

CRYPTOCURRENCY AS AN ALTERNATIVE INVESTMENT

Our mission: "Provide rational and professional solutions to long term investors in the context of efficient markets"

EFPA Luxembourg Webinar 19th September 2022

Yves Choueifaty
President and founder, TOBAM

1. • CrypTOBAM

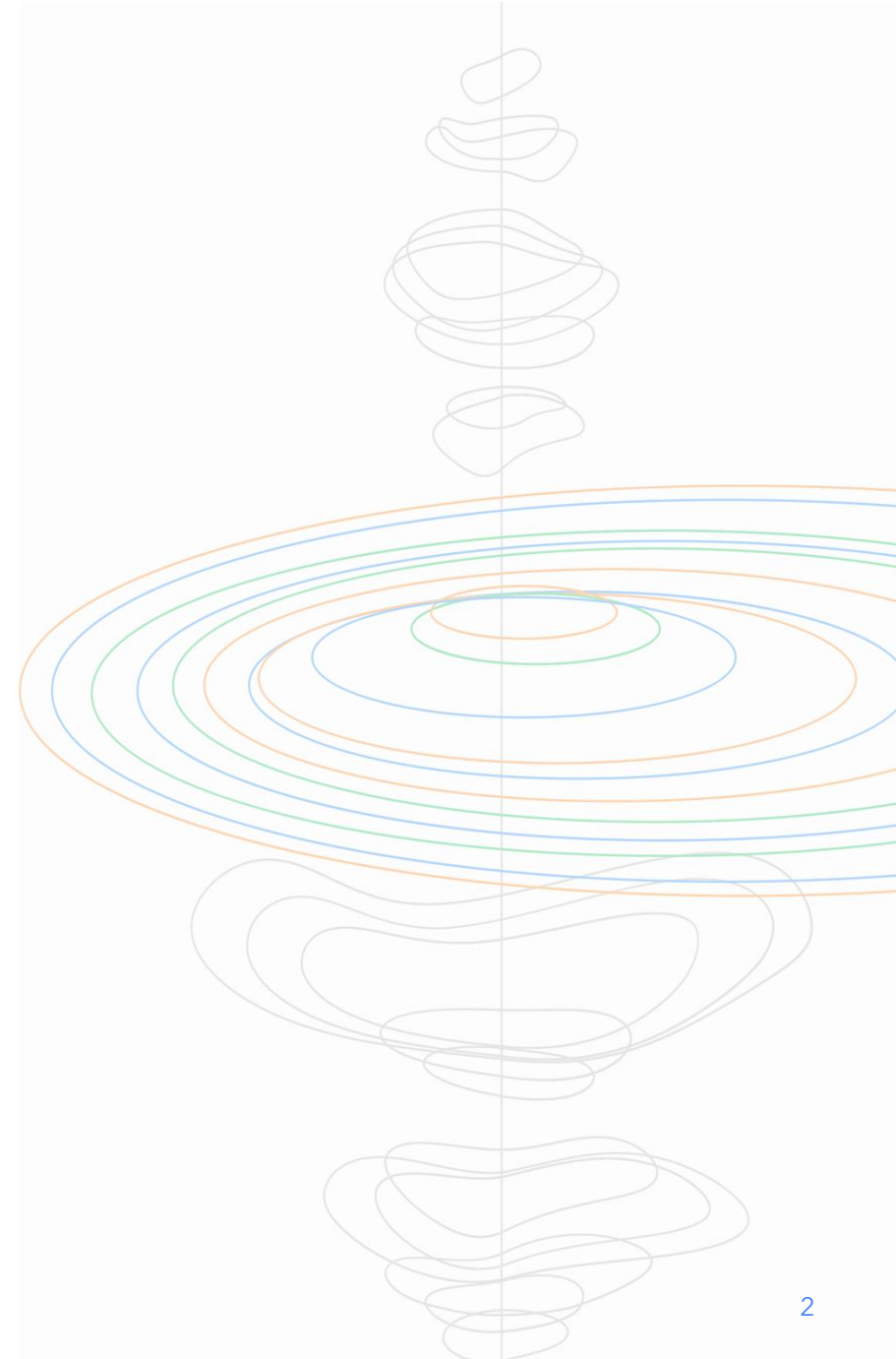
2. • Bitcoin Investment Thesis

- Bitcoin's fundamental characteristics
- Bitcoin's empirical characteristics

3. • Quick investment Thesis DeFi

4. • Quick investment Thesis on NFTs

5. • QnA



RESEARCH DRIVEN ASSET MANAGEMENT

Executive Committee

- President & CIO (Y. Choueifaty)
- Deputy CIO, Head of Investment Management & Co-Head of Research (T. Puhan)
- Co-Head of Research (T. Froidure)
- Head of Business Development (C. Roehri)
- Chief Operating Officer (D. Bellaiche)

45% of the team involved in portfolio management & research (24 people)

- Theoretical support
- Product research & development
- Implementation innovation

" *The team is encouraged to think out of the box in its approach to 'conventional wisdom' to the greatest extent possible. As such, the team's diversity is a critical part of how well it functions.*

We have a large range of expertise, from mathematicians to engineers, economists and traders, all of which feeds in to the team's ability to look at problems or assumptions from a very broad spectrum of viewpoints.

Tristan Froidure, Head of Research

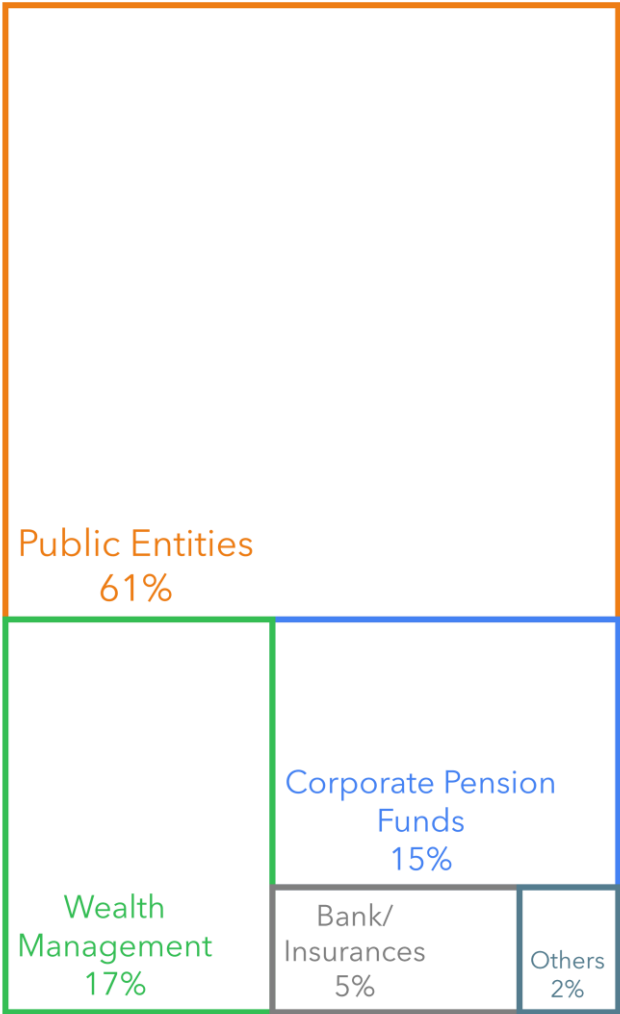


- Paris
 - Dublin
 - New York
 - Hong Kong
 - Frankfurt
 - Luxembourg
- 

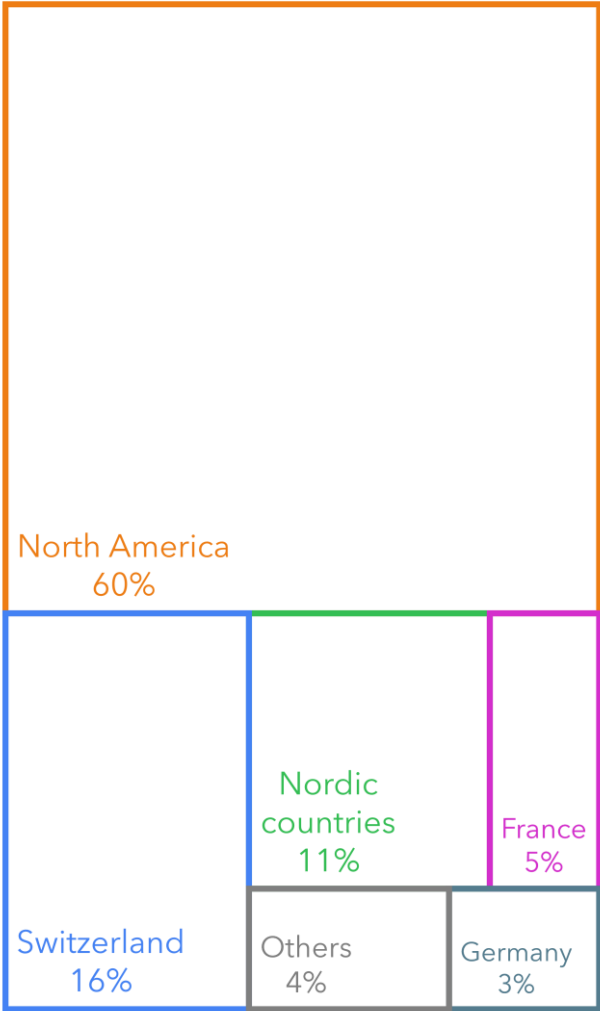
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ASSET UNDER MANAGEMENT BREAKDOWN

