ABTRACT:

In this paper, we present a new set of tools for cryptocurrency investors that are not currently available making investing in cryptocurrency a high risk undertaking. By using a new ranking system that utilizes both momentum analysis and sentiment analysis we created a toolbox for the cryptocurrency investor which enlightens the current state of the cryptocurrency investor market to enable the investor to make more informed decisions. Due to the infancy of the cryptocurrency market, most investors are still novices and need these tools to be able to break into and understand the cryptocurrency investor market. With this novel approach taken to cryptocurrency we have provided a tool to bring cryptocurrency investing into the mainstream for all investors.

The cryptocurrency Bitcoin, based on blockchain technology, is as a secure method to make financial transactions. Within a short span of time, hundreds of cryptocurrencies have been created and more are continually being created. The kind of asset cryptocurrencies will become is yet to be understood. The markets are trying to decide whether they are a hedge, safe haven or the properties of cryptocurrencies such as whether they will behave like speculative assets or in fact become another form of money [4]. Some research has shown that Bitcoin appears to act as a speculative safe haven for investors [4]. In this paper we will be looking at cryptocurrency to determine whether it is an asset class and therefore be tradable amongst other assets on the world’s markets.

Bitcoin is a peer-to-peer cryptographic digital currency that was created in 2009 by an unknown person using the alias Satoshi Nakamoto. Bitcoin is unregulated and hence comes with

benefits (and potentially a lot of issues) such as transactions can be done in a frictionless manner – no fees - and anonymously. It can be purchased through exchanges or can be ‘mined’ by computing/solving

complex mathematical/cryptographic puzzles [1].

In doing this we will be creating a tool for investors to analyze cryptocurrency behavior, comparing their performance and behavior to other asset classes so that investors can confidently invest in cryptocurrency.

Today cryptocurrency is on over 5,400 exchanges with a total market capitalization of $164 billion [2]. There are over 867 currencies and growing exponentially for a 2017 12-fold growth rate. Investors are flocking to cryptocurrencies such as Ethereum where its value increase 41 times in an eight-month period. For comparison, the S&P 500 index took over forty years to achieve the same kind of growth. Although new cryptocurrencies are entering the market contently, Bitcoin appears to be entering a more mature phase where its volatility is decreasing [4].

Only recently have mainstream financial institutions like Fidelity [3] begun to give its customers the ability to add cryptocurrencies to their portfolios. Besides continual development of the cryptocurrency products, additional marketplace tools are needed to support this growing marketplace. Cryptocurrency is so new that even large, stable banks are having a difficult time quantifying the movements and predicting where cryptocurrency is headed next.

To aid both the experienced and lay investor in making a more informed decision, we will be creating a cryptocurrency toolbox for the investor that does not exist today. These tools will be ranking cryptocurrencies considering the trends and other properties of various crypto-coins. Using market capitalization as one of our tools, we will expand on the current use of this parameter being used only historically and forecast its value using momentum and other properties such as sentiment analysis amongst twitter, Facebook and reddit.

Currently the cryptocurrency investor’s tools rely solely on past statistics and this is due to the infancy of the cryptocurrency market. There simply has not been the level of analysis on cryptocurrency that is required to bring it to mainstream assets classes.

Most current forecasting techniques utilize univariate which does not capture other influential factors such as momentum. Due to the highly volatile and unregulated nature of cryptocurrencies, outside factors play an influential role in determining the value of the crypto-coin. We aim to include these factors in our overall analysis to provide a clear picture on what cryptocurrency is and how it can be invested.

In order to better model cryptocurrency, we need to understand how and why it behaves such as it does. One of the main issues with cryptocurrency is that each currency is built somewhat differently. Unlike fiat currency where the units are backed by the government and it has value because the government says it has value, cryptocurrency has value because others who have bitcoin say it has value.

