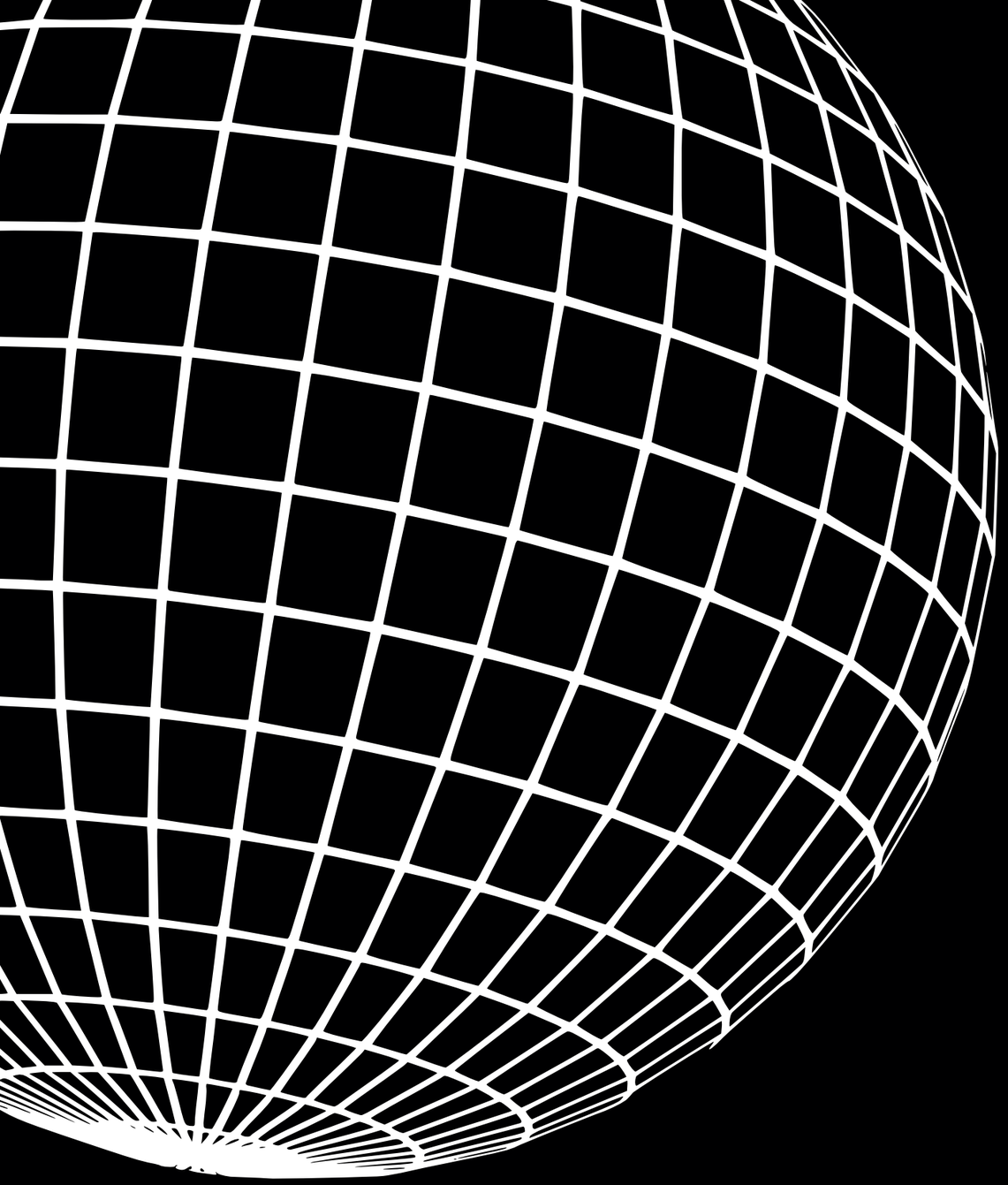
A BITCOIN SUISSE IN-DEPTH
INDUSTRY INSIGHTS INTO MARKETS,
TECHNOLOGY AND REGULATION

OUTLOOK 2024



Outlook 2024
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Disclaimer: numbers, data and analysis / models were finished in first week of November 2023.

Enjoy the Silence before the Storm

A tough year is ending. Inflation, interest rates, wars, and more made the bearish market sentiment, in TradFi and crypto alike, so omni-present during 2023, that many investors were caught by surprise that Bitcoin made +150% (at least at the time of writing this early December). Any TradFi investor would call you crazy for naming a market with a 150% surge a bear market. Well, welcome to crypto – and the Crypto Outlook 2024 edition!

The Bitcoin Suisse Research team once again put together a broad and deep report that aims to help you as an investor to better understand this new asset class. Browsing the report, you will notice how broad the spectrum of topics is: from the interplay between global macro forces and the crypto markets; to a deep dive into 13 predictions of the crypto asset class; to a discussion about how good valuation models for crypto look like; and ending with an eye-opening conversation about the potential for Bitcoin mining to mitigate climate change (yes, you read that correctly).

Before we jump in, allow me a word about our publications. If you are familiar with the previous editions of Crypto Outlook, you may have noticed the new layout and design. In line with the total revamp of our entire research portfolio in the beginning of 2023, the "new" Crypto Outlook is also different in terms of content: even more actionable for investors by presenting those analyses that will influence markets and prices and by highlighting the narratives and developments that are not yet visible in the numbers. What has not changed is our ambition to deliver thorough research that is based on empirics and sound arguments – no matter what the market sentiment is at the time of writing.

The difficulty of thinking about the next year from a global perspective lies in the tension of holding two opposing dynamics in your mind at the same time as **Denis Oevermann** explains in his crypto-macro analysis.

The first dynamic is the global macro turmoil, that has been unfolding in 2023, but goes back to the COVID-induced period of lockdowns. As we enter 2024, markets are expected to face certain headwinds, particularly in the early months. The macroeconomic environment, especially monetary conditions and liquidity are anticipated to remain tight, with low confidence in the control of inflation. The subsequent economic unravelling could lead to short-term market corrections and a recession, especially around the time when the yield curve un-inverts eventually – with the initial yield curve inversion being a historical indicator of impending macroeconomic shifts and turmoil, with a lag of 12-18 months.

The second dynamic is crypto-native. Despite the above challenges, the outlook for crypto assets in 2024 remains overwhelmingly positive. Research suggests that any downturns in the early part of the year should be viewed as temporary. This is due to the expected easing of monetary conditions and subsequent injection of liquidity into the market, following the economic turmoil, which historically leads to a quick recovery and rally in risk assets. Crypto assets, known for their high sensitivity to liquidity, are projected to be among the first assets to recover, outpacing equities in the rebound.

Let me add two thoughts to further support the analysis by Denis Oevermann. Although it is an old narrative, the upcoming halving will be insufficiently priced in again. By April 2024, the block subsidy miners receive will be cut from 6.25 BTC down to 3.125 BTC per mined block. Think of it like this: keeping the BTC price stable in the current fourth epoch requires a demand of at least 328,500 BTC per year. Any additional demand results in fiat-denominated price appreciation. From the fourth halving onwards, demand of 164,200 BTC per year will suffice to keep the price stable. Anything above will result in price appreciation. How likely is it in your view that demand for Bitcoin would fall by 50% in 2024? Because that is what it would take to see the price depreciate.

What knocks the probability even further down is a new, or resurrected, narrative that went front and center in Bitcoin-land in 2023: the longing for the mythical Bitcoin spot ETF in the United States. While the SEC is fully authorized to reject all proposals at any time, you can grasp with your hands the pressure that built in the markets since heavyweights like Blackrock submitted their applications. The next opportunity to get a first, many, or maybe even all applications greenlighted by the SEC presents itself in early January 2024. No matter when: the amount of new investment in-flows could be enormous. If only one percent of only Blackrock's AuM would be redirected into Bitcoin spot ETFs (as Matthew Sigel suggests, see below), that would amount to an additional demand north of 90 billion USD, which is roughly 11% of Bitcoin's market cap as of early December 2023.

We may indeed sail into a perfect storm in 2024, where Bitcoin may have to prove its resilience against a macro environment unprecedented since its inception in 2009.

In his contribution, **Dominic Weibel** goes at length to formulate 13 predictions for crypto for the coming year. Let me just pick out a few ones:

Going a step further than other analyses is the claim that Bitcoin will reach a new All-time-High in 2024, continuing to outperform any other asset class (c.f. Prediction #1). A compact overview comparison across ten asset classes over the last ten years puts strong empirical data to the claim.

Institutional adoption is finally upon us as crypto assets enter traditional portfolios (c.f. Predictions #3 and #4). People said this last year already and talk is cheap, so what about the numbers: what difference would "getting off zero" in crypto terms make for your portfolio? Under prediction #4 you find several model calculations that show the changes in return and Sharpe ratio when the Bitcoin share in a portfolio moves from 0% to 10%.

Finally, a thought-provoking prediction (#7) titled "the non-consensus setup", in which Dominic Weibel expects ETH to outperform BTC in the next crypto bull-run, arguing that Ethereum is – in contrast to Bitcoin – a deflationary cash-flow asset and fully functional computing platform with the best chances to host the bulk of DeFi instruments in the future. On top of that, Ethereum offers intrinsic yield through staking.

One of the key hurdles for institutional investors entering crypto is that valuation models from TradFi are often unsuitable while specific crypto valuation models that feature risk and predictive metrics are still lacking, says **Matthew Sigel**, Head of Digital Assets Research at VanEck in our interview.

While VanEck's sophisticated valuation model for open source blockchains rests on the three pillars penetration rate, market share, and monetization share, their Bitcoin model deviates significantly from that. It rests on the assumption that Bitcoin reaches half of gold's market share, its analogue counterpart. This lead VanEck to set a (long-term) target of $275k per bitcoin, a "conservative estimate" as it excludes potential additional effects from second layer solutions that may extend functionality in the future. They also have an interesting surprising outlook on Ethereum compared to Solana, Ethereum's closest competitor, which I invite you to read.

VanEck is a "fundamentally macro thematic investor". Their main concern echoes our macro analysis: the amount of global debt and the declining credibility of those issuing it. VanEck's models estimate that the US could face interest expenses between 60%-100% of all(!) tax revenues – if interest rates stay above 6% in the future. The underlying thesis is that trading partners of the US will increasingly be hesitant to fund the US system of "sanctions, war, and super woke social policy" and find a way out – and a neutral monetary system is such a way.

Yet, there are also hurdles holding institutional investors back from investing in Bitcoin. The biggest is the energy consumption debate. We had the opportunity to talk with **Harald Rauter**, a sustainability and growth advisor and Bitcoiner about this complex topic.

His verdict on international climate action is sobering. He makes a compelling geo-political argument about why it has been ineffective. Most climate models, named "Shared Socioeconomic Pathways", expect a level of international cooperation that is unrealistic. The support for a set of shared commitments defined in the Paris Agreement in 2005 has been eroding ever since. The reasons are many. Nations are struggling through a reshuffling of the US-dominated world order of the last century. A decaying fiat monetary system with record levels of debt, inflation, and interest rates, puts immense pressure on governments and leads to conflicts over high prices for food and energy. Erupting from this mess are military conflicts and wars.

However, according to Rauter, there is a surprising, alternative pathway to climate action that does not rely on cooperation – Bitcoin mining. The surprise is that Bitcoin, as a side effect of aligning economic incentives, can create climate-positive outcomes in a world of competing nation states. Economic incentives drive Bitcoin mining operations to search for stranded energy globally – and pay for this otherwise unused energy. The changing economics enable new projects that have been unviable so far: building out renewables and reducing venting/flaring of fossil energy sources.

Two additional quantitative projections for you to ponder the changing narrative: First, a recent PWC report estimates "ESG-focused institutional investment" to rise to $33.9 trillion in 2026. Imagine, if 1% of that amount would find its way into "Bitcoin-Climate" projects? Such a demand would be 40% of today's market cap of Bitcoin. Second, at the PlanB Forum 2023, Daniel Batten presented a study according to which the Bitcoin network could become carbon-negative by 2026. How? By putting Bitcoin mining operations onto 35 landfills and capturing the emitted methane to run the miners. This would render Bitcoin mining the *first industry worldwide* to achieve such a feat without resorting to any carbon offsetting. Now, that would be a surprise.

With that I extend my warmest thanks to Dominic Weibel and Denis Oevermann for stemming the lion's share of research effort and our colleagues in Marketing and Legal for getting the report published.

Dear readers, clients and friends, I wish you calm and peaceful holidays with a few silent nights even, because come January, the silence may be over for quite some time in crypto.

"Stay healthy next year and may the fourth (halving) be with you!"

Dr. Marcus M. Dapp
Head of Research at
Bitcoin Suisse

NAVIGATING THE YEAR AHEAD

Crypto & Macro Outlook 2024: Crypto David versus Macro Goliath

by Denis Oevermann,
Investment Analyst & Crypto Researcher
at Bitcoin Suisse

Navigating the Crypto Horizon of 2024 and beyond

As we approach 2024, the crypto market stands at a crossroad of challenging macroeconomic conditions, and a promising bull market. After a modest recovery from its 2023 lows, we might see 2024 split into two distinct phases. The first one testing the crypto market's resilience amidst a potential recession, tightening liquidity and monetary conditions, followed by a second phase, a full-fledged bull run fueled by easing macro conditions as well as the halving and a potential Bitcoin spot ETF.

Our Crypto & Macro Outlook 2024 is anchored in the insights gained from our Crypto & Macro series which we established in the beginning of 2023 to navigate the crypto cycles. These insights successfully helped us to identify various low risk buying opportunities throughout the year amidst tightening macroeconomic conditions. Despite 2023 being a choppy year these low risk buying opportunities signaled a subtle yet overall pivotal shift towards a long-term bullish stance, while we navigated through growing headwinds and increasing odds of a recession.

Our Crypto & Macro Outlook 2024 starts by dissecting the current state of macroeconomics and why the overall macro conditions continue to tighten. However, we also find that crypto is looking bullish long-term nevertheless and that the current times are very attractive for positioning and weather proofing a portfolio for the next bull run. We back the aforementioned with our proprietary in-house risk metrics and cycle dynamics.

Of course, we do not just try to navigate and forecast the macroeconomic conditions, we want to provide a facts and data based, in-depth assessment of potential price projections for the upcoming crypto bull market. We explore the potential market capitalization for the crypto market, as well as peak bull market valuations and price targets for Bitcoin and Ethereum, based on our dynamic price risk metrics and general crypto market cycle dynamics.

As we delve into the most critical macro and crypto specific factors that impact the crypto asset class, we keep our focus on what 2024 holds, by supplementing each analysis step with projections and potential scenarios for the upcoming year and beyond. Our goal is to not only provide a prediction and an outlook, but an actual guide to help navigate the crypto market in 2024 and beyond.

" As we approach 2024, the crypto market stands at a crossroad of challenging macro-economic conditions, and a promising bull market. "

Navigating the Year ahead

Monetary Conditions: Economic Cycles and Market Dynamics

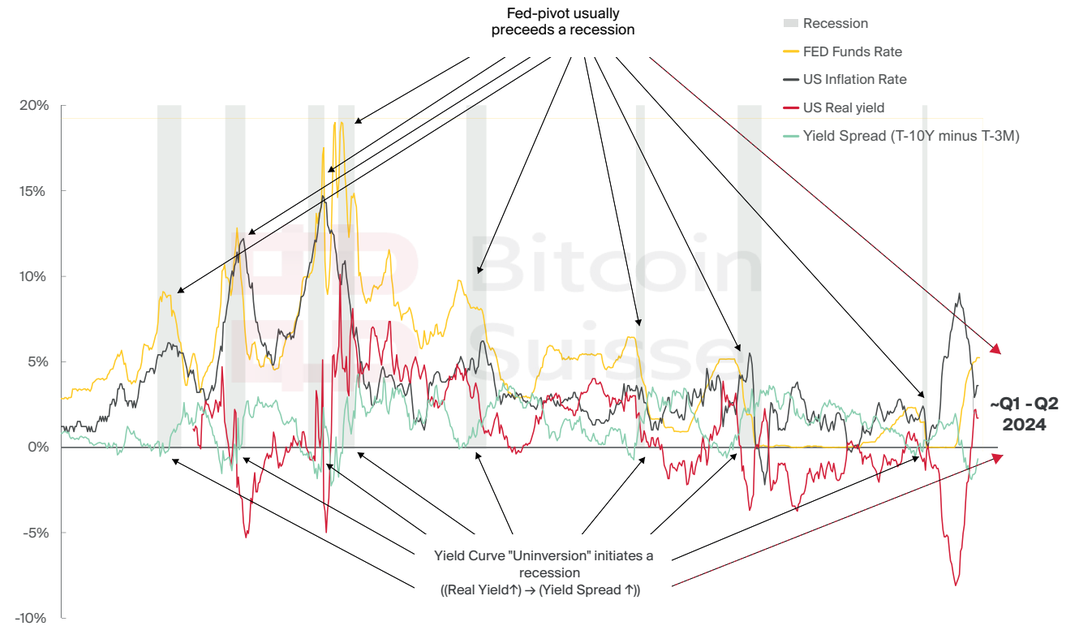
A major building block of macroeconomic conditions and a gauge for assessing the overall economic health are the monetary conditions, which dictate and affect economic fluctuations and price stability. Monetary conditions simultaneously reflect what is going on under the surface in the broad economy and in financial markets. On top of that, patterns in monetary conditions are repeating and almost always follow similar paths which lead to quite predictable outcomes.

We can observe that historically recessions occurred or have been declared retrospectively when the monetary conditions changed in the following manner. An initial spike in inflation, caused by excess liquidity and monetary easing, forces interest rate hikes in response. Short-term interest rates are hiked until inflation comes down sufficiently, while real yields recover and increase somewhat. In the meantime, however, due to the usually abrupt hiking of the short-term interest rate, yield spreads turn negative, implying that short-term interest rates (hiked by the central bank) yield more than long-term interest rates (their equilibrium pricing is determined by supply and demand in the fixed income market). This clearly unsustainable and in the long run "irrational" imbalance, of receiving less yield for long-term debt than the yield on short-term debt, has historically always been temporary. If the long end of the yield curve (long-term interest rates) is lower than the short end of the yield curve (short-term interest rates), the yield curve becomes inverted, which has historically always caused either a recession (in 90% of the instances) or an economic downturn (in the remaining 10% of the incidents) following every single yield curve inversion in the past century.

However, the economic turmoil or recession did not unfold upon the yield curve inversion, but rather once the yield curve un-inverts, which usually occurs an average 12-18 months post initial inversion. The current yield curve inversion occurred in July 2022. With the yield spreads, the difference between long-term rates and short-term rates, still being a moderate distance from turning positive, i.e., the yield curve un-inverting, a recession could still be a few months out, however.

Implications of the current regime of "higher for longer", which has been common amidst similar economic and monetary conditions, are that the rates will unlikely be cut before economic weakness has materialized. This is required to sustainably bring down inflation and help reset the overall system to a healthy, balanced level, which will form a solid fundament for future bull markets across all risk assets. Currently, markets price in first rate cuts around spring 2024, which would align with our predictions for when economic turmoil might materialize, as well as our "second scare" scenario from our fifth Crypto & Macro edition. The rate cuts priced in by the market can be thought of as the aggregate expectation of market participants, for when a pivot in monetary policy might be necessary, thus when a major market weakness is anticipated.

Figure 1: Monetary Conditions

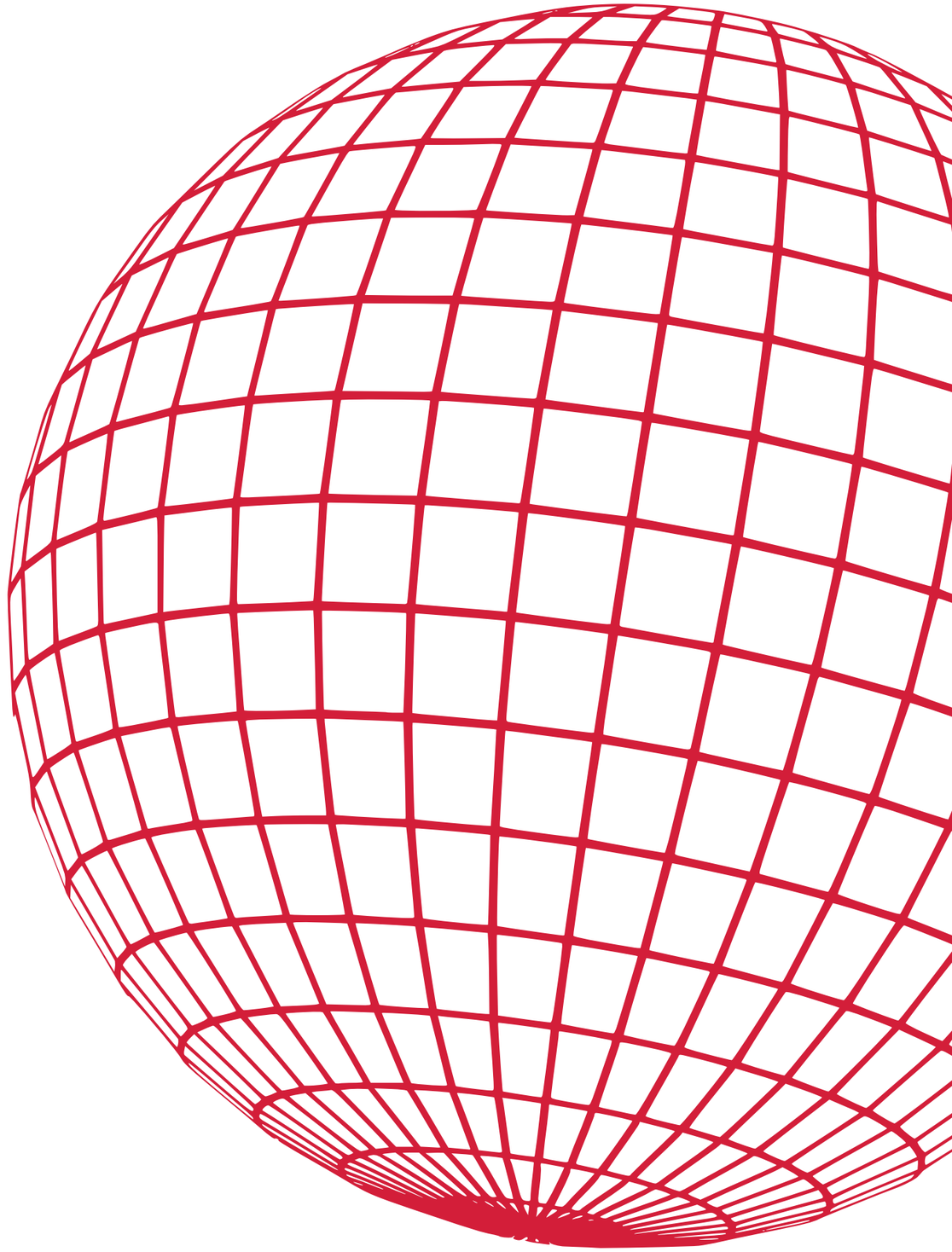


Outlook for 2024

Monetary conditions will remain tight until Q1/Q2 2024, to sustainably reduce inflation. If the FED is forced or decides to pivot and ease prior to balancing inflation, there is a high likelihood of a resurge in inflation later, and a potential “lost decade” ahead in financial markets.

High risk-free rates make the risk premium of most risk assets unattractive, so high-risk assets will give way to low-risk assets. Holding the blue chips out of the risk assets such as BTC and ETH is therefore to be preferred in such periods.

Once economic weakness materializes, and markets witness steep short-term corrections, rates will be cut subsequently, marking the beginning of a new easing cycle and signal a new rally across all risk assets fueled by increasing liquidity.



Navigating the Year ahead

Liquidity Conditions: Ebb and Flow

Though fundamentals matter in the long-term, the overall price action and market dynamics of asset markets and the crypto market are impacted and driven by changes in liquidity. Overall, liquidity is a major driver of asset performance and can be considered a compensation for “currency debasement”. Large in- and outflows of liquidity substantially boost or suppress price action and a close examination of Global Net Liquidity gives potential insights to short- to mid-term price action. Global Net Liquidity is the entirety of global central banks’ asset purchases and balance sheet expansions and thus, a major driver of available liquidity to financial markets.

Contractions in Global Net Liquidity coincide with financial market downturns, while liquidity expansions fuel general economic growth and uptrends in asset prices. Given the close connection of asset returns, following the expansion in liquidity, a disconnect between the two can be, and has always been, only temporary. Currently, markets front run Global Net Liquidity substantially, creating a large gap between liquidity induced price levels and current price levels. This gap, between liquidity and asset prices, due to its appearance also called “liquidity jaw”, will close, as said market inefficiencies can only remain in the interim.

