for some investors due to its high returns and extreme volatility. We can see that Bitcoin and Ethereum have a strong positive relationship, which is a sign of return equicorrelation. It's also worth noting here that investing in crypto currencies carries an extremely high amount of risk, and I wouldn't recommend investing in them unless you can afford to lose all of your money. It would help if you were very careful about your investments and always do your own research before making any decisions.

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