CF Factor Data Series

Methodology Guide

June 2025

Contents

1 Introduction 3

2 Data 3

3 Asset Universe 4

4 Methodology 4

4.1 Factor Portfolios 4

4.1.1 Market 5

4.1.2 Size 5

4.1.3 Value 5

4.1.4 Momentum 6

4.1.5 Growth 6

4.1.6 Downside Beta 6

4.1.7 Liquidity 7

4.2 Factor Exposures 7

1 Introduction

The emergence of cryptocurrencies such as Bitcoin and Ethereum has fundamentally reshaped the global financial ecosystem, presenting both novel opportunities and distinct challenges for investors. Unlike traditional asset classes, digital assets operate outside the boundaries of centralised financial systems, offering high return potential alongside diversification and hedging benefits against traditional markets volatility. Despite their rapid adoption and the growing sophistication of digital asset markets, a significant gap remains in the application of proven quantitative investment frameworks. The CF Factor Data Series addresses this gap by developing a systematic, factor-based approach to cryptocurrency investment, grounded in mathematical rigor and financial theory. Through the identification and construction of style factors specific to digital assets, we introduce an institutional-grade factor product designed to enhance portfolio construction, risk attribution, and investment decision-making in this emerging asset class.

2 Data

The CF Factor Data Series is underpinned by a comprehensive and rigorously curated dataset, sourced through CF Benchmarks' infrastructure. Market data is obtained via public exchange APIs, which provide granular transactional and order book information for a broad set of digital assets. In parallel, on-chain data is extracted using open-source smart contract parsers and direct access to blockchain nodes. This enables systematic collection of protocol-level metrics, such as total value locked (TVL), transaction fees, daily active users, token supply, code commits, and active developers—ensuring that both economic and network fundamentals are captured.

To support data accuracy and validation, on-chain metrics are cross-referenced against independent third-party data provider, Token Terminal. All data is aligned to a daily frequency with timestamp 16:00 Europe/London.

3 Asset Universe

The asset universe is constructed based on the constituents of the CF Broad Cap Index, which captures 99% of the total market capitalization of the investable digital asset space. Assets included in the index are subject to CF Benchmarks' established eligibility criteria, which incorporate minimum liquidity and trading turnover requirements to ensure market quality and investability.

This approach ensures that the factor model is applied to a liquid, representative subset of the broader digital asset market. For further information, please refer to the CF Broad Cap Index Methodology (`https://docs.cfbenchmarks.com/CF%20Digital%20Asset%20Index%20Family%20Multi%20Asset%20Series%20-%20Ground%20Rules.pdf`) and the CF Digital Asset Index Family – Multi Asset Series Ground Rules Methodology (`https://www.cfbenchmarks.com/documents/Crypto%20Index%20Family%20-%20Multi%20Asset%20Series%20Ground%20Rules.pdf`)

4 Methodology

4.1 Factor Portfolios

The construction of factor portfolios is grounded in a systematic long-short framework applied to the CF Broad Cap Index constituents, which serve as the investable universe for all factor strategies.

For each factor, assets are ranked daily based on standardized factor scores derived from one or more descriptors (e.g., price momentum, fee growth, market capitalization, or user activity). On a weekly basis, namely each Monday at 16:00 Europe/London, the portfolio is rebalanced by selecting the top and bottom 50% of assets according to their factor scores. A long position allocating 50% of the capital is established in the top half of the ranked distribution (e.g., assets with the highest growth score), while a short position allocating the remaining 50% of the capital is implemented in the bottom half (e.g., assets with the lowest growth score). All positions are equally weighted within their respective portfolio. Subsequently, the long-short portfolio is constructed from the spread between the two portfolios.

4.1.1 Market

The market factor captures the broad, systematic risk that permeates the digital asset ecosystem. It reflects aggregate influences such as macroeconomic conditions, investor sentiment, and overall market volatility. As such, this factor is defined by the daily returns of the CF Broad Cap (Free Float Market Cap Weight) Index, offering a comprehensive and capitalization-weighted representation of the asset class.

4.1.2 Size

The size factor captures the return differential associated with asset scale, reflecting the hypothesis that smaller-cap digital assets tend to outperform their larger-cap counterparts. This effect is understood to compensate for elevated operational and financial risks while exploiting potential market inefficiencies. In this framework, the size factor is defined by each asset's fully diluted market capitalization. The value is sign-inverted so that higher z-scores are assigned to smaller assets and vice-versa.