Figure 2:
Liquidity Conditions and liquidity jaw for S&P 500

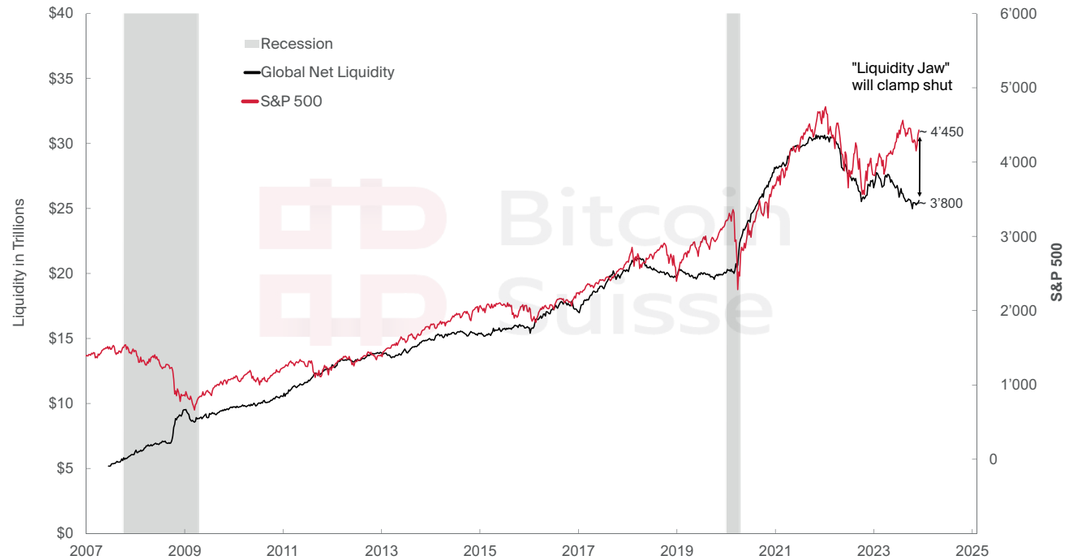
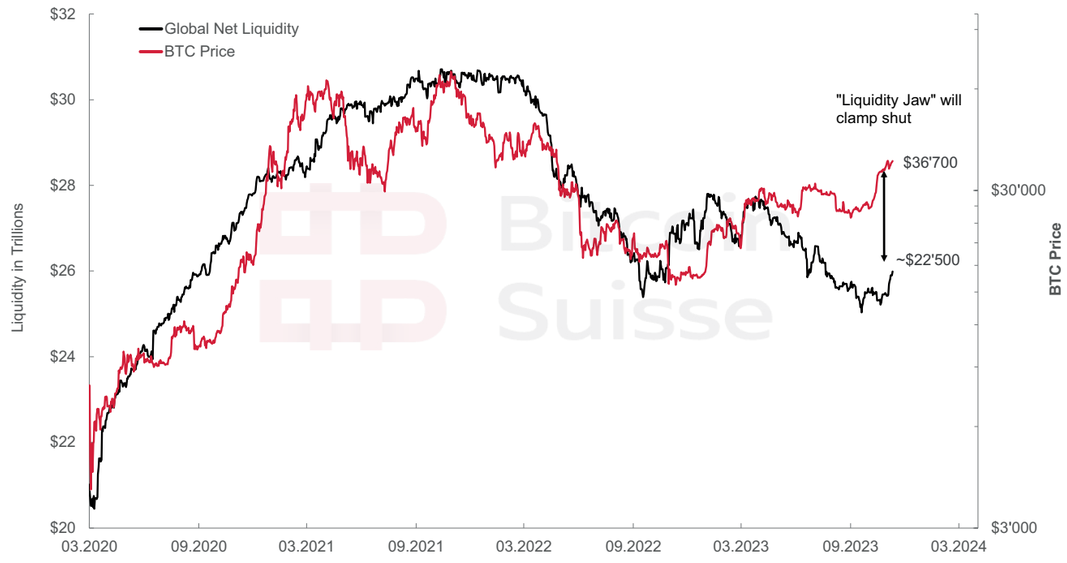


Figure 3:
Liquidity Conditions and liquidity jaw for BTC



Overall, global liquidity conditions are still relatively tight, though the general momentum shifts, implying liquidity tightening is slowing down. However, liquidity overall will continue to remain tight, until financial markets and economic conditions have declined sufficiently, to justify easing liquidity conditions again. Furthermore, Global Net Liquidity is mainly liquidity to financial markets. Therefore, only the liquidity provision to financial markets is tightening slower than prior. The overall trend and lagging impact on financial markets is still going to add downward pressure on valuations, it will just subside. The liquidity tightness and financial conditions for the economy and businesses itself on the other hand, are tightening even more, as measured by ease of access to loans, new loans granted and other means of liquidity.

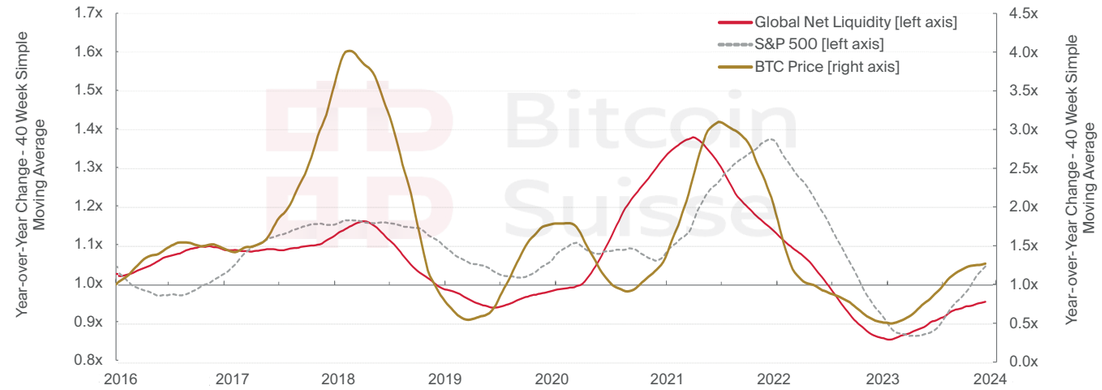
A last point to consider regarding the recent spike and "easing" in liquidity is that a large part of the overall quantitative tightening has been offset by the FED's Reserve Repurchase Agreements (RRP) account being reduced substantially. The FED borrowed more than $2 trillion from the financial system between 2021 and 2023 to absorb excess liquidity to control capital liquidity levels in the markets and maintain long-term monetary policy goals. With quantitative tightening currently ongoing, the FED can "finally" dispose the liquidity back into the system, resetting their RRP balance, while offsetting the effects of the ongoing quantitative tightening somewhat. This effectively reduced the initial repercussions of the quantitative tightening, as it cancelled out with a partial quantitative easing taking place in the meantime. In summary, the real effects of the reduction in Global Net Liquidity have therefore been artificially low, and distorted.

Despite the speed at which liquidity tightening slowing down, the bottom line is that liquidity is still tightening. The effects from that will materialize gradually, especially after the RRP is drained entirely and does not absorb the tightening liquidity anymore. Even though Bitcoin has had a remarkable rally of 130% year to date (YTD), the overall crypto market capitalization (CMC) has not followed suit, being up only around 80% YTD. This indicates that most of the rally is due to a reshuffling and re-allocation of liquidity that has been in the crypto market already. Net new money inflows to the crypto market have been modest overall, and after the most recent rally since September 2023, the CMC is just 7% higher than the levels observed throughout the interim rallies around summer 2022 as well as April and July of 2023.

In Summary, tight liquidity stacks upon stringent monetary conditions and causes the remaining liquidity to only flow into the top assets with the lowest overall risk, which is Bitcoin in the case of the crypto market.

See Crypto & Macro 5.0 where we analyzed the market cycle and macroeconomic conditions interlinking dynamics in close detail. The good news with respect to liquidity is that crypto tends to react first to changes in liquidity and sometimes even front runs the anticipated changes in liquidity, as depicted below. Though the crypto market also front ran its liquidity induced valuation, it still shifted to an overall upwards momentum once the tightening in Global Net Liquidity slowed down. We expect these two induced valuations to re-align in the future, either through a drawback in crypto valuations in the near-term, or through easing liquidity conditions in the short to mid-term. Once liquidity conditions ease, crypto markets will rally first, and the fastest of all risk assets.

Figure 4:
Liquidity Dynamics of Equities and Crypto Assets



■ OUTLOOK FOR 2024

Global Liquidity will remain tight in the interim and suppresses risk asset performance in the short term. This downward pressure will remain until risk assets corrected or liquidity conditions begin to ease.

We see increased liquidity in asset and financial markets around mid-2024, which will boost risk asset prices and close the liquidity jaw gradually.

The crypto market is the most sensitive to liquidity, so once liquidity conditions ease, it will rally first and the most substantial of all risk assets. This will fuel the early bull-market stage even further.

Navigating the Year ahead

Soft Landing, Soft Upside: Constrained Growth for Risk Assets

The solution to economic turmoil and an imbalanced economy and financial/monetary system is either a sharp reset through a recession, or a so-called soft landing, which slowly re-balances the economy over an extended period. The former quickly and abruptly resets the system, with harsh economic pain and weakness in financial markets, whereas the latter tries to slowly and "softly land" the economy into a more balanced equilibrium state, with less severe economic pain being felt by market participants. However, the downside is that soft landings do not manage to sufficiently reset the equilibrium initially, causing stagnation and economic tightness over an extended period until a reset materializes, such as in the 1970s. During this period inflation kept on flaring up repeatedly, because the monetary tightness was lifted too soon, in attempts to not cause the economy to crash abruptly. Consequently, equity markets did not achieve any noteworthy growth for more than a decade, while fluctuating, and neither achieving new all-time highs or lower lows.

On the contrary, getting into a recession in the near term implies more economic pain and a correction in financial markets sooner, and more substantial upside potential sooner for market participants. The economy and markets will recover and move towards new all-time highs more easily on the back of a healthy, reset, and balanced economy than uncertainty and imbalanced conditions. A soft landing would have the likely tendency to delay either scenario while risk assets "climb the wall of worry" even further, not achieving noteworthy upside in the long run amidst non ideal macroeconomic conditions. A recession on the other hand would yield the necessary vent that markets require to correct and rebalance towards an equilibrium instantly and abruptly. A crash and recession get markets to a healthy state faster and more effectively than a soft landing would.

For a healthy and sustained bull market in the crypto markets a soft landing is thus not the preferred outcome in the long run. In the interim, a recession would cause more potential headwinds and a short-term correction in crypto markets. However, such scenarios have in the past provided opportunities to accumulate further crypto asset exposure at more favorable prices, at a time when the crypto market cycle overall transitioned to its bullish phase.

A soft landing would stall the subsequent bull run for risk assets and crypto substantially, and markets will not repeat the same upside of prior years.

In case of a recession, traditional risk assets will correct sharply, and drag down crypto alongside, followed by a long-term rally supported by a "healthy" reset. Recession equals volatility but also opportunity.

In a recession scenario, crypto assets will likely be the first asset class to recover and rally, given their sensitivity and dependency on liquidity.

Navigating the Year ahead

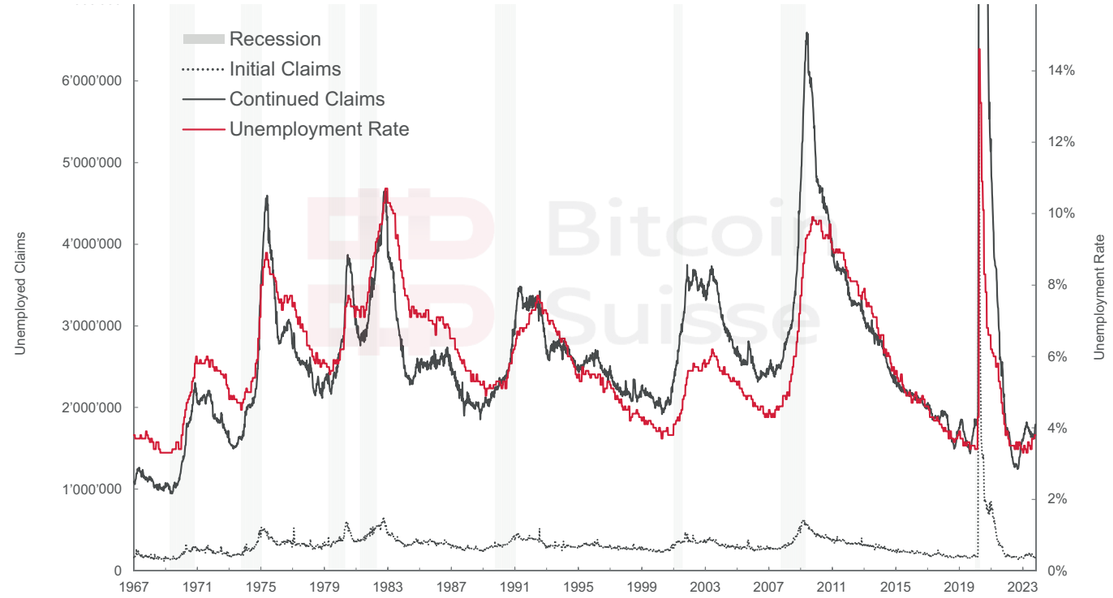
The Labor Market: A final threshold

Given the materializing weakness and economic repercussions due to stringent monetary conditions, tight liquidity conditions and stalling economic activity, the logically induced question would be why we have not seen a recession or economic downturn just yet. A major threshold that stands in between the aforementioned worsening conditions and an economic downturn is, at large, the labor market. As long as people remain in employment and do not drop out of the labor market, an economy can be quite resilient, and absorb a lot of headwinds before faltering.

The unemployment rate has not yet picked up substantially, and remains relatively flat as depicted below, while initial claims, i.e., people that become newly unemployed, did not increase at all over the past period. On the contrary, continued claims, i.e., people that dropped out of the labor market and struggle to find new employment and thus constitute the unemployment basis, continue to grow. A crucial observation is that it is not the initial claims or newly unemployed that drive and lead the unemployment rate, but continued claims, so those that fail to get back into employment. The continued claims have been rising consistently over the past periods, which only now, with a delay, is starting to slowly materialize and add upwards pressure to the unemployment rate. Historically, the unemployment rate tends to have sustained downwards trends at the end of which it reverses upwards sharply, with a recession occurring subsequently. Historically, the continued claims and subsequently the unemployment rate have never increased off their lows without a recession occurring afterwards.

Overall, the aggregate macroeconomic conditions start to show their effects on the leading labor market indicators, suggesting that the final threshold that keeps an economic downturn at bay might fall in the near future. At the current pace this scenario would be likely to unfold in early 2024, unless the labor market recovers and reverts in the opposite direction. Such a scenario would only push out “the inevitable” further, while increasing the likelihood of a soft landing. Given that the unemployment rate reached a 50-year low, on the back of monetary stimulus amidst an economic boom, this seems unlikely in the current regime.

Figure 5:
Labor Market Conditions



■ OUTLOOK FOR 2024

The economic repercussions of stringent monetary conditions and tight liquidity conditions will continue to weaken the labor market.

A recession in early 2024 is likely to be caused subsequently, following sufficient weakening of the labor market.

Navigating the Year ahead

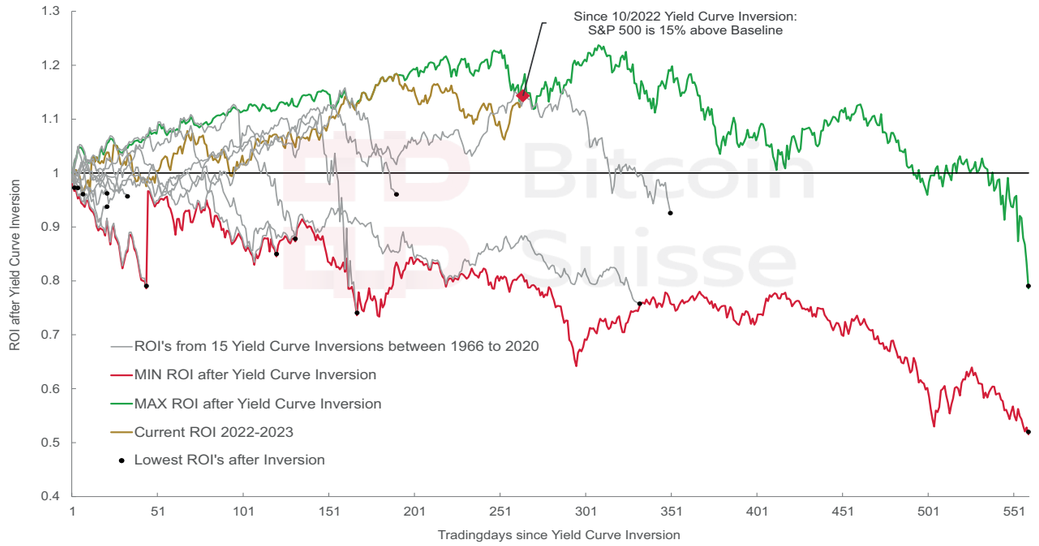
Yield Curve Inversion: Implications for Risk Assets

We have been observing and analyzing the yield curve closely throughout the year in our Crypto & Macro series due to its high significance in reflecting aggregated macroeconomic conditions. An inverted yield curve implies that interest rates of shorter duration treasuries are having a higher yield than those of longer duration treasuries, which is a clear market inefficiency, caused by mistrust and imbalances in the system. As mentioned previously, an inverted yield curve has led to either a recession in 90% of the incidents, and an economic downturn in 10% of the incidents in every yield curve inversion since the Great Depression almost a century ago. Though an inverted yield curve is thus a high certainty indicator that economic turmoil is ahead, the market dynamics of risk assets are somewhat detached from it in the interim.

As plotted below, markets have a high tendency to rally and "climb the wall of worry" into a recession or economic downturn once the yield curve inverted. However, the S&P 500 always turned lower in every single incident of a yield curve inversion, no matter how short or long-lived, despite its initial rallies. Out of 16 inversions since 1966, markets rallied substantially a total of eight times, yet in all cases markets closed below their valuations from the time of the yield curve becoming inverted. The average downturn for the S&P 500 post yield curve inversion in the past has been 16.7%. In the current cycle, the S&P stood at 3'859 when the yield curve inverted in October of 2022, and is up 16.6% ever since, valued at 4'500. Every single historical precedent indicates that the S&P would close below the 3'859 level at some point, while the average historical drop of 16.7% would imply an S&P valued at around 3'211, a roughly 30% drop from current levels. The S&P 500 not closing below the yield curve inversion level of 3'859, roughly 13% below current prices, would be the first outlier in the entire history of available data and be the only 1 out of 16 incidents where a yield curve inversion did not lead to subsequent lower valuations in equity markets.

The crypto market overall follows monetary and liquidity dynamics quite closely, being a risk asset such as the S&P 500, making it a reasonable assumption that it will show similar dynamics following a yield curve inversion. A drop below yield curve inversion levels would thus imply that BTC would drop below ~$20'000 and could even revisit the cycle lows. Such a scenario would require a 50% correction to the downside which seems less likely in our opinion, because even though crypto does get impacted and driven by monetary and liquidity conditions, the overall implications and economic repercussions of an inverted yield curve are largely confined to equities and traditional risk assets. Crypto, on the other hand, is likely less affected by these general macro factors. The overall impact of the inverted yield curve, and the inevitable un-inversion, will still impact crypto price dynamics negatively in the interim, though we project these to be short lived and crypto to recover from such an external hit as the first risk asset. An un-inverting yield curve could be seen as a short-lived opportunity to enter the crypto market at a lower valuation right at the start of the subsequent crypto bull run, as indicated by our research.

Figure 6:
S&P 500 Return on Investment (ROI) after Yield Curve Inversion



■ OUTLOOK FOR 2024

Risk assets such as equities and crypto are likely to rally into a potential recession.

Equity markets will potentially correct in 2024 to the downside and the S&P 500 will drop below $3'859, its level from when the yield curve inverted.

Upon the eventual yield curve un-inversion, the crypto market, together with other risk assets, will likely correct to the downside in the short-term, potentially offering long-term accumulation prices based upon historical evidence for risk assets.

Navigating the Year ahead

Outlook for 2024: Overcoming Recession – Embracing the Rally

Overall, 2024 will be a very bullish year for the crypto market and we would generally classify it as an accumulation and buying opportunity based on our research. Still, we see some headwinds in early 2024 that could cause short-term corrections. The macro conditions are continuously tightening, and there is a low confidence that inflation will be under control very soon with rate cuts not priced in before spring/summer 2024. On top, markets remain reluctant to acquire treasuries at current interest rates, implying the average market expectation is still bearish on markets in the short-term and a correction is unlikely to occur very soon, but rather around the yield curve un-inversion.

Throughout 2023 the macro risks have materialized only slowly, but at some point, they will materialize abruptly, which has a high likelihood of occurring in early 2024. However, once the yield curve uninverts to its normal state and the anticipated macroeconomic conditions materialize in early 2024 falls in place with past seasonal corrections in crypto markets. Once sufficient economic pain has been caused to reset the system, monetary conditions will be eased, and liquidity subsequently injected into the system. Once the actual pivot and rate cut is imminent, bonds will be the first to bottom. Afterwards risk asset prices will recover quickly and move upwards again, driven by easing monetary and liquidity conditions. Because crypto assets are highly sensitive to liquidity, it will be the first risk asset to recover and rally substantially. Equities will still be lagging during this period as their prices are somewhat stickier and not only dependent on liquidity increasing, but also the economy recovering and improving.

Thus early 2024 will be the early stage of the next bull market. The only bearish catalyst we see for the crypto market is the macro side, which our research suggests to only materialize as a temporal correction phase in hindsight. This might be an opportunity amidst the early bull market, however, as indicated by the overall very bullish cycle dynamics predicted for 2024. Despite the recession risk which will cause the crypto market to witness a temporal correction, there might be opportunity costs linked to not being invested and exposed to the tremendous upside crypto potentially offers in the long-run, by not acquiring crypto assets in potentially lower risk price territory around the final stage of the bear market. Overall, a recession will see monetary and liquidity conditions ease in return, and since crypto bottoms first of risk assets it will rally even faster.

We do not see a cycle top in 2024 yet, unless something changes substantially on the macro end or crypto industry factors change dramatically. Based on our research and analysis, 2024 could be a buying and HODLing year before we approach the potential crypto cycle top in 2025. In summary we view 2024 as a potentially very bullish year long-term, implying that low prices and market corrections could support further accumulation.

■ OUTLOOK FOR 2024

Q1/Q2 of 2024 will see the economic turmoil play out – a recession is the most likely scenario.

Crypto markets will correct simultaneously, and not revisit these lows again for the remainder of 2024, nor in the next bear market in 2026 and beyond.

2024 is likely a buying and HODLing year , it will mark the first half of the bull run – we do not expect a cycle peak before 2025.

Navigating the Year ahead

Crypto Market Cap Projection

With the crypto market following an almost perfect logarithmic growth trend, due to its exponential growth and S-Curve adoption, it is easy to model and predict the general dynamics of its seasonal trends and overall cyclicality with relatively high confidence. Plotted below is the total crypto market capitalization (CMC) color coded by our Total Crypto Market Dynamic Cycle Risk Metric which gauges whether the crypto market, based on a specific market cap observation is classified as high risk or low risk. The risk metric considers factors such as momentum, trend, relative market strength and relative inter crypto market cycle dynamics. If prices move up moderately, the risk stays relatively constant, whereas prices moving sideways or declining will reduce the implied risk of the Total Crypto Market Dynamic Cycle Risk Metric. Fitted to the overall growth trend of the CMC are its logarithmic trend channels for cycle tops and cycle bottoms as well as the overall total crypto market cap trendline. The risk metric ought to be used in conjunction with the trend channels to generate a reliable buy or sell signal; the risk itself can be indicated as relatively low, due to tremendous declines in price, while the overall price itself might still be substantially above the trendline. Consequently, dark red, high-risk indications, way above the trendline and close to the top bound function act as a quite reliable sell signal, whereas green and dark green, low risk indications, below the trendline, close to the bottom bound function as reliable long-term entry prices and dollar cost average (DCA) price levels.

We can use these metrics and characteristics to model and simulate the potential progression of the present market Cycle IV and the upcoming bull market. Considering past crypto cycle dynamics and the external headwinds from macroeconomic conditions, there is a potential revisiting of the lower bound and a CMC of around ~$1T in early 2024. Throughout this phase the overall risk remains relatively low and offers quite optimal long-term entry prices to position for the next crypto cycle and upcoming bull market. The remaining risk for altcoins is still relatively high, as also the intra cycle dynamics of crypto induce that they will on average decline against BTC and ETH. This phase could be followed by a moderate and consistent early bull run phase upwards of ~$5T by year-end 2024, based on historical cycle dynamics. This early bull market rally will be largely confined to BTC and ETH, while the large share of altcoins will likely underperform on a relative basis, and be the reason the CMC does not grow as rapidly initially as BTC and ETH. The final bull market phase and Cycle IV peak is projected to be in mid-2025 at a potential peak CMC of up to ~$15T to $20T overall. The Top Bound for Cycle IV in late 2025 stands at $49T with the overall Trendline supporting a CMC of $7.9T. During this final market phase of Cycle IV CMC could grow almost exponentially, while BTC and ETH profits are funneled down to altcoins and further out the risk curve, seeing altcoins outperforme across the board on a relative basis.

Though there is a high confidence of these dynamics playing out in a similar manner, there are potential unaccounted external factors that might skew these dynamics to the upside or downside. A soft landing and lagging economic performance, uncertain monetary and liquidity conditions amidst refiring inflation and a delayed macro crash might reduce the upside of the cycle. On the other hand, a potential super cycle due to abnormal adoption and net funds inflow into crypto assets could cause a tremendous blow-off top peak to the upside, seeing higher valuations and higher volatility outside our models and projections.

Figure 7:
Crypto Market Cap (CMC) color-coded by our Total Crypto Market Dynamic Cycle Risk Metric. CMC Projection for Cycle IV.

The crypto market capitalization (CMC) is likely to see lower valuations around $1T in early 2024 due to cycle dynamics and macro headwinds.

The CMC will rally to roughly $5T by year end 2024 in an early bull run, while BTC and ETH outperform most altcoins on a relative basis.

