Compass SESAMm Crypto Sentiment Adaptive Indices

Methodology

April 25th, 2024

Version History

Readers can access other versions of the methodology online when they become available on Compass Financial Technologies website (`www.compass-ft.com`).

Date	Version	Change	Author(s)
April 25$^{\text{th}}$, 2024	1.0	Methodology Publication	Edouard Mouton and Mario Masoud (Compass Financial Technologies)

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1 Introduction

1.1 Overview

The Compass SESAMm Crypto Sentiment Adaptive Indices (the *CSA*, the *Indices* or the *Index*) is a family of strategy indices which leverage on crypto sentiment scores generated by the generative AI and NLP expert SESAMm to provide a dynamic exposure to the digital asset space (bitcoin or any other crypto indices). The strategies aim to allocate to the crypto assets when the global crypto sentiment is positive and to switch the exposure to a safe asset when the global crypto sentiment becomes negative.

The Indices can be accessed online on the Compass Financial Technologies website (`www.compass-ft.com`) or on Bloomberg or Refinitiv.
The Indices are owned by Compass Financial Technologies S.A. The Index Administrator and Calculation Agent is Compass Financial Technologies.
As of April 25$^{\text{th}}$, 2024, the following *CSA* indices are available:

CSA Indices	
Index Name	Compass API Code
Compass SESAMm Crypto Sentiment Adaptive Bitcoin & Gold Index	CSABTCGC
Compass SESAMm Crypto Sentiment Adaptive Bitcoin & T-Bills Index	CSABTCTB

Table 1: Compass SESAMm Crypto Sentiment Adaptive Indices - Publication Codes

1.2 Motivation

Investing in digital assets presents a unique opportunity for those looking to diversify their portfolio and tap into the innovative potential of blockchain technology and cryptocurrencies. These assets have shown the ability to deliver substantial returns, outpacing traditional investment vehicles in certain periods, driven by rapid technological advancements and increasing mainstream adoption. However, this opportunity comes with its set of challenges, primarily due to the high volatility inherent in the digital asset market. Prices can swing dramatically within short periods, influenced by regulatory news, technological developments, and shifts in investor sentiment. Moreover, the market is susceptible to significant corrections, where the value of digital assets can plummet quickly, erasing gains and testing the risk tolerance of investors.

Sentiment analysis based on generative AI and NLP (Natural Language Processing) offers a sophisticated tool to navigate the volatile landscape of digital asset investments. By analyzing vast amounts of data from news articles, social media posts, and other textual content in real-time, NLP can gauge the public sentiment towards specific cryptocurrencies or the digital asset market as a whole. This sentiment analysis can provide investors with early indicators of market trends, shifts in investor confidence, or potential price movements, allowing for more informed decision-making. By leveraging these insights, investors can better anticipate market dynamics and adjust their exposure accordingly, potentially mitigating risks associated with the high volatility and market corrections characteristic of digital assets.

Based on Crypto Sentiment Scores provided by AI generative and NLP expert SESAMm, CSA strategies adjust allocation dynamically between digital asset (the risk asset) and the safe asset to provide an optimal allocation to the promising crypto asset class.

1.3 Combining digital assets with traditional Safe-havens

Digital asset are renowned for their volatility and promising potential high returns during optimistic market phases. In contrast, Gold, a steadfast risk-off anchor, offers stability during uncertainties, serving as a safe-haven and inflation hedge. Choosing T-Bills over gold as a safe asset offers capital preservation, predictable returns, and attractive yield as of today's high interest rates environment.

The combination of digital assets and safe assets like gold or US T-Bills provide diversification, flexibility, and an alternative to traditional assets, enhancing risk-adjusted performance. The CSA strategy's innate

adaptability aligns portfolios with ever-changing market conditions, ensuring a balanced and resilient investment approach.

