HKVAC Blue Chip Score Methodology

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Version History

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Contents

1. INTRODUCTION

This paper presents the Blue Chip Score methodology, a quantitative modelling approach designed to assess the default risks associated with cryptos. With the increasing popularity and adoption of digital currencies, reliable evaluation tools that can measure the likelihood of default and potential risks have become crucial. The Blue Chip Score methodology, developed by HKVAC, aims to provide a consistent and independent assessment of the default risk of cryptocurrencies. By utilizing quantitative modelling techniques, this methodology offers a fair evaluation framework that can assist investors, regulators and market participants in making informed decisions.

2. OVERALL FRAMEWORK

The Blue Chip Score framework is designed as a fair evaluation framework that can assist investors, regulators and market participants in making informed decisions in the crypto market. By analysing various factors, including but not limited to market performance, tokenomics, sustainability, etc., of a crypto, the Blue Chip Score assigns appropriate weights to each factor.

This framework comprises three components: the Success Factors Score, Market Score, and Risk Volatility Score, which collectively contribute to evaluating the risks associated with a crypto.

Success Factors Score

The Success Factors Score evaluates the fundamental attributes of a crypto base on empirical research. It encompasses the crypto's vision, goals, product prototype, team background, market acceptance, and other critical factors. Through a meticulous assessment process, the Success Factors Score provides valuable insights into the fundamental risk.

Market Score

The Market Score assesses the risks of a crypto based on market factors. These factors include, but are not limited to, market interest, liquidity, trading volume, and competitiveness within the market. The Market Score enables users to gain a comprehensive understanding of the crypto's market performance and risk.

Risk Volatility Score

The Risk Volatility Score reflects the market's volatility risk. It analyses historical data and trends in crypto prices, utilizing a stochastic model to measure price volatility and risk levels. By incorporating this dimension, the Blue Chip Score offers a quantitative assessment of a

crypto's risk profile, enabling users to gauge the potential risks associated with their investment.

Blue Chip Score Calculation

The Blue Chip Score is calculated by assigning appropriate weights to each score within the framework. These weights are determined based on the relative importance of each factor in evaluating a crypto's risks.

$$Blue\ Chip\ Score = Success\ Factors\ Score * (Weight_S) + Market\ Score * (Weight_M) + Risk\ Volatility\ Score \times (Weight_V)$$

Weights

Number of Months Since ICO	Success Factors Score (Weight S)	Market Score (Weight M)	Risk Volatility Score (Weight V)
<= 6	100%	0%	0%
> 6	10%	0% - 90%	0% - 90%

3. SUCCESS FACTORS SCORE

The Success Factors Score assesses the risk of a crypto from two dimensions: Characteristic Information and Market Acceptance Information.

Characteristic Information:

Category	Components
Project Team	Leadership Experience, Team Background, Overall Relevant Experience, etc
Tokenomics	Type of Token, Operation Sectors, Availability of Collateral, etc
Crypto Characteristics	Pricing Mechanism, Method & Channel, Funding & Target, etc
Issue Characteristics	Business Plan, Incentive Pool, Backed Funding, etc
Social / Marketing	Market Sentiment, Technology Community, Social Community, etc

Market Acceptance Information:

Category	Components
Exchange	Trading Pairs from Major Exchanges, Listed from Major Exchanges, Total Value Locked, etc
Investors	Trade Volume, Market Cap, Proportion of holdings from Top Holders, etc

4. MARKET SCORE

The Market Score model utilizes data from the crypto marketplace to develop a structured approach for evaluating risks and determining investment value. This model is comprised of three sub-models, each serving a specific function: the Ground Model evaluates fundamental market acceptance and liquidity; the Liquidity Risk Model acts as a tool for assessing potential shifts in market fluidity; and the Pricing Risk Model provides insights into the potential for significant price changes.

$$Market\ Score = Ground\ Score\ * \big(P(Liquidity\ Risk) + P(\text{Pricing Risk})\big) + Adjustment$$

$Where$

$P(Liquidity\ Risk) = Probability\ of\ having\ significant\ decrease\ in\ liquidity\ in\ coming\ future$

$P(Pricing\ Risk) = Probability\ of\ having\ significant\ decrease\ in\ price\ in\ coming\ future$

4.1. Ground Model

The Ground Model represents the market competitiveness of the crypto itself. Its primary function is to serve as a foundation for risk scoring, indicating the market's acceptance of the crypto.

$$Ground\ Score\ = \left[ln(Mean\_Volume\_D90 * \frac{1}{4}) + ln(Mean\_MC\_D90 * \frac{3}{4})\right] * Adjustment$$

$Where$

$Mean\_Volume\_D90 = Average\ trading\ volume\ of\ the\ crypto\ over\ past\ 90\ days\ relative\ to\ the\ average\ trading\ of\ BTC\ and\ ETH$

$Mean\_MC\_D90 = Average\ market\ capitalization\ of\ the\ crypto\ over\ past\ 90\ days\ relative\ to\ the\ average\ market\ capitalization\ of\ BTC\ and\ ETH$

4.2. Liquidity Risk Model

The Liquidity Risk Model is designed to identify any significant decline in a crypto's trading volume relative to its historical peak. If such a substantial downturn is detected, it raises concerns about potential liquidity risks that the crypto might face in the future.

Given the volatile nature of crypto market data, where deterioration often occurs within a short timeframe, historical information is considered to predict the likelihood of market changes for the following day. By integrating the Ground Model, it enhances the stability of the model and endows it with a more robust long-term predictive capability.

$$P(\text{Liquidity Risk}) = \beta_0 + \sum_{i=1}^{n} \beta_i * Factor_i$$

$Where$
$\beta_i = Coefficient\ of\ Liquidity\ Risk\ Factor\ i$
$Factor_i = Liquidity\ Risk\ Factor\ i$

4.3. Pricing Risk Model

The Pricing Risk Model indicates whether there has been a significant reduction in the crypto's price relative to its average price over the past 30 days. If a substantial decrease is detected, it is considered a potential indicator of risk for crypto in the future.

$$P(\text{Pricing Risk}) = \beta_0 + \sum_{i=1}^{n} \beta_i * Factor_i$$

$Where$
$\beta_i = Coefficient\ of\ Pricing\ Risk\ Factor\ i$
$Factor_i = Pricing\ Risk\ Factor\ i$

5. RISK VOLATILITY SCORE

For a crypto which typically hovers around a narrow price range, like Stablecoins, the performance of Market Score to determinate the sudden price drop may not as good as designed. The crypto experiences an entirely different risk profile when its price drops suddenly by 20%, compared to a 20% drop in the price of BTC. Therefore, it is necessary to consider adding a value at risk (VAR) assessment model that focuses on price anomaly. This model utilizes the GARCH (Generalized Autoregressive Conditional Heteroskedasticity) model to establish a reasonable confidence interval for future prices. If the price deviates significantly from this confidence interval, it indicates a certain level of risk.

By using the logarithmic return rates from the past 360 days, the future 7-day volatility is forecasted by rolling prediction. The average of these standard deviations is then taken as the standard deviation for the next day's return, denoted as std(Return).

$$Z\ Score\ = \frac{\log(Return)}{\mathrm{std}(Return)}$$

6. SCORE TO SCORE GROUP MAPPING

Blue Chip Grade	Blue Chip Score Range	Characteristics
Leader	90 - 100	Prime
Leader	80 – 89	Upper High
Leader	70 – 79	High
Leader	60 – 69	Lower High
Average	40 – 59	High Medium
Average	20 - 39	Low Medium
Laggard	0 – 19	Low

7. CONTACT INFORMATION

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