The CMC will have its final bull run stage in mid-2025, seeing its potential cycle peak valuation of ~$15T to $20T, which will be primed by altcoins outperforming both BTC and ETH on a relative basis.

“The CMC will have its final bull run stage in mid-2025, seeing its potential cycle peak valuation of ~$15T to $20T, which will be primed by altcoins outperforming both BTC and ETH on a relative basis.”

Navigating the Year ahead

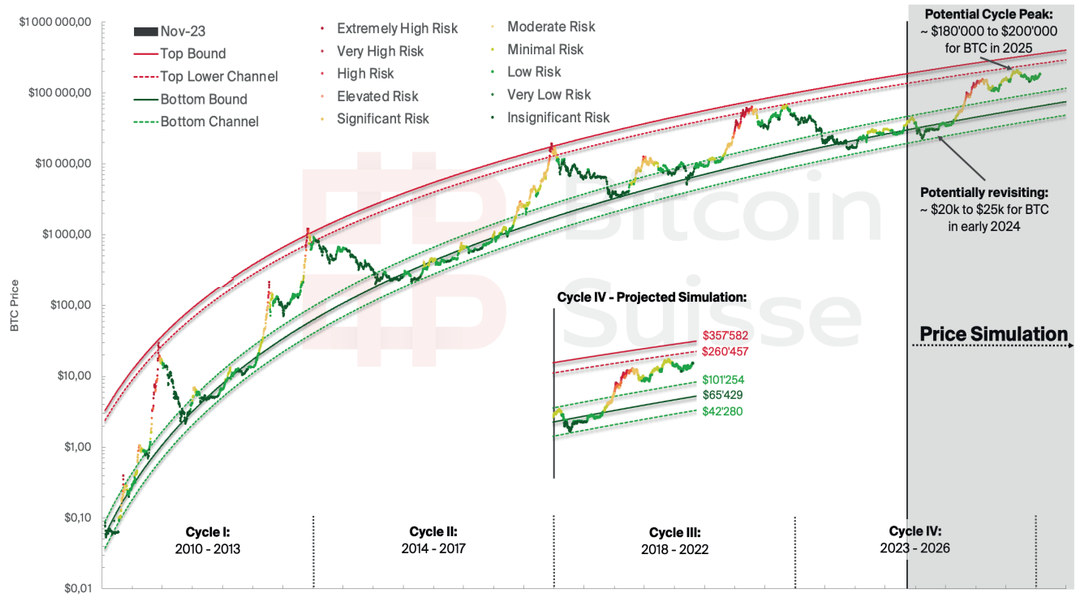
Bitcoin Price Forecast and Cycle Dynamics

Bitcoin is the crypto asset which follows its modelled logarithmic growth trend most closely, due to its exponential growth and S-Curve adoption making it the easiest to model and predict the general dynamics of its seasonal trends and overall cyclicality with high confidence. Plotted below is Bitcoin's price color coded by our Bitcoin Dynamic Cycle Risk Metric which gauges whether Bitcoin, based on a specific price observation is classified as high risk or low risk. The risk metric considers factors such as momentum, trend, relative market strength and relative inter crypto market cycle dynamics. If prices move up moderately, the risk stays relatively constant, whereas prices moving sideways or declining will reduce the implied risk of the Bitcoin Dynamic Cycle Risk Metric. Fitted to the overall growth trend of Bitcoin are its logarithmic trend channels for cycle tops, and lower cycle top bound, as well as its bottom bound and bottom channel trend. The risk metric ought to be used in conjunction with the trend channels, to generate a reliable buy or sell signal; the risk itself can be indicated as relatively low, due to tremendous declines in price, while the overall price itself might still be substantially above the trendline. Consequently, dark red, high-risk indications, way above the trendline and close to the top bound function as quite reliable sell signal, whereas green and dark green, low risk indications, below the trendline, close to the bottom bound function as reliable long-term entry prices and dollar cost average (DCA) price levels.

Considering our risk metric and the cycle dynamics we can model and simulate the likely bull market progression for BTC. Given the current transition of Cycle IV from late-stage bear market to early bull-run, there remains the tail risk of BTC having a final correction. However, BTC fully reset its price in this bear market already, contrary to most other crypto assets, so it will likely be more robust on the downside. A potential macro recession or overall market correction should therefore see its prices stay above $20-$25'000 on the lower end in such a scenario. Any significant deviation of Bitcoin's price to the downside from current price levels could be considered as a strategic entry position to capture the maximum upside for the upcoming cycle phase, as indicated by our cycle dynamics and risk metrics. Based on our research, BTC offers the lowest relative risk based of the Bitcoin Dynamic Cycle Risk Metric and might thus be the major outperformer for the early bull run phase throughout 2024, with new all-time high prices for BTC being likely near year end of 2024. The projected Cycle IV peak for Bitcoin is in early 2025 to mid-2025, as BTC tends to peak as the first crypto asset, before profits are realized and funneled out the risk curve to ETH and altcoins. Bitcoin's potential cycle peak in 2025 could be around $180'000 to $200'000 based on past cycle dynamics and a price simulation in line with our risk metric. The Bottom Bound for the Cycle IV final phase stands at $65'400, while the Bottom Channel ranges from $42k to $101k. On the upside Bitcoin's Top Bound is $357'000 with a Top Lower Channel of $260'000.

Bitcoin is positioned best within its cycle dynamics and according to its Bitcoin Dynamic Cycle Risk Metric out of the major crypto assets. Yet also BTC would be subject to external risk factors and an overall macro crash that has a non-negligible likelihood of materializing in early 2024. However, Bitcoin is the most robust on the downside, and such market corrections are historically relatively short lived. Given the current setup of Cycle IV such an event could be seen as an additional opportunity in the late-stage bear market/early bull market to expand the BTC position for the early bull run, as the majority of upside price performance will be confined to BTC at large. Furthermore, the final Cycle IV peak could be skewed to the upside in case of a mega catalyst that would send prices upwards of the simulated price and closer to the Top Bound even. A macro fallout event, or general macroeconomic tightness might stall Bitcoin's price action on the other hand. Still, certain macro crash events might also support the case for Bitcoin and crypto in the long run, in case of a sovereign default, or further nation state adoption to mitigate macroeconomic conditions.

Figure 8:
Bitcoin price color-coded by our Bitcoin Crypto Dynamic Cycle Risk Metric. BTC price Projection for Cycle IV.



Bitcoin will see its lowest prices for Cycle IV in early 2024, and not revisit these lows again thereafter. Bitcoin reset its cycle dynamics on the downside and is the most robust out of all crypto assets in the current cycle phase – in a final downturn or amidst macro head-winds its price should remain above $20-$25'000.

Bitcoin will make a new all-time high in late 2024, with its final Cycle IV peak occurring in early to mid-2025.

Bitcoin's Cycle IV peak will be around $180'000 to $200'000, with some mega catalyst having the potential to drive valuations closer to the Top Bound of around $357'000.

"Bitcoin will make a new all-time high in late 2024, with its final Cycle IV peak occurring in early to mid-2025."

Navigating the Year ahead

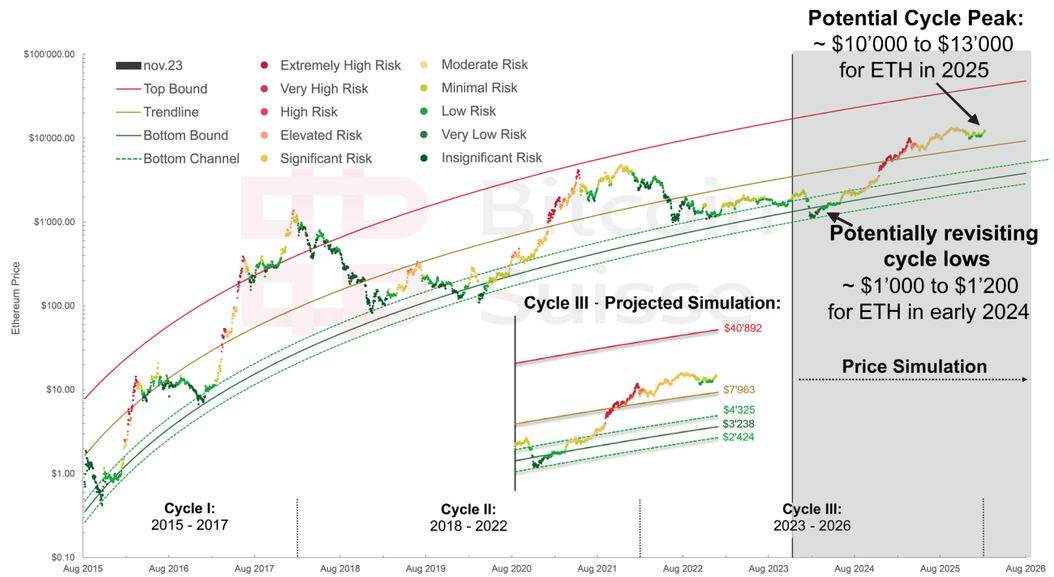
Ethereum Price Forecast and Cycle Dynamics

Due to Ethereum's rapid "catch-up" adoption in its Cycle I it does not follow its logarithmic growth trend as closely as BTC or the crypto market capitalization (CMC). Nevertheless, it shows a consistent exponential growth and S-Curve adoption and therefore the general dynamics of its seasonal trends and overall cyclicality can be modelled and predicted with relatively high confidence. Plotted below is Ethereum's price color coded by our Ethereum Dynamic Cycle Risk Metric which gauges whether ETH, based on a specific price observation is classified as high risk or low risk. The risk metric considers factors such as momentum, trend, relative market strength and relative inter crypto market cycle dynamics. If prices move up moderately, the risk stays relatively constant, whereas prices moving sideways or declining will reduce the implied risk of the Ethereum Dynamic Cycle Risk Metric. Fitted to the overall growth trend of ETH are its logarithmic trend channels for cycle tops and cycle bottoms as well as the overall Ethereum price trendline. The risk metric ought to be used in conjunction with the trend channels, to generate a reliable buy or sell signal; the risk itself can be indicated as relatively low, due to tremendous declines in price, while the overall price itself might still be substantially above the trendline. Consequently, dark red, high-risk indications, way above the trendline and close to the top bound function as quite reliable sell signal, whereas green and dark green, low risk indications, below the trendline, close to the bottom bound function as reliable long-term entry prices and dollar cost average (DCA) price levels.

Combining logarithmic trends and overall cycle dynamics we can simulate the likely progression of ETH for the remainder of Cycle III. Contrary to BTC, ETH has not fully reset its price for the current cycle as much as BTC has, so it has a higher likelihood of declining in the short-term and a higher downside risk and volatility to the downside. An overall crypto market correction or macro recession scenario could therefore cause it to revisit its lows in early 2024 of around $1'000 to $1'200 making it reset its cycle lows in the Bottom Channel. Ethereum can be considered the altcoin market leader, though itself it is a blue-chip, and tends to underperform against BTC in these stages of the market cycles. Overall Ethereum's Dynamic Cycle Risk Metric is still relatively low, nevertheless, so despite its higher volatility to the downside it still offers a generally noteworthy risk-reward ratio for its projected bull run ahead.

Ethereum will likely make its Cycle III lows in early 2024, and rally subsequently in the early bull-run, chasing Bitcoin, while outperforming altcoins across the board. Any short-term correction in ETH could serve as a chance to acquire ETH at a lower price in order to profit from a potential subsequent bull run . Near the year-end 2024 ETH could be close to its former all-time high of around $4'500. Throughout early 2025 to mid-2025 Ethereum is projected to reach its peak valuations of Cycle III of up to $10'000 - $13'000. At this cycle phase ETH will outperform Bitcoin, while some of the price gains will be realized and funneled out the risk curve into altcoins, which will mostly outperform ETH subsequently. The Top Bound for Ethereum is at $40'900 at the end of Cycle III, while the Trendline supports ETH prices of roughly $8'000. Ethereum's Bottom Bound is at ~$3'200 and the Bottom Channel ranges from ~$2'400 to ~$4'300.

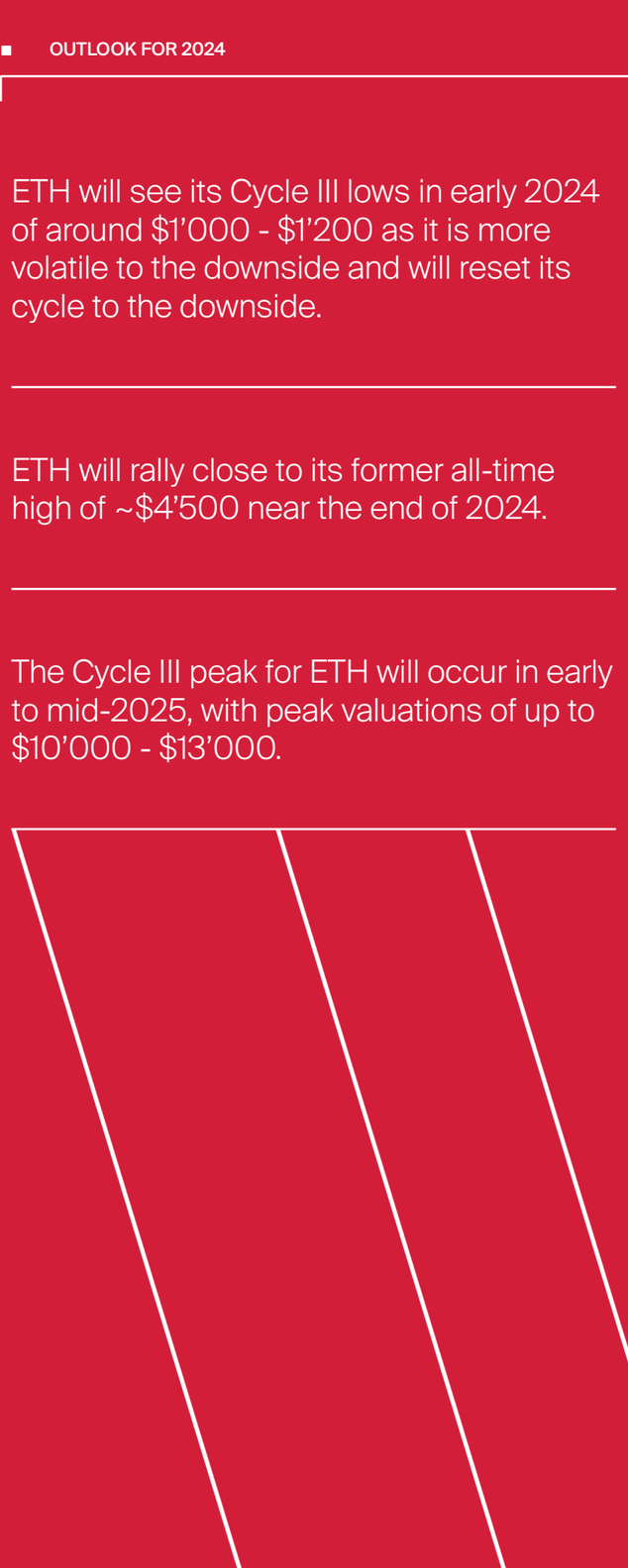
Figure 9:
Ethereum price color-coded by our Ethereum Crypto Dynamic Cycle Risk Metric. ETH price Projection for Cycle III.



ETH will see its Cycle III lows in early 2024 of around $1’000 - $1’200 as it is more volatile to the downside and will reset its cycle to the downside.

ETH will rally close to its former all-time high of ~$4’500 near the end of 2024.

The Cycle III peak for ETH will occur in early to mid-2025, with peak valuations of up to $10’000 - $13’000.



“ ETH will rally close to its former all-time high of ~$4’500 near the end of 2024. ”

Navigating the Year ahead and beyond

Given our comprehensive analysis and aggregation of the macro economic factors together with the crypto market cycle dynamics we want to provide a final overview of the key factors to consider when navigating the crypto market in 2024 and beyond.

OUTLOOK FOR 2024

Given the tight monetary and liquidity conditions, coupled with the current late-stage bear market / early-stage bull run in crypto markets, historical crypto market dynamics show that limiting major crypto holdings to BTC mainly, ETH to a lesser extent, proved itself to have been beneficial. Altcoins might be selectively confined to high confidence bets only, because those select few altcoins that end up outperforming their BTC or ETH pair usually do not achieve a substantial outperformance to justify the excessive risk taking in the current market conditions.

Q1 and Q2 of 2024 have the highest chance of a macro recession and downturn occurring, and once it materializes, we likely see the lowest prices for 2024, while not revisiting these lows going beyond 2024.

OUTLOOK FOR 2024

While a recession is a large tail risk for crypto, once the economic downturn materializes will coincide with easing liquidity and monetary conditions which will cause the crypto market to rally and recover first and add to the bull run momentum. Historically, recessions have therefore been generally excellent buying opportunities in the long run.

Despite the almost certainty that a crash and correction might come, the riskiest strategy in the current market conditions is to be divested from markets entirely, as we already face relatively low risk long-term accumulation prices for crypto assets as according to our risk metrics. Furthermore, markets tend to go up most of the time, and we are nevertheless in the transitioning phase to an early bull market.
The downside risk of a recession is best mitigated by limiting exposure to blue chips within the crypto market, such as BTC which gives sufficient exposure to the upside while covering the downside risk best within the crypto market.

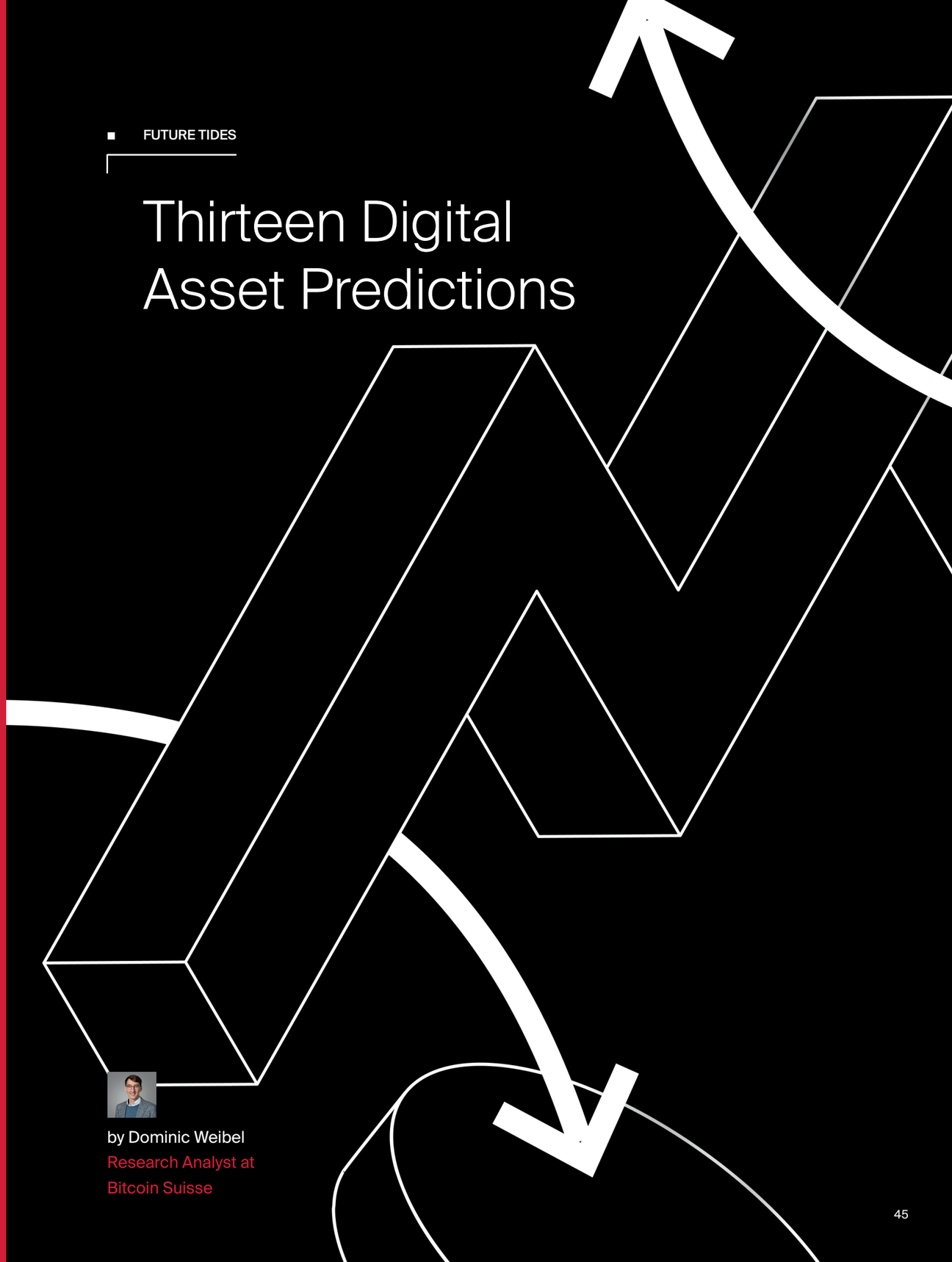
Our research suggests that 2024 will be a bullish year. We might have short corrections as in any bull market, but those could be seen as further buying opportunities. We do not see a top in 2024 occurring unless some major substantial change on the macro end or regarding the crypto industry materializes.

In our opinion, going further out the risk curve from end 2024 and early 2025 onwards might allow gaining maximum upside on the final phase of the crypto bull run through altcoins, before gains are usually consolidated into BTC and ETH again.

Navigating the Year ahead

Table of Figures

Thirteen Digital Asset Predictions



by Dominic Weibel
Research Analyst at
Bitcoin Suisse

Thirteen Digital Asset Predictions

What's next?

It has been two years since the crypto market peaked, and while 2023 was somewhat convenient, anyone following the space is certainly wondering: what's next?

Will history rhyme and ship yet another four-year cycle on the back of the Bitcoin halving? Will we finally see true crypto adoption based on product-market fit? Will we see an institutional bonanza triggered by a spot ETF approval? Is there a potential black swan looming? And not to forget, when supercycle?

The contents of this article are based on our combined knowledge and are generally available knowledge derived from historical evidence which might not materialize again even under similar or identical circumstances. The predictions in this article are purely conjectures on what might or might not happen. None of the following content is intended or to be understood to include any advice or recommendation for action or non-action in financial or other matters.

PLEASE NOTE

The content presented subsequent to this disclaimer should not, under any circumstances, be interpreted as investment advice.

"*Men Wanted: For hazardous journey. Small wages, bitter cold, long months of complete darkness, constant danger, safe return doubtful. Honour and recognition in case of success.*"

- Ernest Shackleton

PREDICTION #1

Sticks out a mile: The SEC greenlights a U.S. Spot Bitcoin ETF in 2024

2023 saw a major increase of ETF spot applications and an emphasis towards BTC and ETH from financial powerhouses such as BlackRock, Fidelity or VanEck. It has been 6 years since VanEck first filed for a Bitcoin spot ETF, yet never in history were the odds higher for an approval than right now.

We expect green lights in one sweep for all applications approaching January 10th, which is the final deadline for ARK. What changed in the recent months that supports our prediction?

OUR PREDICTION

Revived momentum as renowned financial institutions, such as BlackRock with an impeccable application track record, Invesco, or Franklin Templeton applied for Bitcoin spot ETFs.

The SEC meaningfully engaging with ETF issuers while facing sustained pressure from Congress and the federal court ruling against the SEC in resounding favor of Grayscale.

Various proxies such as GBTC's discount to NAV narrowing down to single digits (in line with the 90% projection of Bloomberg analysts) and the sustained bid on COIN (up 300% YTD, outperforming BTC; Coinbase filed as custodian for 9 of 12 Bitcoin ETFs) indicate high odds of approval.

Caution however, rallies on the back of TradFi vehicles historically failed twice: with the launch of CME futures marking the top in 2018 and the launch of the Bitcoin Futures ETF marking the top in October 2021. Moreover, the SEC rejected all 33 ETF applications to date.