Diversification: Combining digital asset and Gold/T-Bills in a CSA strategy offers a diversified approach to risk management. T-Bills and Gold's stability during risk-off phases can counterbalance the potential volatility of digital asset during risk-on periods, creating a more balanced portfolio.

Flexibility: The strategy allows for adaptability based on changing market conditions. When risk sentiment shifts, the allocation between digital asset and Gold/T-Bills is adjusted to optimize returns and manage risks effectively.

Alternative to Traditional Assets: Including digital asset alongside Gold/T-Bills provides exposure to alternative assets outside traditional financial markets. This can be appealing to investors looking for non-traditional options to enhance their portfolio's risk-adjusted returns.

The safe asset choice depends on the investor's risk tolerance. Gold may be suitable for those seeking a balanced approach, accepting higher risk than T-Bills in a hope of higher returns, while T-Bills may be more suitable for conservative investors prioritizing capital preservation.

2 Underlying Components

2.1 Risky Assets

Strategy risky assets are digital asset indices.

Risky Assets - Underlying Components			
Index	Bloomberg Code	Refinitiv Code	Type
Compass Crypto Reference Index Bitcoin	CCRIBTC Index	.CCRIBTC	Index

Table 2: Risky Assets - Underlying Components

In respect of Calculation Date t and Underlying Component i, Underlying Component prices are closing levels on t, as displayed on the Bloomberg or Refinitiv pages provided in table 2) or the last available closing price if no closing price is available on t.

The Compass Crypto Reference Indices ($CCRI$) have been designed to provide institutional investors with independent and robust cryptocurrency reference prices. Based on a resilient and BMR-ready compliant methodology, they serve as independent and transparent reference prices to value cryptocurrency portfolios or as benchmarks for investors willing to issue investment products tracking cryptocurrencies prices.

More details on the CCRI indices including their methodology are available on the Compass website (`www.compass-ft.com`)

2.2 Safe Assets

Safe assets used in the Indices as of April 2024 are listed below:

Safe Assets - Underlying Components			
Index	Bloomberg Code	Refinitiv Code	Type
13-Week US Treasury Bill High Rate	USB3MTA Index	US3MINV=RR	Rate
Invesco Physical Gold ETC	SGLD LN Equity	SGLD.LN	Equity

Table 3: Safe Assets - Underlying Components

In respect of Calculation Date t and Underlying Component i, Underlying Component prices are closing levels on t, as displayed on the Bloomberg or Refinitiv pages provided in table 3) or the last available closing price if no closing price is available on t.

3 Sentiments Scores

The Sentiment Scores data used to define the signals are provided by SESAMm.
(https://www.sesamm.com).

SESAMm: SESAMm is a leading artificial intelligence and NLP (Natural Language Processing) technology company serving global investment firms, corporations, and investors, such as private equity firms, hedge funds, and index providers. SESAMm analyzes more than 20 billion documents in real time to generate insights and indicators for controversy detection on investments, clients and suppliers, ESG, and positive impact scores, among others. With a global footprint, SESAMm supports a team of over a hundred professionals, spread across six strategically situated offices in international hubs like Paris, New York, and Tokyo.

Harnessing sentiment scores through NLP for analyzing articles and blogs offers invaluable insights for investing in Bitcoin. By gauging public sentiment, investors gain a deeper understanding of market dynamics, enabling more informed decision-making and risk management in the volatile cryptocurrency landscape. SESAMm's Crypto Sentiment Scores are based on the Crypto Sentiment Scores (negative, positive, neutral) computed using a proprietary, fine-tuned robust NLP algorithm on articles related to the defined crypto entities. SESAMm's Crypto Global Sentiment Score is based on the Crypto Sentiment Scores of single cryptoassets (negative, positive, neutral) computed using a proprietary, fine-tuned robust NLP algorithm on articles related to the defined crypto entities. Then, a Polarity indicator is used to build the final score, which is defined as:

$$Polarity(t) = \frac{PositiveSentiment(t) - NegativeSentiment(t)}{PositiveSentiment(t) + NegativeSentiment(t)} \tag{1}$$

with :