AuM by **Clients Type**

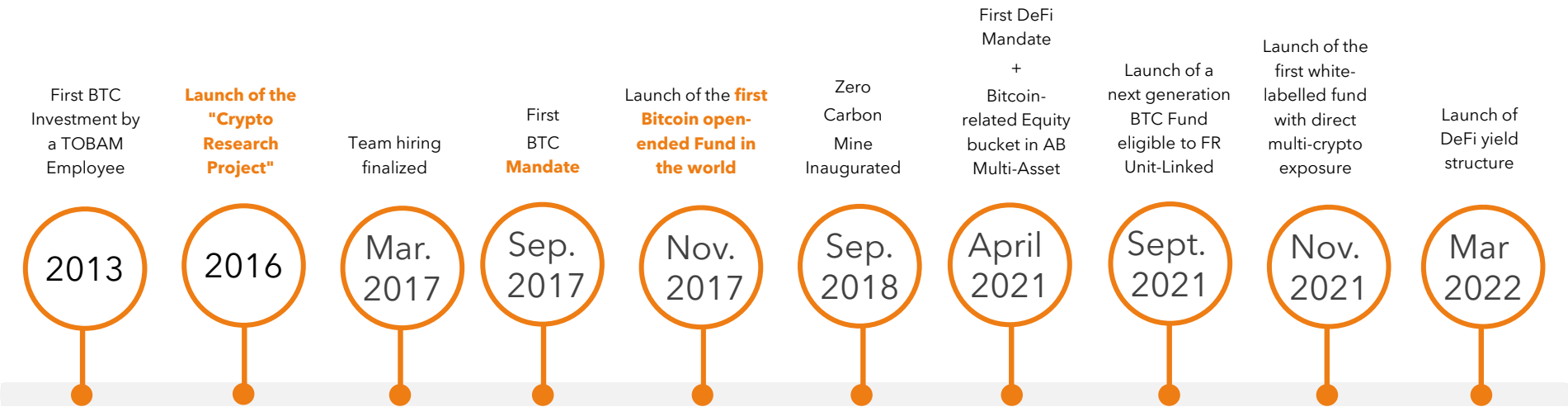


AuM By **Clients Geography**



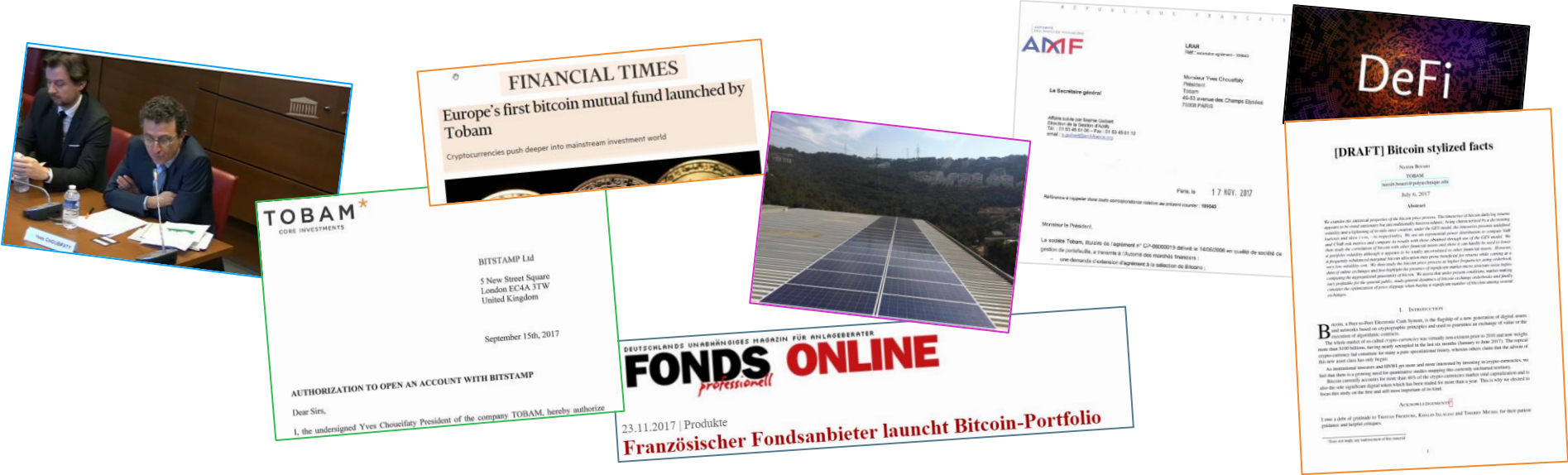
Source: TOBAM, figures as of June 30, 2022, including Maximum Diversification® ETF

TOBAM'S JOURNEY INTO CRYPTO



• Research projects

Market impact Forks CO2 Time Diversification Crypto Anti-Benchmarks ...



4 YEARS LIVE TRACK RECORD
→ 100.00% CORRELATION WITH BTC

- Gross Performance and Tracking Error since inception
 - (20/11/2017 - 30/06/2022)



TOBAM BITCOIN CO2 Offset Fund	
Return:	141.81%
Annualized return:	21.12%
Hist vol:	80.18%
Sharpe ratio:	0.25
Sortino ratio:	0.41
Downside volatility:	48.61%
The NYSE Bitcoin Index	
Return:	143.98%
Annualized return:	21.35%
Hist vol:	80.20%
Sharpe ratio:	0.25
Sortino ratio:	0.42
Downside volatility:	48.60%
Tracking error:	0.52%
Info ratio:	-0.45
Beta:	1.00
Correlation:	100.00%

03/09/2019 - 06/30/2022		Weekly	Calculation	Correlation	USD				
<Filter>		Correlation Matrix (6 Rows x 6 Columns)							
Security	21SHARES BITCOIN SINGLE	NYXBT Index	TOBAM BITCOIN-A2	GBTC US Equity	VONTOB 0 PERP Corp	COINXBE SS Equity			
11) 21SHARES BI...	1.000	0.893	0.894	0.967	0.876	0.971			
12) NYXBT Index	0.893	1.000	0.995	0.911	0.886	0.913			
13) TOBAM BITCO...	0.894	0.995	1.000	0.907	0.885	0.913			
14) GBTC US Equi...	0.967	0.911	0.907	1.000	0.923	0.974			
15) VONTOB 0 PE...	0.876	0.886	0.885	0.923	1.000	0.898			
16) COINXBE SS E...	0.971	0.913	0.913	0.974	0.898	1.000			
Sum									

Sources: TOBAM, Bloomberg. Returns reflect live data from 20 November 2017 to 30 June 2022. Disclaimer: Past performance is not an indicator or guarantee of future performance. The value of your investment and the income derived from it may go down as well as up and you may not get back the full amount invested. Performance details provided are in USD. The returns and/or performance graphs provided on this page are gross of management fees, sales charges and other commissions, other relevant taxes and charges payable by an investor are not included in the calculations. The risk free rate of return is calculated using the one month USD LIBOR rate. TOBAM Bitcoin Fund gross annualized performance between November 20, 2017 to June 30, 2022 is +21.12%, while the performance net of fees and transaction costs is +18.13%.

1. • CrypTOBAM

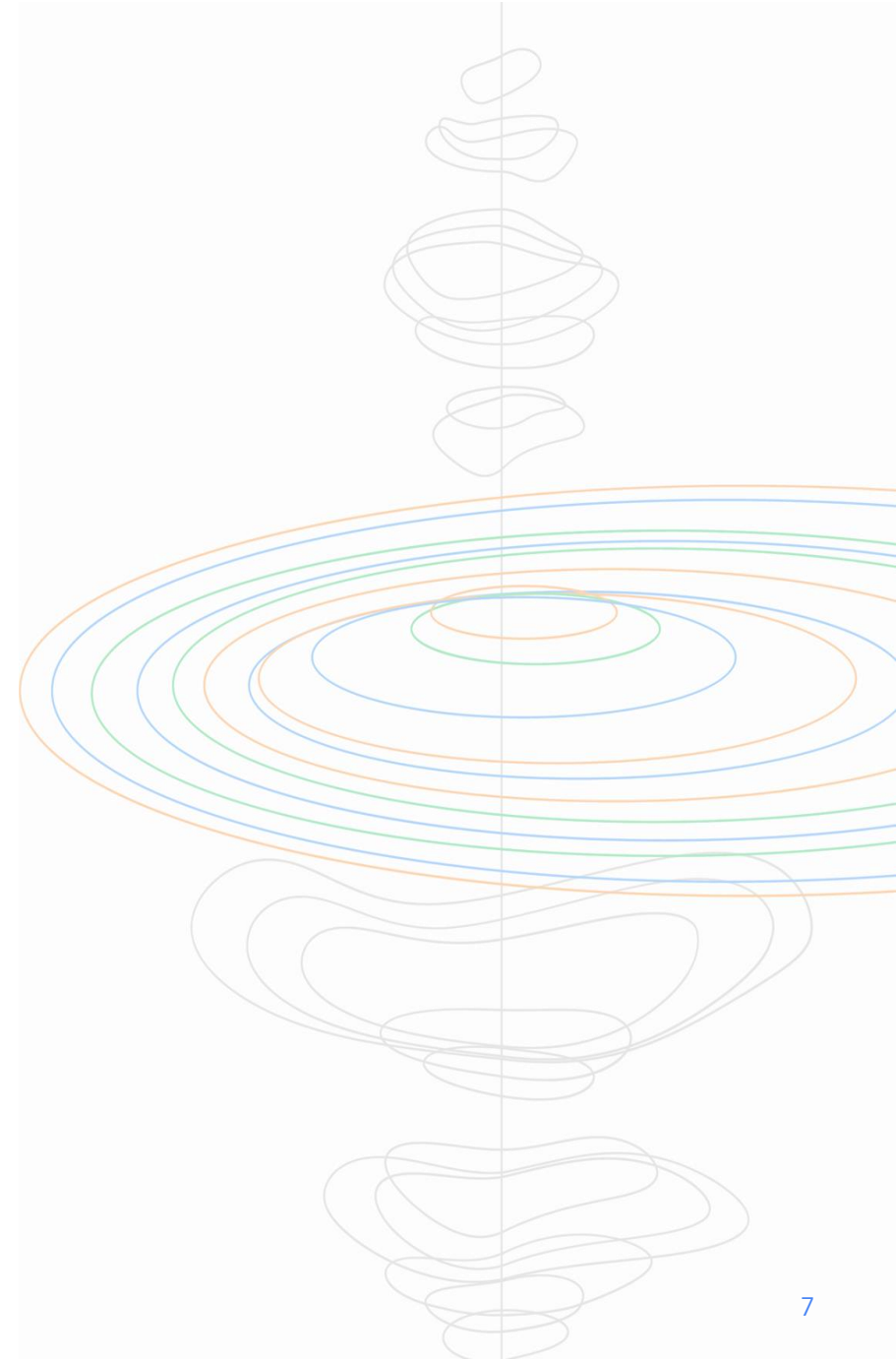
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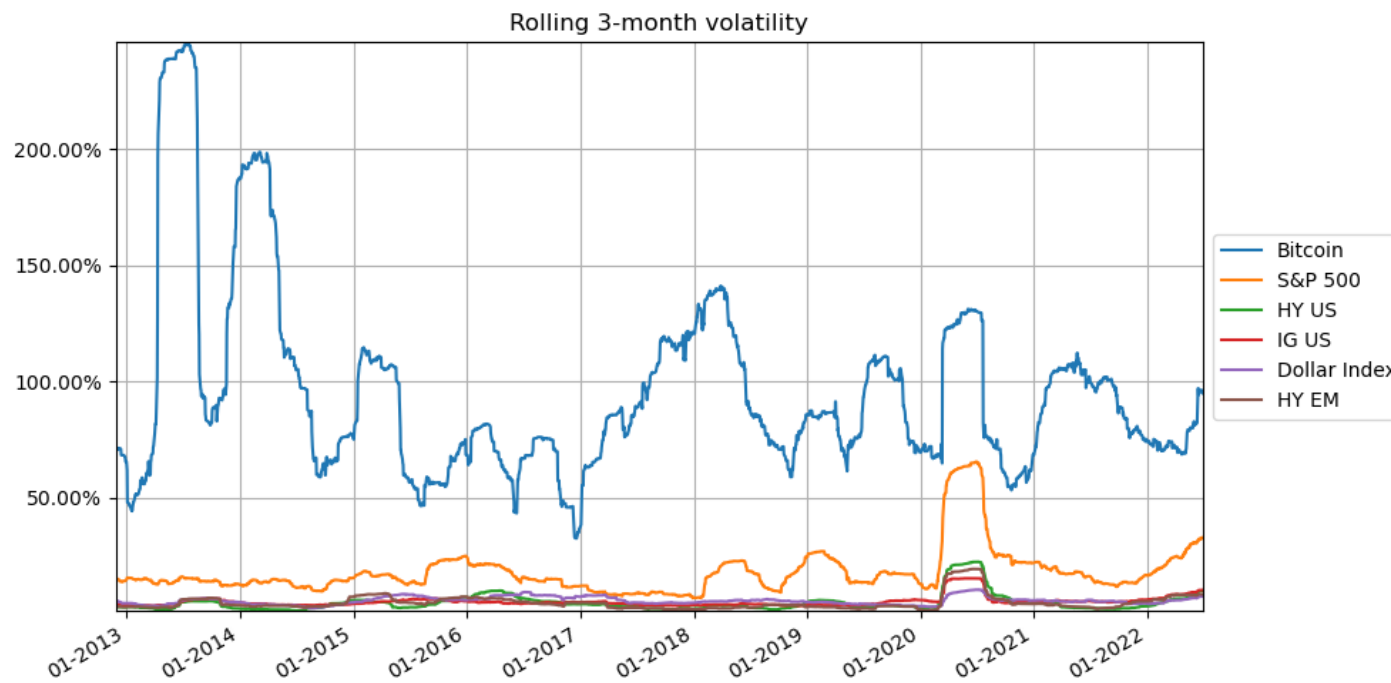
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WARNING: BAD NEWS, BITCOIN IS A VERY VERY VERY RISKY ASSET

- Rolling 3 month volatility



Source: TOBAM, FRED. 3-month volatility calculated on daily returns from November 26, 2012, to June 30, 2022.
Past performance, risk and behaviour are not indicative of future performance, risk and behaviour.