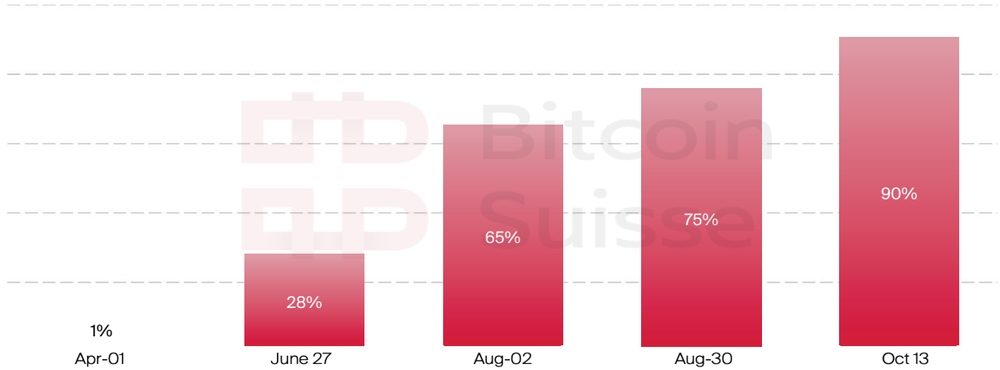
"*We expect green lights in one sweep for all applications approaching January 10th, which is the final deadline for ARK.*"

■ PREDICTION #1

Deadlines of U.S. spot Bitcoin ETF applications

Issuer	Company	First Deadline	Second Deadline	Third Deadline	Final Deadline
ARK 21Shares Bitcoin ETF	21Shares and ARK	29/06/2023	13/08/2023	11/11/2023	10/01/2024
Bitwise Bitcoin ETP Trust	Bitwise	01/09/2023	16/10/2023	14/01/2024	14/03/2024
iShares Bitcoin Trust	BlackRock	02/09/2023	17/10/2023	15/01/2024	15/03/2024
VanEck Bitcoin Trust	VanEck	02/09/2023	17/10/2023	15/01/2024	15/03/2024
WisdomTree Bitcoin Trust	WisdomTree	02/09/2023	17/10/2023	15/01/2024	15/03/2024
Invesco Galaxy Bitcoin ETF	Invesco & Galaxy Digital	02/09/2023	17/10/2023	15/01/2024	15/03/2024
Wise Origin Bitcoin Trust	Fidelity	02/09/2023	17/10/2023	15/01/2024	15/03/2024
Valkyrie Bitcoin Fund	Valkyrie	04/09/2023	19/10/2023	17/01/2024	19/03/2024
Global X Bitcoin Trust	Global X	07/10/2023	21/11/2023	19/02/2024	19/04/2024
Franklin Bitcoin ETF	Franklin Templeton	17/11/2023	03/01/2024	31/03/2024	30/05/2024
Hashdex Bitcoin ETF (Novel Filing)	Hashdex	17/11/2023	03/01/2024	31/03/2024	30/05/2024
Grayscale Bitcoin Trust (Conversion)	Grayscale	23/12/2021	02/06/2022	05/07/2022	TBD

Evolving odds of approval for U.S. spot Bitcoin ETFs



Odds according to Bloomberg ETF analysts (Eric Balchunas and James Seyffart): April 1: No activity; June 27: BlackRock filing; Aug. 2: Grayscale legal hearing; Aug. 30: Grayscale ruling; Oct. 13: S-1 updates. Source: Bitcoin Suisse, Data: Bloomberg

An ETF approval would be monumental for the digital asset space. Not only does Bitcoin mimic gold's properties as a store of value and inflation hedge, but we do also identify major parallels to the transformative launch of the SPDR Gold Shares ETF (GLD) back in October 2004, the first U.S. gold ETF.

"With the spot ETF, you're going to be mainlining a Bitcoin-only exchange directly into the veins of every brokerage account holder in the U.S., including the registered investment advisors that have not been able to buy these futures-based products."

- Matthew Sigel, Head Digital Asset Research at VanEck

■ OUR PREDICTION

GLD allowed access for many who could not easily acquire or store physical gold. It had a swift impact on the price of gold as inflows altered the physical supply and demand equilibrium. Ever since its introduction (price quadrupled to date), the supply held in ETFs heavily correlated with the underlying price.

Like gold, Bitcoin has sound money properties, a fixed supply but is not accessible by most institutional and wealth managers in the U.S.

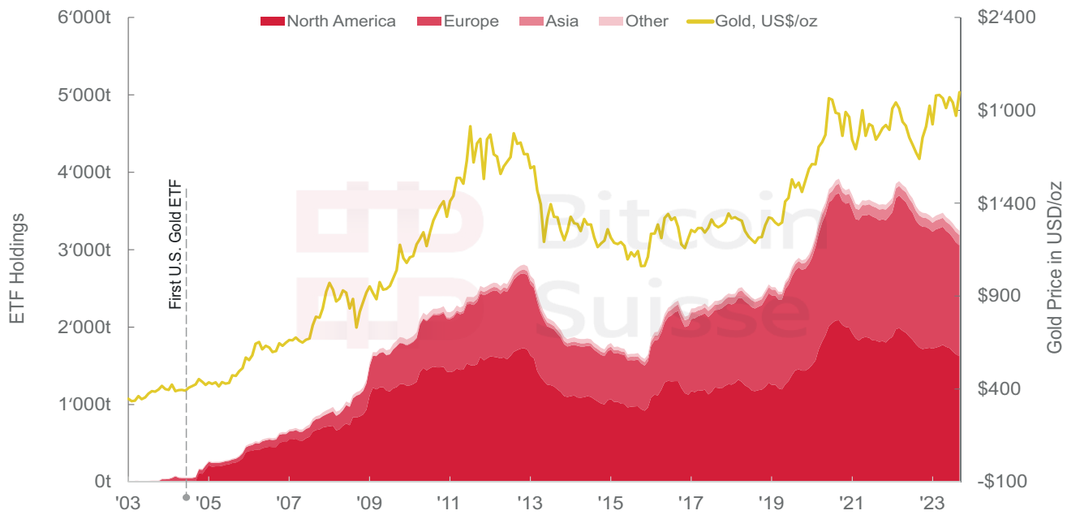
Bitcoin emissions are hardcoded and its supply inelastic, even if you throw infinite hashpower at it, you will not be able to mine more, while you are certainly able to ramp up gold mining in case of spiking demand.

The amount of ETF gold holdings equates to 1.5% of the supply. Yet gold has a 17x larger MCAP and ~36% less supply held in financial vehicles compared to bitcoin, hence every dollar flowing into a Bitcoin ETF will have a greater impact than in gold markets.

■ PREDICTION #1

The U.S. ETF opened the door for gold to thrive and mature. We think that similar dynamics apply to Bitcoin and the digital asset space if the most capital-heavy market gets efficient access.

The impact of the first gold ETFs



Sources: Bitcoin Suisse, Data: Bloomberg, Company Filings, ICE Benchmark Administration, World Gold Council, Gold.org, Data as of 31 October, 2023

■ OUR PREDICTION

An approval in January will give broad access to the youngest and most disruptive asset class since more than a century. It will bring more regulatory clarity, inclusion, legitimacy, maturity and prevent the industry from moving outside the U.S. bypassing the major miss experienced with semiconductors.

It will provide a gateway for a new class of investors, including RIAs, pension funds and other money managers that could not access BTC at scale without an ETF wrapper.

Compared to futures-based products that create efficient forward rates markets and yield price reducing mechanics, spot ETFs are more capital- and tax-efficient, simple, transparent, and ensure investor protection in a convenient and familiar way. Put simply, Bitcoin spot is limited, Bitcoin futures are not. They typically lead to a better performance especially for buy and hold strategies that suit portfolios with BTC exposure.

NYDIG estimates demand for a Bitcoin spot ETF at around $30 billion, derived from the size of gold ETFs. Matthew Sigel from VanEck expects $1B+ within the first month. Galaxy estimates the inflows to hit $14.4B projecting +75% price performance in the first year, and $38.6B by the third year. At $35k per BTC, we currently face $11.5B in annual supply emissions via block rewards. $14.4B would wipe out the entire structural selling induced by mining. Matthew Hougan from Bitwise Investments expects ETFs to pull in $55B within 5 years based on demand in smaller markets such as Canada that operate spot ETFs already.

The Canadian spot ETFs are a good primer for potential demand. They hold around $2B in BTC. The U.S. stock market, however, is 22x the size of the Canadian stock market. Plus, the U.S. may act as a role model for other countries that are hesitant to make an ETF move.

The immediate impact upon approval might turn out to be moderate or to be a short-term sell the news event. The long-term gravity of an ETF approval however is substantial and will cause major second order effects in demand and other domains such as adoption across the industry.

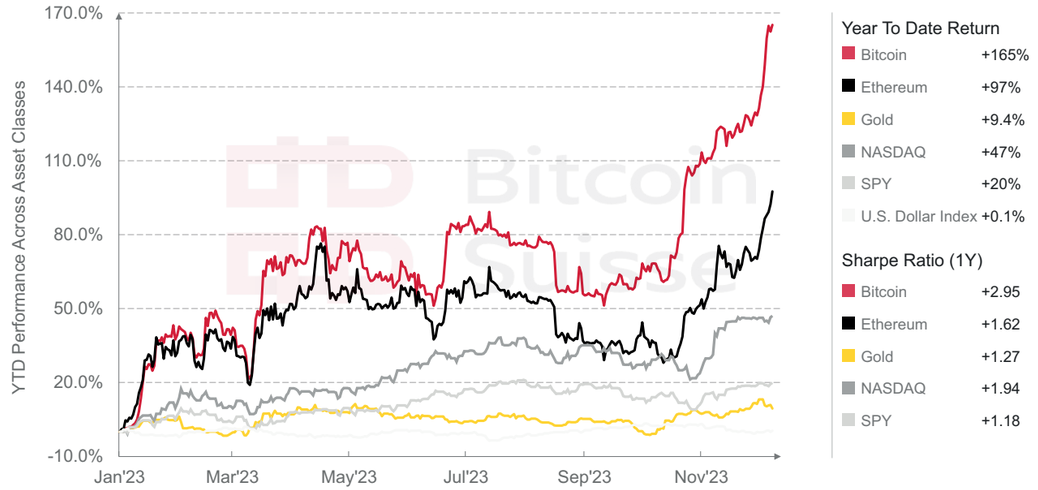
PREDICTION #2

Bitcoin will continue to outperform any other asset class and print a new all-time high in late 2024

2023 was an exceptional year for digital assets and for the market leader Bitcoin in particular. Its unique properties become increasingly relevant in a period of high inflation, extreme fiscal policies and weaponization of global finance. Since its inception, the market performance reflects that the above is true and we believe that will continue into 2024 and onwards.

We have confidence in the idea that you can ignore the best performing asset class only for so long. The asymmetric returns of BTC and ETH leave the entirety of other asset classes look half-pie and market participants across the globe will certainly realize that.

YTD market performance across asset classes



Sharpe Ratio: average return relative to the standard deviation of returns over the specified rolling window, a higher Sharpe implies higher risk-adjusted returns. It is one of the key metrics in TradFi to assess the risk-return profile, the performance relative to the underlying volatility of an asset. Source: Bitcoin Suisse, Data: Bloomberg, Galaxy Research, PortfoliosLab, Data as of 12 November, 2023

OUR PREDICTION

2023 was a primer. Despite macroeconomic uncertainty, Bitcoin and Ethereum outperformed any other asset class by substantial margins, even on a risk adjusted basis.

On an asset specific level, only individual stocks such as Meta or Nvidia came with a higher Sharpe ratio.

Best performing asset class, a decade of excellence for Bitcoin

2013	**Bitcoin** 5507%	**US Nasdaq 100** 36.6%	**US Large Caps** 32.2%	**EAFE Stocks** 21.4%	**High Yield Bonds** 5.8%	**US REITs** 2.3%	**US Cash** -0.1%	**EM Stocks** -3.7%	**Commodities** -7.6%	**Gold** -28.3%
2014	**US REITs** 30.4%	**US Nasdaq 100** 19.2%	**US Large Caps** 13.5%	**High Yield Bonds** 1.9%	**US Cash** -0.1%	**Gold** -2.2%	**EM Stocks** -3.9%	**EAFE Stocks** -6.2%	**Commodities** -28.1%	**Bitcoin** -58%
2015	**Bitcoin** 35%	**US Nasdaq 100** 9.5%	**US REITs** 2.4%	**US Large Caps** 1.2%	**US Cash** 0.1%	**EAFE Stocks** -1%	**High Yield Bonds** -5%	**Gold** -10.7%	**EM Stocks** -16.2%	**Commodities** -27.6%
2016	**Bitcoin** 125%	**Commodities** 18.6%	**High Yield Bonds** 13.4%	**US Large Caps** 12%	**EM Stocks** 10.9%	**US REITs** 8.6%	**Gold** 8%	**US Nasdaq 100** 7.1%	**EAFE Stocks** 1.4%	**US Cash** 0.1%
2017	**Bitcoin** 1331%	**EM Stocks** 37.3%	**US Nasdaq 100** 32.7%	**EAFE Stocks** 25.1%	**US Large Caps** 21.7%	**Gold** 12.8%	**High Yield Bonds** 6.1%	**Commodities** 4.9%	**US REITs** 4.9%	**US Cash** 0.7%
2018	**US Large Caps** 4.5%	**US Cash** 1.7%	**US Nasdaq 100** -0.1%	**Gold** -1.9%	**High Yield Bonds** -2%	**US REITs** -6%	**Commodities** -11.6%	**EAFE Stocks** -13.8%	**EM Stocks** -15.3%	**Bitcoin** -73%
2019	**Bitcoin** 95%	**US Nasdaq 100** 39%	**US Large Caps** 31.2%	**US REITs** 28.9%	**EAFE Stocks** 22%	**EM Stocks** 18.2%	**Gold** 17.9%	**High Yield Bonds** 14.1%	**Commodities** 11.8%	**US Cash** 2.2%
2020	**Bitcoin** 301%	**US Nasdaq 100** 48.6%	**Gold** 24.8%	**US Large Caps** 18.4%	**EM Stocks** 17%	**EAFE Stocks** 7.6%	**US REITs** 4.7%	**High Yield Bonds** 4.5%	**US Cash** 0.4%	**Commodities** -7.8%
2021	**Bitcoin** 66%	**Commodities** 41.4%	**US REITs** 40.5%	**US Large Caps** 28.7%	**US Nasdaq 100** 27.4%	**EAFE Stocks** 11.5%	**High Yield Bonds** 3.8%	**US Cash** -0.1%	**EM Stocks** -3.6%	**Gold** -4.2%
2022	**Commodities** 19.3%	**US Cash** 1.4%	**Gold** -0.8%	**High Yield Bonds** -11%	**EAFE Stocks** -14.4%	**US Large Caps** -18.2%	**EM Stocks** -20.6%	**US REITs** -26.2%	**US Nasdaq 100** -32.6%	**Bitcoin** -65.5%

Best ← Annual return → Worst

	Cumulative	Annualised
Bitcoin	**328'006%**	**111.1%**
US Nasdaq	**564.1%**	**19.1%**
Gold	**14.5%**	**1.3%**

Source: Bitcoin Suisse, Data: Creative Planning, Data as of 8 Dezember, 2023

"Our expectation is that crypto will be dominated by ETH and BTC and it will scale from more than $1 trillion today to $25 trillion in 2030."

- Cathie Wood, Ark Invest

■ **OUR PREDICTION**

Prior to Bitcoin, it was hard to pick the best performing asset class year in year out. Savvy people managed to, but most did not, which is why diversification is so crucial.

n the last 11 years, that changed somewhat as the new kid on the block altered the game. Looking at the ten most important asset classes, there is not much shuffling when it comes to annual top performers. From 2013, Bitcoin managed to dominate any other asset class on an annual basis in 8 out of 11 years. In that period, it managed to ship an annualized return of 95.4%, it is a performance unheard of. It is the best performing asset over a 1y, 3y, 5y, and 10y period, basically any timeframe one wants to pick.

As the market matures, we will see diminishing returns, less intense blow-off tops, but also less severe drawdowns and overall a less volatile asset class. Data shows decreasing volatility peaks over the last 3 years, an overall contracting envelope, and since recently it is converging with the CBOE volatility index for U.S. stocks.

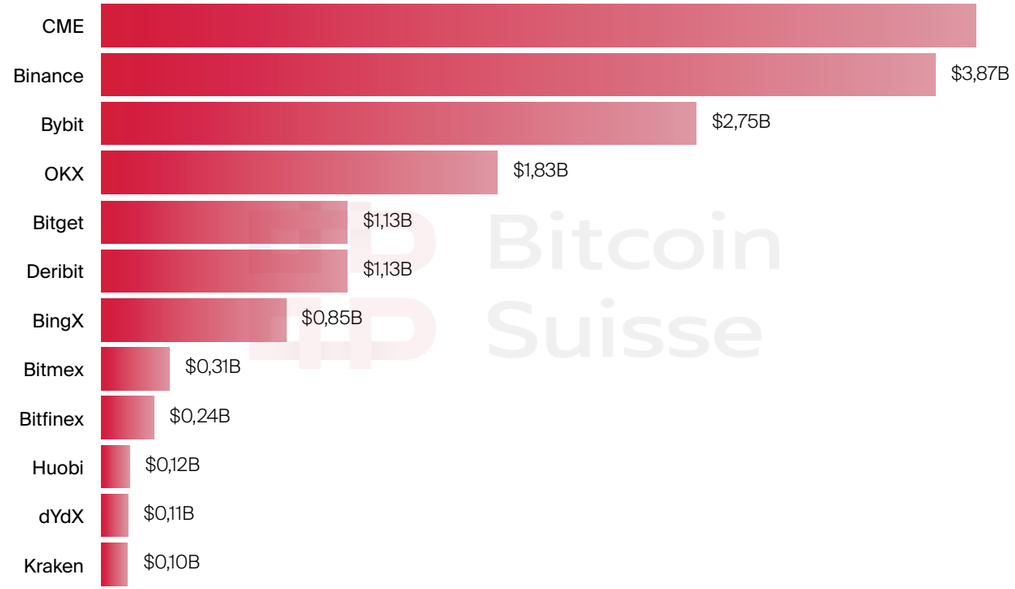
Based on the cycle dynamics of Bitcoin and other analyses in this Outlook, we expect Bitcoin to print a new ATH and continue to outperform other asset classes in 2024.

PREDICTION #3

The era of institutional adoption is upon us

Digital assets are the first genuinely new asset class in the last 150 years. It inherits the most transformative potential across finance, tech and social after the invention of the internet and institutions are waking up to that fact. We expect 2024 to shift up gears in institutional adoption of digital assets and here's why.

The institutional flippening: CME takes over Binance in Bitcoin OI



Source: Bitcoin Suisse, Data: Coinglass, Data as of 14 November, 2023

OUR PREDICTION

Within the last weeks, BlackRock and Barclays used JPM's blockchain infrastructure in a milestone collateral transaction, Euroclear and World Bank issued the first tokenized Eurobond, UBS launched ETF trading in Hong Kong, Japanese Bank Nomura launched an ETH fund, BlackRock filed for an ETH spot ETF, HSBC announced custody services for institutional investors, Thailand's Kasikorn Bank bought $103M stake in crypto exchange, Standard Chartered's Zodia Custody expanded to Hong Kong, CBOE announced margined BTC and ETH futures for January 2024, and the list goes on.

Besides the above, we identified other key indicators reinforcing the odds of an institutional avalanche being imminent.

The Bitcoin open interest on CME flipped Binance's in a sustainable fashion for the first time in the past two years. Futures markets are the largest trading infrastructure available, and we believe it is an expressive metric to measure institutional interest. Moreover, Bitcoin open interest in options recently increased sharply and hit an all-time high of $15B on Deribit.

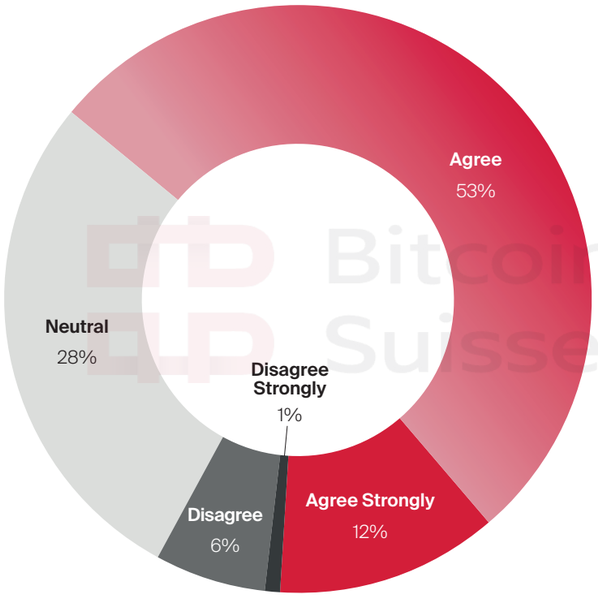
OUR PREDICTION

The institutionalization of market structures is well underway. As such, we observe new ATHs in Bitcoin under management within ETPs, flashing institutional demand, increased institutional confidence and elevated sentiment. A recent survey conducted by Institutional Investor Custom Research Lab supports our view.

They found that according to 250 surveyed institutional investors, digital assets are likely to become a widely adopted investment vehicle within 3-5 years.

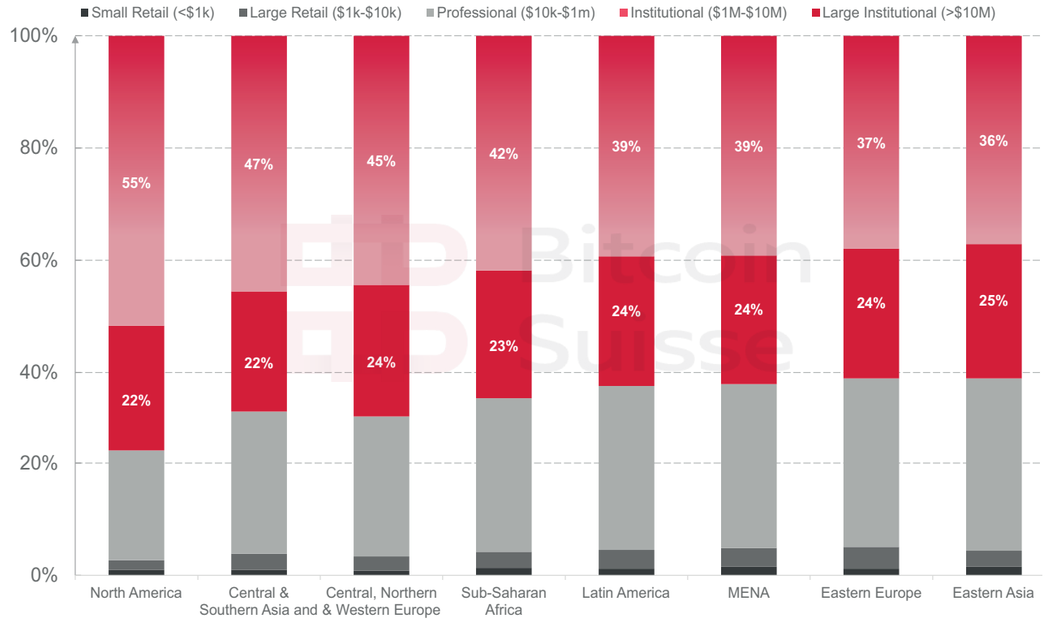
64% that had previous exposure are doubling down on digital assets, 45% without exposure plan initial allocations, a material signal.

Most institutional investors agree that digital assets will become a widely adopted investment vehicle by institutions



Source: Bitcoin Suisse, Data: Coinbase – 2023 Institutional Investor Digital Assets Outlook Survey

Transaction volume by transfer size and region



■ **OUR PREDICTION**

Another key indicator in adoption metrics signals that most of the transactional volume in crypto is already happening via institutional channels. The U.S. in particular is highly driven by institutional activity, 77% of transaction volume stems from transfers above $1M, more than any other region.

As the perception of Bitcoin transforms into an institutional asset, pensions, endowments, and other financial structures will likely bring passive and long-term buy-side flows, and it does not take large allocations of these capital heavy entities to move the needle.

With a looming systemic threat from Binance being likely off the books, the digital asset space is ready for institutions.

PREDICTION #4

Digital assets enter traditional portfolios

Once perceived as a highly volatile asset, Bitcoin's peak volatility lies in the past. With the rationale outlined in the previous predictions, we have high confidence in BTC and ETH becoming integral parts of conventional portfolios starting in 2024.

OUR PREDICTION

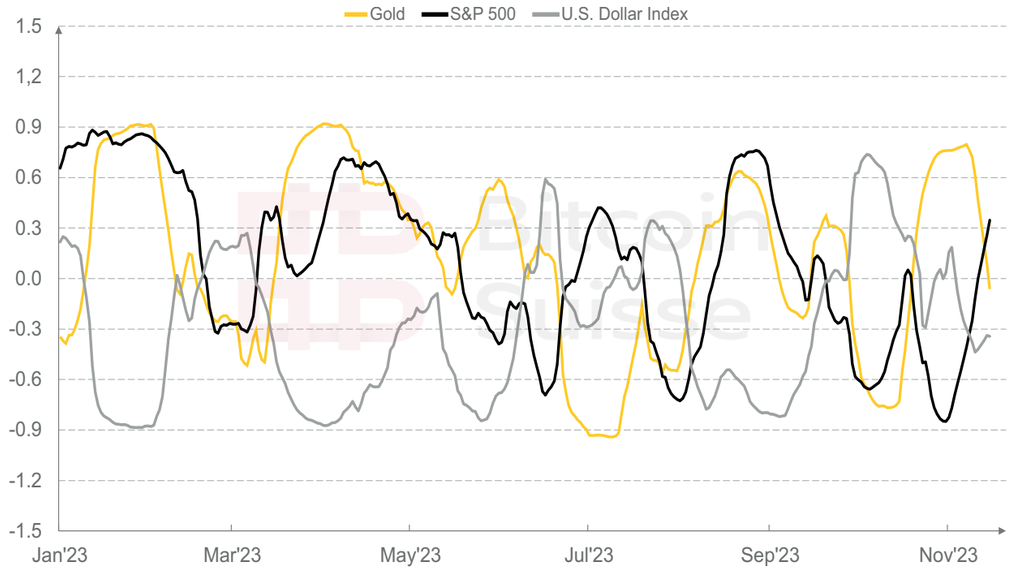
With a spot ETF, traditional portfolios are enabled to fully tap into digital assets. A spot ETF will remove the bottleneck that constrained capital flows and substantially boost acceptance, legitimacy, and regulatory clarity for the asset class.

According to the Digital Asset Council of Financial Professionals, 77% of financial advisors plan to recommend bitcoin to clients if an ETF becomes approved, instead of currently 12%.

Neither JPM, Goldman Sachs, Morgan Stanley or any other major bank had BTC exposure in their model portfolios despite its unique properties and sustained performance.

Bitcoin has emerged as a powerful source of diversification and a true unicorn in how it correlates with other asset classes. Sometimes it acts like exponential gold, sometimes like an S&P and growth stock beta, sometimes like the Dollar index. As we saw earlier, regardless of which asset class it currently correlates with, it tends to have a lead foot, outpacing its asset class peers.