4.1.3 Value

The value factor reflects a protocol's ability to generate economic output relative to its capital base and market valuation, combining measures of both efficiency and user engagement. It is constructed as the average z-score of two key ratios: transaction fees relative to total value locked (Fees/TVL) and daily active users relative to market capitalization (DAU/MCap)[1]. This composite metric captures how productively a protocol utilizes its resources while also serving as a proxy for user-driven demand. A higher combined score indicates efficient resource utilization

[1] The value score for non-programmable assets, such as BTC or LTC, is computed solely using the DAU/MCap metric. Similarly, for any asset where only one of the two ratios is available, the value score is determined based exclusively on the available ratio.

and strong user engagement

4.1.4 Momentum

The momentum factor captures short-term price persistence by identifying assets that have recently exhibited strong performance. It is computed as the average z-score of two metrics: the 2 weeks cumulative performance and the 2 weeks risk-adjusted cumulative performance. This approach aligns with established findings in traditional financial literature and demonstrates empirical relevance in digital assets, where price trends tend to exhibit momentum over short horizons.

4.1.5 Growth

The growth factor captures the expansion of a protocol's network activity and user adoption. In the context of digital assets, it reflects metrics such as fee generation and user engagement, which serve as indicators of increased platform utilization and operational scale. The factor is defined as the average z-score of 30-day fee growth and 30-day weekly active user growth [2], thereby identifying assets exhibiting consistent and measurable increases in underlying network usage.

4.1.6 Downside Beta

The downside beta factor captures an asset's sensitivity to adverse market conditions by isolating its behavior during periods of negative market returns. Empirical evidence shows that assets with lower downside beta tend to outperform their higher-beta counterparts over the long-term, due to their reduced participation in market drawdowns and more stable return profiles during periods of elevated volatility. As such, it is estimated through a regression of the asset's daily returns over the most recent four-week period against market returns observed exclusively during negative sessions. The resulting value is sign-inverted to ensure that assets with lower downside

[2]Where data availability is limited and only one of the two input metrics is observed, the factor score is computed using the available component alone to ensure continuity in the asset's representation.

exposure are assigned higher z-scores.

4.1.7 Liquidity

The liquidity factor captures the ease with which a digital asset can be traded without significantly impacting its price. Empirical evidence shows that illiquid assets tend to command a higher risk premium than their more liquid counterparts, serving as compensation for trading friction and price volatility. To quantify this, the factor is measured using token turnover, defined as trading volume as a percentage of circulating supply. The value is sign-inverted such that higher z-scores are assigned to less liquid assets.

4.2 Factor Exposures

Once the factor portfolios have been constructed using their respective factor scores, each asset's exposure to systematic risk is estimated through a time-series regression. Specifically, the daily returns of the seven factor portfolios—Market, Size, Value, Momentum, Growth, Downside Beta, and Liquidity—are regressed against the daily returns of the underlying asset.

This regression yields a set of factor loadings (betas), which quantify the sensitivity of an asset's returns to each factor. These exposures provide insight into how much of an asset's return can be attributed to systematic drivers, as well as the direction and magnitude of its relationship to each individual factor. In doing so, the model enables the assessment of how strongly an asset—or portfolio—is exposed to each underlying risk factor.

The regression uses the latest three years of daily returns, where available, to ensure a robust and stable estimation window. For assets with a shorter trading history, a minimum of one year of daily data is required to compute exposures, accommodating newer assets without compromising statistical relevance.

The regression model is specified as follows:

$$R_{i,t} = \alpha_i + \beta_i^{\text{mkt}} F_t^{\text{mkt}} + \beta_i^{\text{size}} F_t^{\text{size}} + \beta_i^{\text{val}} F_t^{\text{val}} + \beta_i^{\text{mom}} F_t^{\text{mom}} + \beta_i^{\text{grw}} F_t^{\text{grw}} + \beta_i^{\text{dbeta}} F_t^{\text{dbeta}} + \beta_i^{\text{liq}} F_t^{\text{liq}} + \epsilon_{i,t} \tag{1}$$

Where:

- $R_{i,t}$ is the return of asset i at time t
- F_t^j is the return of factor j at time t
- β_i^j is the loading (exposure) of asset i to factor j
- α_i is the intercept of asset i
- $\epsilon_{i,t}$ represents the residual return (idiosyncratic component) for asset i at time t

By decomposing returns into systematic (and idiosyncratic) components, this model allows for a clearer understanding of the role each factor plays in shaping asset and portfolio performance.

