New Cryptocurrency Ranking Methodology

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**Abstract.** The cryptocurrency market is in its infancy and highly volatile. Existing ranking sites such as [www.coinmarketcap.com](http://www.coinmarketcap.com) are insufficient for traders because they only consider one factor, market capitalization. Experienced traders consider many other factors in evaluating investments. A new beta website, [www.coingecko.com](http://www.coingecko.com), considers additional factors to market capitalization such as liquidity, developer, community, and public interest. This new ranking does not consider key financial indicators or factors such as momentum to rank cryptocurrencies. By adding in other factors, rankings could be made for optimal buying and selling opportunities sorted by level of risk. This new ranking methodology would incorporate key financial factors such as Commodity Selection Index and use a voting system to determine buy, sell, or hold status. The status allows filtering of the ranking. Factor weighting would determine rank order. Value of ranking is determined by investment simulation measured against traditional buy and hold of “blue chip” market capitalization cryptocurrencies.

# 1 Introduction

The cryptocurrency market started in 2009 with the bitcoin network and in 2010, the first bitcoin exchange opened. As of September 7, 2017, there are 5,475 cryptocurrency exchanges according to Coin Market Cap with a total market capitalization of $164 billion for 867 currencies. By comparison, this market capitalization represents 20% of Apple’s market cap.

The market is growing exponentially. For instance, the number two cryptocurrency in market capitalization, Ethereum, grew 4,100% in eight months in 2017. The Standard and Poor’s 500 Index which is made up of 500 of the most widely traded US stocks took over 40 years to achieve the same kind of growth. The cryptocurrency market is currently in its infancy and to enable it to grow into maturity will require solid tools by which investors can rely upon.

With so much growth in an industry, many people want to get involved in this emerging market. But, t with limited tools for researching, trading, and transacting Investing can be daunting for new and current investors. Only recently has mainstream financial institutions like Fidelity [1] begun to give its customers the ability to add cryptocurrencies to their portfolios. Besides continual development of the cryptocurrency products, additional marketplace tools need to be developed to support this growing marketplace.

A good place for new investors to learn about cryptocurrencies is to visit [www.coinmarketcap.com](http://www.coinmarketcap.com) website to see a ranking of cryptocurrencies by market capitalization. Market capitalization is the price of the currency times the number of currencies in circulation. This metric gives an investor a relative size of the currency. These currencies are often labeled “blue chip” meaning they are well-established and financially sound compared to others. For instance, see Table 1 for an example ranking of cryptocurrencies by market capitalization.

**Table 1.** Coin Market Cap top five ranking as of September 16, 2017.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Rank | Name | Market Cap (million) | Price per Coin | Max Supply (million) |
| 1 | Bitcoin | $59,879 | $3,613.67 | 21,000 |
| 2 | Ethereum | $23,309 | $246.24 | - |
| 3 | Bitcoin Cash | $7,397 | $445.98 | 21,000 |
| 4 | Ripple | $6,856 | $0.18 | 100,000,000 |
| 5 | Litecoin | $2,5448 | $48.12 | 84,000 |

Many investors only invest in blue chip currencies and utilize a strategy of buy and hold believing that the currency will continue to go up in value as the market grows and because of the limited supply of the currency. For them, investing by market capitalization is sufficient. But, for investors who prefer to buy and sell based on the volatility of the market, only considering market capitalization is not sufficient. These investors will perform research on the currencies considering other factors such as trading liquidity and sentiment of its user and development communities. Until recently, there was no web site for investors to research that consider other factors.

A beta website at [www.coingecko.com](http://www.coingecko.com) developed a ranking algorithm that incorporates factors liquidity, developer, community, and public interest in addition to market capitalization to determine ranking. See Table 2 for an example ranking of its ranking. By incorporating non-financial factors and applying a custom algorithm, a different ranking resulted with different results for ranks three through five compared to straight market capitalization. Which ranking is better for an investor? Is there an opportunity for another ranking that incorporates more financial factors that account for market momentum?

**Table 2.** Coin Gecko top five ranking as of September 16, 2017.

|  |  |  |  |
| --- | --- | --- | --- |
| Rank | Name | Total Score | Max Supply (million) |
| 1 | Bitcoin | 91% | 21,000 |
| 2 | Ethereum | 83% | - |
| 3 | Litecoin | 77% | 84,000 |
| 4 | Monero | 70% | - |
| 5 | Ripple | 70% | 100,000,000 |

# 2 Problem

Current ranking of cryptocurrencies in the marketplace do not address the needs of traders who frequently buy and sell. These traders need a ranking that includes key financial indicators whose results are voted on to determine a buy or sell position along with weighting of key factors that provide a ranking of buy and sell opportunities.

# 3 Background

Stock market indices were created as a tool to be used by investors and other financial managers to describe a market. Using a standard tool allows the investor or financial manager to compare various funds, stocks and other investments to one another. The number itself is not important but this number of time is what is of interest to the investor.

These indices may be classified in different ways to reflect the desired market that an investor or financial manager is interested in. Grouping various stocks or funds together allows the public to gauge and track the performance of those investment tools. Cryptocurrency does not have an index to which the public can look to in order to understand the performance of this investment or compare it as an investment against others.

Current and past approaches to creating these indices include market value indices, price weighted and equal weighted indices. Each of these methods has their strengths and weaknesses.

