

# Differentiated Analysis of Cryptocurrencies and Stocks Based on Investor Perspective

Dongyang Lan <sup>1,\*</sup>, Zequan Wang <sup>2</sup>

<sup>1</sup> Department of Reading, Nanjing University of Information Science and Technology, Nanjing, 210044, China

<sup>2</sup> Nanjing Foreign Language School, Nanjing, 210008, China

\* Corresponding Author Email: dr809025@student.reading.ac.uk

**Abstract.** With the rise of crypto assets recent years, it helps more investors take participate in investing and think how to optimize their portfolios. The digital relations were introduced and new crypto assets should have its function aspect affect the financial sector. Due to professional knowledge is lacking, most investors couldn't make proper choices and depend on their subjective thoughts. In some areas, cryptocurrency is not recognized by jurisdiction but it also applied in various fields depending on its characteristics. This paper aims to analyze various qualities such as profitability, liquidity and so on with many famous stocks and heated crypto assets. Another proposal is analyzing the differences between crypto assets and stocks for their better performance of portfolios. The methodology is searching specific data from the website CoinMarketCap.com, finance.yahoo.com and others to calculate various ratios, making dynamic charts and using models from other references. We wonder the various factors could be adopt behind different portfolios like time, policies and abrupt changes over the world which could affect the prices of stocks or crypto assets. In the final part, is about the conclusion of the difference between crypto assets and stocks that they have different characteristics by analyzing various data.

**Keywords:** Differentiated analysis; crypto assets; stocks; characteristics.

## 1. Introduction

In finance field, portfolio optimization is always one appealing question which for scholars and investors. There is an increasing tendency for crypto assets recent years, so it appeals to more investors taking participate in applying more capital. Digital relations were introduced by crypto assets, so financial sector have been affected by its function [1, 2]. The rising tendency of crypto assets could be witnessed from their significant growth and more institutions which concentrate on issuing it and offering financial services of it. Crypto asset is one intangible asset which issued, sold or transferred by the security of cryptographic technology and electronically shared by a specific algorithm to another user. Based on the jurisdictions, although crypto assets are not recognized, their characteristics also have functions [3, 4]. The impressive growth of crypto currency markets has in high relation to speculative activity, but crypto currency markets have been found that have highly bubble-prone [5, 6]. Stocks have kept stable status in the investment field for many years, most investors would take participate in putting their money. In this paper, we would introduce two portfolios which one is a pure stock portfolio including some famous stocks and another is a crypto assets portfolio including six crypto assets: BTC, ETH, Tether, XRP, BNB, USD Coin. By comparing the two portfolios, the proposal is taking use of changing prices, returns, transactions of crypto assets and key abilities including risks, profitability and market ratios of stocks for the differences between these two alternatives and help make better options. Various ratios will be taken such as Current Ratio, Debt Ratio and Sharpe Ratio [7], the changing prices of crypto assets and stocks, calculating the  $R_{i,t}(\text{daily returns}) = \frac{P_{i,t}}{P_{i,t-1}} - 1$  to illustrate multiple dimension's ability of these two portfolios for our financial performance optimization [8]. Some definitions would be applied to describe the data about stocks and crypto assets including  $A_i = \text{Volume of crypto currency}$ ,  $B_i = \text{Price of crypto price}$ ,  $U_a = \text{highest volume of crypto currency for sale and other data}$  [7]. According to Novy Marx [9], if we choose stocks based on the quality, which means making detailed choices could help investors get

more profits than original thoughts. It's found that crypto assets have been become an important alternative since its birth and there are lots of investors take it as a strong alternative. After combining crypto assets with stocks, if the meaning of data were useful, the investment portfolios could perform well, risks associated with volatility will decrease and portfolios will be more diversified to keep stable for more profits than initial portfolios investors choose.