- **Positive/Negative Sentiment(t)**: is the average positive/negative sentiment calculated for day t for a given company. This daily sentiment is calculated by aggregating article-level sentiment. The score is the exponential moving average of the polarity. The exponential moving average gives more weight to recent articles than to old ones. We created different variants of the score by varying several parameters:

- **Memory**: The crypto universe is much more volatile, as things move faster compared to classical finance. We use a half-life of 7 days to weigh the importance of related articles to each token. A half-life of 7 days means that an article that is 7 days old counts for 50% compared to an article published today.

- **Volume**: Weighting the sentiment by volume to highlight days with significant events.

$$CryptoSentimentScore(t) = \frac{\sum_k^t (1-\alpha)^{t-k} \times volume(k) \times polarity(k)}{\sum_k^t (1-\alpha)^{t-k} \times volume(k)} \tag{2}$$

with :

- *volume* : number of articles related to the entity on day k

- *polarity* : average polarity of articles related to the entity on day k

- α : memory parameter

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4 Index Design

4.1 Introduction

The strategy leverages on Crypto Sentiment Scores provided by the AI and NLP expert SESAMm to allocate more in the risky asset when the global crypto sentiment is positive and to switch the exposure to a safe asset when the global crypto sentiment becomes negative.

To maximize the robustness of the strategy, the sentiment based signal (the Sentiment Signal) is coupled with a trend following signal on the price of Bitcoin (the Price Signal). In the case of uncertainty when the two signals aren't synchronized, the strategy uses a risk approach coupled with the strength of the active signal to define the risky asset exposure.

The final signal, $RiskyExposure_t$, is obtained by smoothing the latest $RiskyExposure_t^{local}$, making it less volatile and more robust to signal outliers.

4.2 Signals Input data

The Sentiment Signal uses the Global Crypto Sentiment Indicator which is an aggregation of the main Crypto Sentiments Scores provided by SESAMm.

The Price Signal is based on Risky Asset prices.

4.3 Primary Signals construction

The Sentiment Signal and the Price Signal are based on triple moving average crossings providing a strong confirmation signal of the market direction. The output of both signals is either 0 or 1.

The signal is 1 if and only if the signal underlying value (the Global Crypto Sentiment Indicator or the price of the Risky Asset) is higher than the short moving average, that itself is higher than the longer moving average.

At t, we compute:

$$Average_{t,n}^{SI} = \frac{1}{n} \times \sum_{k=0}^{n-1} SI_{t-k}$$

$$PrimarySignal_t^{SI} = \mathbb{1}_{SI_t > Average_{t,n\_short}^{SI} > Average_{t,n\_long}^{SI}}$$

with SI being the Signal Input data, n_long the number of observations considered to compute the long moving average and n_short the number of observations considered to compute the long moving average

4.4 Risky Asset and Safe Asset Exposures

Once signals have been computed, the risky asset exposure is defined by aggregating both signals and coupling it, if necessary, to a risk and strength allocation process.

We identify three regimes when determining the risky asset exposure:

Both primary signals are equal 1

This means that the strategy favors an allocation towards the risky asset. In this case, the exposure to the risky asset is set to $Expo_{Max}$,

$$RiskyExposure_t^{local} = Expo_{Max}$$

Both primary signals are equal to 0

This means that the strategy favors an allocation towards the safe asset. In this case, the exposure to the risky asset is set to $Expo_{Min}$,

$$RiskyExposure_t^{local} = Expo_{Min}$$

Only one of the two signals (the "active signal") is equal to 1 , the other equals 0