GOOD NEWS: INVESTORS ARE RISK TAKERS

Theorem:

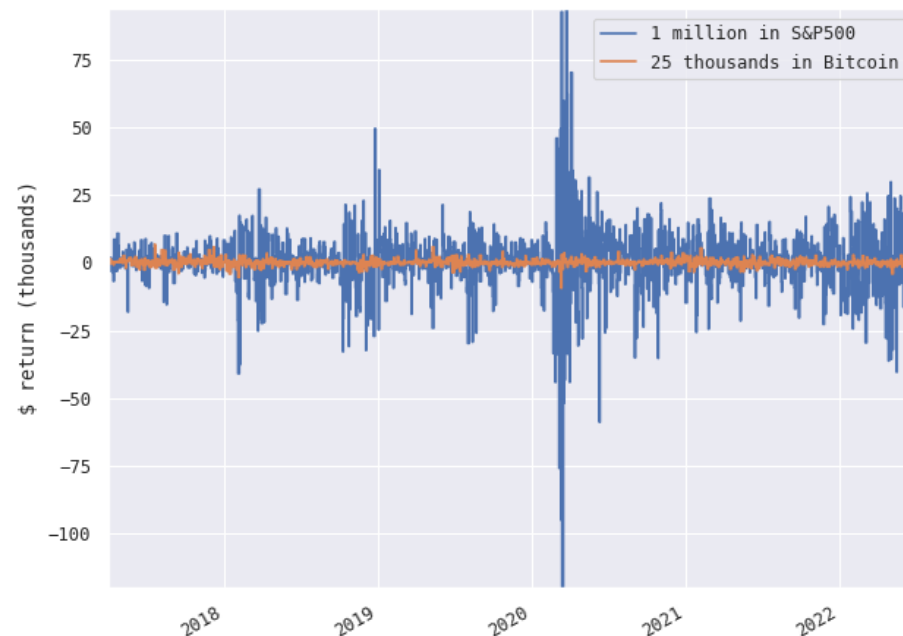
Risk is not relevant to the Investment case.

Risk should only determine the Investment size.

US\$ 1 million at 10% volatility is far riskier than US\$ 25 000 at 80% volatility

% volatility is not relevant, what is relevant is the \$ volatility.

"Size matters!"



Source: TOBAM and FRED. Hypothetical returns from March 31, 2017 to June 30, 2022 provided for illustrative purposes. Hypothetical results do not represent the results of actual trading using client assets. Warning: Past performance is not an indicator or a guarantee of future performance.

- The risk of an asset should determine the size of the investment, not whether to invest or not.
- We should not be able to say "it is too risky for me"

TOBAM'S BITCOIN INVESTMENT THESIS: A POTENTIAL NEW INTERNATIONAL STANDARD MEASUREMENT OF VALUE

Definition of a Standard:
A unit used as a norm in measurement

- Meter: Standard of length
- Kilogram: Standard of mass
- Celsius: Standard of temperature
- Mole: Standard of quantity



Source: Bureau International des Poids et Mesures, Pavillon de Sèvres (France).

Bitcoin, candidate to become a standard unit of value?

- The economy is about production, exchange and storage of goods, services, risks, labour, innovations, contracts...
- In order for these activities to occur, we need a measurement of value. We need a *standard* of value.

ANSWERING 99% OF QUESTIONS ABOUT BITCOIN

// 99% of questions about Bitcoin are answered by replacing the word "Bitcoin" by "Gold" //

BARTERING & COMMODITY MONEY

- Commodities Money (bags of salt, tea, tobacco, live cattle..)

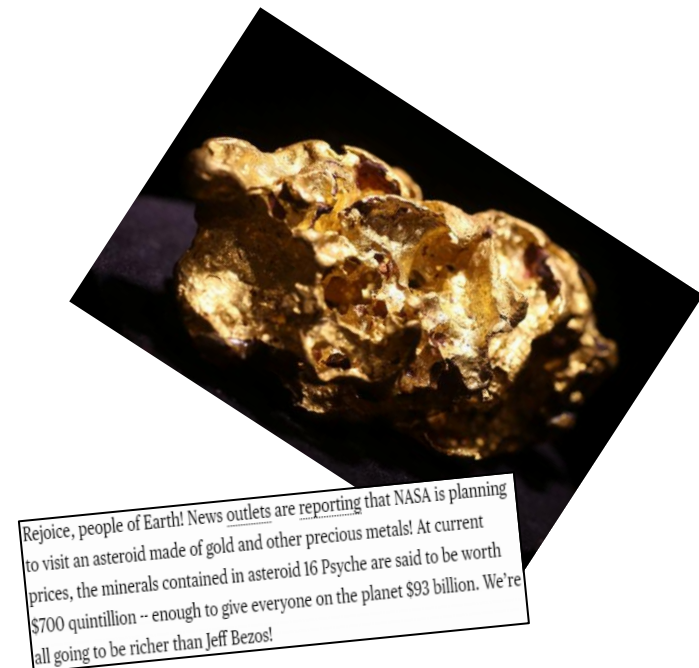
COINS & PAPER MONEY

- Metals objects introduced as money around 5000 B.C.
- First metal coins introduced by the Lydians by 700 B.C.
- Paper Money introduced in ancient China around A.D. 960

REPRESENTATIVE MONEY - Introduction of the precious metal Standard (Silver & Gold)

- With the introduction of paper currency and non-precious coinage, commodity money evolved into representative money. This meant that what money itself was made of no longer had to be very valuable. Representative money was backed by a government or bank's promise to exchange it for a certain amount of silver or gold.
- Fiat Money ("Let it be done" money, 1971)
Representative money has now been replaced by fiat money. Money is now given value by a government fiat or decree.

Answering 99% of question about Bitcoin ... except one!



Source: <https://www.thoughtco.com/history-of-money-1992150>

BITCOIN INVESTMENT CASE: FUNDAMENTAL CHARACTERISTICS

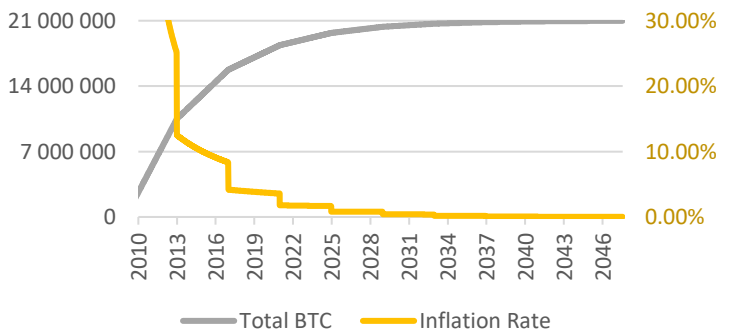
Some of the essential characteristics of a standard:


1. Unalterable

2. Non-Forgeable

3. Difficult to seize
- }
- The Blockchain technology
4. Not Manipulated by a central authority
5. Non-Inflationary
6. Exchangeable

"THERE IS 21 000 000 OF IT !!"





TIME
@TIME

Why Bitcoin Matters for Freedom
It could make a real difference for the 4 billion people who can't trust their leaders or access the banking system
time.com



TOBAM believes that Bitcoin has the theoretical qualities of a standard measurement of value

BITCOIN INVESTMENT CASE: FUNDAMENTAL CHARACTERISTICS

NOT MANIPULATED, NON-INFLATIONARY

HISTORY OF STANDARDS COMPARISONS

- US\$ => Inflationary

Annual money supply growth +5.6% on average before 2008 and 20% per year on avg since then

- Roman Denarius => Inflationary

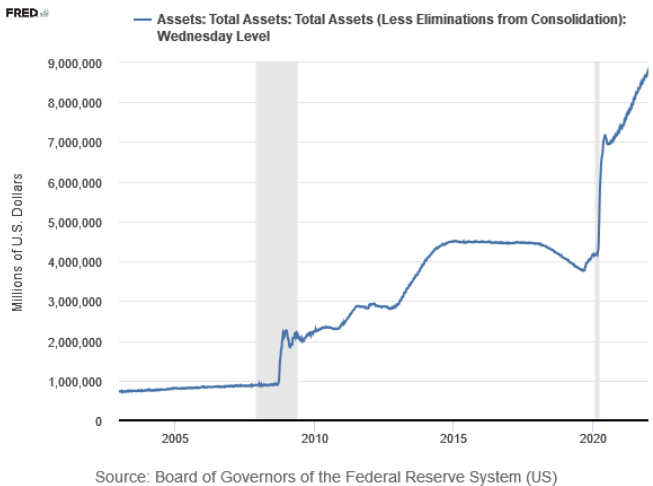
Debasement: % of silver in the Roman Denarius went from 4 g. of silver when it was first minted. By the time it was discontinued, it contained less than 0.1 gram. Number of coins multiplied (Bretton Woods 1.0?)

- Gold => Inflationary

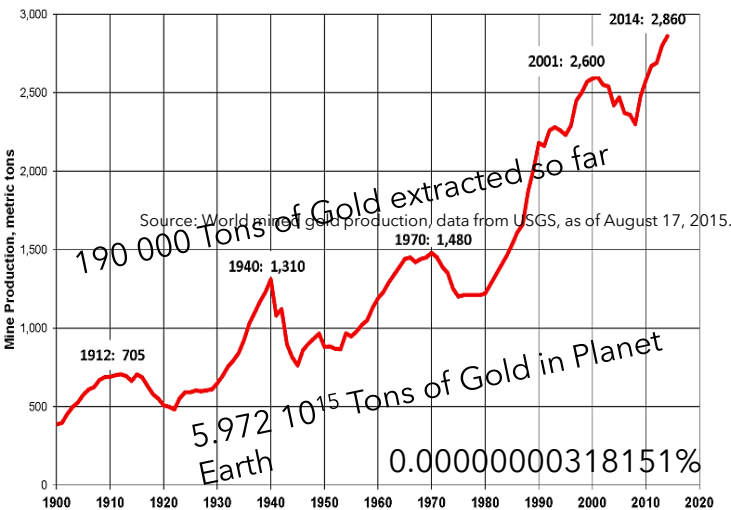
Money supply in Gold (btw 1.1% & 2.4% per year of added supply growth)

Bitcoin => Non Inflationary

- US Federal Reserve total assets



- Gold mine production, metric tons



BITCOIN INVESTMENT CASE: FUNDAMENTAL CHARACTERISTICS

NOT MANIPULATED, NON-INFLATIONARY

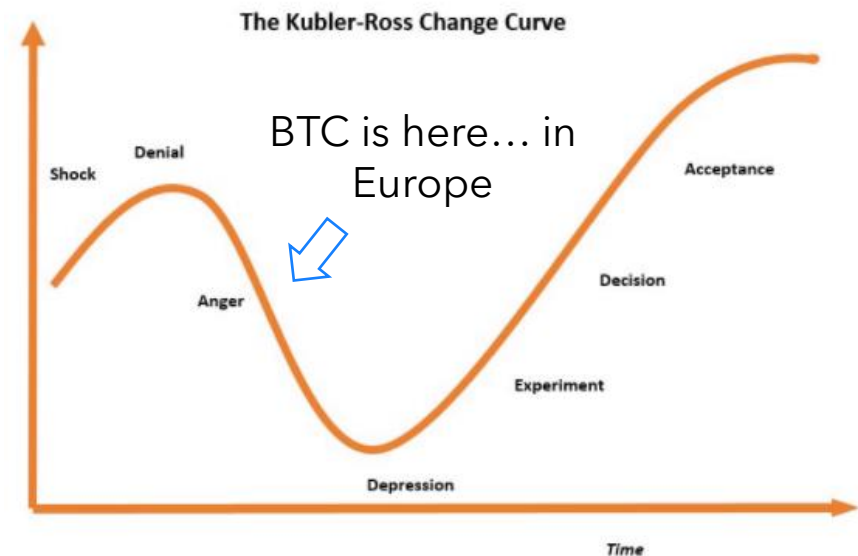
Bitcoin is well debated and discussed.