## 2. Analysis of Crypto Assets and Stocks

### 2.1. Characteristics of Crypto Assets and Stocks

Before our data about stocks and crypto assets, the most important thing is to understand what the features, stocks and crypto assets have. The features of crypto assets we attach importance are: 1. Volatility: In investing field, all investors want their portfolios have lower volatility to keep stable 2. Utility: it means that crypto assets should have various applications for investors which help them broaden their portfolios. 3. Security: The security of crypto assets is always the most important issue that investors care about. Crypto assets undoubtedly have its disadvantages compared to stocks, because it has high volatility and may face to online theft [10]. The features of stocks are common that: 1. Stocks are more quantizable than crypto assets because stocks are based on specific companies. 2. As for stocks, investors could get more information about the company and there are more professional practitioner globally. But stocks are also face to lower online theft and if the companies face changes, the prices of stocks would rapidly change even go broke. This paper will analyze various data of crypto assets and stocks for their different qualities which offer information for investing.

### 2.2. Analysis of Crypto Assets

What's worth mentioning is that when we talk about crypto assets, blockchain technology is the key to it. Vitalik Buterin describe the blockchain technology as a magic computer which anyone could have the power to upload information and make operations [11]. Each crypto asset has its own supported blockchain technology and network of nodes which provide processing power and memory capacity [12]. Most investors consider crypto assets as an intangible digital asset because it depends on the specific algorithm to exchange the number of them and the information. And the vulnerability of crypto assets is also due to the blockchain technology, if an owner's private key is uncovered or lost, investors who invest it would undertake the loss of money.

First and foremost, we would focus on the crypto assets. The prices are changing timetable of six crypto assets for getting information about their volatility and returns of them.

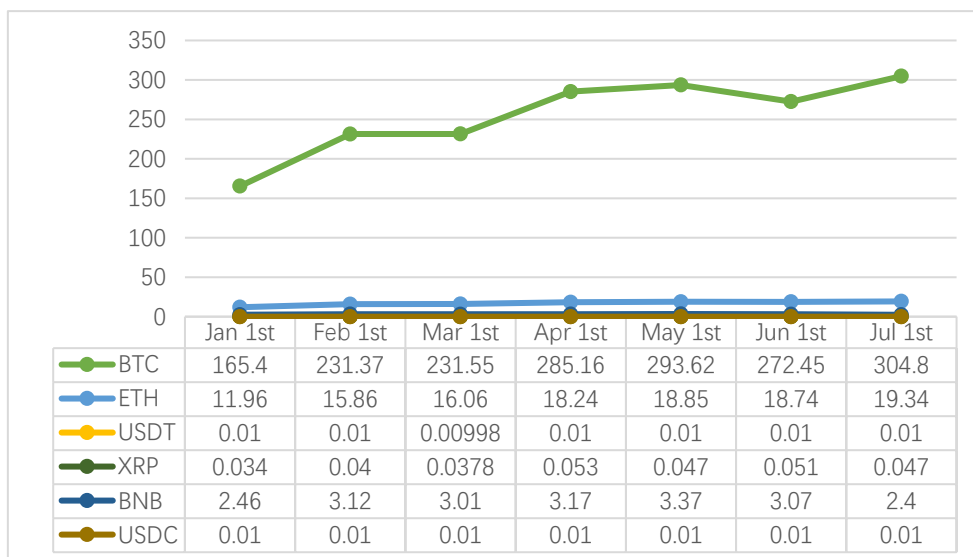


Figure. 1 Prices of Crypto assets/one hundred

Figure 1 illustrates the prices tendency of six crypto assets, among them the prices of USDT and USDC are almost keep stable, BTC are rising every month which has the highest prices because it is the most famous crypto assets over the world. Except USDT and USDC are kept \$ 1. 00 because they are stablecoin and BNB fluctuates, other crypto assets are all kept rising tendency, it reflects that up to now crypto assets perform well this year. If investors want to save their money rather than taking risks, stablecoin may become a good choice for their portfolios. The results from Table 1 show the owner who has crypto assets need to pay attention to the prices of them, Due to the high volatility of crypto assets, investors may get higher profits or lose their money.