Disclaimer & Disclosures

- This information is provided by CF Benchmarks Ltd.
- CF Benchmarks Ltd ('CF Benchmarks") is a limited company registered in England and Wales under registered number 11654816 with its registered office at 6th Floor One London Wall, London, United Kingdom, EC2Y 5EB.
- CF Benchmarks is authorised and regulated by the Financial Conduct Authority (FCA) as a Registered Benchmark Administrator (FRN 847100) under the UK Benchmarks Regulation.
- CF Benchmarks is authorised to undertake the following regulated activity 'Administering a Benchmark." Administering a Benchmark" is a regulated activity under article 63S of the Financial Services and Markets Act 2000 (Regulated Activities Order) 2001 (SI 2001/544) (RAO), which, in summary, means acting as the administrator of a benchmark as defined in article 3.1(3) of the benchmark regulation.
- CF Benchmarks is **NOT** a registered investment advisor and does **NOT** provide investment, tax, legal, or accounting advice in any geographical locations. You should consult your own financial, tax, legal, and accounting advisors or professionals before engaging in any transaction or making an investment decision.
- All information contained within, including recordings, is for educational and informational purposes **ONLY**. None of the Information constitutes an offer to sell (or a solicitation of an offer to buy) any cryptoassets, security, financial product, or other investment vehicle or any trading strategy. No member of CF Benchmarks nor their respective directors, officers, employees, partners, or licensors provide investment advice, and nothing contained herein or accessible through CF Benchmarks products, including statistical data and industry reports, should be taken as constituting financial or investment advice or a financial promotion.
- Information containing any historical information, data, or analysis should not be taken as an indication or guarantee of any future performance, analysis, forecast, or prediction. Past performance does not guarantee future results. The Information should not be relied on

and is not a substitute for the skill, judgment, and experience of the user, its management, employees, advisors, and/or clients when making investment and other business decisions. All Information is impersonal and not tailored to the needs of any person, entity, or group of persons.

- Charts and graphs are provided for illustrative purposes only. Index returns shown may not represent the results of the actual trading of investable assets/securities.
- The Information may contain back-tested data. Back-tested performance is not actual performance but is hypothetical. There are frequently material differences between back-tested performance results and actual results subsequently achieved by any investment strategy. The back-test calculations are based on the same methodology that was in effect when the index was officially launched. However, back-tested data may reflect the application of the index methodology with the benefit of hindsight, and the historic calculations of an index may change based on revisions to the underlying economic data used in the calculation of the index.
- All information and data contained in this publication is obtained by CF Benchmarks from sources believed by it to be accurate and reliable. Because of the possibility of human and mechanical error as well as other factors, however, such information and data is provided 'as is" without warranty of any kind.
- No member of CF Benchmarks nor their respective directors, officers, employees, partners, or licensors make any claim, prediction, warranty, or representation whatsoever, expressly or impliedly, either as to the accuracy, timeliness, completeness, merchantability of any information or of results to be obtained from the use of any CF Benchmarks products.
- No responsibility or liability can be accepted by any member of CF Benchmarks nor their respective directors, officers, employees, partners, or licensors for
    1. any loss or damage in whole or in part caused by, resulting from, or relating to any error (negligent or otherwise) or other circumstance involved in procuring, collecting, compiling, interpreting, analyzing, editing, transcribing, transmitting, communicating, or delivering any such information or data or from use of this document or links to this document; or

2. any direct, indirect, special, consequential, or incidental damages whatsoever, even if any member of CF Benchmarks is advised in advance of the possibility of such damages, resulting from the use of, or inability to use, such information.

- The user of the Information assumes the entire risk of any use it may make or permit to be made of the Information. **CF BENCHMARKS DOES NOT MAKE ANY EXPRESS OR IMPLIED WARRANTIES OR REPRESENTATIONS WITH RESPECT TO THE INFORMATION (OR THE RESULTS TO BE OBTAINED BY THE USE THEREOF), AND TO THE MAXIMUM EXTENT PERMITTED BY APPLICABLE LAW, IT EXPRESSLY DISCLAIMS ALL IMPLIED WARRANTIES (INCLUDING, WITHOUT LIMITATION, ANY IMPLIED WARRANTIES OF ORIGINALITY, ACCURACY, TIMELINESS, NON-INFRINGEMENT, COMPLETENESS, MERCHANTABILITY, AND FITNESS FOR A PARTICULAR PURPOSE) WITH RESPECT TO ANY OF THE INFORMATION.**

- No part of this information may be reproduced, stored in a retrieval system, or transmitted in any form or by any means—electronic, mechanical, photocopying, recording, or otherwise—without prior written permission of CF Benchmarks Ltd. Any use of or access to products, services, or information of CF Benchmarks Ltd requires a licence from CF Benchmarks Ltd or its authorized licensing agents.

- CF Benchmarks is a member of the Crypto Research group of companies, which is in turn a member of the Payward group of companies. Payward, Inc. is the owner and operator of Staked, a provider of block production and validation nodes for decentralized PoS protocols on behalf of institutional investors. `Staked.us` is a source of input data for the CF Staking Series.