This means there is no strong consensus on the expected price evolution. In this situation, the minimum exposure allocated to the risky asset is 50% of the available allocation budget ($Expo_{Max}$ - $Expo_{Min}$) and the exposure can increase up to to $Expo_{Max}$. The excess exposure above the minimum exposure will depend on the risky asset volatility ($RiskAppetite$) and on the strength of the active signal ($SignalStrength$).
In this case, the exposure to the risky asset is computed as:

$$RiskyExposure_t^{local} = Expo_{Min}$$

$$+ \left[\frac{1}{2} \times SignalStrength_t^{SI} + \frac{1}{2} \times RiskAppetite_t \right] \times (Expo_{Max} - Expo_{Min})$$

With,

- *SignalStrength*: It measures the strength of the active signal by monitoring the acceleration of the signal. The greater the acceleration, the higher the value of the Signal Strength. This indicator is capped at 1.

$$SignalStrength_t^{SI} = \left(\frac{SI_t - Average_{t,n\_short}^{SI}}{Average_{t,n\_short}^{SI} - Average_{t,n\_long}^{SI}}, 1 \right)$$

- *RiskAppetite*: This indicator aims to reduce the potential risky asset exposure when the market is highly volatile and at the opposite to increase the risk asset allocation when the market volatility is low. It is computed based on the inverse of the historical volatility and by applying a Min-Max normalization to obtain a ratio between 0 and 1.

$$RiskAppetite_t = \frac{Inv\_Vol_t - Min\_Inv\_Vol_t}{Max\_Inv\_Vol_t - Min\_Inv\_Vol_t}$$

$$Inv\_Vol_t = \cfrac{1}{\sqrt{\cfrac{HV_{Convention}}{HV_{Window}} \times \sum_{k=1}^{HV_{Window}} \left(ln \left(\frac{S_{t-k}^{Risky}}{S_{t-k-1}^{Risky}} \right) \right)^2}}$$

$$Max\_Inv\_Vol_t = Max(Inv\_Vol_t, AveragedUpperVol_t)$$

$$Min\_Inv\_Vol_t = Min(Inv\_Vol_t, AveragedLowerVol_t)$$

$$AveragedLowerVol_t = \frac{\sum_{k=0}^{HV\_Min\_Max\_Window-1} \left(Inv\_Vol_{t-k} \times \mathbb{1}_{Inv\_Vol_{t-k} \leq Inv\_Vol_t} \right)}{\sum_{k=0}^{HV\_Min\_Max\_Window-1} \mathbb{1}_{Inv\_Vol_{t-k} \leq Inv\_Vol_t}}$$

$$AveragedUpperVol_t = \frac{\sum_{k=0}^{HV\_Min\_Max\_Window-1} \left(Inv\_Vol_{t-k} \times \mathbb{1}_{Inv\_Vol_{t-k} \geq Inv\_Vol_t} \right)}{\sum_{k=0}^{HV\_Min\_Max\_Window-1} \mathbb{1}_{Inv\_Vol_{t-k} \geq Inv\_Vol_t}}$$

With,

- $HV_{Convention}$ means 365

- HV_{Window} means the historical window used to compute the volatility

- $HV\_Min\_Max\_Window$ means the historical window used to compute the average upper-lower volatility bounds, for normalization purpose

By construction, the exposure in the risky asset could reach $Expo_{Max}$. This happens only when both indicators reach 1, meaning the recent volatility is low (compared to previous times) and the strength of the active signal is very high.

Finally, to determine the risky exposure $RiskyExposure_t$, the local risky exposures ($RiskyExposure_t^{local}$) computed on a daily bases are smoothed by curve fitting, for each t, a straight line ($P_t(x) = a_t.x + b_t$). At t, we search for a_t and b_t that minimize:

$$SmoothError_t = \sum_{k=0}^{smooth\_window-1} (RiskyExposure_{t-k}^{local} - P_t(t-k))^2$$

We define $smooth\_window$ equal to 14.
The final risky exposure is the value of the fitted-polynom at t:

$$RiskyExposure_t = P_t(t)$$

The exposure to the safe asset is defined as:

$$SafeExposure_t = Max(0; 1 - RiskyExposure_t)$$

5 Index Calculation

5.1 Definition

- Div_t^i is with respect to the Underlying Component i, the aggregate net cash dividend, if any, as displayed on Refinitiv, after the deduction of the Withholding Tax Rate if any, and attached to the Underlying Component for which Calculation Date t is the Ex-Date. If an Ex-Date occurs on a date that is not a Calculation Date, such Ex-Date is deemed to occur on the first Calculation Date immediately following such date.

