1. **Executive Summary**
   1. **Introduction and Problem Overview**
   2. **Mission Statement**
   3. **Objectives**

*Roger*

1. **Fund**
   1. **How the Fund Solves the Problem**

A key purpose of the DCI is the diversification of a very volatile crypto-currency market. This allows for an investment in the entire cryptocurrency space, without the risk of betting on a single coin, and without the hassle of holding coins from different exchanges or in different wallets. There are many coins available, some are very valuable investment vehicles, however others are highly volatile and frankly others are worthless. The goal of DCI is to manage an index fund of coins that is the weighted average of the top 30 coins.

Clearly, what makes a top performing coin is somewhat subjective, however, we aim to maximize return while minimizing risk. The key to that is creating a weighted average of many un-correlated (or negatively correlated) coins with the highest possible expected return (keeping in mind that the profile of such coins changes over time). Unfortunately, many coins are highly correlated, very volatile and some have a non-zero probability of spontaneous failure. There are competing metrics for which we can optimize our portfolio towards; specifically maximizing expected return versus minimizing volatility. We chose to maximize the Sharpe Ratio, which is a ratio of expected portfolio returns over the portfolio standard deviation.

Our process is to simulate millions of possible future single-year market prices, based on the historic volatility and correlation of returns using the last 1 year of data (coins must have existed for at least 1 year to be included in our portfolio). We also factor in a penalty for the newest coins that have less history and a chance of going to zero using a proprietary scoring function based on the Lindy Effect, see below.

Within this simulation, we can report maximum expected draw-dawn, maximum days of loss, expected return, expect 95th percentile return/loss and the expected sharp ratio. More importantly, within this simulation, we perform an optimization using a genetic algorithm to develop an optimal portfolio. After each simulation, we rebalance the portfolio by up-weighting top performing assets and down-weighting poor performing assets until we create an optimal portfolio of assets across all future scenarios in terms of both minimizing volatility and maximizing return.

A portion of the DCI coin will also be invested in enterprises that increase the value of the entire crypto-currency space. Such as…*[for Roger to fill in]*

This is not a coin to day trade, this is a coin to buy and hold (not HODL) because we have done the hard work of diversifying the portfolio for maximum value over the next 1 year holding period. Additionally, we periodically reweight the portfolio to move new top performers in, and to move bottom performers out. And, of course, any asset that is expected to fail, due to a hack or fraud or any other specific reason, would be immediately removed from the portfolio to be replaced with the next best performing coin.

The Lindy Effect states simply that the future life expectancy (or in our case, probability of failure) is proportional to both the health and existing longevity of the thing, this is also part of the Doomsday argument. Put simple, fads fade quickly and old things tend to continue to last. For our purposes, coins that have been around for a long time and have high market share have a near zero probability of spontaneous failure, while newer coins with a lower volume have a higher probability of spontaneously going to zero.

For our purposes, we will define the probability of failing on a single day as a function of health (market cap), longevity, percent of coins in circulation and sentiment.

* 1. **Prerequisites for Candidate Coins**
  2. **Rebalancing the Fund**

In a volatile market, rebalancing is particularly important to see gains over what the market can provide through a pure hold strategy. It is important to note that this is not an arbitrary buy and sell, but a periodic and systematic movement between assets within a portfolio.

Consider holding a pair of coins/assets across 3 periods where you initially have 1 unit of each. If the price of a more volatile asset (A) drops in period 2, and we hold instead of rebalancing, then when value of asset A returns to the original price in period 3, then we are indifferent, seeing neither gain nor loss.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Asset A** | **Asset B** | **A Holdings** | **B Holdings** | **Total Value** |
| Period 1 | 100 | 100 | 1 | 1 | 200 |
| Period 2 | 50 | 100 | 1 | 1 | 150 |
| Hold | 50 | 100 | 1 | 1 | 150 |
| Period 3 | 100 | 100 | 1 | 1 | 200 |

If, however, we choose to rebalance at period two towards the more volatile asset**,** and then the price returns to its original value, then we can realize gains above a pure hold strategy.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Asset A** | **Asset B** | **A Holdings** | **B Holdings** | **Total Value** |
| Period 1 | 100 | 100 | 1 | 1 | 200 |
| Period 2 | 50 | 100 | 1 | 1 | 150 |
| Rebalance | 50 | 100 | 1.50 | 0.75 | 150 |
| Period 3 | 100 | 100 | 1.50 | 0.75 | 225 |

This logic is similar if the price moves up and comes back down. If we do nothing, the value at period 3 shows no change

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Asset A** | **Asset B** | **A Holdings** | **B Holdings** | **Total Value** |
| Period 1 | 100 | 100 | 1 | 1 | 200 |
| Period 2 | 150 | 100 | 1 | 1 | 250 |
| Hold | 150 | 100 | 1 | 1 | 250 |
| Period 3 | 100 | 100 | 1 | 1 | 200 |

However, if we rebalance by moving away from the more volatile asset and towards the more stable, we see an increase in valuation.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Asset A** | **Asset B** | **A Holdings** | **B Holdings** | **Total Value** |
| Period 1 | 100 | 100 | 1 | 1 | 200 |
| Period 2 | 150 | 100 | 1 | 1 | 250 |
| Rebalance | 150 | 100 | 0.5 | 1.75 | 250 |
| Period 3 | 100 | 100 | 0.5 | 1.75 | 225 |

This type of rebalancing works in a generally stable and increasing market. However, if certain assets are declining due to collapse, then rebalancing down can lead to higher losses. However, the expected value by rebalancing is consistently higher. However, there is a benefit of rebalancing through simulation where we can account for the risk of collapse of a single asset.