Is there a correlation between fiat and cryptocurrency? In some research, Bitcoin has been found to be negatively with the Yuan and the USD while being positively correlated with the USD/EUR exchange rate [4]. This is part of our model, using various foreign exchange rates and determine how they representative of the price of cryptocurrency. Liquidity is one of the major issues with cryptocurrencies. With fiat currency, a large transaction is easily absorbed into the system with little affect to the exchange price. On the contrary for cryptocurrencies where a large transaction will incur heavy fees and cause a large fluctuation in the exchange price of the currency [5]. A set of financially motivated kernels is constructed for the EURUSD currency pair and is used to predict the direction of price movement for the currency over multiple time horizons. MKL is shown to outperform each of the kernels individually in terms of predictive accuracy [12]

In order to determine whether cryptocurrencies such as Bitcoin can be considered an asset class similar to the world’s government backed currencies, the cryptocurrency would need to satisfy three questions. Can it be used as a medium of exchange? Can it be used as a unit of comparability between two good and it must store value over time [4]. Price fluctuations in Bitcoin and other cryptocurrencies are dependent on both internal and external factors[4]. The internal factors are supply and demand but since the supply is deterministic this means that the only internal driver is the demand for Bitcoin. The demand for Bitcoin is determined by the hash rate. External factors affecting the price of Bitcoin is the adoption rate and how it is being used as an investment vehicle. In the short-term Bitcoin acts as a safe-haven investment and in the long run acts as a hedge [4].

Factor investing is where an investor will invest funds in the underlying risk factors that make up an asset class. One of these factors is momentum. The momentum of an asset is looking at the past performance of an asset and using that to determine the future of that asset. The momentum strategy of Jegadeesh and Titman (1993) was able to produce abnormal positive returns [10].

In determining the cryptocurrencies that we use for our model we used each coin’s market capitalization. Market capitalization is a term that has been borrowed from stock markets and inappropriately applied to the crypto space. It is defined as the total value of all shares outstanding of a company. But in crypto land, we have taken to defining market cap as the value of all publicly (not total) available coins or tokens. [14] In our analysis we use the current standard for market capitalization but also include a percentage showing the coins that are in circulation divided by the total coins outstanding.

========🡺 some other comments that may be helpful in the document

For those unfamiliar, the Sharpe ratio is a way to normalize returns for the risk that was taken to achieve them, with higher values being better. It is calculated here as the annualized return divided by the annualized volatility, so we are using a zero risk free rate. Data is from March 17th, 2017 to August 30th, so the major caveat of a small sample size applies to all data in this analysis. A quick note on methodology, when comparing crypto to traditional assets we use the standard 252 trading day annualization factors, and remove weekends and holidays from the data set. When looking at exclusively crypto assets, we use the full 365 day year and 15:00 US Central time as each daily closing price. For a detailed description of the Bletchley Indexes used here see Index Methodology [14]

[1] Bayesian regression and Bitcoin

[4] Exploring the Determinants of Bitcoin’s price, an application of Bayesian Structural Time Series

[2] Coin Market Cap website

[3] Stern, H: Fidelity Labs Tests Digital Asset Wallet On Fidelity.com. August, 09, 2017. <https://www.fidelity.com/about-fidelity/corporate/fidelity-labs-tests-digital-asset-wallet-on-fidelity.com>

[5] <https://www.coindesk.com/solving-liquidity-challenge-decentralized-exchanges/>

[6] Predicting the price of Bitcoin using Machine Learning

[7] Algorithmic Trading of Cryptocurrency

[8] Application of Neural Network for Forecasting of Exchange Rates and ForEx Trading

[9] Automated Bitcoin Trading via Machine Learning Algorithms

[10] Facts and Fantasies About Factor Investing

[11] Bitcoin Market Volatility Analysis Using Grand Canonical Minority Game \_ Ortisi \_ Ledger

[12] Currency Forecasting using Multiple Kernel Learning with Financially Motivated Features 2010

[13] Does Governance Have a Role in Pricing\_ Cross-Country Evidence From Bitcoin Markets

[14] <https://www.bletchleyindexes.com/blog/idx_perf_post>