We observe 4 types of criticisms:

- Criticism driven by **Passion** or **Ideology**
- Criticism driven by **Conflicts of Interest**
- Criticism driven by **Ignorance**
- Criticism driven by **Reason**



- The Kübler-Ross Change Curve

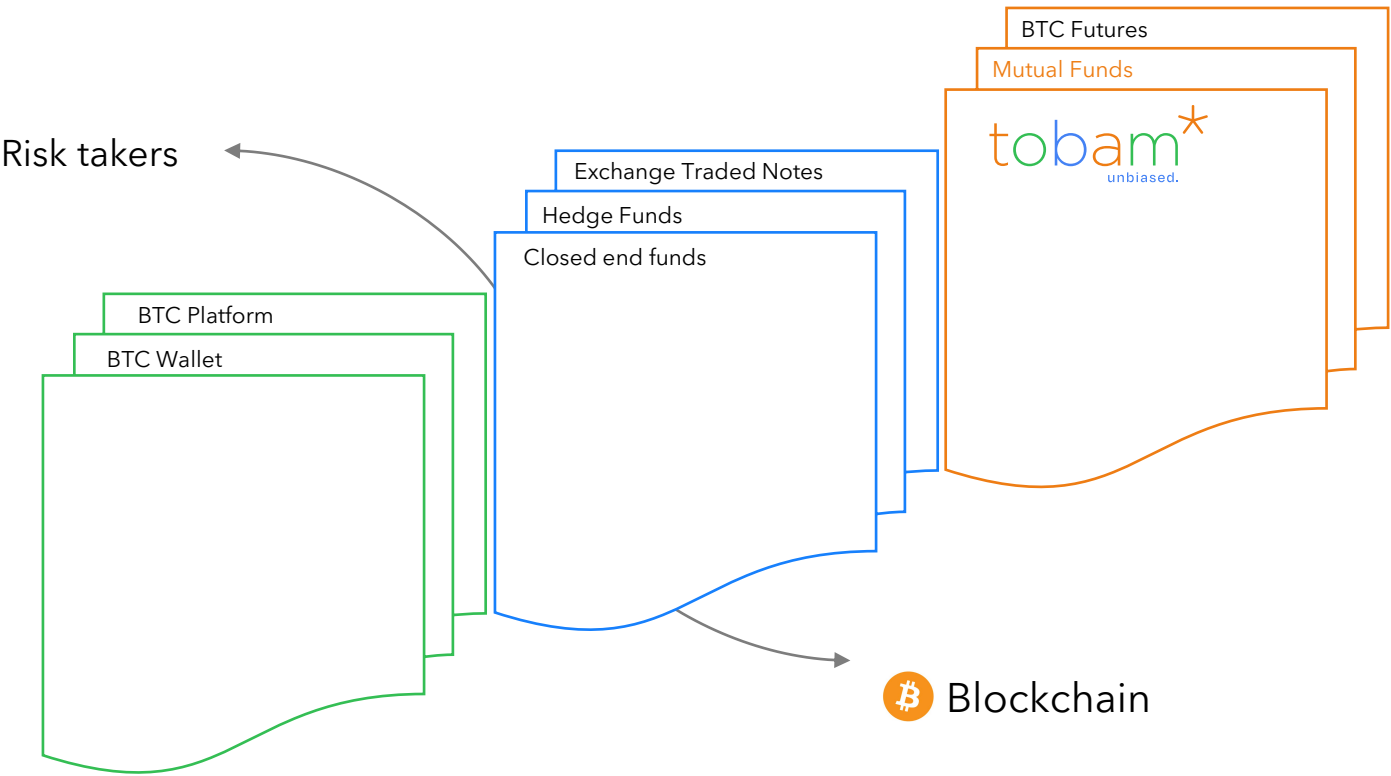


Source: Kübler-Ross Change Curve also known as the stages of grief is a model consisting of the various levels or stages of emotions which are experienced by a person who is soon going to approach death or is a survivor of an intimate death. The Kubler-Ross Model also holds true when it comes to business, societies, work or employment in the way changes are integrated.

BITCOIN INVESTMENT CASE: FUNDAMENTAL CHARACTERISTICS

CONCLUSION

In our opinion, all reasonable criticism against the BTC will find their answers in the rapid development of a new financial system



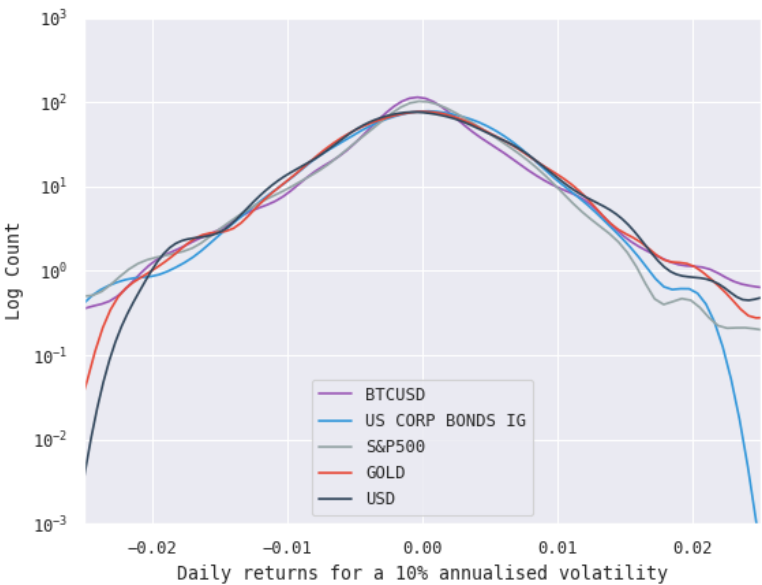
BITCOIN INVESTMENT CASE: EMPIRAL CHARACTERISTICS

1. BTC RISK NATURE IS CONVENTIONAL

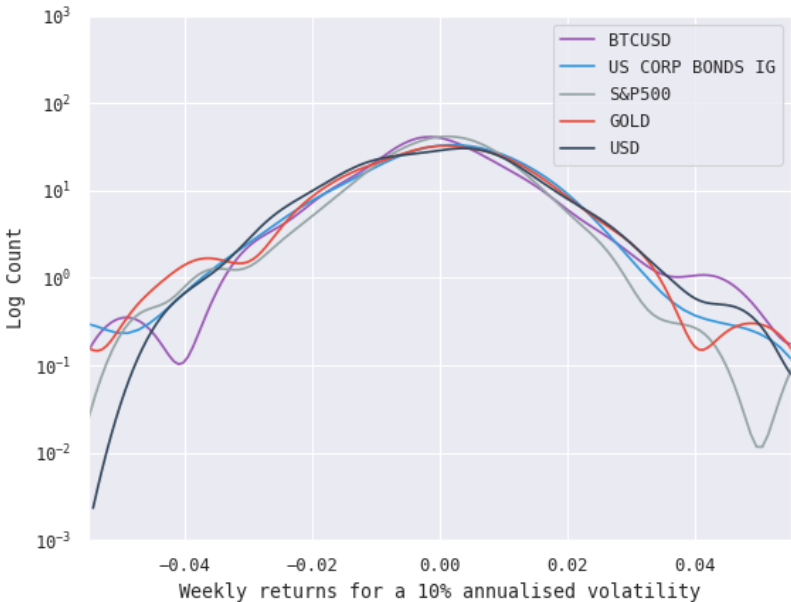
BTC, being much more volatile, must be scaled accordingly

In this example, we compare the distribution of daily returns of the equivalent of a 10% volatility position: i.e. 10% exposure in BTC, versus 237% exposure in US IG corporate bonds

- Distribution of daily returns of 10% volatility position in BTC, Gold, US\$, S&P500 and US Corporate bonds



- Distribution of weekly returns of 10% volatility position in BTC, Gold, US\$, S&P500 and US Corporate bonds

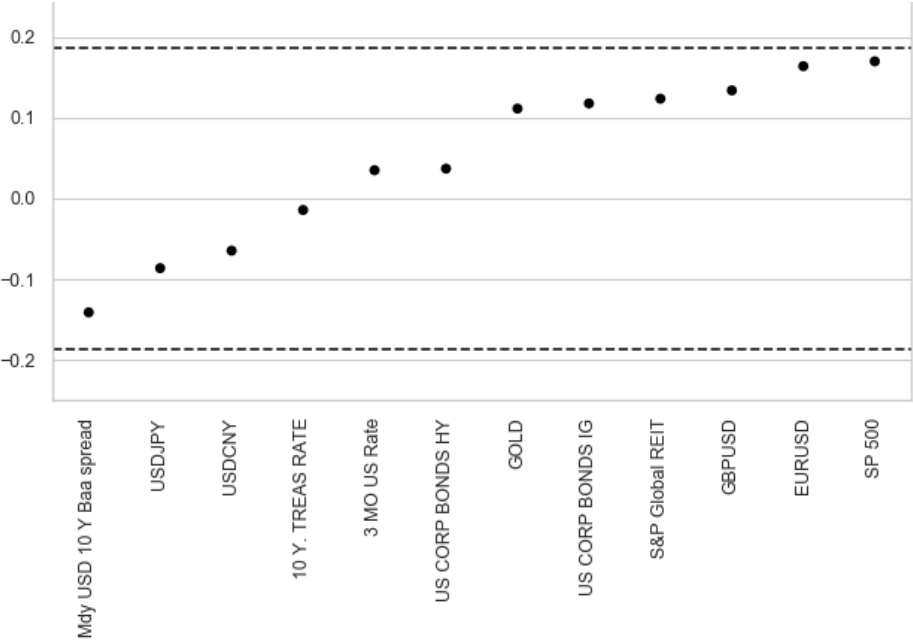


Source: TOBAM and Bloomberg. Hypothetical returns from 2011-01-11 to 2022-06-30 provided for illustrative purposes. Hypothetical results do not represent the results of actual trading using client assets. Hypothetical results are for information purposes only. They are intended to illustrate how the Strategy may have behaved. These hypothetical results are gross of tax and exclude costs of transaction and fee assumptions. Warning: Past performance is not an indicator or a guarantee of future performance. The value of your investment and income received from it can go down as well as up and you may not get back the full amount invested. Performance details provided are in USD and do not include reinvested dividends.