- FX_t^i is with respect to the Underlying Component i, and a Calculation Date t, the foreign spot exchange rate to convert in the currency of the index (as per table 4) one unit of the Underlying Component currency obtained using the WM Reuters Rate displayed on the Bloomberg page "WMCO" on such Calculation Date, or any successor service or page for the purpose of displaying such foreign spot exchange rate, as deterMined by the Calculation Agent or the latest WM Reuters Rate if no such rate is published as of such date

- $IL(t)$ is the official Index Level on t

- $IRR(t)$ is the Interest Rate Return on t as defined in Appendix 11

- Q_t^{Risky} is the quantity of risky asset as of the close of t as defined in section 5.4

- Q_t^{Safe} is the quantity of safe asset as of the close of t as defined in section 5.5

- $Rebalancing\ Date$ means any first Calculation Date of any month

- $RiskyExposure$ is the Index exposure to the risky asset as defined in section 4.4

- $Spread_1$ is a funding spread applied when the Index takes a leveraged exposure to the Underlying Component

- S_t^i is in respect to the Underlying Component i, the spot price of the Underlying Component i on day t expressed in local currency as displayed under the field Close on Refinitiv

- t means any Calculation Date

- t_0 means the Index launch date

- UCL_t means the Underlying Component Level as computed in section 5.2

5.2 Underlying Component Level

On each Calculation Date t in respect to each Underlying Component i,

If the Type of the Underlying Component i **is** *Rate*, the Underlying Component Level (UCL_t^i) is computed using the formula below:

If $t = t_0$,

$$UCL_{t_0}^i = 1000$$

Else,

$$UCL_t^i = UCL_{t-1}^i \times (1 + IRR_t)^{nbDays}$$

Where,
    $nbDays$ is the number of calendar days between t and $t-1$

Else, the Underlying Component Level (UCL_t^i) is computed using the formula below:

If $t = t_0$,

$$UCL_{t_0}^i = 1000$$

Else,

$$UCL_t^i = UCL_{t-1}^i \times \left(\frac{S_t^i + Div_t^i}{S_{t-1}^i} \times \frac{FX_t^i}{FX_{t-1}^i} \right)$$

5.3 Index Level

On each Calculation Date t, the Index level IL_t is computed using the formula below:
If $t = t_0$,

$$IL_{t_0} = 1000$$

Else,

$$IL_t = IL_{t-1} + Q_{t-1}^{Risky} \times \left(UCL_t^{Risky} - UCL_{t-1}^{Risky} \right) + Q_t^{Safe} \times \left(UCL_t^{Safe} - UCL_{t-1}^{Safe} \right)$$
$$- Max \left(0; Q_{t-1}^{Risky} \times UCL_{t-1}^{Risky} + Q_{t-1}^{Safe} \times UCL_{t-1}^{Safe} - IL_{t-1} \right) \times Spread_1 \times \frac{ACT(t-1,t)}{360}$$

5.4 Q_t^{Risky} computation

If t is a Rebalancing Date,

$$Q_t^{Risky} = RiskyExposure_t \times \frac{IL_t}{UCL_t^{Risky}}$$

Otherwise,

$$Q_t^{Risky} = Q_{t-1}^{Risky}$$

5.5 Q_t^{Safe} computation

If t is a Rebalancing Date,

$$Q_t^{Safe} = Max(0; 1 - RiskyExposure_t) \times \frac{IL_t}{UCL_t^{Safe}}$$

Otherwise,

$$Q_t^{Safe} = Q_{t-1}^{Safe}$$

5.6   Calculation

A Calculation Date t means any calendar day other than a Saturday, a Sunday, which is not a bank holiday in UK.