The market value indices look at the capitalization of the various firms and use them to weight the value of each company’s stock into the final value of the index. This index has two methods of calculating this weight. The other method being used for the market value index is the free float index. This index will also use the total value of the company but it differs on which shares are used to calculate that value. The free float index does not use the shares that are in the hands of the member which is in control of the company. This method measures the liquidity of the shares of the company and the S&P 500 is an example of such an index. The capitalization method uses the total value of the company and one large company or industry can have a dramatic effect on the total value of the index. During the technology bubble of the late 90’s, the technology sector dominated the indices which used market capitalization and subsequently were also affected by the following tech bubble bursting.

A price-weighted index, such as the Dow Jones Industrial Average, is less common and uses the actual price of the stocks to determine the value of the index. This is a weighted average and is also modified to account for stock splits. The largest issue with this type of index is that a stock listed at $10 will count half as much as a stock valued at $20 toward the value of the index.

Equal weighted indices, such as the MSCI, are where each of the stocks contribute equally to the total value of the index.

Cryptocurrency is in its infancy when compared to the stock market indices already created. Seeing as it is not fully adopted there is not a lot of activity in the market index arena. TaiFu is an index, the world’s first cryptocurrency market, which uses market capitalization of thirty largest cryptocurrencies on any given day. The problem with this index is that because that the components can change from day to day. Therefore, a comparison of the index value from today against the index value as of one year prior does not mean as much when looking at the S&P 500 index value over time. This is where a new index can fill the need of investors and allow the public to track the performance of the index over time.

# 4 Approach

The approach to solving the problem of providing a ranking system for traders is to obtain past cryptocurrency data from Coin Market Cap’s or Coin Cap’s API for their list of supported coins. This history data will then be persisted into a database for analysis.

Next, a list of new variables will be defined and created for each coin and persisted. The determination of the new variables will be discovered from our advisors and research.

Next, portfolio strategy testing methodology approach will be deployed to train a learning algorithm to optimize on the training data and comparing it against test data.

The results of the learning algorithm should provide weights on the variables that should prioritize the coins based on a recent window of data.

1. Start with variables

2. Use some learning algo to optimize over running sample windows

3. Research some sample for estimating weights, another sample window for testing

This would all be standard portfolio strategy testing. Some decent literature and tools out there on it, especially in Python.

Obtain marketplace data from coinmarketcap via API

Determine financial indicators such as CSI and build them to calculate values for currencies.

Determine number of indicators required to indicate a buy or sell flag.

Develop program to converge model to beat

Create an investment simulator.

Investment strategy

Random start, random bucket of money to invest, list of investment strategies

Max gain today

Notes:

* Research problem space and past work. Also, survey marketplace to gauge interest and need.
* Segment/Membership: Decide on symbols (market) to use for portfolio.
* Data: Build tool to pull data by range from a large exchange that provides symbol pairs for USD. Store data in a DB.
* Data: Study time series data and index of portfolio.
* Algorithm: Iterate on an algorithm and compare with portfolio individual pairs.
* Rebalance: Decide on rebalance criteria and experiment.
* Adoption: Create a plan for mass adoption. Are other tools needed?

# 5 Ethics

While there is a lot of upside to the evolving concept of cryptocurrency there is also a good amount of downside. At the moment, there are numerous vulnerabilities and complex issues that must be addressed before the market will be welcomed by the vast majority. Most of these issue trace back to the pseudo, anonymous nature of their transactions. This feature by design, makes it very difficult for society to accept and govern. Due to this lack of governance, many believe cryptocurrencies will inevitably be abused.

The following questions will be addressed in our research:

* What are the positives and negatives of cryptocurrencies?
* What is the regulated landscape of cryptocurrencies?
* What are the risks of investing in this landscape?
* What are the risks of financial anonymity on society?
* What are the ethical obligations on the cryptocurrency community?

# 6 Analysis

Notes:

* Exploratory data analysis.
* Algorithm development

# 7 Results

Notes:

* Application of algorithm
* Feedback from community if appropriate

# 8 Future Work

# References

1. 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

Below is place holder:

1. Baldonado, M., Chang, C.-C.K., Gravano, L., Paepcke, A.: The Stanford Digital Library Metadata Architecture. Int. J. Digit. Libr. 1 (1997) 108–121

2. Bruce, K.B., Cardelli, L., Pierce, B.C.: Comparing Object Encodings. In: Abadi, M., Ito, T. (eds.): Theoretical Aspects of Computer Software. Lecture Notes in Computer Science, Vol. 1281. Springer-Verlag, Berlin Heidelberg New York (1997) 415–438

3. van Leeuwen, J. (ed.): Computer Science Today. Recent Trends and Developments. Lecture Notes in Computer Science, Vol. 1000. Springer-Verlag, Berlin Heidelberg New York (1995)

4. Michalewicz, Z.: Genetic Algorithms + Data Structures = Evolution Programs. 3rd edn. Springer-Verlag, Berlin Heidelberg New York (1996)

# Appendix: Plan of Milestones

# History of Feedback

### September 12, 2017

Comments on your proposal - first a formatting comment: please follow the format exactly.  Do not change it.  For example, there is no blank line between paragraphs.

Question on your proposal: What is the problem you are solving? In addition, how do you measure success? Why is it not trivial to create an index? Specifically, how would it be created?  How would it be used?

In writing, do not state your opinions…eg do not use “Our belief…” Write neutral.  This is not an opinion piece.

The concept is good, but it’s not clear why this is a capstone project.  Indexes are created all the time. Why is it hard? How is this more than a simple exercise? How do you assess success?   You are missing all of the problem details and measures of success.

Please add the problem and additional details.