BITCOIN INVESTMENT CASE: EMPIRAL CHARACTERISTICS

2. BTC IS A DIVERSIFYING ASSET (1)

Correlation Spectrum: Bitcoin versus most asset classes



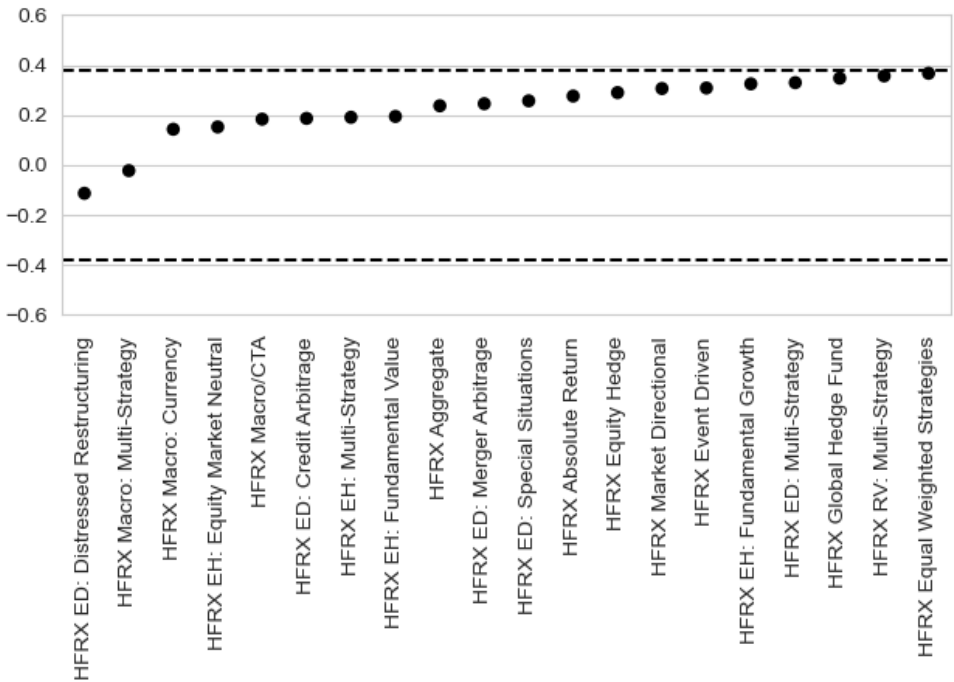
No significant correlation to any traditional assets

Source: TOBAM and Bloomberg.
Weekly correlation with BTCUSD, 2-tailed deflated 95% confidence intervals around 0 (log normal assumption)
Correlation calculations made from March 31, 2017 to June 30, 2022. Warning: Past performance is not an indicator or a guarantee of future performance. The value of your investment and income received from it can go down as well as up and you may not get back the full amount invested.

BITCOIN INVESTMENT CASE: EMPIRAL CHARACTERISTICS

2. BTC IS A DIVERSIFYING ASSET (2)

Correlation Spectrum: Bitcoin versus HFRX indices



No significant correlation to HFRX alternative indices

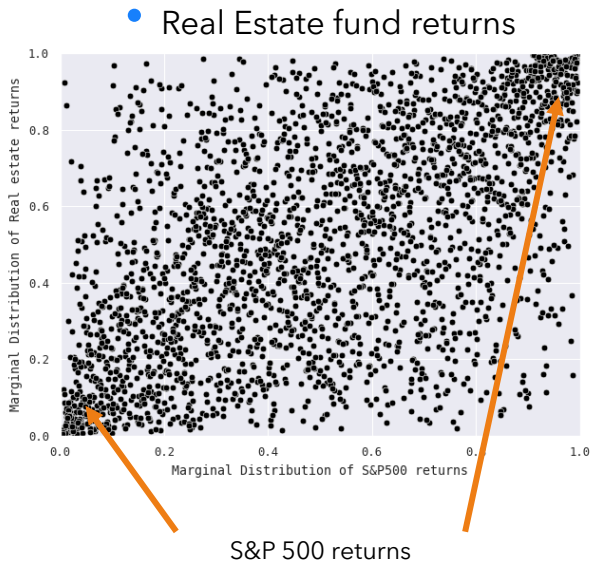
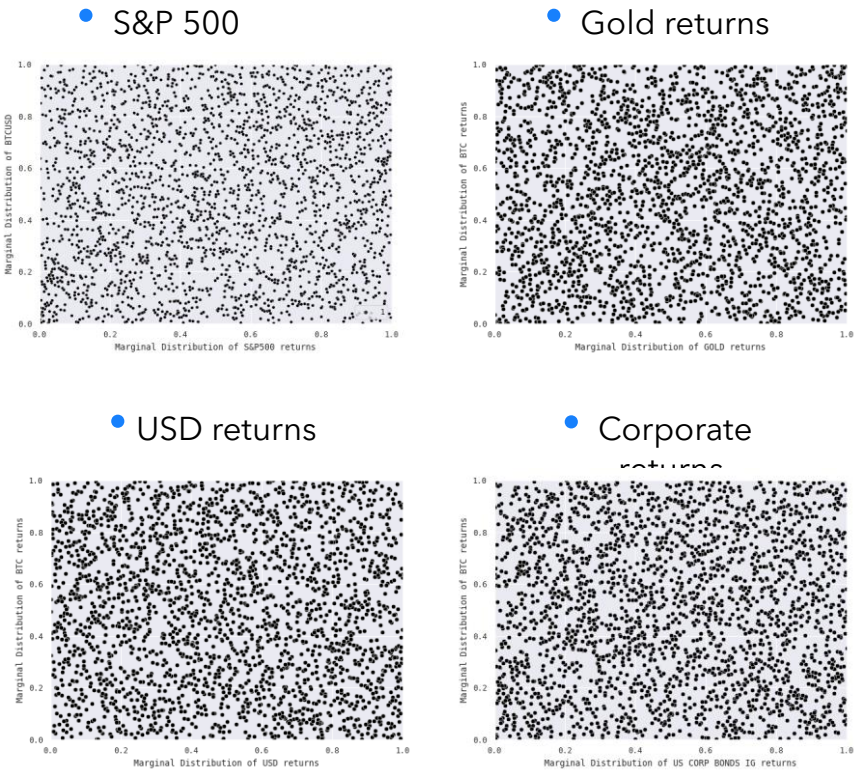
Source: TOBAM and Bloomberg.
Monthly correlation with BTCUSD, 2-tailed deflated 95% confidence intervals around 0 (log normal assumption)
Correlation calculations made from 31/03/2017 to 30/06/2022. Warning: Past performance is not an indicator or a guarantee of future performance. The value of your investment and income received from it can go down as well as up and you may not get back the full amount invested.

BITCOIN INVESTMENT CASE: EMPIRAL CHARACTERISTICS

2. BTC IS A DIVERSIFYING ASSET (3)

Marginal Distribution of BTC returns versus S&P500, Gold, US\$ and US corporate bonds returns

Looking at the joint distribution of the BTC and the four assets, **no pattern emerges**
As a reference, a dependence pattern would look like this (stocks vs real estate):



Extreme returns notably are very much correlated: Stocks and Real Estate funds are moving together especially in extremes

Source: TOBAM, Bloomberg. Calculations made from 31/03/2012 to 30/06/2022.
Past performance, risk and behavior are not indicative of future performance, risk and behavior.

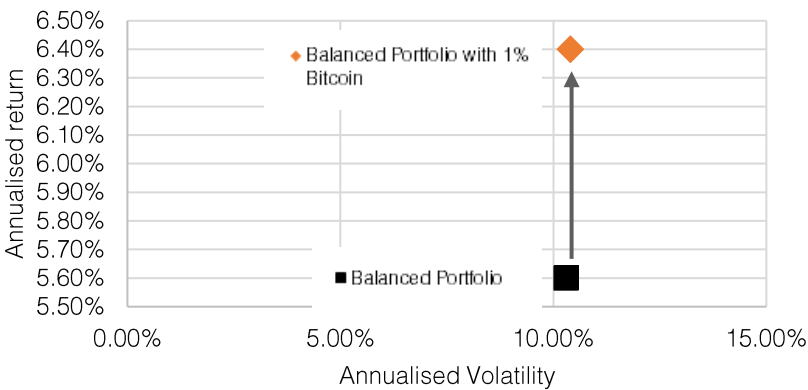
BITCOIN INVESTMENT CASE: EMPIRICAL CHARACTERISTICS

3. BTC AS A DIVERSIFIER

Tobam Research: Hypothetical 60/40 Balanced Portfolio¹
5-Year Period 2017-03-31 to 2022-06-30

- Diversification benefits of adding 1% of BTC

Summary Statistics	Balanced Portfolio	Balanced Portfolio with 1% Bitcoin	Difference
Annualized Return	5.6%	6.4%	0.8%
Annualized Volatility	10.3%	10.4%	0.1%
Sharpe Ratio	0.5	0.6	0.1
Max Drawdown	26.0%	26.0%	0.0%



The addition of 1% of Bitcoin in a balanced portfolio may improve returns by 0.8% with no increase in max. drawdown over the period

¹160% MSCI ACWI / 34% ML US Corporate + 6% ML US HY Index
Source: TOBAM, MSCI and FRED. Hypothetical returns from March 31, 2017 to June 30, 2022 provided for illustrative purposes. - daily rebalancing Hypothetical results are for information purposes only. These hypothetical results are gross of tax and exclude costs of transaction and fee assumptions. Warning: Past performance is not an indicator or a guarantee of future performance. The value of your investment and income received from it can go down as well as up and you may not get back the full amount invested. Performance details provided are in USD and do not include reinvested dividends. Performance returns and/or charts illustrating performance provided on this page are Gross of management fees, sales charges and other commissions, other taxes and relevant costs to be paid by an investor are not included in the calculations.

BITCOIN INVESTMENT CASE: EMPIRICAL CHARACTERISTICS

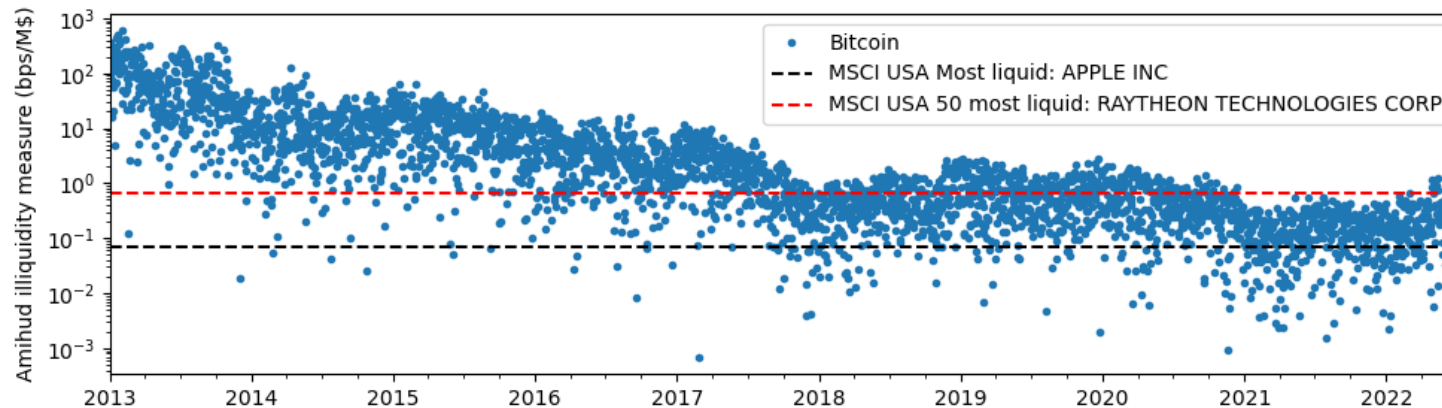
4. VOLUME AND VOLATILITY ON EXCHANGES (2)

Despite the OTC trades, exchange volumes represent the overall activity fairly.

We highlight a significant increase in liquidity since 2012: trading \$1mn in 2013 moved the price by 100 bps vs 1 bp only in 2021.