5.7   Rounding of Data

Index values are computed with all decimals available and are published with a precision of 2 decimals. Exposure values are rounded to 6 decimals.

5.8   Calculation Frequency and publication

The Indices are computed and published on every Calculation Date at 10:00pm London Time.
Index levels are published on the Compass Financial Technologies website (`www.compass-ft.com`) and are distributed to Bloomberg and Refinitiv.

6 Index Governance

6.1 Index Administrator

Compass Financial Technologies (France) is the Administrator of the Index ("the Index Administrator"). The Index Administrator is responsible for the day-to-day management of the Index and is also responsible for decisions regarding the interpretation of these rules.

6.2 Index Calculation Agent

Compass Financial Technologies is the Calculation Agent of the Compass Crypto Family Indices. It is responsible for the day-to-day management of the Index computation according to this methodology.

6.3 Index Committees – Supervisor

Compass Financial Technologies has established governance functions to review and provide challenges on all aspects of the Index determination process. Governance functions are managed by the Compass Oversight Committee and by the Compass SESAMm Crypto Sentiment Steering Committee.

Compass Oversight Committee:

The Compass Oversight Committee oversees all areas of the benchmark determination processes. It is responsible for supervising and controlling the Index operations team on all Compass indices. It is also responsible for:

1. Periodic review of incidents
2. Making final decisions in case the Index operations team are not capable or allowed to take decisions
3. Defining and implementing organisation procedures for the Index operations team
4. Defining and overseeing measures that allow for mitigation of operational risks
5. Supervising internal or external audit results
6. The implementation and supervision of the potential codes of conduct that have to be implemented

The Committee is comprised of senior representatives of Compass Financial Technologies and external industry experts.

Compass SESAMm Crypto Sentiment Steering Committee (the Steering Committee):

The Steering Committee is responsible for:

1. Determining the calculation methodology and the rules governing the publication of the Index
2. Making periodic reviews of the Index to validate the robustness of the methodology and to analyse the impact of methodology changes
3. Organising consultation with Index stakeholders if necessary
4. Ensuring that Index offers a reliable and representative view of the market

The Steering Committee is composed of members from Compass and from other entities. The Steering Committee may include individuals or representatives of companies, academics, external counsels, or market participants.

The Steering Committee assembles once a year in April. However, at the request of a member of the committee, the Steering Committee may meet on any other day of the year to discuss potential "market emergency" and "force majeure" events or any other situation, which makes an extraordinary meeting necessary.

All Committee decisions will be published without delay following the Committee decision.

The Steering Committee members as of April 2024 are:

- Edouard Mouton, Compass Financial Technologies
- Guillaume Le Fur, Compass Financial Technologies
- Thomas Montagnon, SESAMm
- Paul Marty, SESAMm

As of April 25st, 2024, Edouard Mouton chairs the Steering Committee.

7   Methodology applicable

The Index is computed and maintained in accordance with this Methodology and the *Index Adjustment and Disruption Policy* (`www.compassft.com/Index_Adjustment_and_Disruption_Policy.pdf`). In the event of any inconsistency between the *Index Adjustment and Disruption Policy* and the Index Methodology, the Index Methodology shall prevail.

8   Methodology Changes - Maintenance

This methodology may be supplemented, amended in whole or in part, revised or withdrawn at any time. Supplements, amendments, revisions and withdrawals may also lead to changes in the way the Index is compiled or calculated or affect the Index in another way.
In the absence of exceptional circumstances affecting the Index calculation or methodology, this Methodology is reviewed annually. The review will includes, inter alia, the following points:

1. Verify if the methodology and computation are still in line with the original purpose of the Index

2. Make sure the quality and quantity of the input data remain sufficient

Changes made to this methodology are published after the review date and implemented on a reasonable time horizon.