Only two things should trigger a rebalancing, information and schedule. Certainly, specific information about the likely failure of a coin should indicate a rebalancing towards a more stable asset. However, outside of that, rebalancing should adhere to a strict schedule…

1. **XIC – The Token**
   1. **Overview**

XIC is the token associated with a participant having a stake in the fund. It utilizes 8 decimal precision due to the fund’s long term growth potential. Even as the fund grows, new investors should be welcomed rather than forced out due to large trading costs. Its value is derived from the underlying cryptocurrency assets and is expected to fluctuate with the market. This coin is supposed to be an indicator of the status of the cryptocurrency market based on the performance of the top 30 coins at a given time. As mentioned in the sections describing the funds, the member coins are subject to vary over time. Furthermore, ledgers of balances and associated addresses are kept for the purposes of dividend distribution.

* 1. **The Rules**

Most of the basic rules apply to XIC. You are only allowed to trade up to as many XIC as you hold. Events are included in the source code so that traders may confirm the completion of transactions. A mint is utilized to produce new coins. New coins will only be produced in two circumstances; during a crowdsale or presale and upon the distribution of dividends. Both of these will be discussed later.

* 1. **Security**

Many of the sensitive components of the source code are password and address protected. For clarification, an attacker would need a password and the address the contract originated from in order to access various functions in the smart contract such as the mint. The ability to change the password access to the contract also exists for routine security updates or if the team feels threatened at any time. In order to ensure that our token provides the most value to the participants, the XIC token address will not be distributed until the end of the crowdsale. The DCI team is taking every possible precaution in order to maintain the integrity of the coin, the fund, and the participants in our crowdsale.

*Brian*

1. **Initial Coin Offering or Presale**
   1. **Overview, Goals, and Rules**

DCI is executing a capped crowdsale. The total supply available to participants is 160,000,000 XIC with an additional 20,000,000 XIC available to the DCI team. Once this cap has been reached, no one will be able to send any ETH to the contract address. If an individual attempts to send ETH so that the cap is broken, that participant will be refunded the extra ETH and receive the remaining XIC allocated. Additionally, DCI requires a minimum contribution of 1 Ether in order to participate in the crowdsale.

In addition to this being a capped crowdsale, tokens will be offered in blocks. These blocks have their own associated exchange rates of ETH to XIC (PROVIDE MORE SPECIFIC INFORMATION ON EXCHANGE RATES). Blocks and exchanges rates will remain the same until the amount of XIC allocated to said block is depleted. Unlike the global cap of the sale, if a participant sends ETH and should receive more XIC than the current block has left, the participant will receive all of the XIC at the exchange rate associated with the block with which the exchange occurred in.

Events are used in the smart contract that allows participants to confirm the completion of their transaction and to let users know that the funding goal was reached which results in the closing of the sale. As previously mentioned, participants are not able to contribute to the sale once the goal has been reached or the contract has been disabled. There is no deadline based on time in this crowdsale.

* 1. **Security**

Similar to the XIC token contract, many of the functions in the crowdsale contract are password and address protected. This contract also includes the ability for the issuer to change the password associated with these functions. Additionally, DCI has the ability to remotely disable or self destruct the crowdsale contract.

While there is no deadline contingent on time of the sale and the contract automatically disables once the funding goal is reached, these precautions are necessary if the DCI team feels threatened in any way. The DCI team will do its best to communicate openly with the participants and potential participants regarding the status of the contract. If the contract is remotely self destructed, any ETH sent to the contract **will be lost forever**. Make sure you consult our website, subreddit, or social media accounts before deciding to participate to ascertain the status of the sale. These measures are in place to protect the honest participants of the crowdsale. If the crowdsale is prematurely terminated, refunds will be given to all of the participants of the sale and the address of the XIC token contract will not be distributed.

1. **Dividends**
   1. **Rules**

Dividends can only be distributed by and the amount can only be determined by the DCI team. In order to protect against high inflation rates, the distribution of dividends is not on an automated schedule. These are distributed through a separate contract that has access to the ledgers in the token contract. The DCI plans to distribute dividends on a yearly schedule but reserves the right to not issue dividends to holders in certain circumstances. (Like What? Down market, ..what else?)

* 1. **Distribution Logic**

Once the amount of XIC to be distributed is determined (how are we going to determine this?), the amount received for each held XIC, d, is given by the ratio of the total amount of XIC to be distributed, X, to the total supply of XIC before the distribution of dividends, T.

d = X/T

Each user is given an amount of XIC, n, according to the product of d and the balance of the holder, b.

n = d \* b

**Conclusion**

*Roger*