Amihud's illiquidity measure: $\frac{\text{abs}(\text{return})}{\text{dvolume}}$ (*dvolume = dollar volume*)

• Amihud's Illiquidity measure since



Source: MSCI, TOBAM. www.data.bitcoinity.org. Calculations from 31/12/2012 to 31/12/2021. Ranking of MSCI USA stock liquidity done since 2017. Past performance, risk and behavior are not indicative of future performance, risk and behavior.

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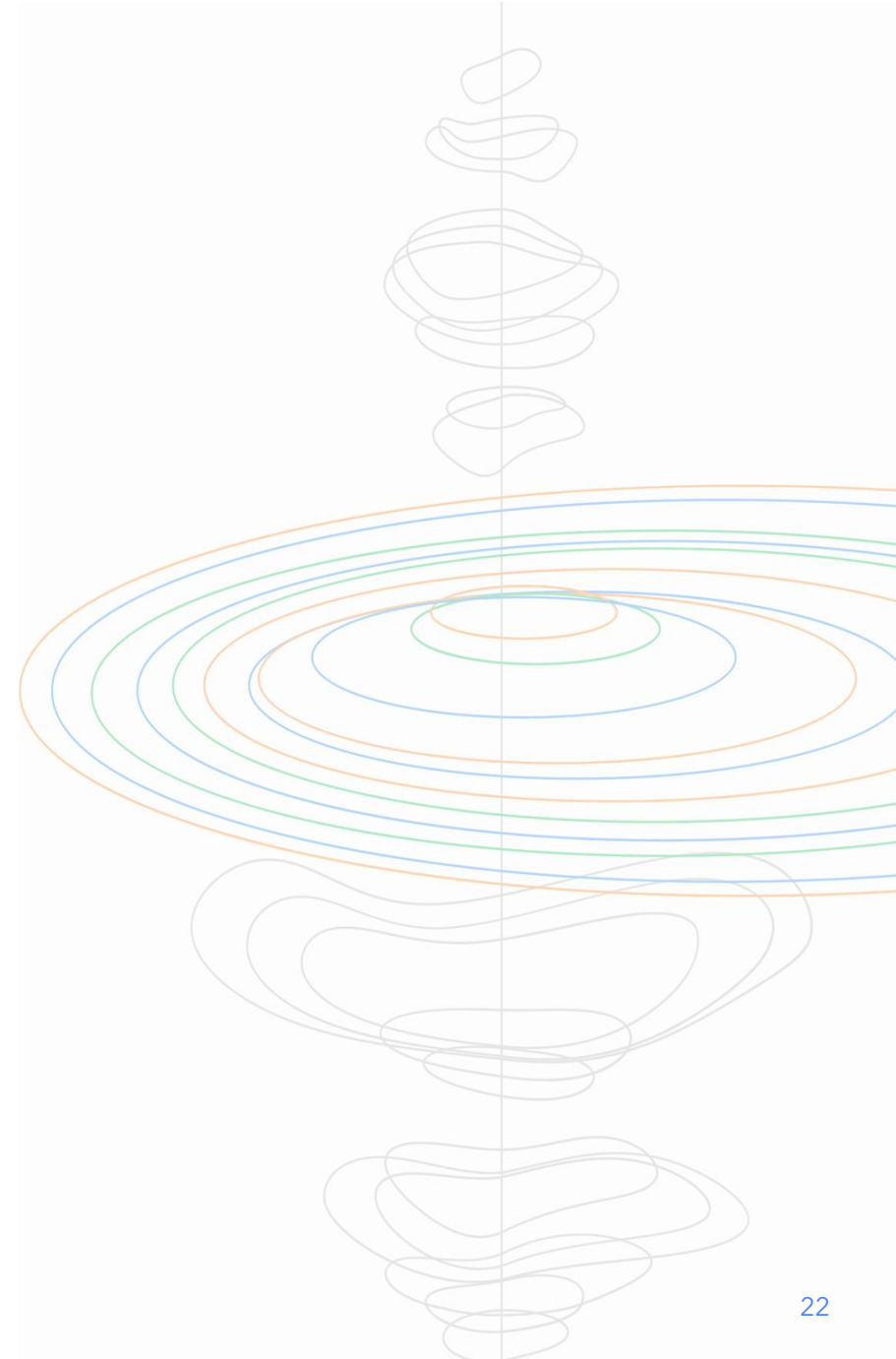
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THE CRYPTOBAM DEFI YIELD INVESTMENT THESIS

What is Defi?

Based on the transparent and decentralized **blockchain technology**, **Decentralized Finance** ("DeFi") is creating a new **peer to peer financial system**, (the internet of value), in which, amongst other prerogatives, **everybody could be a lender** (provided he/she has assets to lend) and **everybody could be a borrower** (provided he/she has assets/resources to collateralize) via **smart contracts**.

DeFi offers a variety of financial services in an open environment that does not rely on intermediaries like custodians, central clearing houses or escrow services, as these roles are assumed by smart contracts.

Most of the times theses services are provided through the use of Decentralized Apps ("dApps").

THE CRYPTOBAM DEFI YIELD INVESTMENT THESIS

WHAT'S THE OPPORTUNITY/RISK?

What is the opportunity?

The financial needs generated by the accumulation of wealth in crypto, and

The huge business opportunities in these new fields (Web 3.0),

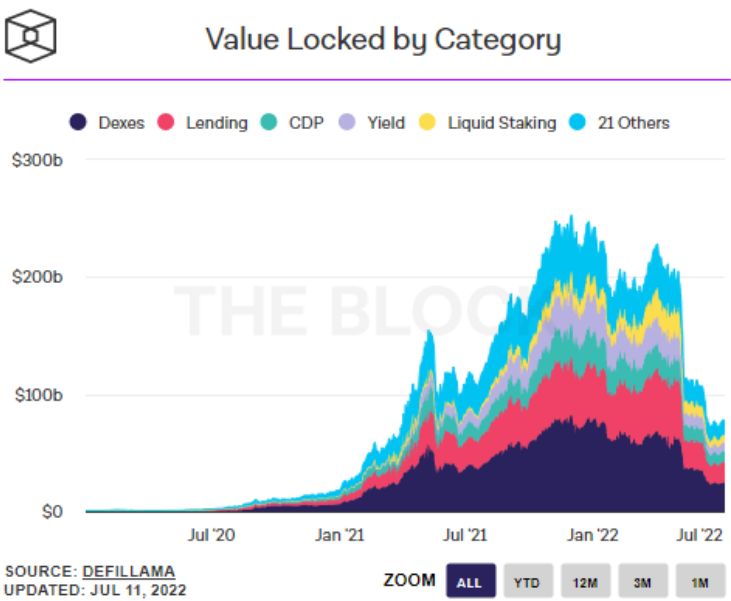
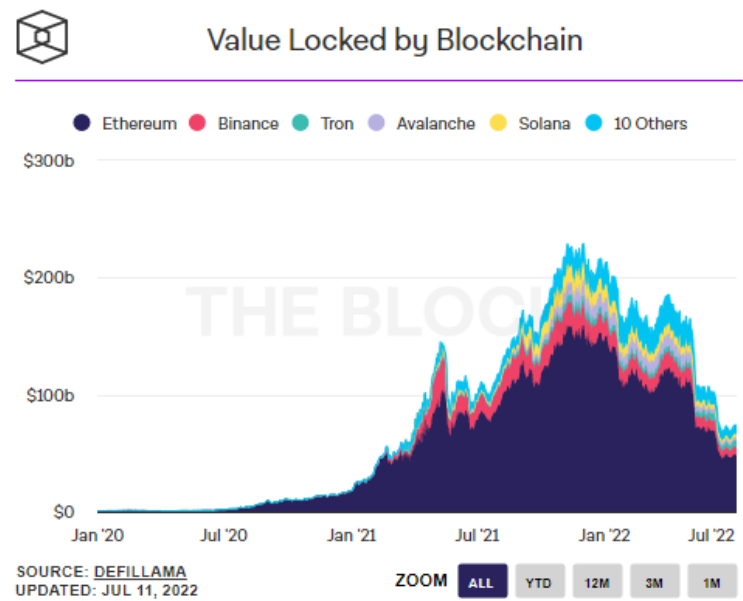
are not serviced by traditional structuring institutions.

-> **attractive risk-reward** opportunity in secured DeFi financing:

- a. Benefit from the growth of a sector without directly incurring crypto-asset volatility
- b. De facto 0-duration risk, mostly variable yields
- c. Quasi-real-time, 24/7
- d. Fully open source ensures a high level of transparency
- e. Apart from some of the stable coins' valuation, fully algorithmic

THE CRYPTOBAM DEFI YIELD INVESTMENT THESIS

EMPIRICAL FINDINGS



Source: theblockcrypto.com.

Total Gross Value Locked ("TVL") in Defi is:

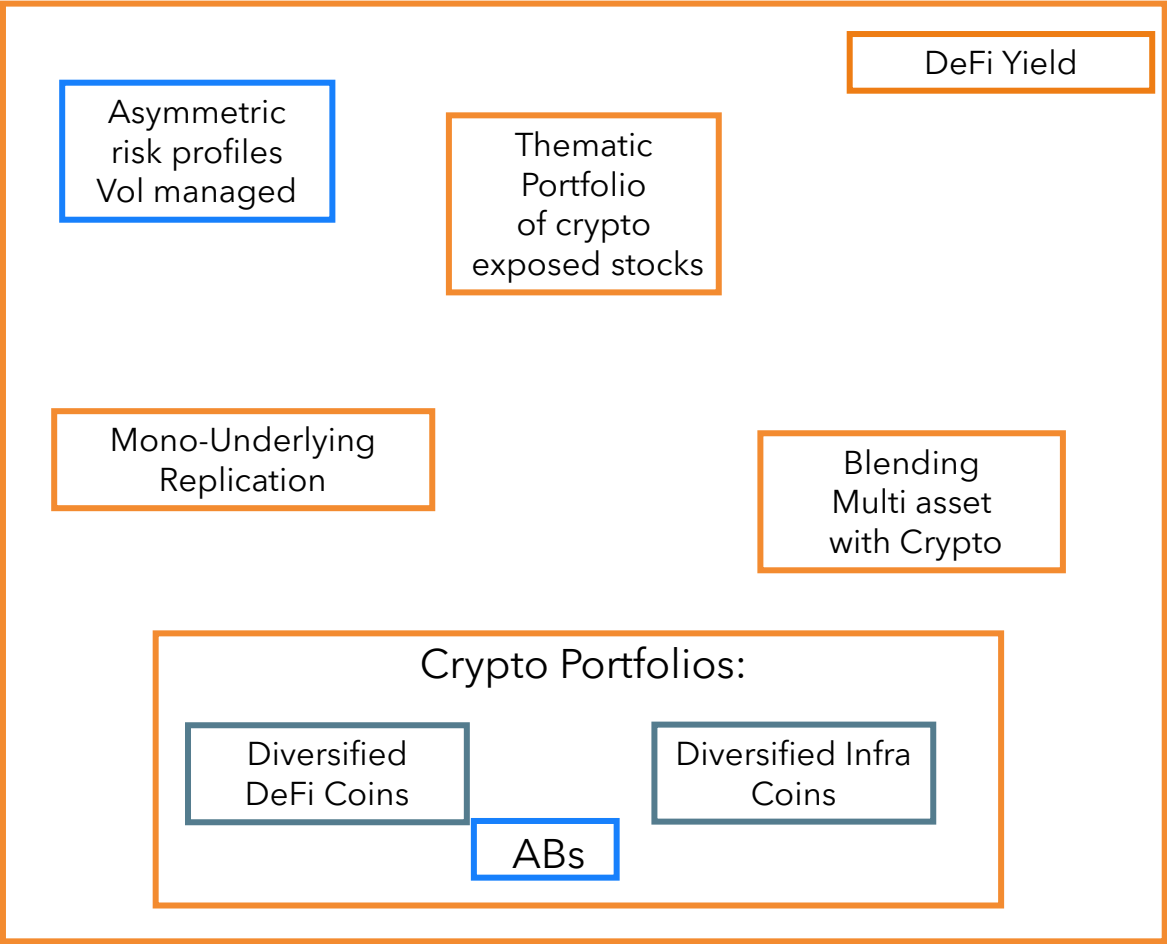
- in excess of \$58b (as of June 2022),
- Largely based on the Ethereum network

The vast majority of the TLV comes from 2 categories:

- Lending
- Liquidity providing to Decentralized Exchanges ("DEX").