Compass Financial Technologies may terminate any of the Indices due to certain extraordinary market circumstances.

Changes or termination will be subject to the review and approval of the Steering Committee which will receive all the information related to the change or termination. In case of material changes, a notice will be provided at least two weeks in advance.
The results of the Steering Committee meetings will be published in a press release on Compass Financial Technologies website and distributed timely to data vendors and major news sources.

9   Expert Judgment

The Index is based on written and transparent rules and procedures with the purpose of minimising as much as possible the exercise of discretion and expert judgment.

The Index is built from input data that is not interpolated, extrapolated or adjusted. In case of lack of data, the last available data is employed.

Nevertheless, the exercise of expert judgment may become necessary in case of errors and Index restatements, delayed and missing data, hard forks, airdrops, or unexpected situations arising from market stress.

In the event that expert judgment is exercised, this will be done by resorting to the written procedures reported in the methodology and by communicating the decisions taken to the Steering Committee and the Internal Compliance Function in order to prevent conflicts of interest and to protect the integrity and the independence of the Index determinations. In addition, the interest of the Index users and the market integrity will be taken into account.

10   Cases not covered in rules

In cases which are not expressly covered in these rules, operational adjustments will take place along the lines of the aim of every Index. Operational adjustments may also take place if, in the opinion of the Index Administrator, it is desirable to do so to maintain a fair and orderly market in derivatives on the Index and/or

this is in the best interests of the investors in products based on the Index and/or the proper functioning of the markets. The Index Administrator will report to the Supervisor if it took a decision about a case which is not specifically covered in the rules for comments and review.

11 Liability

The Index Administrator and the Supervisor are not liable for any losses resulting from supplementing, amending, revising or withdrawing the rules for every Index. The Administrator will do everything within its power to ensure the accuracy of the composition, calculation, publication and adjustment of the Index in accordance with relevant rules. However, neither the Index Administrator, nor the Supervisor are liable for any inaccuracy in the Index composition, calculation and the publication of the Index levels, the information used for making adjustments to the Index and the actual adjustments. Furthermore, the Index Administrator and the Supervisor do not guarantee the continuity of the composition of any of the Index, the continuity of the method of calculation of the Index, the continuity of the dissemination of the Index levels, and the continuity of the calculation of the Index.

Appendix A: CSA parameters

CSA Indices - Parameters				
Compass API Code	**Currency**	**Risky Asset**	**Safe Asset**	t_0
CSABTCGC	USD	CCRIBTC	T-Bills	04/01/2017
CSABTCTB	USD	CCRIBTC	Gold	04/01/2017

Table 4: CSA - Indices

CSA Indices - Parameters		
Compass API Code	$Expo_{Min}$	$Expo_{Max}$
CSABTCGC	0%	100%
CSABTCTB	0%	100%

Table 5: CSA - Indices

CSA Indices - Parameters		
Compass API Code	**Bloomberg Code**	**Refinitiv Code**
CSABTCGC	CSABTCGC Index	.CSABTCGC
CSABTCTB	CSABTCTB Index	.CSABTCTB

Table 6: CSA - Indices

Appendix B: IRR Computation

If the Underlying Component is the 13-Week US Treasury Bill High Rate,

$$IRR_t = \left(\frac{1}{1 - 91/360 \times DRR_{t-1}} \right)^{1/91} - 1$$

Where,

DRR_{t-1} is defined as the "High Rate" of the most recent 13-Week US Treasury Bill as published by the US Department of the Treasury on its official website (`https://www.treasurydirect.gov/auctions/announcements-data-results/`. The most recent T-Bill referenced must have an auction date that is at least one day prior to the calculation date t.

12 Disclaimer

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