Bitcoin correlation to traditional asset classes



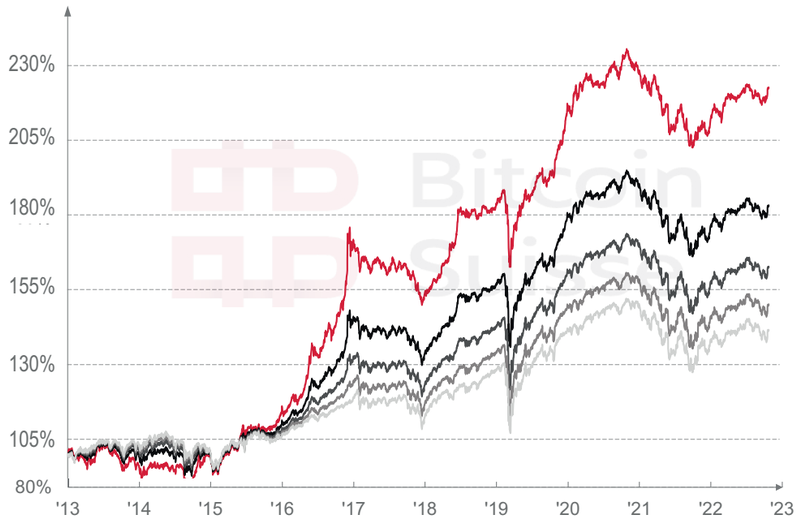
To quantify the correlation between assets, the Pearson Correlation Coefficient is used to estimate the strength of the linear relationship between two price variables while +1 equals a perfect positive linear correlation, -1 equals a perfect negative linear correlation, and 0 equals no linear correlation.Source: Bitcoin Suisse. Data: IntoTheBlock as of November 12th, 2023.

We expect that digital assets with BTC at the forefront will continue to prove themselves as universal hedge with asymmetric returns. These properties will allow for the next generation of progressive portfolios that seek exposure to digital assets for good reasons.

"I think if you're trying to look at timeframe charts in BTC or ETH right now you've lost the plot. No indicator or deviation really matters here. Crypto is about to become a core part of every retirement portfolio. Your charts don't matter."

- Adam Cochran, General Partner at Cinneamhain Ventures

Bitcoin correlation to traditional asset classes



Annualized Return

10% BTC	+12.4%
5% BTC	+8.2%
2.5% BTC	+6%
1% BTC	+4.6%
0% BTC	+3.7%

Sharpe Ratio

10% BTC	+0.88
5% BTC	+0.63
2.5% BTC	+0.43
1% BTC	+0.30
0% BTC	+0.21

Money market	2.5%	2.5%	2.5%	2.5%	2.5%
Gold	5.0%	5.0%	5.0%	5.0%	5.0%
Global bonds	32.5%	32.5%	32.5%	32.5%	32.5%
Global equities	50.0%	55.0%	57.5%	59.0%	60.0%
Bitcoin	10.0%	5.0%	2.5%	1.0%	0.0%

Daily data sourced between December 31st, 2013, and November 8th, 2023 (excluding weekends). Dates are adjusted to follow the U.S. ETF trading calendar. Normalization of missing value(s) for any date(s) where the last value is equal to the previous value. Model portfolios are quarterly rebalanced, and calculations exclude all transaction costs and fees. Dividends or other cashflows earned during a quarter are considered and are deployed in the next rebalancing period for each model portfolio. The risk-free rate used for the Sharpe ratio calculation is based on the Eurodollar 3m Future until June 20,2033 and SOFR 3m Future onwards. Each asset class, except for BTC, is represented by an actual tradable asset (ETFs and Futures). The ETFs in the model portfolio are U.S.-based vehicles and may not be MiFID II/FinSA compliant instruments. No fractional positions for traditional asset classes. ETFs representing traditional asset classes: Money market (cash) = SPDR Bloomberg 1-3 Month T-Bill ETF (BIL); Gold = SPDR Gold Shares (GLD); Global bonds = A 50/50 mix between the Vanguard Total Bond Market Index Fund (BND) & the Vanguard Total International Bond Index Fund (BNDX); and Global equities = iShares MSCI World ETF (URTH). Money market and gold weights are fixed across all model portfolios. Global bonds weight is dependent on the fixed combined weights between money market and gold. Global equities weights are dependent on the different weight levels from Bitcoin. Source: Bitcoin Suisse. Data: CoinGecko, Investing.com, and Yahoo! Finance.

OUR PREDICTION

According to our model portfolios, adding a bitcoin allocation to a traditional diversified portfolio that includes cash, gold, bonds, and equities yields significant benefits.

Not only are we able to diversify from uncommon sources of systemic risks in balanced portfolios, but it also improves overall performance and enhances the portfolio's overall risk adjusted returns. Notably, the largest marginal yield improvement is with BTC allocations between 1% and 2.5%, respectively, with only minor changes in volatility.

Bitcoin's historical impact on a traditional diversified portfolio is substantial across many timeframes yielding improved returns and improved Sharpe ratios.

At this point, it is hard to ignore Bitcoin. With the ETF opening the gateway, we project that BTC earns a distinct role in the long-term construction of balanced portfolios.

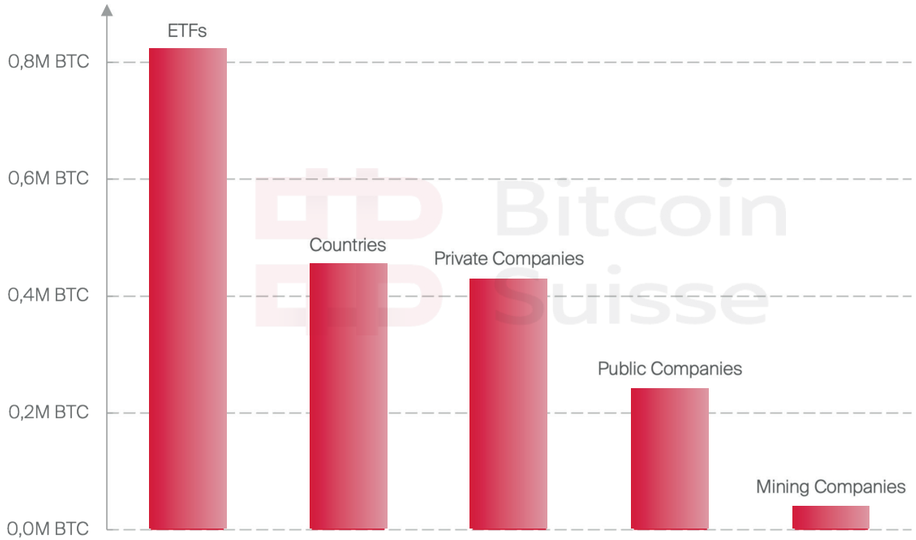
PREDICTION #5

BTC and ETH become reserve assets for companies and governments alike while a next sovereign will make Bitcoin legal tender

The amount of BTC in treasuries and ETFs hit almost 10% of the total supply, providing outsized returns, a hedge against monetary debasement and a neutral source of diversification to any company and any government globally.

We expect to see a surge in digital asset embracing countries within 2024 inducing a fair amount of awareness, adoption, structural demand, and enhanced infrastructure.

BTC holdings in publicly traded and private companies, financial vehicles and countries



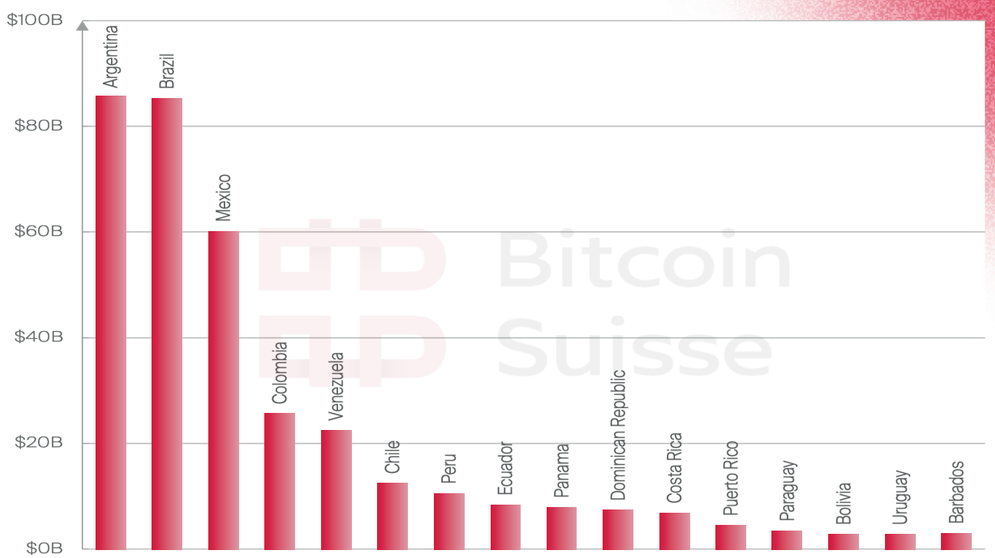
# Entities	# BTC	Value	% Total Supply
71	1'941'156	$73.3B	9.24%

Category

ETFs	819'125	$30,9B	3.90%
Countries	451'968	$17.1B	2.15%
Public Companies	240'682	$9.1B	1.15%
Private Companies	429'381	$16.2B	2.05%
BTC Mining Companies	38'218	$1.4B	0.18%

Source: Bitcoin Suisse, Data: Buy Bitcoin Worldwide, Data as of 26 November, 2023

LATAM countries by cryptocurrency value received between 2022-2023



■ OUR PREDICTION

Via nation-state mining proxies, various energy-rich nations such as UAE, Oman or Bhutan signaled strategic fitness for reserve Bitcoin at the sovereign level.

We project the next sovereign following El Salvador's legal tender path stems from the Middle East, LATAM, Sub-Saharan Africa or Central/Southern Asia. They host mostly emerging countries that rank high in global crypto adoption, face monetary debasement or substantially rely on trade.

According to Chainalysis, Argentina ranks 15th in global crypto adoption, and 1st in crypto-currency value received between 2022-2023 in LATAM. If Milei follows through, we might experience a landmark event in sovereign crypto adoption as Argentina bolsters almost 17x in GDP compared to El Salvador ($487B vs. $29B).

Another area that we believe is warming up to digital assets is company balance sheets.

The odds of Argentina making that move are elevated given the recent momentum of pro Bitcoin president-elect Javier Milei, persistent inflation, a rather young population compared to OECD countries and a high smartphone penetration rate.

What if companies would allocate gross revenue along the lines of Boyaa Interactive?

Rank	Company Name	Gross Revenue 2023 in $B	20% of Gross Revenue in $B
1	Walmart	638.78	127.76
2	Amazon	554.02	110.80
3	Saudi Aramco	502.35	100.47
4	Sinopec	473.53	94.71
5	PetroChina	435.30	87.06
6	Berkshire Hathaway	401.77	80.35
7	Apple	383.28	76.66
8	UnitedHealth	359.98	72.00
9	CVS Health	347.80	69.56
10	Exxon Mobil	346.17	69.23

■ OUR PREDICTION

Gaming giant Boyaa Interactive based in Hong Kong plans to invest $90M or 20% of their 2022 gross revenue into BTC and ETH.

As digital assets enter mainstream minds-hare, we expect more companies, even non-crypto affine, to take a more progressi-ve approach towards this new asset class. ETFs will ease access as well as acceptan-ce and these signals will not stop radiating at the leaden wall of companies.

PREDICTION #6

Stablecoins bottomed implying that liquidity is coming back

To date, crypto's most adopted use case is tokenized dollars. By asset type, stablecoins bolster the major share of digital asset transaction volume across the globe. In the face of CBDCs, stablecoins provide a viable alternative to CBDCs and might help the U.S. to curb de-dollarization. Stablecoins are moreover a core component of DeFi, growing from a supply of $1B in 2018 to over $125B by 2023, 90% of which are deployed on Ethereum and Tron. We project that the stablecoin supply bottomed in 2023 and will from this point onwards only increase.

For the last 1.5 years, the stablecoin supply was on a steady decline not only induced by the fatal blow up of Terra but also due to a risk-off environment and attractive off-chain yields as the FED funds rate kept climbing.

This started to change with the emergence of yield-bearing stablecoins, that provide capital-efficient, and scalable improvements to the earlier generation of stablecoins. Stablecoin such as DAI, Lybra or Prisma do now inherit yield bearing off-chain assets and yield bearing on-chain assets.

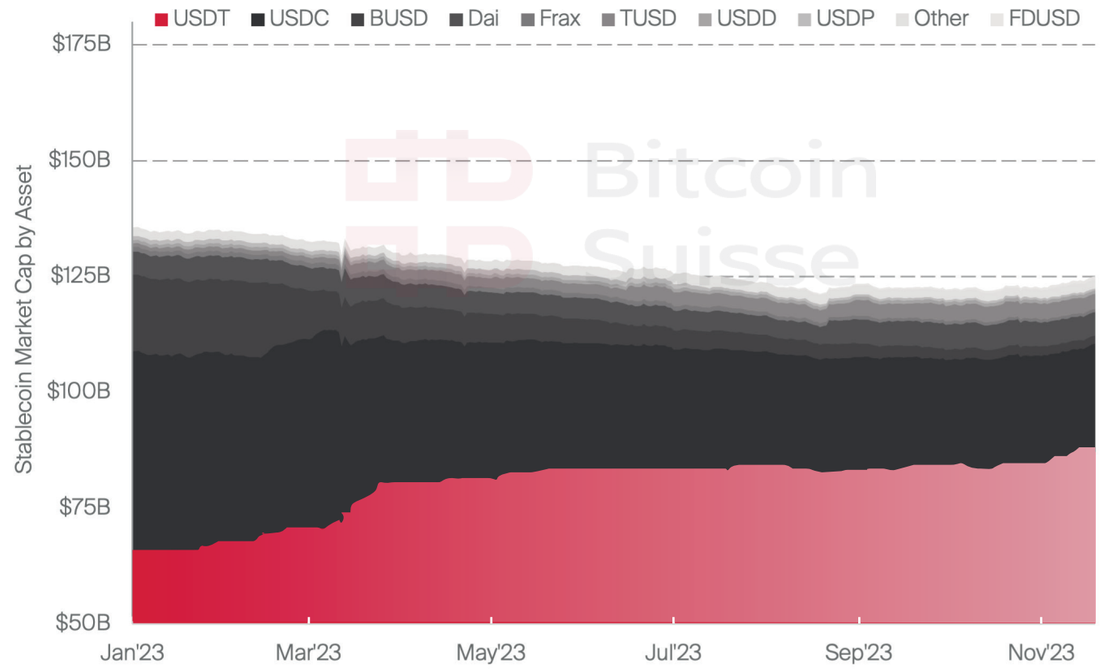
The yield incentivization found in LST- and RWA -backed stablecoins helped bootstrap new supply, attracting more users to migrate back on-chain.

In October, the stablecoin supply ratio to Bitcoin, the ratio relative to the aggregated market cap of all stablecoins, hit a two year high despite Bitcoin's performance throughout 2023.

OUR PREDICTION

However, in the last 2 months we had an overall increase of stablecoins which is a great indicator for an overall healthy market and sentiment. It is a precursor akin to global liquidity and M2 money supply but within the crypto microcosm. We expect this trend to be sustained. As this dynamic acts as a liquidity proxy, we view the regained uptrend as a positive change implying market strength for the next phase of the cycle.

Stablecoin market cap by asset



Overall Stablecoin MCAP

30-Day Change	+2.1%
90-Day Change	+3.2%
YTD Change	-7.7%
Market Share	9.1%

Source: Bitcoin Suisse, Data: Messari, Data as of 19 November 2023

PREDICTION #7

The non consensus setup: ETH will be the fastest horse among institutionally available digital assets

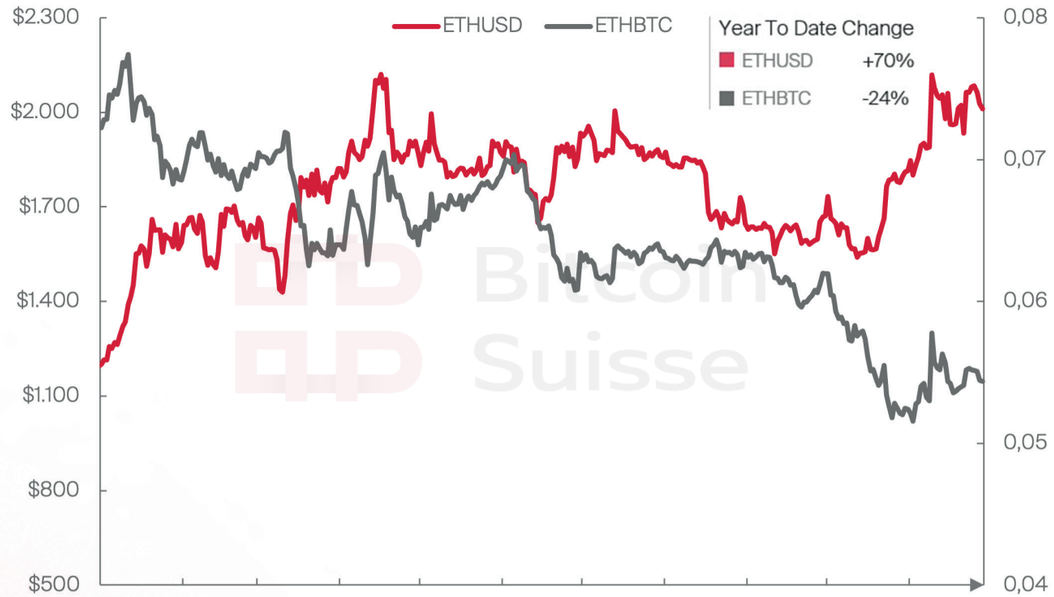
BTC outperformed ETH for most of this bear market, in line with historichistorical data. With the potential ETF approval in January, all eyes are on Bitcoin. In our opinion however, this arguably opens a potential non-consensus setup as outlined below.

OUR PREDICTION

ETH was more resilient in this bear market, maintaining an ETH-BTC ratio 230% higher than previously. It bottomed first in June 2022 and did not set a lower low post-FTX collapse, while BTC did.

BTC never outperformed ETH in the later stages of a bull market.

YTD price performance of ETH against USD and BTC



OUR PREDICTION

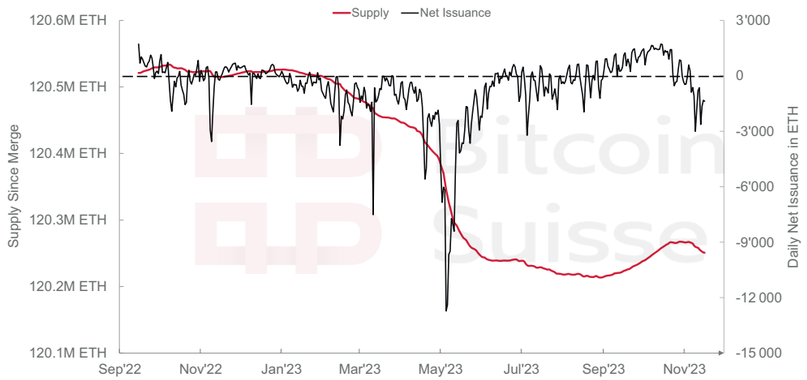
From an investment perspective, ETH feeds a different rationale than Bitcoin as it represents a global computing platform that will likely host the new fabric of global financial markets. It derives value from cashflows, its network effects, large developer base and lindyness. It already blends into the physical world via tokenization, payments, commerce, and gaming.

ETH has not lost interest from a fundamental perspective. Blockspace demand is sufficient, the net issuance, accounting for new ETH emissions minus burned ETH, is deflationary and MEV burn might boost these dynamics. Bitcoin's supply peaks in a century, Ethereum's supply likely peaked already. We expect deflation to increase as on-chain activity heats up and real yield spikes.

$450B and provides $60B in economic security (Bitcoin provides $10B according to Justin Drake), more than any other chain. It has best-in class client diversity, and soared past 100M addresses with balance recently. Ethereum's L1 full time developer dominance rose above 50%. Plus, ETH is a great collateral asset, providing access to its flourishing ecosystem in a non-custodial fashion.

It currently secures a total value of more than
ETH is net deflationary, generated $2.1B in fees in 2023, $1.75B in revenue (supply burned). In its first 7 years, Ethereum surpassed $10B in overall revenue, outpacing most of blue-chip tech stocks including Microsoft and Meta. Remarkably, that revenue stems from a period of less than 3 years starting with the introduction of Ethereum's burning mechanism.

Supply dynamics and net issuance of ETH since the transition to Proof-of-Stake



Supply since Merge (15.09.22)	
Supply Change	**-0.27M ETH (-0.21%)**
	-$0.54B*
w/o Merge	**+4.53M ETH (+3.18%)**
	+$9.1B*

*at ETH=$2'000, Data as of 17.11.2023

Ethereum will act as benchmark for TradFi to cross the chasm into tokenized and digital assets, likely yielding a monetary and liquidity premium over other networks. With its unique feature set, ETH will likely become the second of two assets that meet institutional interest, making it one of the most compelling investor opportunities globally.

Among others, Fidelity and BlackRock recently filed for spot Ethereum ETFs, indicating high conviction of financial powerhouses and demand from clients. We expect approvals to happen within 2024 following a BTC ETF approval. ETH would then achieve regulatory parity to BTC, a crucial puzzle piece that is still missing. Notably, while the SEC did not officially acknowledge ETH as a commodity yet, their prior actions implied accepting its commodity status.

Once the dust of the Bitcoin ETF and the halving event settles, we project the mainstream focus to shift to Ethereum, capturing flows that previously went to BTC with the difference that Ethereum has a way lower market cap. We expect that Ethereum's yield bearing properties will play a decisive role here, likely following the stock lending model in traditional equities yet with the crypto equivalent of dividends.

Simply holding ETH in these ETFs won't be enough. Institutional staking and fixed yield strategies are fields we expect to fly in 2024. ETH's productive cashflow properties will bring additional yield enhancement through staking and hence a higher return on ETF holdings in addition to Ethereum's vanilla growth potential. We saw first products like the 3iQ Staking ETF already launching in Canada.

We have a high conviction that asset managers will capitalize on additional fees and thus put serious effort into a product with intrinsic yield that fits the ESG narrative. A story that is easy to sell and not priced in yet.

We expect the entirety of the outlined properties and conditions to act in favor of ETH as an asset.

Deadlines for U.S. spot Ethereum ETF applications

Issuer	Company	Exchange	Custodian	Next Deadline	Final Deadline
VanEck Ethereum ETF	VanEck		Gemini	25.12.2023	23.05.2024
ARK 21 Shares Ethereum ETF	21 Shares & ARK	CBOE	Coinbase	26.12.2023	24.05.2024
Hashdex Nasdaq Ethereum ETF	Hashdex	Nasdaq	N/A	01.01.2024	30.05.2024
Grayscale Ethereum Trust	Grayscale	MYSE	Coinbase	06.12.2023	18.06.2024
Invesco Galaxy Ethereum ETF	Invesco & Galaxy	CBOE	Coinbase	23.12.2023	05.07.2024
iShares Ethereum Trust	BlackRock	Nasdaq	Coinbase	~25.01.2024	~07.08.2024
Fidelity Ethereum Fund	Fidelity	CBOE	Fiderity	~21.01.2024	~03.08.2024

Source: Bitcoin Suisse, Data: Bloomberg, Data as of 30 November 2023

"Investments can be explained with a 2×2 matrix. On one axis you can be right or wrong. And on the other axis you can be consensus or non-consensus. Now obviously if you're wrong you don't make money. The only way as an investor and as an entrepreneur to make outsized returns is by being right and non-consensus."

- Andy Rachleff,
co-founder and Executive Chairman of Wealthfront

PREDICTION #8

Functionality will enter Bitcoin: a first glimpse into a sustainable security model

Bitcoin's current security model is not sustainable as it mostly runs on native issuance. However, there is a maximum supply hard-coded into Bitcoin after which miner compensation runs solely based on transaction fees. While 'tail emissions' are sometimes discussed as a last resort, they aren't a satisfying option. It would harm Bitcoin's sound money properties being a scarce, fixed supply asset. With recent developments, we expect that improved functionality will enable a sufficient and sustained security model.

Transaction fees were supposed to substitute waning block rewards. To date however, transaction fees did not amount to a sufficient ratio, causing headaches around Bitcoin's long-term security.

With the emergence of Ordinals, new momentum entered with effects evident throughout the ecosystem. Bitcoin had its best year in blockspace demand since a decade.

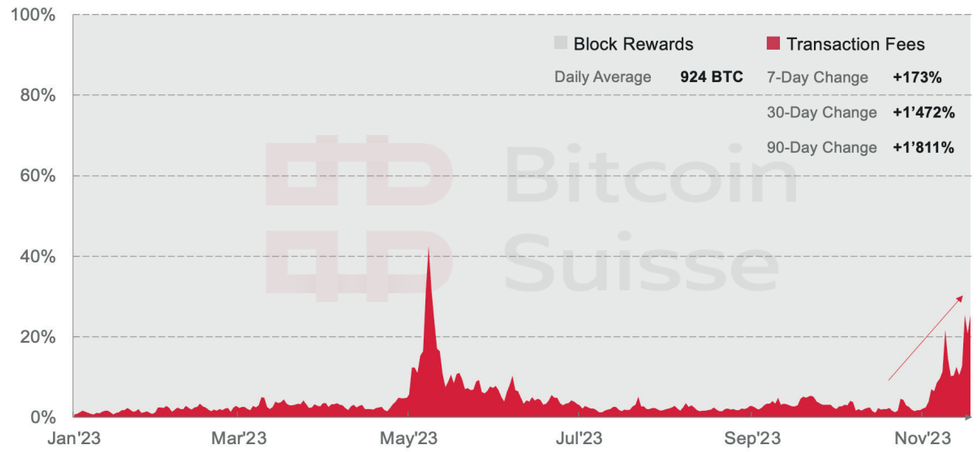
Bitcoin's 7-day average transaction fees hit $7M, closely chasing Ethereum, marking a 6-month high. It is now the third most popular network for NFTs by volume next to Ethereum and Solana.