CRYPTOBAM:

Fiat denominated products



Zero Carbon Mining

BTC Layer 2

DeFi Tokenization

- = Vehicle Format
- = Mandates
- = Research

THEMATIC STRATEGIES DESCRIPTION

TAKING ADVANTAGE OF CRYPTO ADOPTION AND BLOCKCHAIN VIA LISTED STOCKS

- Sufficient liquidity
- Highly correlated to the price of Bitcoin

THE SOLUTION:

- Identify listed equities that have an economic exposure to BTC and Blockchain
- Select them according to fundamental and quantitative criteria
- Combine them in a way that minimizes TE to BTC

The correlation of assets are subject to risk and may change over time.

The above represents TOBAM's opinion only. The value of your investment and income received from it can go down as well as up and you may not get back the full amount invested.

ALTERNATIVE LAYER 1 AND DEFI COINS DESCRIPTION

ALTERNATIVE LAYER 1:

Objective: Diversify a Bitcoin and Ethereum heavy allocation by investing in alternative blockchain protocols

DEFI COINS:

Objective: Gain exposure to leading DeFi protocols which may potentially disrupt and replace traditional financial schemes

DEFI YIELD STRATEGY DESCRIPTION

OBJECTIVE:

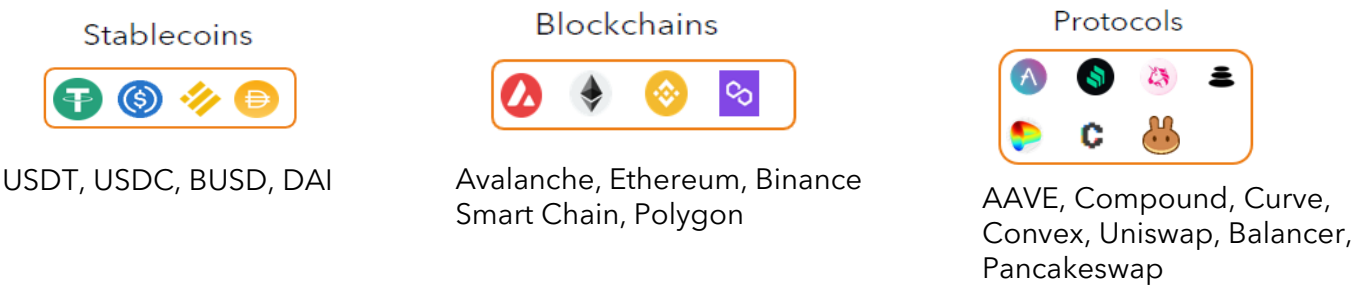
The objective of the strategy is to generate yield in the DeFi landscape via a market neutral strategy with no duration risk.

HOW:

Only stablecoins (USD pegged crypto-assets) to limit the directional risk

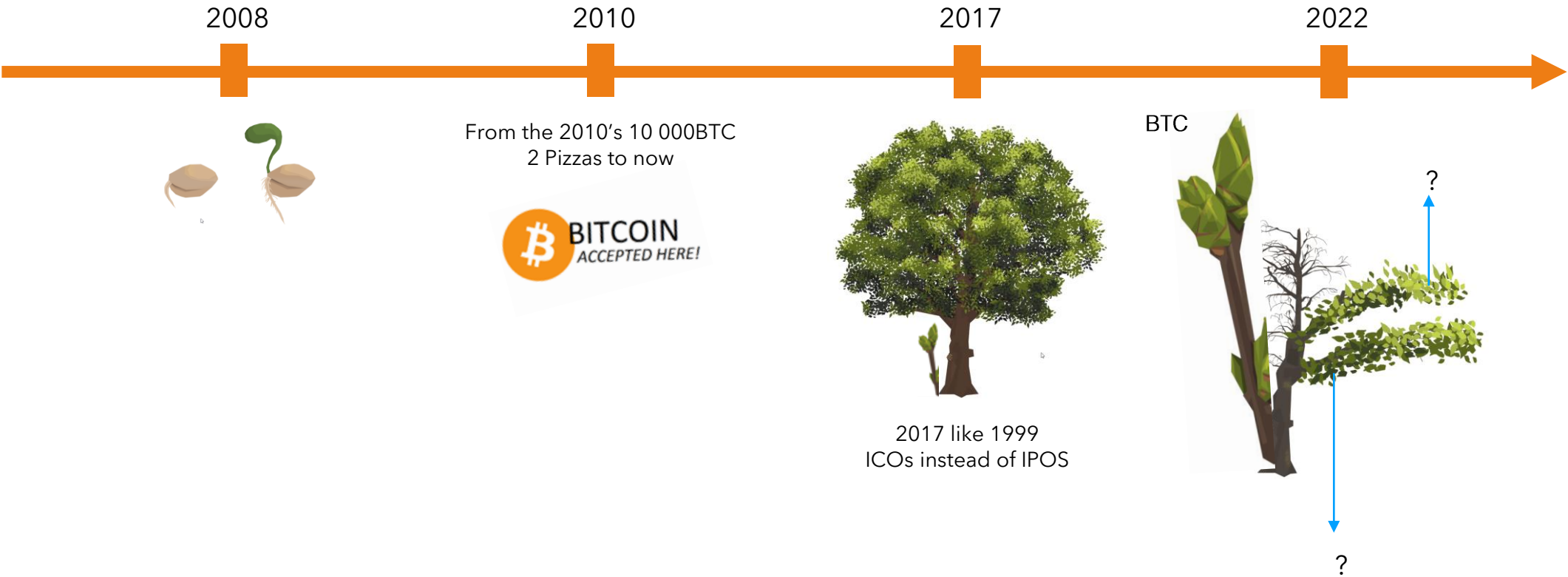
- Lending on decentralized protocols
- Providing liquidity to decentralized Automated Market Makers (AMM) pools

Diversification is key and is achieved in three different dimensions (illustration as of June 22):



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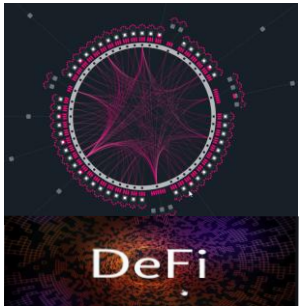
OUR VISION OF THE FUTURE OF CRYPTO:



- Amazon price divided by 10!



- BTC price divided by 10!



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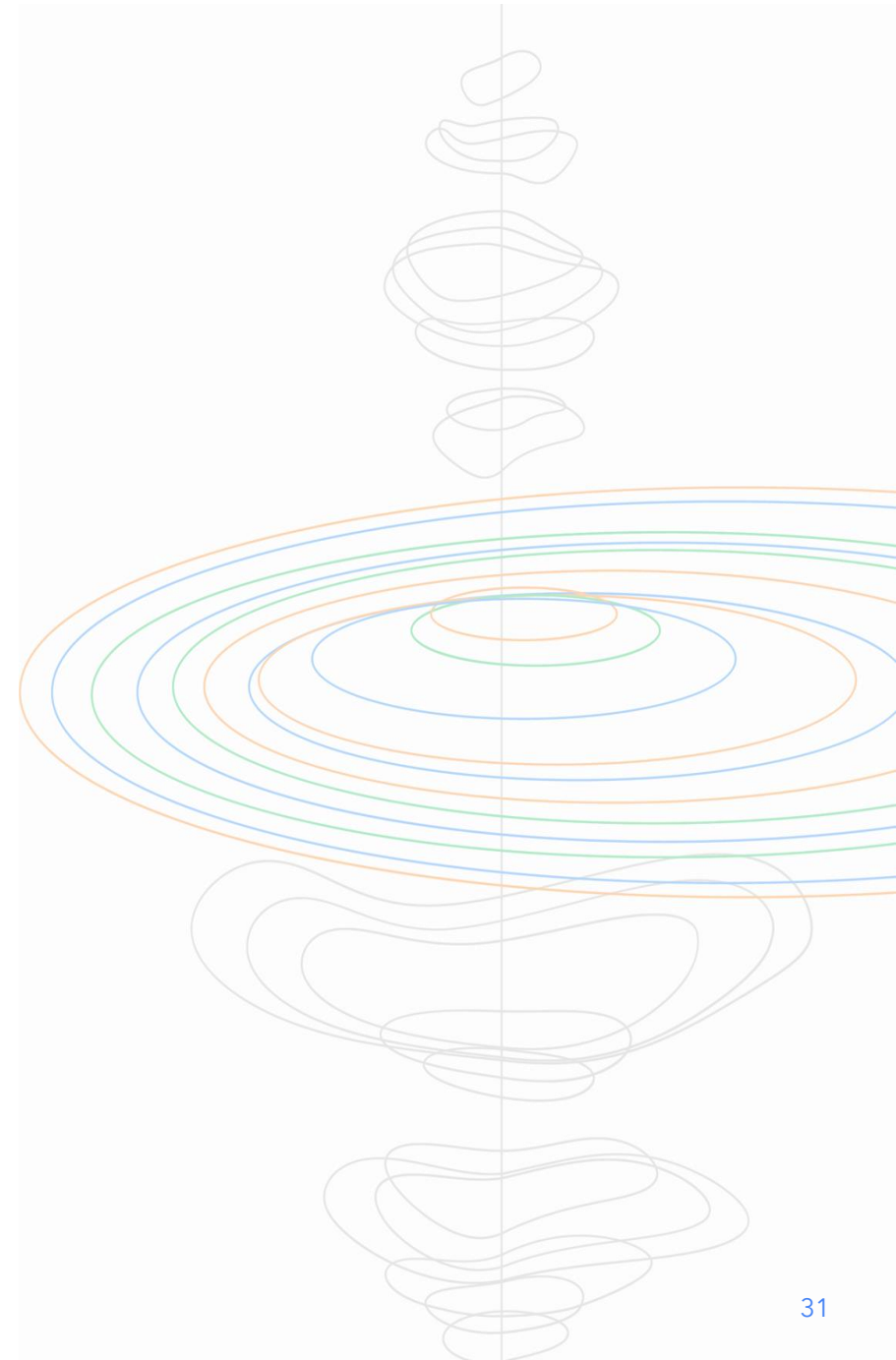
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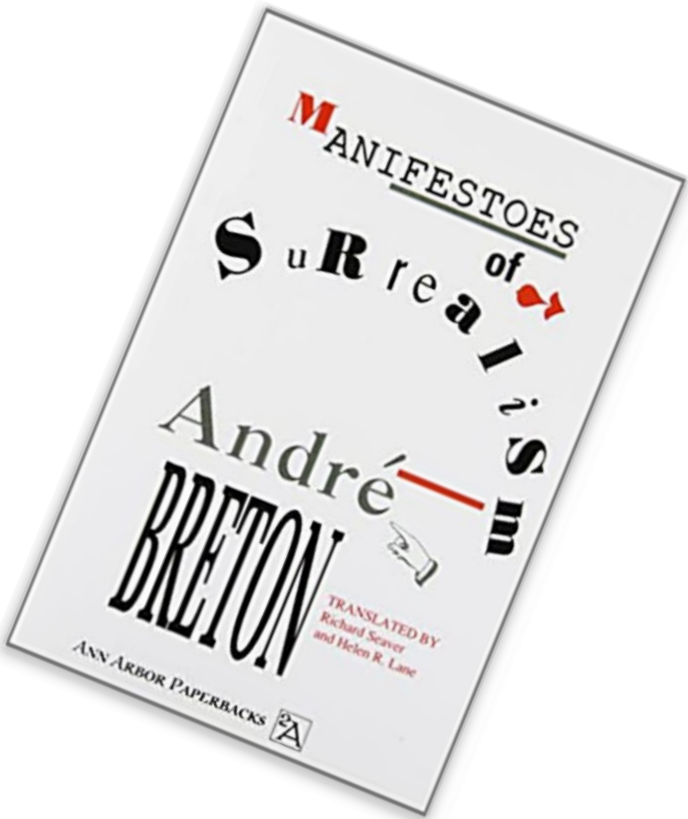
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A POTENTIAL INVESTMENT THESIS ON NFTs IN THE DOMAIN OF ARTS



Salvador Dalí, Apparition of Face and Fruit Dish on a Beach, 1938.