Then we would calculate the daily returns of crypto assets for get the ability of them,  $R_{i,t}(\text{returns}) = \frac{P_{i,t}(\text{Price at time } t)}{P_{i,t-1}(\text{Price at time } t-1)} - 1$ . We use the latest two days' data of July 15th and July 16th, returns of these six crypto assets are 0.54% (BTC), -2% (ETH), 0.53% (USDT), -1% (XRP), -6.6% (BNB), 0.36% (USDC). Combing table 1 with former returns, although most of crypto asset prices are rising profits, their daily returns are slight even minus. So, if take importance to daily returns of crypto assets, it may couldn't get satisfied results and crypto assets have become a long term alternative for investing.

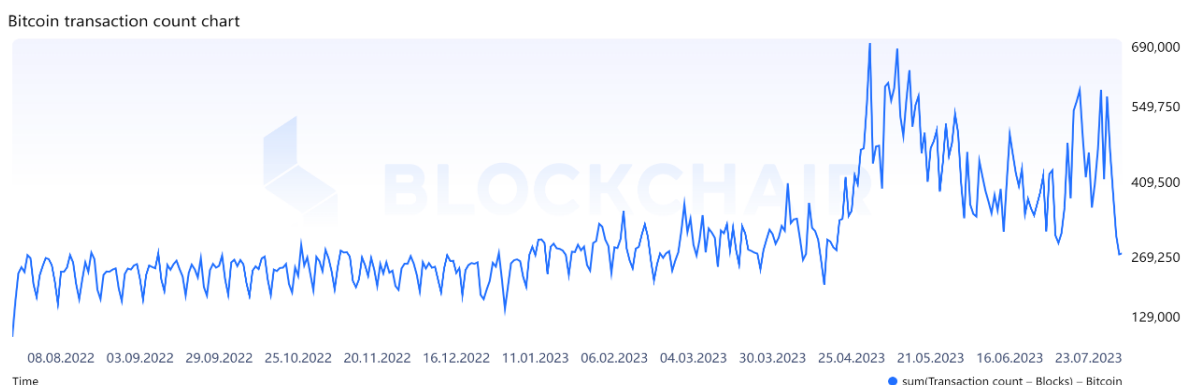


Figure 2. The chart of Bitcoin transactions

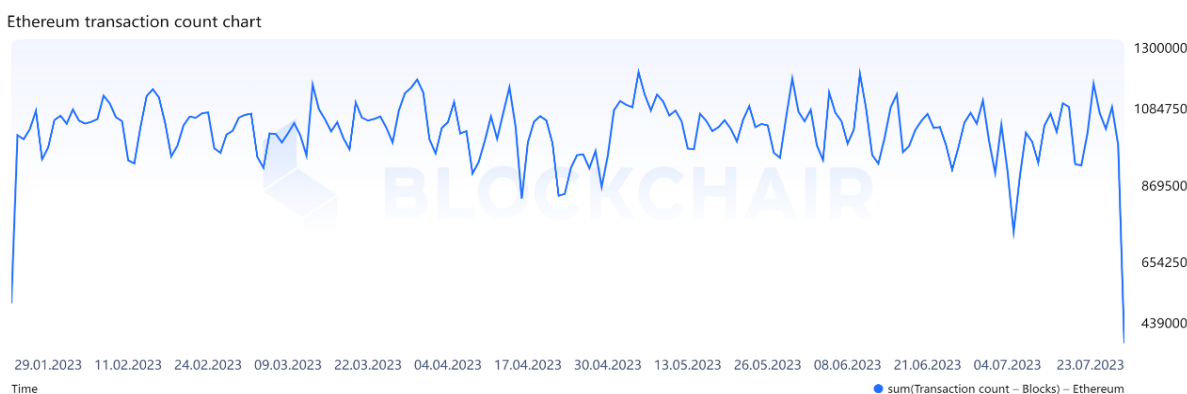


Figure 3. The chart of Ethereum transactions

From the chart of figure 2 and figure 3, we could indicate that based on the lowest prices in them, it has higher transaction than BTC and both they are kept at high transaction this year. The volume each day of crypto assets and the 24-hour trading volume are also higher than stocks, it means that crypto assets has keep popular between investors and there are abundant institutions invest capital in this field due to the rise of cryptocurrency concept.