As mining profitability increased via the recent surge in activity and the price performance of bitcoin, hash rate managed to print yet another ATH.

Ordinals and BRC20s continue to prove how functionality creates blockspace demand and as a result, yields transaction fees that will become an integral and essential part of miner compensation.

Inscriptions have also sparked more interest in other areas such as sidechains (Stacks), zk-rollups, proof systems such as ZeroSync or new execution solutions such as BitVM.

Rewards paid out to miners in the form of issuance (block rewards) and transaction fees



Miner Rewards are revenues generated from transaction fees and the block subsidy. Transaction fees are the dynamic fee charged for transacting on the network, while the block subsidy is the block reward that miners earn from the emissions in form of the underlying native token. Source: Bitcoin Suisse, Data: IntoTheBlock, Data as of 18 November 2023

OUR PREDICTION

We predict that 2024 will see a major vortex of innovation hitting the Bitcoin network. Post halving, we expect that transaction fees exceeding 50% of the overall miner rewards will not be outliers anymore.

PREDICTION #9

Liquid staking will record the highest growth rate in DeFi sparked by institutional staking and restaking

Staking and liquid staking took off in mindshare, innovation and mostly TVL post Merge. In line with our predictions from last year, liquid staking protocols saw consistent inflows, outpacing withdrawals after Shapella was deployed on mainnet. In our view, the sector is primed for growth because a multitude of verticals line up.

OUR PREDICTION

While staked ETH increased by more than 100% since the Merge and is now ranging above 24% of overall supply staked, we expect that ratio to substantially increase moving forward.

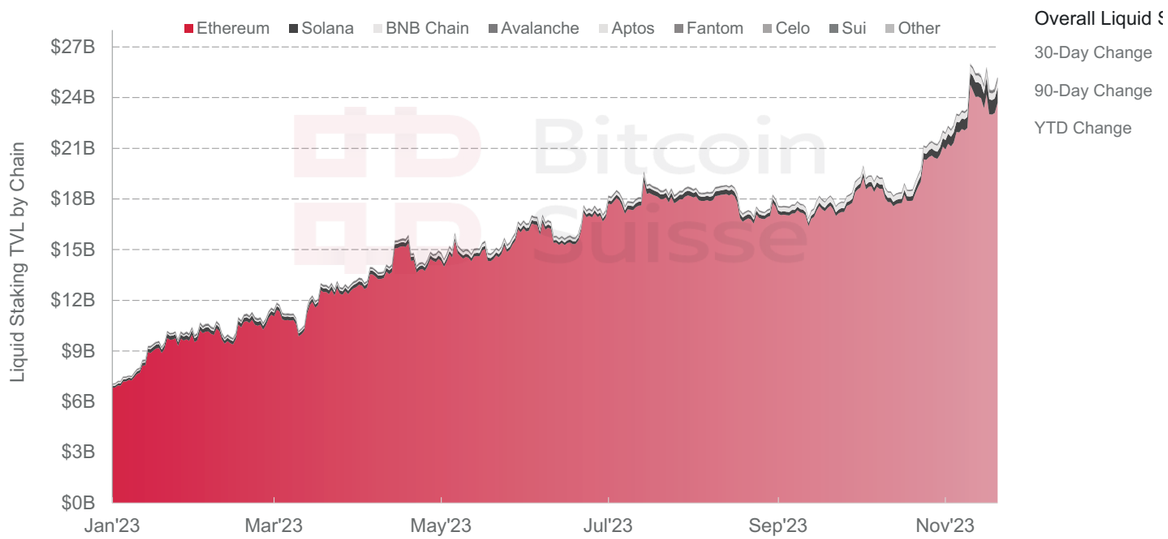
Externally, the rate cycle topped, and the Fed will very likely loosen its monetary policy in the coming months, bringing the interest rates back below the on-chain "risk-free" rate: Ethereum's staking rewards. That alone will create substantial demand as investors migrate back to on-chain opportunities.

Internally, we expect staking rewards to increase over 5% despite an increase in validators for two reasons. On-chain activity picks up and execution layer rewards (transaction fees, MEV) will spike alongside. Restaking is next in line to bring momentum and on-chain yield back into fashion. We expect it to disrupt the entire staking landscape in 2024 and will yield significantly higher rewards for validators that decide to opt into services.

EigenLayer will bring permissionless innovation and unconditionally interoperable systems. It will amplify Ethereum's decentralized trust network to a plethora of applications such as decentralized sequencers (Espresso), data availability layers (EigenDA), RaaS (AltLayer), bridges (Polyhedra, Hyperlane) or risk mitigation protocols (Drosera). It will furthermore introduce another domain known as liquid restaking with the same benefits known from liquid staking.

In our view, the approval of an Ethereum spot ETF will represent the advent of institutional liquid staking as it allows for a more flexible management of redemption cycles. Please note, institutional staking can become a concern given the mechanics of Proof of Stake.

Liquid staking TVL



Overall Liquid staking TVL

30-Day Change	+38%
90-Day Change	+46%
YTD Change	+256%

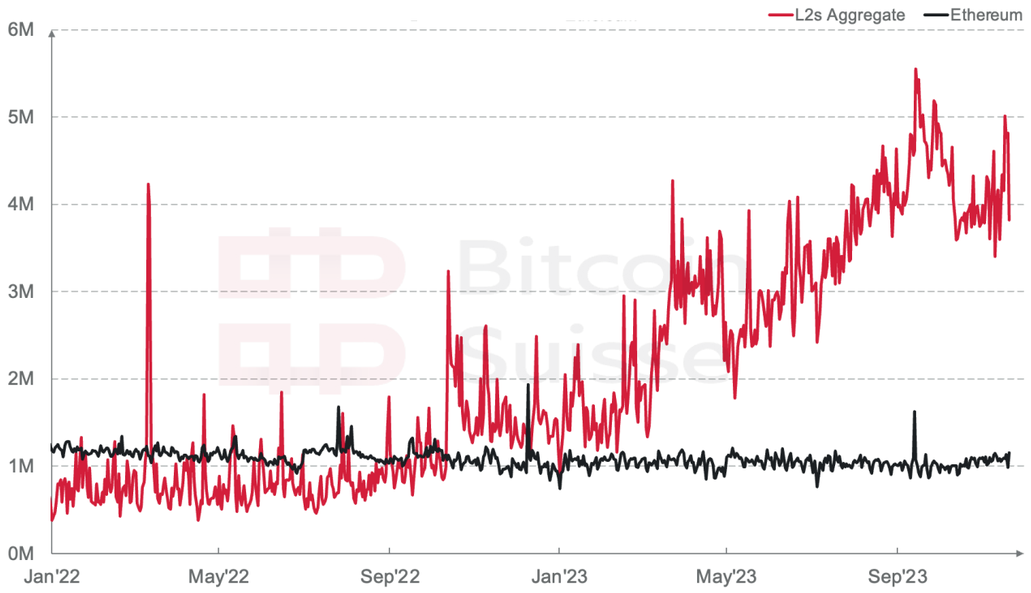
Source: Bitcoin Suisse, Data: Messari, Data as of 20 November 2023

PREDICTION #10

Rollups will become the primary liquidity hubs super-charged by data availability solutions and EIP4844

The rollup centric roadmap of Ethereum continued to materialize throughout 2023 and surpassed Ethereum in tps in a sustainable fashion (scaling factor at 4.5x). The rollup ecosystem now hosts more than 2.3M weekly users overtaking Ethereum at ~1.5M (1.52x dominance). While risks around state validation, data availability (DA), upgradeability, and sequencers are still present, we expect the rollup space to thrive in 2024.

Layer 2 activity on an upward trajectory across 2023



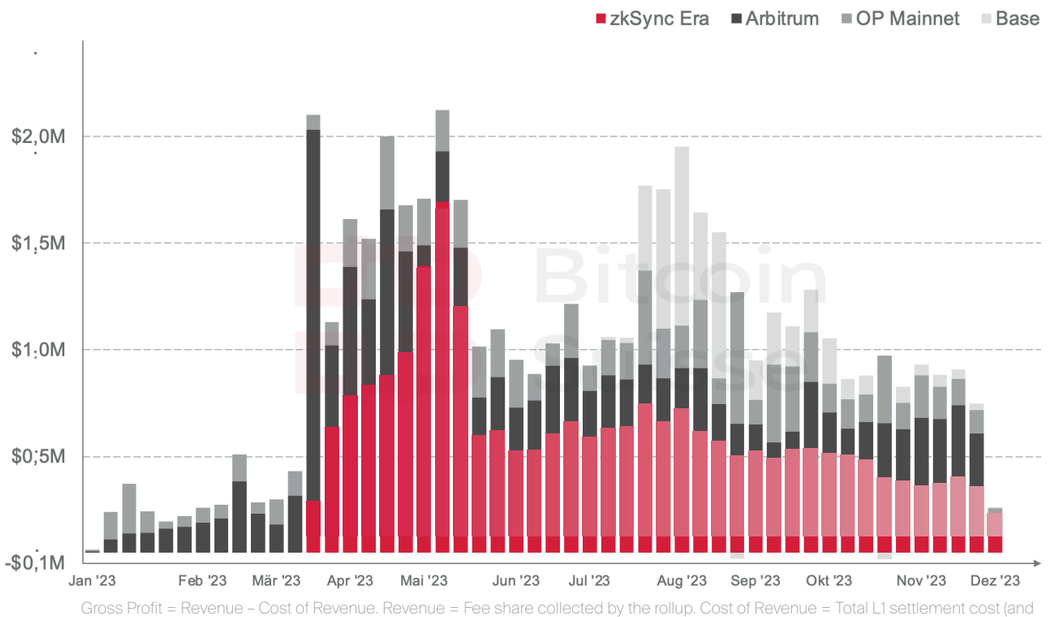
OUR PREDICTION

In a bull market, high transaction costs will increasingly drive users to rollups and stimulate adoption, increasing sequencer revenues. An overseen yet material aspect. Arbitrum, for instance made $6M in fees in November, yielding a gross profit of $1.5M after accounting for sequencing and DA cost (90% of expenses). This margin can easily increase to 70% with EIP4844 (Proto-Danksharding, tenfold 10fold DA cost reduction) and even higher with Celestia/EigenDA and improved data compression (zero-byte compression, signature aggregation, and stateless compression). In our view, this will lead to a re-evaluation against L1s as soon as rollups redistribute profits via staking.

The above incentivizes rollups to seriously consider alternative DA solutions to boost their margins and become leaner. Multiple protocols announced to integrate with EigenDA such as Celo, Mantle, or Layer N, or Celestia such as Manta or Caldera. However, it begs the question on how much value is leaking from Ethereum being on track to become a pure settlement layer. The answer is: it's a short-term concern as full Danksharding (recapturing the DA crown), parallelized EVM, based rollups (sequencing handled by the base layer) and enshrined rollups are on the horizon. Moreover, ETH is used as money and will likely develop a more pronounced monetary premium.

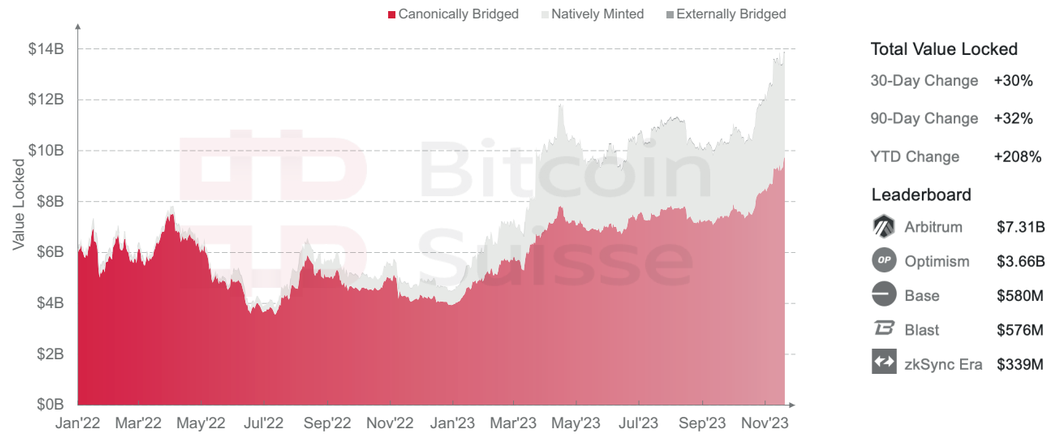
Hence, in our view, rollups will overall drive value back to Ethereum, solidifying its dominance while fresh rollups such as Base opening up DeFi to 100M Coinbase users or Blast democratizing yield on the native rollup level will ensure momentum.

Layer 2 gross profit across 2023 of selected rollups



Gross Profit = Revenue – Cost of Revenue. Revenue = Fee share collected by the rollup. Cost of Revenue = Total L1 settlement cost (and potential fee share with OP mainnet) + on-chain expenses + token expenses. Source: Bitcoin Suisse, Data: Token Terminal, Data as of 05 December 2023

Total Value Locked across rollups



The TVL on L2Beat consists of canonically bridged, externally bridged, and natively minted assets and hence reflects the entire Ethereum ecosystem, not only assets utilized in dApps. Source: Bitcoin Suisse, Data: L2Beat, Data as of 20 November 2023

OUR PREDICTION

On the risk side, we expect further development progress and stage 2 maturities (see L2Beat). Arbitrum leads these efforts with operational fraud proof systems and a broad validator base.

Another trade-off introduced with the Cambrian explosion in distinct rollups is composability, liquidity fragmentation and a UX burden on users that are forced to navigate across various ecosystems. We predict that sufficient solutions will be available in time. Among them are based rollups, L3 communication hubs aggregating proofs across chains (e.g. zkLink, Polyhedra, Succinct Labs), shared sequencing, IBC enabled rollups (zk-IBC, Polymer Labs). The friction involved on the user surface level will be abstracted away.

"In line with our predictions from last year, liquid staking protocols saw consistent inflows, outpacing withdrawals after Shapella was deployed on mainnet."

Finally, it's worth having a look at the competition brewing between monolithic giants like Solana offering composability or dense liquidity and the modular stack that allows for tailored optimizations.

OUR PREDICTION

We observe that rollups innovate and iterate faster than their less flexible L1 hosts, resulting in a competitive advantage. On the innovation side for 2024, we are excited about new VMs (Eclipse), UTXO based DeFi (Fuel), new programming languages (Arbitrum Stylus), native account abstraction, decentralized sequencing (Espresso), Risc Zero proof systems allowing for adaptive challenge periods, hybrid zk proof systems like Metis or fast finality solutions like MACH from AltLayer.

While the monolithic and modular approach are distinct paradigms of trust-minimized execution, we project that rollups will eventually dominate in throughput, latency and cost.

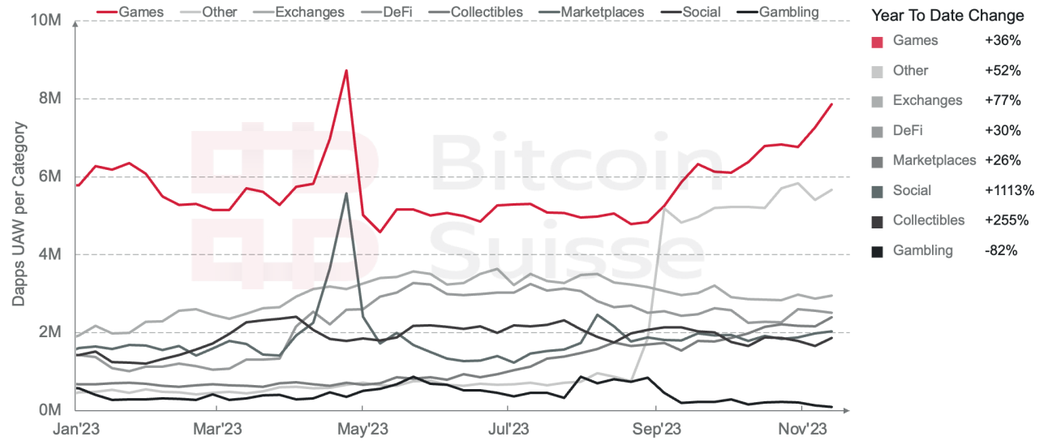
Lastly, the demand-side network effects around developers, dApp deployments (Arbitrum 491 protocols vs. 115 on Solana), users, or liquidity maintained by players such as Arbitrum are hard to negotiate.

PREDICTION #11

Mainstream applications bring 50 million new on-chain users

The space has been building for more than 13 years now, but outside of speculation and to-kenized dollars did not yet manage to ship an application that organically pulls in retail. We believe that time has come, we believe this will change in 2024.

Unique Active Wallets (UAW) per application category



Source: Bitcoin Suisse, Data: DappRadar, Data as of 23.11.2023

OUR PREDICTION

The crypto ecosystem is hosting an astonishing ~440,000 smart contracts and ~15,000 dApps on 53 chains. NEAR gave a primer on mass adoption on the application level with Sweat Economy, hitting almost 1M in Unique Active Wallets in the previous 30 days.

We expect to see at least one breakthrough solution hitting mainstream adoption across the following domains: Social, Gaming and Gambling. In contrast to web2, value accrues to users, builders, creators, and communities that contribute to the game, platform or application running on blockchain rails.

Scalability and usability, the necessary preconditions for an application frontier need to be met. With consistent innovation, the crypto industry managed to bring a plethora of scaling solutions across L1s, L2s, L3s (Hyperchains, Madara, Orbit), VMs, RaaS', data availability solutions, and compression. We furthermore observed usability improvements across the stack with AA, WaaS, or PWAs (Progressive Web Apps) enabling web2-esque UX.

OUR PREDICTION

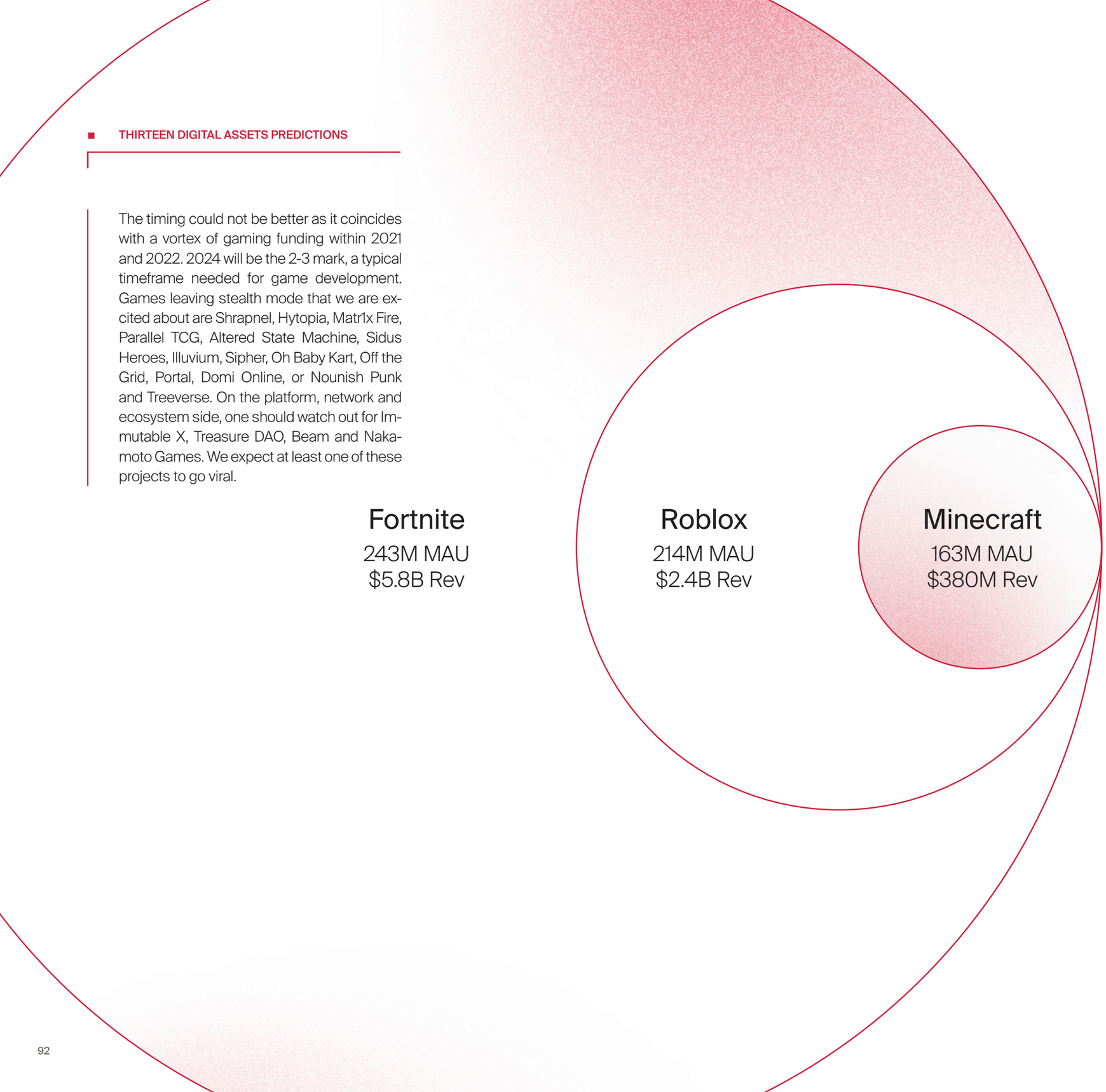
3.1B people or 39% of the global population play games. The total gaming space is estimated to hit $610B by 2032, while crypto gaming is valued at ~$15B today. More than $100B of which is estimated to be captured within GameFi at a CAGR of more than 27%. We have high conviction that there is no bigger trojan horse for crypto adoption, it is a superset of all other crypto narratives. Messari confirms, that the game segment is also becoming the leading sector by investor attention.

We observe major enthusiasm from gaming companies like Ubisoft or EpicGames, that could boost the industry's expansion from the traditional shore. The hyped launch of GTA VI with along with rumors of a potential crypto integration will put the gaming narrative into focus

Games with underlying blockchain technology enable true ownership of in-game items. There are massive markets trading such items from e.g. World of Warcraft or Counterstrike that would benefit in efficiency, cost, price discovery, ownership, liquidity or provenance. In a first ever. they would allow for cross-platform utility, a future that even Roblox CEO David Baszucki is an advocate of. Others like game publisher Square Enix (Final Fantasy) announced the launch of its first NFT game, Symbiogenesis. If these players move, we believe that most AAA publishers will follow suit.

We expect gaming to finally meet longstanding expectations, likely attracting the major share of new on-chain citizens.

The timing could not be better as it coincides with a vortex of gaming funding within 2021 and 2022. 2024 will be the 2-3 mark, a typical timeframe needed for game development. Games leaving stealth mode that we are excited about are Shrapnel, Hytopia, Matr1x Fire, Parallel TCG, Altered State Machine, Sidus Heroes, Illuvium, Sipher, Oh Baby Kart, Off the Grid, Portal, Domi Online, or Nounish Punk and Treeverse. On the platform, network and ecosystem side, one should watch out for Immutable X, Treasure DAO, Beam and Nakamoto Games. We expect at least one of these projects to go viral.



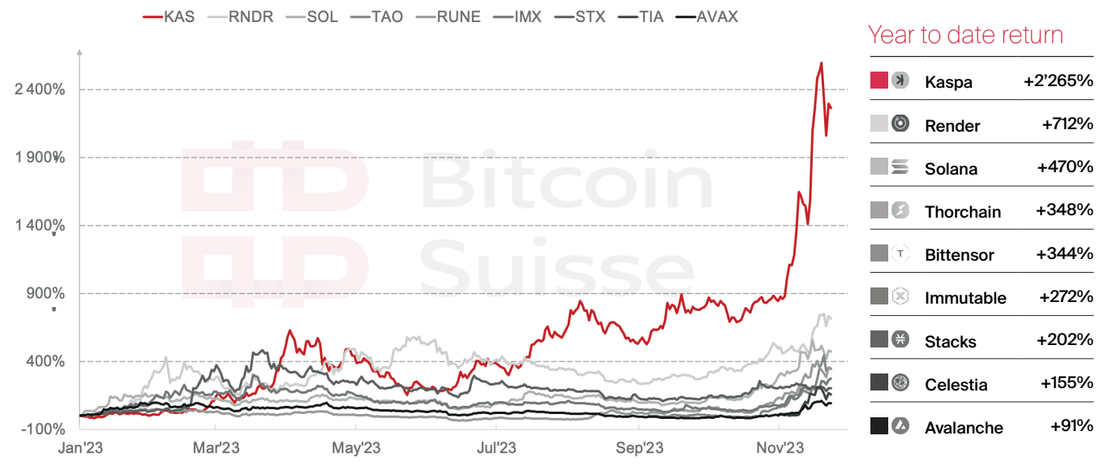
Decentralized gambling and betting are another area to watch. After the ICO era, and the first two waves of DeFi protocols, the industry desperately seeks real yield and sustainable cash flows. Protocols such as Rollbit (P/S =0.69 annualized based on November revenue of $56M,) and WinR (P/S=1.3 annualized based on November revenue of $0.13M) a fully decentralized platform with no operators nor owners running on immutable smart contracts, provide just that. They essentially allow you to become the house. In our view, the next expansion cycle of these platforms is close. Mostly because fully homomorphic encryption (allows computation on encrypted data) and zk technology now enables games like on-chain Poker with code-level fairness in a truly decentralized fashion.