René Magritte
Clairvoyance (La Clairvoyance), 1936



André Breton

B. 1896; D. 1966
Based in Paris



Joan Miró

B. 1893; D. 1983
Based in Paris and Catalonia, Spain



Salvador Dalí

B. 1904; D. 1989
Based in Spain, Paris, and the U.S.



René Magritte

B. 1898; D. 1967
Based in Brussels



Yves Tanguy

B. 1900; D. 1955
Based in Paris



Frida Kahlo

B. 1907; D. 1954
Based in Mexico City



Max Ernst

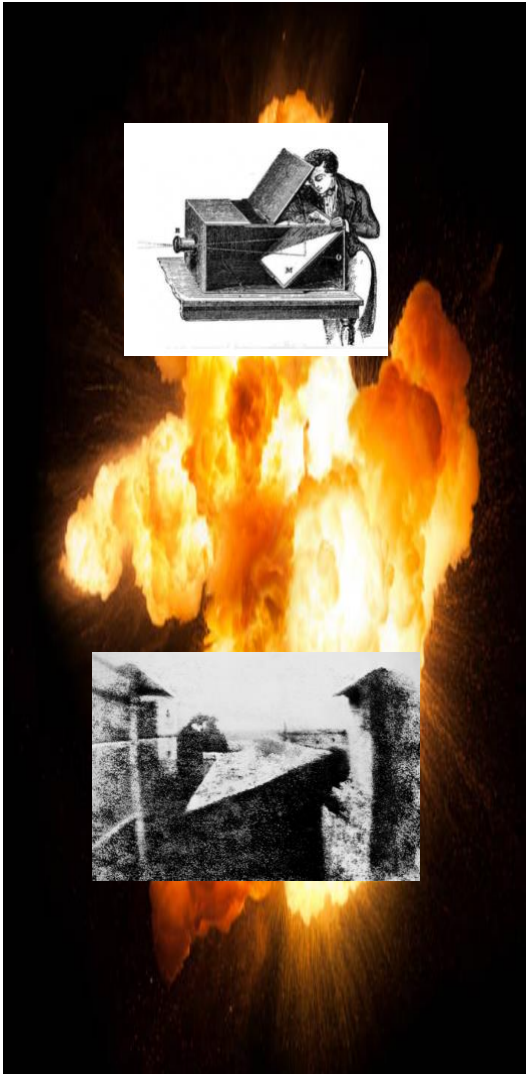
B. 1891; D. 1976
Based in Paris



Meret Oppenheim

B. 1913; D. 1985
Based in Switzerland

A POTENTIAL INVESTMENT THESIS ON NFTs IN THE DOMAIN OF ARTS



Symbolism

Impressionism

Cubism

Abstract art

...

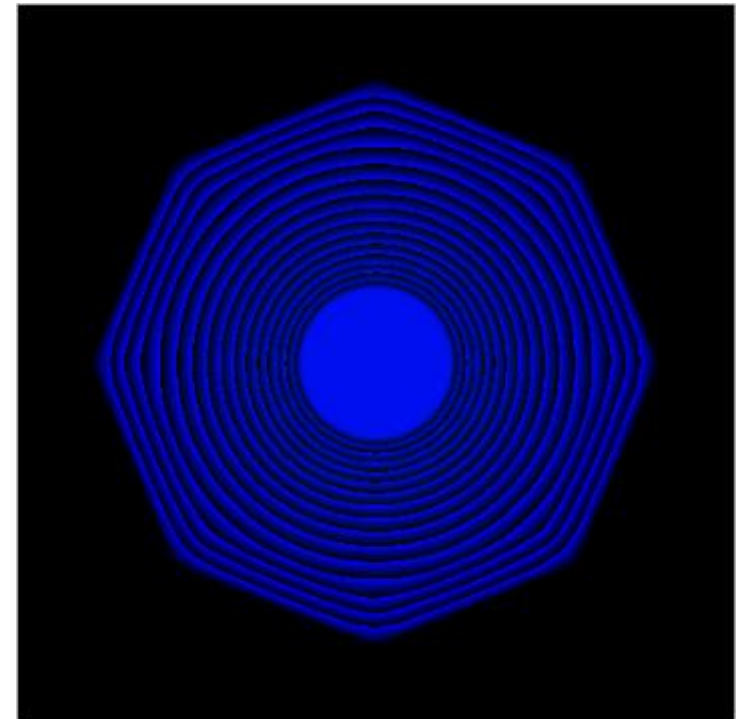
A POTENTIAL INVESTMENT THESIS ON NFTs IN THE DOMAIN OF ARTS



David Hockney in studio drawing in computer, 2008 - photo: Jean Piere Goncalves de Lima



The first known "NFT", Quantum, was created by Kevin McCoy and Anil Dash in May 2014, consisting of a video clip made by McCoy's wife, Jennifer



RISKS

- Risk of capital loss: The strategy does not benefit from any guarantee or capital protection. Any of the risks listed here can lead to a loss of the capital invested in the respective stablecoin/blockchain/dApp.
- Liquidity Risk: The strategy involves investing in assets whose liquidity may decline sharply. In these conditions, it is possible that positions cannot be easily unwinded.
- Technological risk: Due to particular factors such as platform or bridge disruptions, malfunctioning of the algorithmic code of stable coins or changing regulation, the strategy presents a greater degree of technological risk than that generally associated with investments on the major financial markets or assets.
- Cybercrime & Market Manipulation Risk: Cryptocurrencies, platforms, bridges etc. can be subject to cyber attack, risks of hacking, rug pulls/exit scams, front running or flash loan attacks.

RISKS

- Stablecoin risk: Stablecoin sponsors may be unregulated. Stablecoins may be “runnable” if the reserve assets backing the stablecoin mismatch the stablecoin’s liabilities.
- Collateral risk: The collateral posted by the borrowers can be subject to drastic price drops that might lead to losses for the lending strategies once price drops are such that the collateral cannot be exchanged anymore into stable coins without taking big losses.
- Bridge risk: The failure of a bridge might have wider consequences for the value of the wrapped tokens that might propagate further to native tokens.

ABOUT TOBAM

TOBAM is an asset management company offering innovative investment capabilities designed to increase diversification. Its mission is to provide rational and professional solutions to long term investors in the context of efficient markets.

The Maximum Diversification® approach, TOBAM's flagship investment process founded in 2006, is supported by original, patented research and a mathematical definition of diversification and provides clients with diversified core exposure, in both the equity and fixed income markets.

In line with its mission statement and commitment to diversification, TOBAM also launched a separate activity on cryptocurrencies in 2017.

TOBAM manages approx. US\$10 billion (at Dec 31, 2021). TOBAM's team is composed of 51 professionals.

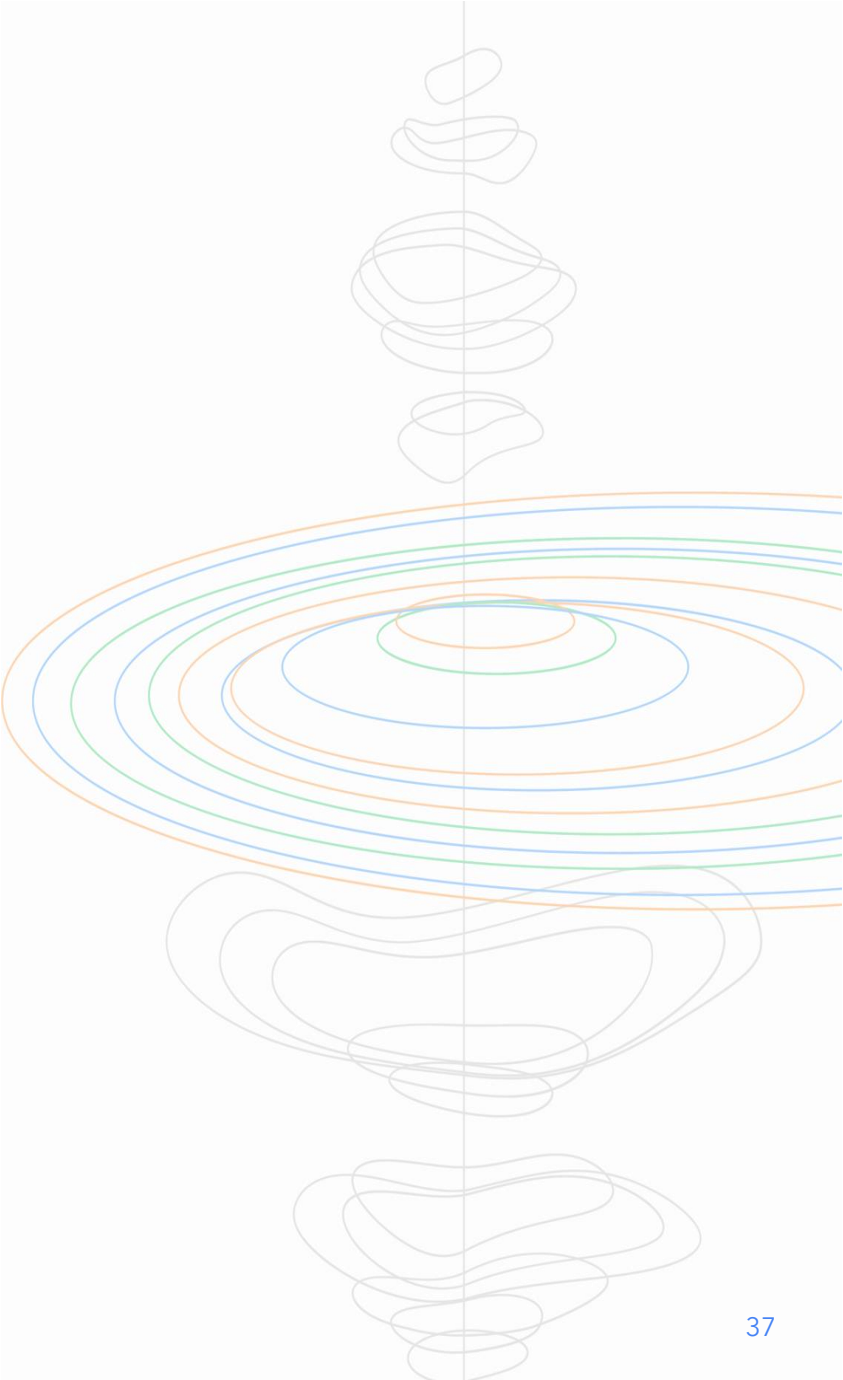
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