Table 1. Market Cap of six crypto assets

	BTC	ETH	USDT	XRP	BNB	USDC
Market Cap/ \$	580,798,420,254	225,081,437,443	83,754,272,892	38,760,641,351	37,762,519,125	26,840,812,351

From these six crypto assets' market cap in Table 1, the number of them are higher than most of stocks based on the characteristics that crypto assets publish for everyone globally to get capital and create a heated pattern for investing. From various research show that most of the volume is traded at lower scores got by worse governance institution [13]. It means that crypto assets appeal to plenty investors who believe that: (i) their investment in crypto assets is profitable (ii) crypto has advantages for paying (iii) have enough and professional knowledge to deal with risks and high volatility.

Last but not least, profitability of crypto assets is one of important point comparing with stocks which get stable investment. So, this paper introduces these crypto assets' 7 days return to use: -1.4% (BTC), -3.0% (ETH), 0% (USDT/USDC), -0.9% (XRP), -2.4% (BNB). Coming with former daily returns, the results show that except stablecoin, other crypto assets have all have minus profits and it may have an increasing decrease in one day. So, there are lots of potential real investors are skeptical about investing it because they don't believe in it or interested in it.

### 2.3. Analysis of Stocks

After analyzing crypto assets, we would focus on some famous stocks for multiple dimension's quality. Choosing a nice stock or cryptocurrency is an important part of an investment. In this part, we mainly study and compare the ways of analyzing these two qualities.

There are hundreds of thousands of stocks in the market and we have already developed several ways of picking which to invest. Risk, profitability, market value ratios and momentum are the main points most investors focus on after deciding which sector to invest. We will choose several stocks for better understanding.

First and foremost, we look at risk analysis. In this part, we have beta, market capability and financial ratios. Beta measures the exposure of the stock to the only market risk assumed in CAPM. If a stock has a Beta of 1, then the stock has average market risk. If the Beta is under/over 1, then it is uner/over average market risk. The market cap is a useful tool for comparing companies within the same industry or sector. It also serves as a key factor in determining a company's inclusion in various market indices like the S&P 500 or the Dow Jones Industrial Average. Investors often consider market cap alongside other financial metrics when making investment decisions. In financial ratio part, we calculate Current ratio (Current Assets / Current Liabilities) and Quick ratio ((Current Assets – Inventory) / Current Liabilities) for liquidity analysis and Debt ratio (Total Debt/Total Assets), Debt-to-Equity ratio (Total Debt / Total Equity) and Equity ratio (Total Assets / Total Equity) for solvency analysis.

Let us look at three representative stocks from the financial services sector.

**Table 2.** Risk Ratios of BX, BAC, MS

	Beta	Market cap	Current ratio	Debt ratio	D/E ratio
Blackstone Inc (BX)	1.42	\$111.71B	1.17	31.65	1.367
Bank of America (BAC)	1.2	\$228.63B	0.77	16.68	10.16
Morgan Stanley (MS)	1.46	\$142.63B	1.33	27.84	2.43

From Table 2, these 3 companies are all big cap stocks in the same industry, and they have similar Beta that are all greater than 1, so they have similar market risk. As for Debt Ratio, it shows a company's ability to solve its debt. So, the conclusion is that Debt Risk Ranking is  $BX > MS > BAC$ . Current Ratio reflects a company's liquidity. By looking at the data we can conclude that Liquidity Risk Ranking is  $MS > BX > BAC$ . Another is D/E Ratio, if D/E ratio is high, it means that equity is low and debt is high, so BX has the lowest debt or the highest equity. These liquidity ratios and solvency help investors get the knowledge of stocks or decide to invest them.