PREDICTION #12

Strong early stage, strong late stage

Historically, projects that provided outsized returns in late bear market and early bull market stages kept momentum throughout full-fledged bull markets. We curated projects that match this paradigm and provide insights on underlying fundamentals.

YTD of selected digital assets



Year to date return

Kaspa	+2'265%
Render	+712%
Solana	+470%
Thorchain	+348%
Bittensor	+344%
Immutable	+272%
Stacks	+202%
Celestia	+155%
Avalanche	+91%

Source: Bitcoin Suisse, Data: Tradingview, Data as of 23 November 2023

OUR PREDICTION

Avalanche, almost losing the race against Ethereum's network effects, came back with a bang. They have been cooking on the institutional shore (Request for Streaming PoC with Citi and JPM, Republic Note via INX), on the gaming shore (e.g. Shrapnel, Beam) and on the tech stack side with IBC integration (Landslide) and Subnet-Only Validators. Avalanche's overall total addressable market extended substantially, and usage metrics indicate already what we expect to be a sustained trend.

Solana, the monolithic powerhouse, heavily oversold after FTX went belly up, finally managed to liberate itself from the stain. While the ecosystem experiences a revival in users (occasionally flipped BTC in active addresses) and TVL, there is crushingly good tech under the hood and in the pipeline (compressed NFTs, localized fee markets, firedancer, async execution, dynamic base fees and storage pricing, multiple concurrent leaders). A convincing setup for bets outside Ethereum based on fast and cheap transactions without fragmentation issues.

OUR PREDICTION

Opposite of Solana sits Celestia, the first production ready alternative DA solution fostering the modular paradigm. It allows rollups to thrive on cheap, scalable data availability based on innovations such as data availability sampling. The market agrees on its relevance while other projects such as NEAR join the race with their DA layer. On our DA watchlist: Celestia, NEAR, EigenDA and Avail.

Key metrics of selected digital assets

	Ticker	Vertical	MCAP	Sharpe (1Y)	Vola (30D)	Exchanges
Kaspa	KAS	Next Gen PoW	$2.74B	2.65	1.62	6
Render	RNDR	Decentralized Compute	$1.20B	2.18	1.26	24
Solana	SOL	Monolith	$23.9B	1.86	1.41	41
Thorchain	RUNE	Cross-Chain	$1.64B	2.07	1.69	11
Bittensor	TAO	Decentralized ML	$1.35B	2.55	1.69	2
Immutable	IMX	Gaming	$1.77B	-	-	28
Stacks	STX	Scaling Bitcoin	$0.89B	1.29	0.65	16
Celestia	TIA	Modular	$0.82B	6.44	2.57	8
Avalanche	AVAX	Enterprise, Gaming	$7.53B	0.92	1.34	39

Source: Bitcoin Suisse, Data: Messari, Artemis, Data as of 23 November 2023

OUR PREDICTION

Kaspa popped with an efficient PoW and GhostDAG consensus mechanism trying to follow the steps of Bitcoin. Meanwhile, Stacks, a Bitcoin L2, made noise as the only protocol to offer native Bitcoin yield. Its milestone Nakamoto upgrade expected in early 2024 brings sBTC and major optimizations across the stack. Both projects are worth monitoring, providing a potential beta play on BTC.

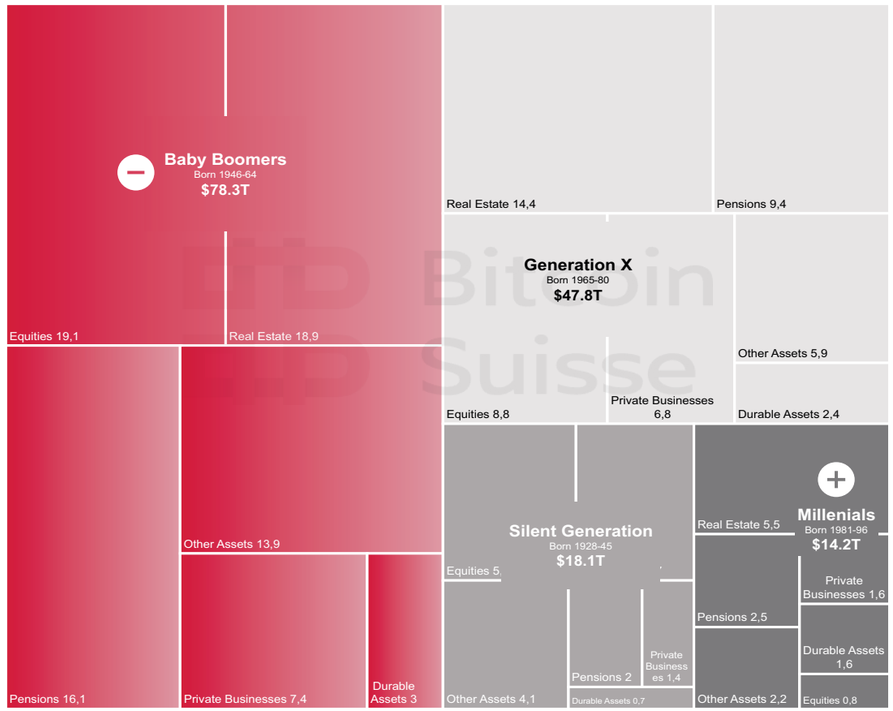
Lastly, fundamentally attractive projects that lean into the AI narrative will likely not lose steam in the months ahead as computing and storage becomes a bottleneck and debates around decentralizing AI ramp up. This affects most components in the decentralized machine learning supply chain from storage to data pre-processing and model training. Projects worth mentioning are Render, Bittensor, Filecoin or Akash.

PREDICTION #13

Final assembly line: too much demand, too little supply

Digital assets are the most vibrant, most disruptive, most dynamic, most performant, and most transformative asset class available to mankind. We enter an era where digital asset exposure becomes the norm, where a lack of exposure equates to risk. In this prediction, we look at the law of supply and demand and outline why we believe that the price equilibrium of BTC should arguably be substantially higher some months down the line. Comparing the upcoming demand and supply domains with a cocktail, we are dealing with a well-meant long island iced tea and here's the recipe:

The great wealth transfer



Source: Bitcoin Suisse, Data: Federal Reserve

Demand

OUR PREDICTION

Macro:
rate cycle peaked, possible QE measures upon yield curve un-inversion, global liquidity is coming back (M2 bottomed), expansionary fiscal policies, federal debt service at ATHs, election year with multiple pro crypto candidates, an overall risk-on setup is looming.

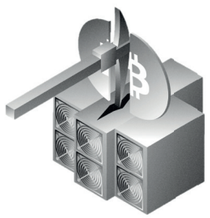
Institutional:
a potential ETF does not just mean significant inflows upon approval, but it elevates digital assets in acceptance, legitimacy, and regulatory clarity. This aligns with the plain benefits of having digital assets in diversified portfolios.

Adoption:
gaming, betting, social applications, tokenized dollars in countries tortured by inflation, DeFi and RWAs attract millions of new users.

Risk mitigator:
digital assets as a solution to looming threats from CBDCs (3.7 billion people are living under authoritarian regimes experimenting with CBDCs), deep fakes, privacy (FHE, zk), decentralized and democratized AI, data ownership.

Demographics:
the great intergenerational wealth transfer is the most overseen component. The wealthiest generation, baby boomers, will retire through 2045, transferring more than $70t in assets to younger generations, mostly millennials, a wealth transfer eclipsing any in the past. By 2030, millennials will hold 5 times more wealth than today. So what? The digital asset adoption rate of millennials is factors higher than that of baby boomers, on average 5x. One in five Americans hold digital assets, 60% of which are millennials and gen Z. It is reasonable to assume that a fair share of that wealth is flowing into digital assets. Galaxy estimated a resulting capital flow of $20M-$28M daily over the next 20 years.

Bitcoin halving table



	25 BTC 2012	12.5 BTC 2016	6.25 BTC 2020	3.125 BTC 2024
Halving price	$12	$645	$8’596	?
1 year after	$1’013	$2’502	56’760	?
Return	+8’341%	+288%	+560%	?

Source: Bitcoin Suisse, Data: Federal Reserve

Supply

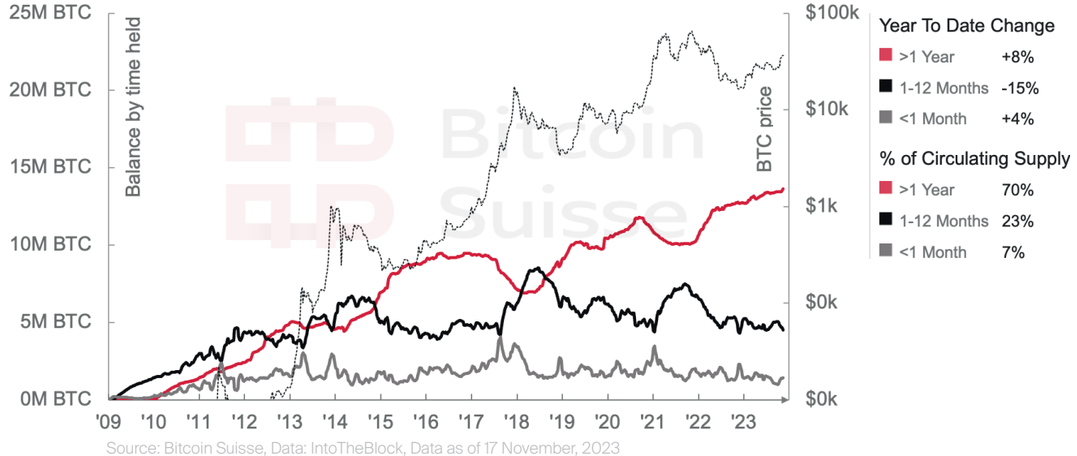
■ OUR PREDICTION

Halving:
the 4th Bitcoin halving is estimated for April 2024. Post-halving, there is $5.75B less structural supply hitting the market (calculated based on BTC at $35k). Historically, Bitcoin yielded strong gains in the year that followed the halving and early trends of this 4 years cycle echo past patterns.

Long term holders:
the supply dynamics indicate that long-term holder supply is on a sustained upward trajectory (BTC ATH at 70% not moved in >1Y, ETH ATH at 76% not moved in >1Y). The short-term holder supply flashes exhaustion and mid-term holder supply is ranging at multi-year lows. We derive strong signs of holder conviction, leaving ample room for growth as increasing supply age is a proxy for illiquidity. Historically, cycle tops are skewed towards short- and mid-term holder supply. There are no signs however of a trend inversion and long-term holder supply distribution. Note that supply held in TradFi vehicles such as spot ETFs is increasing too.

Exchange reserves:
showing a sustained multi-year decline, recently hitting an ATL of 2M BTC. It suggests that BTC is migrating towards more illiquid and less speculative venues that puts the available supply at historical lows, another strong signal of elevated long-term positioning and accumulation. Note that supply leaving exchanges is also subject to institutional and TradFi vehicles like custody.

BTC balance by time held



Source: Bitcoin Suisse, Data: IntoTheBlock, Data as of 17 November, 2023

Combining the above, there is a major supply crisis assembling. For a fair number of holders, Bitcoin is a one-way street, a buy and never sell asset held by a community of believers with high conviction. The potential solution to debt money in a world that seeks safe haven alternatives. Meanwhile, regulatory derisking and major streams of adoption will materialize, bringing multiple demand verticals that stumble into the halving event. Never in digital asset history did we have such a textbook setup for price discovery.

Please note that there is a chance of macroeconomic turmoil in 2024 and there is a chance of the SEC rejecting ETFs. Such events may however be considered as an opportunity. The overall odds are heavily in favor of digital assets. And while this entire article focuses on dynamics that may influence performance, it is key to understand context. Vehicles such as ETFs are solely tools. The core primitives of digital assets provide the substance, offering a disruptive emerging monetary technology in a permissionless, inclusive and immutable fashion. Price is only a lagging indicator of fundamentals.

To sum up, we project that liquidity will chase strong narratives. And since digital assets are a very rhythmic and reflexive asset class, we might face the culmination of catalysts engineered for more than a decade. This could result in an endless twap into digital assets with ever reinforcing feedback loops while institutional demand runs into supply constraints. Digital assets are ready for prime time. In our view, the supercycle is closer than ever.

"Has anyone ever seen an asset that gets smoked -80%+ multiple times but comes back stronger each time over multiple cycles across 15 years?"

-Alex Thorn, Head of Research at Galaxy

The author thanks Marcos Benvenuto for the valuable support creating model portfolios.

INTERVIEW

Crypto Valuation and Bitcoin's Green Investment Thesis

Dominic Weibel
Research Analyst at
Bitcoin Suisse

A Glimpse into Sound Valuation Models, the Institutional Impact, and Crypto's Seat at the Portfolio Table

An interview with Matthew Sigel, Head of Digital Assets Research at VanEck, about potential U.S. spot ETFs, sound valuation models and digital assets in traditional portfolios.

Dominic Weibel:

Welcome to our Outlook '24 interview in the light of institutional digital asset adoption. We are very honored to welcome Matthew Sigel who heads the digital assets research division at VanEck. With a profound understanding of the digital asset ecosystem, Matthew is at the forefront, sharing research and analysis and insights that elucidate the transformative potential of the crypto domain.

VanEck is known not just for its innovative ETFs, but also as a player that is very forward thinking in the digital asset space and currently manages billions in assets. VanEck continually showcases its influence and trustworthiness in various markets.

Today, we aim to tap into Matthew's expertise, as he hopefully provides us with a lens into the current and future trajectory of the crypto landscape. And therefore, Matthew, thank you for taking the time to be with us today.

Matthew Sigel:

Thanks for having me and the kind introduction.

Dominic Weibel:

We have a lot of ground to cover today, and I suggest we start with a brief introduction of yourself and VanEck. Moreover, I know you have a TradFi background, thus, I'd be keen to know why you dedicated yourself to this entirely new and interesting asset class. Go ahead.

Matthew Sigel:

I started my career as a news reporter, journalist at Bloomberg, CNBC. And what you find in journalism is that the logistics and the logistical effort involved in just getting images and audio on a TV screen or words on the print, like so much time goes into that, that a lot of time focus is lost on the real work and the real truth. And we can see that today very clearly. The polarization of facts.

15 years ago, I was relatively early to understand that the mainstream media was going through a huge period of disruption because of web2 companies like Google, and there was not much future there. So, I always covered finance. I got jealous of all my sources who had bigger balance sheets than me, networked my way into TradFi and ended up spending four years working for Cathie Wood who now runs ARK Invest. This was during the Alliance Bernstein days. So, we were running global equity portfolio, very heavy in web2 platforms. We recognized that there would be natural monopolies that would form. And even though this was pre-Bitcoin days, we were asking ourselves, what is going to disrupt these super normal margins that Google and its peers are likely to generate? The disruption can come from regulation, or it can come from innovation. Being a relatively free market capitalist, I hoped it would come from innovation.

So, when Bitcoin started to take off, I just identified that as a killer app that would leverage the new kind of liberalization of cryptography that had emerged when Bill Clinton allowed for cryptographic exports in the early part of this century, which kind of turbocharged the growth of Google and web2. Maybe I'd be tortured in creative ways for my passphrase. Given the performance of the asset right now, it seems like others may be thinking along the same route. After working for Cathie, I had 10 years in

investment banking research and sales equities. And it's during that period that I began to invest pretty heavily in Bitcoin and other digital assets.

Meanwhile, VanEck, as an $80 billion money manager with large exposure to gold and gold mining stocks is a macro thematic shop. And the CEO, Jan van Eck, is someone who embraces the innovator's dilemma. Hence, we didn't want to let Bitcoin disrupt our gold holdings without getting involved in that ecosystem. So VanEck, unable to get the spot Bitcoin ETF to market in 2017, when we first filed, began investing in Bitcoin and ventures off the firm's balance sheet in order to get smarter and build a network. And then I joined in 2021 to accelerate the product offering.

"We now have almost 20 products across digital assets. Many of them are passive ETN products in Europe. We also got a number of private funds here in the U.S. Overall, it totals to about $500 million in digital assets compared to our $80 billion in TradFi. We think that ratio is likely to grow over time."

Dominic Weibel:

I would like to dive into the subject of spot ETFs first. As we know, a lot of momentum currently centers around the potential U.S. spot ETFs. VanEck is also part of that marathon. Things heat up as January is knocking on the door where the final deadline sits for some of these applications. As you mentioned in that context, it is impressive that VanEck was one of the earliest applicants. What's your outlook on the timeline, when do we get green light and how is VanEck currently preparing for that scenario?

Matthew Sigel:

There are a few limitations as to what I can speak to about the ETF because our filing is live with the SEC, but the deadlines for these products are basically all in the first couple weeks of January. Unless something changes in the body language of the SEC chair, we would expect all products to come to market generally at the same time by January 10th. It could be earlier and really depends on how quickly the SEC can circulate the documents around their various departments who all have to chime in.

Dominic Weibel:

The markets position themselves as we speak and price in potential approvals. As such, we had a substantial spike in inflows to various funds. Let's cover the potential implications of such an approval. As we know, a spot ETF is considered to bring way more demand. At the same time, the halving event happens in April 2024 removing around $6 billion in annual supply at current valuations from the market. Given the law of supply demand curves, we should face more demand while supply drops. Therefore, we will arguably see a higher equilibrium price. Moreover, there are some cool indicators around long-term holder supply versus supply that moved in less than 24 hours. Both metrics are diverging indicating signs of declining on-chain liquidity. Just recently, we published a report with CoinMetrics on free float supply containing sharp insights on the ever decreasing free float supply. What I'm trying to say is this kind of price inelastic supply of Bitcoin and all the upcoming catalysts should lead to a fairly high impact of spot ETFs.

Outlets like Galaxy Digital modeled how much value could flow into these ETFs, projecting $14.4 billion in the first year and around $40 billion in year 3 with a potential price impact of 75%. What's your outlook on that? Moreover, why will the U.S. spot ETF have such an impact when the Canadian one didn't have a lot of impact? What differences are we dealing with?

Matthew Sigel:

One interesting stat over the last month: there are about 30 Bitcoin ETFs that are already on the market. And those are a mix of spot products in Canada and Europe and the futures-based products, including ours, that trade here in the U.S.. In the last month, those products, just the Bitcoin ETNs, have seen a combined inflow of $400 million.

The total year-to-date number is $600 million. Thus, two-thirds of the inflows into all these products came in the last four weeks, and that coincided with Bitcoin being up 26% in October. I think that's an indication of how much the price can move on what feels like relatively modest flows when those flows are one way.

With the spot ETF, you're going to be mainlining a Bitcoin only exchange directly into the veins of every brokerage account holder in the U.S., including the registered investment advisors that have not been able to buy these futures-based products.

And the reason why it matters is because the size of the U.S. institutional capital markets and asset management industry is orders of magnitude larger than it is in Canada or Europe. You have a much freer market DNA among American investors.

The SEC's objection was around issues of custody and market manipulation. As Coinbase has gained market share throughout the year and the SEC looks set to bless these products, those fears have faded. We were debating on today's morning call what would be a successful outcome and what would be an unsuccessful outcome. Somewhere in the $100 million plus range on day one and a billion dollar plus at the end of month one could be the base case for what these products could attract.

Dominic Weibel:

Those are fairly substantial numbers. I also think the U.S. is generally perceived as a role model and plenty of jurisdictions and entities follow what the U.S. does. Hence, greenlighting a U.S. ETF will likely bring a huge bump in legitimacy to that asset class.

Dominic Weibel:

When it comes to digital asset valuations, both institutional investors and retail investors alike face challenges. For instance, what is the fair value of Bitcoin or ETH. When is it overvalued, when undervalued? In the domain of valuation models, VanEck established themselves as one of the pioneers.

In my opinion, VanEck arguably came up with the soundest valuation models for both Bitcoin and ETH.

In TradFi, it's common to have a broad range of valuation models and there are various tools on how different assets such as equities or commodities are treated. Since digital assets are fairly new asset class however, there are still plenty of entities trying to figure out proper valuation models. Let's dive into the available approaches, shed some light on their importance and explore which traditional tools are currently applicable to the digital asset space.

Matthew Sigel:

Sure, I think you identify what is a large obstacle for institutional investors to buy tokens directly. And that is a lack of cohesive and commonly agreed upon valuation model. Many of the most sophisticated institutional investors want to have risk parameters around the assets that they're buying. They want to be able to identify what is fair value? What is the replacement cost? What is the possible upside potential?

In equities, you basically do that by trying to predict what the earnings of a company will be, say, five years out. Try to figure out what valuation the market may pay for those earnings. So that's price divided by earnings, known as PE ratio, and then discount that back to today. For stocks, earnings consist of a numerator, the income, and then the denominator, which is the shares outstanding. And in TradFi, generally, the share's outstanding portion is relatively predictable, and it's governed by regulation and self-regulation around: new share issuance and the disclosure that must come with granting new shares.

In crypto, there's just a lot more known unknowns. You're basically holding call options on this alternative financial future in which open source blockchains intermediate a meaningful percentage of the world's financial flows.

But how many tokens will there be outstanding? How will that token capture value from all the value that's going across its network? The tokens oftentimes blend elements of commodities, currencies, equity, fixed income, all into one asset. So, it's a very bespoke process. And I'd say that's one of the reasons why we have a lot more uncertainty in our valuation models for crypto than we do for equities.

We recently put out a piece on Solana and the price target ranged from $10 to $3,000 with a base case of $300. And I understand the kind of pushback and laughter about how wide that range is. The lower bound could be zero. We did not say that, but these call options are just incredibly volatile. And in most cases, the cash flow, the stream of earnings, that we want to project and then discount back to today, haven't materialized, yet.

We're buying liquid venture, which in a lot of cases does not even have revenues or earnings. So, we must center ourselves around three major pillars. What's going to be the penetration rate of these open source blockchains? How much market share are they going to take? And in what categories?

We divide the world into these three categories. The one pillar is penetration. The second is market share, meaning how much of that open source blockchain value can blockchain A capture? And then the third pillar is the monetization. What's their take rate going to be of all the value that flows across the blockchain? And from there we can arrive at a cashflow estimate, from which we deduct expenses, which often include validator expenses and taxes. And then we DCF (Discounted Cash Flow, editor's note) that back to today. That's the overarching way we approach it.

Dominic Weibel:

I am familiar with the Solana report and figured that it's quite a broad range, but frankly, it's also a first attempt to get an idea with a rather high degree of confidence.

The discounted cashflow model is one of the most powerful tools to value certain digital assets. However, it does not apply to Bitcoin because Bitcoin is more perceived as a commodity and a store of value like digital gold. Bitcoin actually outperforms gold and fiat currencies when it comes to monetary traits. Just to name a few, scarcity, durability, portability, divisibility, or scalability. In these traits, Bitcoin dominates against both fiat and gold. You also explored Bitcoin valuation models. What approach did you take for Bitcoin? How do you account for monetary premium? And which cash flow multiples did you apply to your models?

Matthew Sigel:

Our Bitcoin valuation is different from others. To your point, Bitcoin is not a cash flowing asset except to the miners. It's impossible to do a DCF for now. We'll see, and this is hotly debated internally, that Ethereum's roadmap transforms Ethereum into a settlement layer while transactions and data availability happen on other chains. If that materializes, Ethereum and Bitcoin may be more similar than they have been previously.

Our BTC price target is $275k and it doesn't incorporate the potential that Bitcoin becomes a settlement layer for other smart contract layer twos like Stacks or Lightning Network. It really just looks at what's the stock of all the gold that is above ground and held for investment purposes. Let's assume that Bitcoin reaches half the market share of gold as a ratio of all the money outstanding in the world. And that's how we get to $275k on BTC. If there emerges a functioning stablecoin market on a Bitcoin L2 or a flourishing NFT market, that would provide upside to our target price. But we're basically looking at the polling of young people that perceive Bitcoin as digital gold. Given our significant gold holdings, we have a decent read on the supply demand dynamics in the gold market.

Dominic Weibel:

So, you primarily derive the indicators from the gold market. The demographics aspect you mentioned will play a crucial role in my opinion. Imagine the amount of wealth at some point within the next 10 to 20 years is flowing to young generations who are more familiar with digital assets than they are with other traditional asset classes. What I'm trying to say is, the demographics induced wealth transition will play a vital role in the adoption of digital assets.

Matthew Sigel:

Definitely, and I do think this is a retail-driven asset class.

So, when I first got into Bitcoin in 2016-2017, there were taxi drivers pitching it to me. I remember traveling on business and I got to my meeting with institutional investors and they're like, oh, that's a top signal. Even your taxi driver has talked about it. I'm like, no, you don't get it. This is a retail-driven asset. It is meant to disrupt your business. The taxi driver talking about it is bullish, not bearish.

Now there may be a point when that turns, and I do think that we're going to need institutional adoption and we can get into how we define that to power the next leg of this bull market.

Dominic Weibel:

Did we ever have such an asset? A retail driven asset?