Next, we analyze asset utilization and profitability. In this part, we have an asset turnover ratio, profit margin, return on asset (ROA) and return on equity (ROE). An asset utilization ratio measures how efficiently a firm is using its assets to generate revenues or how much cash is being tied up in other assets such as receivables and inventory. A profitability ratio assesses a company's effectiveness in turning sales or assets into profits. Asset Turnover ratio (Sales / Total Assets) is used

to evaluate a company's efficiency in generating sales revenue from its assets. It measures how well a company utilizes its assets to generate sales. Profit Margin (Net Income / Sales) is a financial metric that measures a company's profitability and efficiency in generating profit from its sales revenue. It expresses the percentage of profit earned for each dollar of sales made. The profit margin is a critical indicator for investors, analysts, and stakeholders as it provides insights into a company's ability to manage costs, pricing strategies, and overall financial health. ROA (Net Income / Total Assets) is used to measure a company's profitability in relation to its total assets. It indicates how efficiently a company utilizes its assets to generate profit. ROE (Net Income / Total Equity) is used to measure a company's profitability in relation to the shareholders' equity. It provides insights into how effectively a company uses shareholders' investments to generate profit.

Let us look at three representative stocks from the technology sector (see Table 3).

**Table 3.** Utilization and Profitability Ratios of APPL, MSFT, IBM

	Asset turnover ratio	Profit margin	ROA	ROE
Apple Inc. (APPL)	1.2	25.31%	20.56%	196.96%
Microsoft Corporation (MSFT)	0.54	36.69%	14.83%	43.68%
International Business Machines Corporation (IBM)	0.48	2.94%	3.76%	8.08%

We can see that APPL has the highest asset turnover ratio, which means that it can generate revenue, most effectively. In terms of profit margin, Microsoft is the most profitable company. However, in terms of ROA and ROE, APPL is the most profitable company. Considering all the data above, we can get the profitability ranking APPL > MSFT > IBM.

Then we look at market value ratios. In this part we will talk about Price-to-Earning (P/E) ratio, Price-to-Book (P/B) ratio, Price/Earnings to Growth rate (PEG) ratio, dividend yield and insider buying. These data will tell different kinds of investors whether it is a good time to buy or sale a stock. P/E ratio (Market Price per Share / Earnings per Share) is used to assess the valuation of a company's stock relative to its earnings per share (EPS). It compares the market price of a company's stock to its earnings per share. If the P/E ratio is less than 10, it is a good time for value investors to buy the stock. P/B ratio (Market Price per Share / Book Value per Share) is used to assess the valuation of a company's stock relative to its book value per share. It compares the market price of a company's stock to its book value, which is the net asset value of the company per share. If the P/B ratio is less than 1 or 2, value investors may buy the stock. PEG ratio (P/E ratio / Annual Earnings Per Share (EPS) Growth Rate) is used to assess the valuation of a company's stock relative to its earnings growth. It combines the Price-to-Earnings (P/E) ratio with the company's earnings growth rate to provide a more comprehensive picture of the stock's valuation. When the PEG ratio is greater than 1, a PEG investor may buy the stock. Dividend yield ((Annual Dividend per Share / Market Price per Share) × 100) measures the annual dividend income generated by a company's stock relative to its current market price. It is expressed as a percentage and is used by investors to assess the income potential of a dividend-paying stock. An income investor usually buys a stock when the dividend yield is above 3% or 4%. Insider buying provides insights into the confidence and sentiment of those with intimate knowledge of the company. When insiders buy shares of their own company, it may signal their belief that the stock is undervalued or that they have positive expectations about the company's future performance. If there is insider buying, it may be a good time to invest.

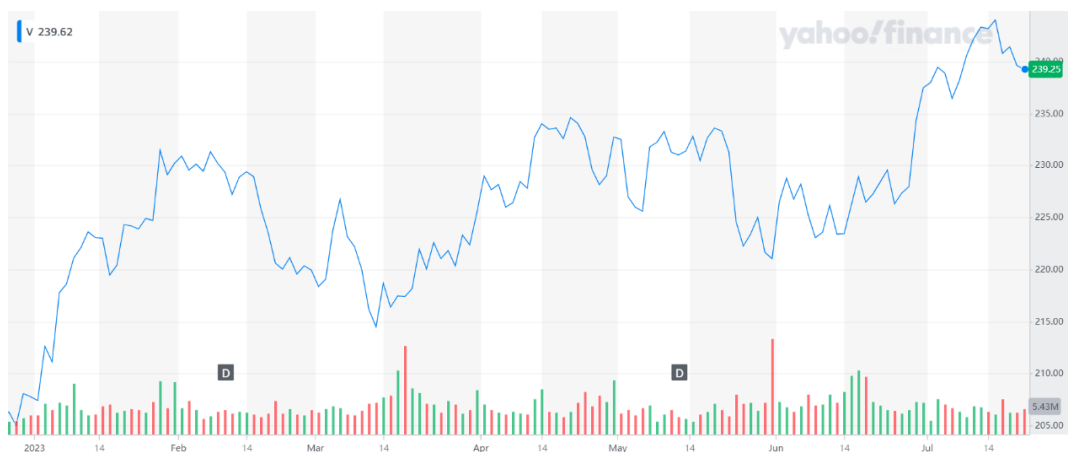
Let us look at three representative stocks (see Table 4).

**Table 4.** Market Ratios of INTC, ORCL, AVGO

	P/E ratio	P/B ratio	PEG ratio	Dividend yield	Insider buying
Intel Corporation (INTC)	15.36	1.39	-29.84	1.53%	Yes
Oracle Corporation (ORCL)	38.83	303.73	3.36	1.28%	Yes
Broadcom Inc. (AVGO)	26.99	15.47	1.59	2.18%	Yes

Considering the data above, value investors may buy INTC for its small P/B ratio, PEG investors may not be interested in all three stocks and income investors may not buy the stocks. All the three stocks have insider buying, which means the stocks are undervalued.

Finally, we analyze momentum of the stocks. Momentum refers to the tendency of an asset's price to persist in its current direction over a certain period. If a stock has a positive momentum, the stock price is getting higher in a period of time and may attract momentum investors. We can compare a stock's recent price, 50-day moving average price and 200-day moving average to calculate whether the stock is momentum.



**Figure 4.** Prices of Visa Inc.(V)

Figure 4 is the chart of Visa Inc. (V). We can see from the chart that the stock price tends to increase over this period of time, indicating a positive momentum. Also, we can get the conclusion by comparing recent price \$239.62, 50-day moving average \$231.32 and 200-day moving average \$219.32. Momentum investors may invest the stock.



**Figure 5.** Prices of Nasdaq Inc. (NDAQ)

Figure 5 is the chart of Nasdaq Inc. (NDAQ). We can observe a negative momentum. The stock price is falling in this period. We can also get the conclusion by comparing the recent price \$50.71, 50-day moving average \$52.54 and 200-day moving average \$57.54. Momentum investors may not buy this stock.

In summary, we need to consider risks, profitability and asset utilization, market value ratios and momentum when investing in stocks. We can find various data and there are many numbers to calculate. We need to consider which ratio to analyze and what kind of investors we are. When combining crypto assets and stocks together, investors could consider more ratios, abilities and changing prices. So, after the analysis of crypto assets and stocks, the key to making decisions about

these two alternatives should decrease the volatility of portfolios and improve the ability of dealing with risks for better performance of investors' portfolios.

### 3. Conclusion

The paper aims to analyze the differences between crypto assets and stocks which are mainstream option for investors to make better performance of their portfolios. Crypto assets, in this day and age, have already attracted many investors. The tables were introduced in this paper were the changing prices of crypto assets, their daily returns of July 15th and July 16th, Bitcoin and Ethereum's transactions and long-term returns of these crypto assets. After the analysis, as newly developed assets based on the advanced computers and blockchain technology, crypto assets have higher volatility, the higher possibility of theft online, higher prices to purchase and the huge gap of returns. As for stocks, various ratios including current ratio, debt ratio, ROA, ROE, PEG ratio and others were used for main three abilities: Risks, Profitability and Market Ratios of stocks. This information was introduced to help investors get the meaning of crypto assets and stocks' data for making better choices and performance of portfolios. When making analyses, we can depend on this information and rely on more approaches when choosing stocks and crypto assets. The difference is that crypto assets have higher volatility which affect the returns of it, the transactions in one day even the higher prices for purchasing but its advantage is also could make higher profits in short time. Stocks are more controllable, stable and have more information and professional institutions than crypto assets, but it also decreases the operability and lower profits.

### Authors Contribution

All the authors contributed equally, and their names were listed in alphabetical order.

### References

- [1] Weyl E G. A price theory of multi-sided platforms. *American Economic Review*, 2010, 100(4): 1642-1672.
- [2] Gudelis D., Guogis A. Integrating public and business management: a model of interaction between public and private sectors. *International Review on Public and Nonprofit Marketing*, 2011, 8(1): 1-9.
- [3] Nawari N O., Ravindran S. Block chain and building information modeling (BIM): Review and applications in post-disaster recovery. *Buildings*, 2019, 9(6): 149-154.
- [4] Villanustre F., Chala A., Dev R., Xu L., Furht B., Khoshgoftaar T. Modeling and tracking Covid-19 cases using Big Data analytics on the HPCC system platform. *Journal of big Data*, 2021, 8(1): 1-24.
- [5] Cheah E T., Fry J. Speculative bubbles in Bitcoin markets? An empirical investigation into the fundamental value of bitcoin. *Economics Letters*, 2018, 130: 32–36.
- [6] Corbet S., Lucey B., Yarovaya L. Datestamping the Bitcoin and Ethereum bubbles. *Finance Research Letters*. 2018.
- [7] Hasan M Sami, S M Arifuzzaman. Comparing Pure Stock Portfolio with Stock and Crypto-currency mixed Portfolio through LSTM to Compare & Analyze Investment Opportunities for Portfolio Performance Measurement. *Australian Journal of Engineering and Innovative Technology*, 2021, ISSN 2663-7804: 2663-7790.
- [8] Saman Adhami, Dominique Guegan. Crypto assets: the role of ICO tokens within a well-diversified portfolio. *Journal of Industrial and Business Economics* 2019, 2019-11-01, ISSN 0391-2078: 1972-4977.
- [9] Novy R Marx, *The Quality Dimension of Value Investing*. National Bureau of Economic Research, Simon Graduate School of Business, University of Rochester, 2013.
- [10] Helmut Stix. Ownership and purchase intention of crypto-assets – survey results. *Empirica*, 2021, 2021-02-06, ISSN 0340-8744: 1573-6911.
- [11] Buterin V. Visions part I: the value of blockchain technology. *Ethereum Blog*, (2015).

- [12] Silvia Bartolucci and Andrei Kirilenko. A model of the optimal selection of crypto assets. Royal Society Open Science 2020-08-01: 2054-5703, (2020).
- [13] Sabino Correa. Crypto Governance: Analysing and Comparing Crypto Assets Trading Platforms. The Journal of The British Blockchain Association, 2020, 2020-02-18, ISSN 2516-3949: 2516-3957.