Matthew Sigel:

Lots of collectibles are like that. If you look at how people in China, for example, want to get their money offshore, a lot of times they're using Rolex watches. That's a type of asset class that individuals use to transport and transact. There's less institutional participation. It's collectible commodities with unique characteristics that preserve purchasing power. And Bitcoin now, it's 15 years of franchise value. It's a brand now. Stanley Druckenmiller was just talking about that last week. I think that's what appeals to young people.

Moreover, Bitcoin does have a use, it absorbs stranded energy. The oil, gas and coal companies, especially outside of the U.S., that are facing bigger barriers to get their product to market either because of carbon intensity targets or U.S. sanctions, find a beneficial set of characteristics in Bitcoin. It provides an incredible sink to monetize stranded energy and move it anywhere in the world. I noticed that Argentina's largest private oil and gas company that accounts for 15% of domestic Argentinian production just announced that they will be mining Bitcoin with the excess gas that is created in the flaring process.

Dominic Weibel:

I would like to recycle back to Ethereum arguably being on a path to a valuation model that might be more akin to the Bitcoin one. Interestingly Bitcoin might also come to the Ethereum cash flow side now that we see elevated development activity around L2s, the BitVM or zk-rollups for Bitcoin. Of course, that would be awesome without changing opcodes at the base layer, but even if it's necessary, it will be overall beneficial, as Ethereum proves that fees follow functionality. Currently however, Bitcoin does not offer too much functionality, but at some point, that might change, bringing cash flow aspects towards Bitcoin too.

In Ethereum substantially different aspects are at play. For instance, we have reward emissions in the form of staking rewards, and a dynamic that is akin to buybacks in the stock market, Ethereum's burning mechanism. Both play a vital role in your valuation models and fairly so. And so do transaction fees and MEV (Maximal Extractable Value, editor's note), basically every value that can accrue at the base layer. if you don't mind, please guide us through your Ethereum analysis framework and don't hesitate to share your bull and bear cases for ETH based on your cashflow multiples.

Matthew Sigel:

One way that might be helpful is comparing and contrasting the Solana price target to the Ethereum price target. Our base case for Solana implies about a 10x upside. And that happens with Solana achieving just a 30% market share in terms of the value being intermediated among all open source blockchains. For ETH, we get 5x upside, and that's assuming that ETH captures double the market share, hence double the market share of Solana. We need 70% market share for that 5x. With simple math like that, you can see that in a vacuum, risk reward for Solana appears to be a lot better than Ethereum. There's very little in the price in terms of what the market is expecting on their terminal market share.

Now you also have to account for the volatility of the token, some of the unique supply demands of the token, the level of uncertainty around the future roadmap, or the lack of any meaningful TVL on Solana. But in a vacuum, you'd have a higher Solana weighting than Ethereum in our fundamental model because of the upside that can be generated with half the market share.

The key variables that we look at, I mentioned those three pillars earlier, are penetration, market share, and monetization. In our Solana model, we're assuming that the token captures value at one fifth the level of Ethereum. Thus, the blended Ethereum token take rate comes out to about 2% in our model when you combine finance, metaverse, social, gaming, and infrastructure. For Solana, we're assuming about 60 bps blended, therefore a much lower take rate. The network is engineered from a perspective of abundance, whereas Ethereum appears to be engineered from a perspective of scarcity by pushing all those transactions to L2s.

Dominic Weibel:

That's highly interesting Matthew. In the last weeks, ETH snapped back into a slightly inflationary environment and at the same time we see increased rollup activity.

Matthew Sigel:

There's not too much activity on the base layer. That's one problem of this month's rally. The flows are coming from ETNs. We can also see the ETH to BTC ratio breaking down. It looks quite similar to me as it did in late 2019 when BTC had bottomed and was kind of in a choppy but upward range. The market didn't sound all clear that we're into this new bull market until the BTC halving and then ETH dominance rose along with the entire market cap. My framework is that we're in that late 2019 parallel. Same thing's happening with Bitcoin miners. They're lagging the Bitcoin price pretty dramatically here, which also occurred pre-halving in 2020. For ETH, I just think we need to see more on-chain activity. That's what drives gas fees. That's what drives monetization of the token while for BTC, the use case is hodling.

Dominic Weibel:

I fully agree from the cycle perspective, it's very similar. However, while being in a slightly inflationary environment of ETH issuance, we also see Ethereum's rollup centric roadmap materializing. Transactions happening on L2s are now at a scaling factor of 4.8 compared to base layer transactions. Is there

a case for Ethereum, where blockspace becomes abundant via L2s and we face a scenario similar to Solana?

Matthew Sigel:

I think that's the thesis, but even L2 transactions started tailing off. I think it was in August, which really corresponded with the new leg lower that we've seen in the ETH-BTC ratio.

Dominic Weibel:

They peaked, yes. Moreover, I guess a good amount of activity is not organic based on airdrop farmers.

Matthew Sigel:

You can tell from our approach that we're trying to make money by taking a slightly longer-term view than the high frequency folks. The volatility of market share within the L2s is quite high and unpredictable to justify large positions in those types of tokens. From my perspective, it's more of a wait and see on those.

Dominic Weibel:

The layer two narrative is very alive. Monitoring how much value accrues to these rollups is highly important. Several dashboards indicate that we are and will deal with substantial cash flows to L2s as they rake the delta between transaction fees paid to the base layer and the transaction fees collected in the first place, but also the MEV accruing to rollups, something to watch.

Moreover, there are rather established players already. From early on, Arbitrum and Optimism could gather quite significant market share and made important progress on the decentralization side. So yes, while a volatile space and no clear winner yet, Lindy Effects are at play.

I'd like to refer back to valuation models, especially looking at cashflow assets. How do we consider the difference in supply impact compared to stocks? What I'm talking about is that neither dividends in the most common case nor buybacks in stock markets change the total supply of the underlying stock. There's no burning of supply for instance. And if there's a dividend paid, it's usually in fiat terms and not based on inflationary emissions. Yet for both Ethereum dynamics like burning and staking rewards, we have a material supply impact that alters the total and the free float supply.

Another important difference is that digital assets have way less overhead and substantially higher margins than stocks. I wonder, how did you account for these two mechanics in your valuation models?

Matthew Sigel:

Well, I would slightly disagree with the premise that equities who buy back their shares don't occasionally see declining share count. They do. And that declining share count can make their earnings per share look a lot better. You can see that with many equities that ended up having negative equity. It is possible to buy back shares, decrease your share count and make your stock go up because of that. In the case of digital assets, determining the terminal supply is one of the biggest unknowns that we have. Every other Ethereum model essentially uses the price of Ethereum in order to predict the price of Ethereum, which doesn't make any sense to me. You have to start with some top-down beliefs about what the penetration levels of this asset class can be, and then what the take rate for the network can be benchmarking it against existing networks with similar functionality. The whole use case here, I think, is that this is a deflationary asset class that brings automation to existing workflows. It should enable cost savings and consumer welfare because of that. So that's of how we think about it.

In our base case for ETH, we see 5% across all finance, banking, and payments revenues by 2030 going through open source blockchains. We see 10% of infrastructure, meaning decentralized compute, storage, networking, wireless, et cetera. And then we have this third category, metaverse social and gaming, where the penetration rate is 20%, so much higher because we think that crypto assets can enable new markets in those emerging consumer tech areas.

Then we look at the value capture. How much can the Ethereum token capture as a percentage of all that value benchmarking it against competition in the web2 or TradFi world. And because finance is such a competitive and mature market, we give ETH just a 3% take rate. For infrastructure, we give it a 5% take rate, looking at AWS margins and others. And then for metaverse social and gaming, our take rate is much higher, as high as 10%.

When we're monitoring this, we're going into the subcategories. Who's consuming the gas? What category do we put them into? How fast are they growing? Is that application likely to sustain momentum or is it just being goosed by airdrop incentives? That is how we think about it in an end market by end market basis.

Finally, we had to make some considerable assumptions to figure out what percent of the outstanding ETH would be burned and how many transactions might occur. The number of transactions is not that relevant. They're selling block space. It's about how much data, what's the demand for data across these blockchains and which chain is going to be most efficient and able to sell that space at the most predictable and lowest prices.

Dominic Weibel:

Great insights, thank you. However, I thought that stock buybacks usually end up in the treasury and are therefore not really removed from the total supply.

Matthew Sigel:

Usually that is the case, but it doesn't have to be. And there's considerable regulations around how transparent companies must be around their share count.

I was looking at the Bitcoin miners just the other day and the top five miners have grown their share count by an average of around 400 to 500% in the last three years. So, we got to keep those companies' feet to the fire as well, right?

Dominic Weibel:

To consolidate the previous conversation, ETH can more or less be perceived or valued akin to a growth, high beta stock or cash flow equity and dividend paying asset, while the characteristics of Bitcoin lead to a valuation model that is more akin to a commodity which is mostly driven by a monetary premium.

Which one of these asset specifics is usually performing better in tight monetary conditions and an inflationary environment? Is it cash flow assets or is it a store of value kind of commodity? Or can it be both?

Matthew Sigel:

In the real world, when there's a big risk-off event, then profitability, cash flow, strong balance sheets tend to outperform. In crypto, the correlations are more volatile. And just when you think you're in the safe asset, for instance ETH versus alternative coins, let's say in May or June of 2022. The bear market is underway, Luna has collapsed, the alts are acting terribly, everyone's crowded in ETH and then boom, there's a deleveraging event and ETH went from being the lowest vol crypto asset to the highest vol crypto asset.

I have some biases around which of the digital assets should be the highest vol and the lowest vol (volatility, editor's note) and Bitcoin should probably be the lowest vol in my opinion. Yet two weeks ago we got to a point where Binance's BNB and Tron's TRX were at lower vol than Bitcoin. That didn't make any sense to me. That's a signal you want to buy BTC and ETH and sell TRX and BNB. And it played out in the last couple weeks. It's overall just so much more of a changing and dynamic environment.

Dominic Weibel:

You must be on your toes continuously in these markets. Let's focus on the case for crypto in portfolios and how that will play out in the upcoming years. For instance, Larry Fink just recently shifted his crypto emphasis rather significantly. He now considers it to be a flight to quality and safety asset. It's one of the best performing assets YTD, even on a risk adjusted basis. And even financial advisors shifted from a potential 1% allocation to now considering even 5% exposure to crypto.

Why will digital assets, maybe based on the above facts, become an integral part of traditional portfolios, maybe even in the not-too-distant future? Is crypto really that ultimate hedge against sticky inflation, monetary debasement, and extreme fiscal policies?

Matthew Sigel:

Well, at VanEck, we are fundamentally macro thematic investors. That's the DNA of the firm. We meet twice a week as a firm, all the active management professionals, and all asset classes are present: emerging markets equity, emerging markets debt, multi-asset portfolios, natural resources, digital assets. And the one theme that continued to arise over the last several years is around the vast amounts of debt in the world, and the declining credibility of those who are issuing it, i.e., G7 governments plagued by incredible amounts of polarization and disagreement about basic facts. Including the basic fact around what the U.S. debt levels are going to look like. The implications of that have not been properly digested by investors.

And we see a possible future in which the interest expense alone on U.S. debt could be 60% of all tax revenue. That's just at 6% interest rates. If we got up to 8%, 9%, you could be looking at a scenario in which interest expense on U.S. debt is 100% of tax revenues.

How can you pay for necessary items at that point? What is left on the policy plate that the Fed has not already tried? There's wealth tax, maybe there's a default, there is explicit printing and paying, which looks like what we're going to do in this next kind of Israel-Ukraine package.

> And you just wonder what young people are going to think as they come of age and realize that they're paying more interest on debt than they're getting back. And Bitcoin in particular acts as a protest vote from U.S. government trading counterparties who no longer want to fund some of what the U.S. tax revenues are going to, namely sanctions, war, super woke policy at the social level. They're looking for some type of neutral monetary system that is not subject to the whims of these unaccountable fed bureaucrats who keep getting it wrong.

I was in a Twitter debate with a pro-Palestinian folk just a couple hours ago. They're a Bitcoiner, I'm a Bitcoiner. We disagree pretty vehemently on what the facts are on the ground in the Middle East and we agree that every 10 minutes Bitcoin is going to create a block that contains a version of the truth that both sides agree on.

For the countries that are on the fringes of the world's financial system like El Salvador being a good case in point and hopefully Argentina in a couple weeks, they will slowly adopt Bitcoin either for their central bank reserves or as legal tender over the next decades, just as a safety valve that lets the entropy from this polarization out into something which everyone can agree on. That's where my strongest conviction is.

The past cycles show that when Bitcoin rallies, folks take their profits and speculate on higher risk assets. In past cycles that was Ethereum and the long tail of all L1s. I think there's a lot of policy work that needs to get sorted out in the U.S. before those tokens are bought and put on company balance sheets or country balance sheets. I think that day is much closer for Bitcoin. We'll see what that rally will unlock for the rest of the ecosystem.

In our terminal DCFs for Ethereum, we've got this 5% penetration level for finance, banking, and payment revenues. It's still a very, very modest target that gives us 5x upside for ETH, 10x upside for Solana and BTC.

Dominic Weibel:

If you have that context, that 5x seems pretty conservative. However, the current macro landscape with its interdependencies and dynamics has broad side effects on the digital asset industry. The S&P is in correction territory, we face an ever-increasing monetary debasement, the Fed is trying to curb

inflation, but GDP remains above expectations, and there might be a debt spiral looming. Just recently, the Treasury announced that it puts another $1.6 trillion on top of their debt pillow. If you think about it, it's more than double the market cap of Bitcoin, that the Treasury just adds within the next six months. Bitcoin seems tiny if you look at these numbers. House prices in the U.S. are incredibly unaffordable. You need $100K in annual income, while the median household income is only $68k. Three years ago, you could afford a house at $60 annual income. These numbers are crazy. If that was not enough, the yield curve is un-inverting making it very hard to navigate the space right now. If there's one asset class that benefits from all that, it must be crypto. Arthur Hayes in one of his recent reports said, they must start the money printer again as things break. As a result, we will have a big party especially in risk assets, but subsequently, we also face a major hangover.

Matthew Sigel:

Meanwhile, Bitcoin makes higher highs and higher lows throughout each cycle. Best performing asset class in three, five, 10 years. I don't think it's going to be too hard to get some of these institutional investors to put 50 bps or 1% into a spot Bitcoin ETF. Remain hopeful that that's one of the major catalysts of next year's bull run.

Dominic Weibel:

Pieces are falling into place. There's one more major catalyst, tokenization. While it's a flavor of the last quarter, real world assets are getting traction in the midst of tightened monetary conditions and elevated risk-free rates. The on-chain citizens seek access without having to move off-chain. Thus on-chain treasuries are booming. Then we see tightened credit conditions from banks who are more conservative in lending money. Private credit markets might be the next area that will substantial and sustained growth in this environment.

Real world assets allow us to build traditional portfolios on chain, diversify more, and bring liquidity to illiquid off-chain assets. There's a lot to be excited about. How do you see the real-world asset narrative to play out in the coming months and years? Will it be another bullish catalyst?

Matthew Sigel:

We've done a lot of work on real world assets, both from an issuer perspective, as well as an investor perspective. And I have to say that the conclusion is not too bullish. The real-world assets that are going on chain, especially these T-bills products, which by the way, peaked a couple of weeks ago, and now the AUM has been declining as folks likely take assets out to chase the BTC bull run.

But most of these assets are not permissionless. They must be minted to whitelisted wallets. They cannot be pledged in DeFi unless that DeFi exchange itself is essentially a whitelisted entity. They offer lower yields than you can get in T-bills directly with less security because of the smart contract risk and the lack of liquidity. I appreciate the infrastructure that's being built and in our venture portfolios, we are invested in some of these infrastructure builders. But as an $80 billion TradFi player, we have no interest in putting a portion of those assets on-chain because of lower liquidity, and elevated risk.

As an issuer, we're struggling to see the economics. And especially with MiCA, even bringing a simple commodity gold token, market requires treating it like a stable coin. There's all types of capital requirements that MiCA demands and it's very tough to make the economics work unless you are already at scale. MiCA seems to be more about regulatory capture and entrenching winners than it is about really unlocking innovation in this space.

It feels to me like these T-bills products are a place for sophisticated digital asset investors to capture yield when they are bearish. Maybe that becomes a bigger story in three or four years when hopefully Bitcoin made another all-time high, much of TradFi is now involved and they want to take risk off the table. But if you're looking at this, what might be the beginning of this bull run and a much better setup for 2024 with the halving, the election and the ETFs, why would you want to dither around in these real world assets? I'm just not seeing the use case.

Dominic Weibel:

Interesting take and a nice alternative perspective on the mostly bullish views around the RWA area.

Matthew Sigel:

Look at Maker underperforming dramatically here in the last one month. That was the best proxy for real world assets. I appreciate very much the revenue that they're able to derive from that. But in a period where it's risk on, that token is down.

Dominic Weibel:

What do you think about the current risk-free rate, which considering the debt, deficits and the monetary debasement, appears not so risk-free anymore? Do you think there's a future where we see a broadly accepted risk-free rate stemming from staking rewards? Is that a possibility?

Matthew Sigel:

It will for a very small subset of digitally native corporations. Yet even in our bull case, that's less than 10% of financial activity. I like to think about which countries are most likely to adopt digital assets as a part of their policy. For Bitcoin, that will be countries that are rich in energy. For Ethereum, it would be countries that are rich in human capital, that have programming talent to build a storefront on Ethereum, to build a business on Ethereum. It has less to do with your energy and more to do with the human capital in your country.

Dominic Weibel:

I think we are not too far away from achieving application stage escape velocity where the infrastructure layer is not the focus anymore, but adoption is really driven by major applications. I feel that should happen within the next year. For some closing thoughts, do you mind giving us your boldest, maybe two predictions for the next year?

Matthew Sigel:

Sure, prediction number one, another sovereign besides El Salvador will buy BTC for their central bank reserves.

Number two would be that Gary Gensler resigns. It's quite common for SEC chairs to step down after big losses in the courts. I found a couple in the last 20 years. So that would be call number two, although I had that as a prediction a year ago and it hasn't happened yet. So, running out of time on that one.

Dominic Weibel:

Let’s close the interview here. It’s been an absolute pleasure to talk to you and gather experience and knowledge. Your insights into this very dynamic, volatile world of digital assets were invaluable for us and very enlightening. On behalf of Bitcoin Suisse and our audience, thank you so much for sharing time with us.

Matthew Sigel:

It’s great spending time with you all. Thank you, Dominic.

Scan to watch
the full video interview

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So, when I first got into Bitcoin in 2016-2017, there were taxi drivers pitching it to me. I remember traveling on business and I got to my meeting with institutional investors and they’re like, oh, that’s a top signal. Even your taxi driver has talked about it. I’m like, no, you don’t get it. This is a retail-driven asset. It is meant to disrupt your business. The taxi driver talking about it is bullish, not bearish.

”

-Matthew Sigel, Head of Digital Assets Research at VanEck

Bitcoin's green turn: An investment thesis for climate change mitigation

Since discovering Bitcoin in 2016, Harald Rauter has been focusing on developing the investment case for Bitcoin as a mechanism for achieving superior economic- and environmental returns. Harald Rauter advises ESG-sensitive capital pools like foundations, HNWI and enterprises in developing tailored investment strategies that leverage Bitcoin's unlocking potential for higher risk-adjusted returns while simultaneously achieving unrivaled CO2 emission reduction. For the past 10 years he has been an investor and portfolio manager for climate-positive investments both in the public- as well as the private sector. Harald Rauter holds a PhD in Natural Sciences from ETH Zürich and a master's degree in economics from the Vienna University of Economics.

Learn more about his work at www.bitcoinfirst.work or contact him at harald@bitcoinfirst.work.

Marcus Dapp:

Welcome, Harald! Thanks for talking with me about the grand questions of energy transition, climate change, and how Bitcoin fits in all of this – which to many people feels like a contradiction. As we cover a complex topic, let us kick-off with some "simple" yes/no -questions.

Is climate change real? 100%.

Is global warming caused by humans? Predominantly, yes.

Are we as humanity using too much energy? No, we are using too little.

Are we effective in the way we combat climate change today? Absolutely not.

Is Bitcoin a waste of energy? Not at all.

Is Bitcoin an environmental disaster? It is exactly the contrary.

Will Bitcoin contribute to mitigating climate change? It has an incredible potential to do so, yes.

These few answers will certainly trigger some people, for several reasons. Why are you qualified to talk about these controversial and complex issues?

Harald Rauter:

This is an exciting opportunity to talk about a very controversial topic. It looks more controversial than it really is because we want to have a regenerative and a sustainable future for us as humanity on this planet. My background is in natural sciences, I hold a PhD in biochemistry. I am not working in this field anymore, but what scientific education gives you is a very analytical way of looking at a problem and the skillset to do so, which comes in handy for a very physical-chemical challenge like climate change. Then, for almost 10 years I worked in the climate innovation field. I have been working for an institution which was a subsidiary of the European Commission looking at ways of how a regenerative economy and societal fabric can look like to move from a carbon-intensive present into a carbon-extensive future. This touches many different dimensions: policy, innovation, questions around social fabrics, theories of change, and so on. I felt very privileged to be in this phase of climate change related questions incredibly early.

Things started to change 2018 when Greta Thunberg started her movement where it became socialized to a broader public. From this moment onwards, I did not have to explain anymore what climate innovation and climate change means, because it was in front of everybody. If you think about it, it is not that long ago, 5-6 years, when this desensitization with regards to the problem started. Now we are scrambling to find answers to this challenge. And it feels like we are treadmilling on the same spot and are losing the ability to have constructive conversations about what the desirable future looks like and how we can build it.

And the last missing piece: how did I end up in Bitcoin? The truth is, I came from quite a different angle to most. I was writing my master's thesis in 2017 for my MBA education and was starting to get interested in the question, why is it getting harder and harder for us to organize ourselves in an increasingly complex world? Complexity driven through digitization and globalization. Legacy institutions, it seemed, are unfit for purpose today. I started to dig deep into questions around cybernetics, regulation and self-regulation, and gained a good understanding of why these legacy institutions are not able to

cater to the needs that we will have in the future.

I had this light bulb moment when I stumbled upon Bitcoin, and I realized this could be an infrastructure that allows us to build new ways of interaction, new ways of interacting with each other, be it money or information, or knowledge, or whatever. How does Bitcoin fit into a thesis of moving from a more structurally organized society to a networked based society?

Today, I am negotiating both spaces. I am 100% convinced that climate change is a real threat to our viability on this planet and that we need to look deeply and honestly at how we go about the problem of institutions unfit for the future. We need to ask openly: is this the whole spectrum of possible solutions that we have or are there more? I am advocating for there is much more and that Bitcoin can and should play a prominent part in this conversation about the mitigation of climate change in a way that is not oppressive but empowering, not limiting, but enriching, and that ultimately gives us prosperity and abundance not in a controlled, but in an empowered way.

Marcus Dapp:

This is a remarkable answer and a position very few people have. Let us structure our chat in parts: from the role of energy in the climate change mitigation field, to the role of Bitcoin mining in general, to the thesis that Bitcoin mining has the potential to make climate-positive contributions. To kick it off:

Can you help us understand how climate change, its mitigation and the energy question are interrelated?

Harald Rauter:

I'm a firm proponent of climate science. We have sophisticated tools that allow us to synthesize various sources of information; we do not need a thermometer to interpolate the temperature situation 150'000 years ago. We also have sophisticated tools that help us to print and plot trajectories for the future. The scientific picture only leads to one logical conclusion, which is that we went through a success story of hydrocarbons, and we need to call it a success story because it led to an enormous amount of prosperity for human flourishing. However, we have paid a long-term price by continuously enriching the atmosphere with greenhouse gases. Greenhouse gases are defined as gases that can interact with light and bind heat in a certain confinement. This confinement, due to the atmospheric conditions, is close to the surface with all kinds of secondary and tertiary effects which in the long run will create a lot of problems, and already do.

When we talk about mitigation, we need to ask ourselves what are the main drivers of this atmospheric enrichment of carbons? If we look at the data sets, the sectors that contribute most to the enrichment of hydrocarbons in the atmosphere – 75% of the emissions that we produce as humanity – are related to energy generation and consumption. That could be energy generation in its various forms, electricity, heat, but also energy for buildings, for mobility, etc. If you aggregate all, we end up with about 75% of emissions in the energy sector.

If we want to build a mitigation strategy and if we are open about it, then all cards are on the table. For instance, you can advocate and say: "Marcus, you're only allowed to fly once per year, and in order to do so, you have to eat 5 steaks less." That is a very top-down policy. Is it desirable? Personally, I do not think so. I am looking for ways of how we can achieve the necessary outcomes without sacrificing the values that make our society a desirable society: freedom, privacy, freedom of movement, personal liberties, and Bitcoin. Bitcoin mining, just by chance, happens to have these interesting properties that come into effect here.

Marcus Dapp:

Before we come to Bitcoin, in the yes/no questions, you said that the current ways in which we are trying to mitigate the climate change problem internationally are not very effective. Could you elaborate on that?

Harald Rauter:

Getting a bit technical, but I think it is worth it: What are we observing? One group of scientists investigate the physical and chemical relationships and effects of atmospheric composition, and how they have changed over time, and what we can expect in terms of consequences. Another group is thinking about: How do we now go about this? What are we doing now with this information?

The deeper I dig in understanding the rationales and decisions of these groups over time, I realize that they're not only scientifically driven, but also politically driven. We talk about custodians to governments like the United Nations, so they are in a way not free in agenda-setting and decision-making, because they're funded by governments that pursue their own interests. Inevitably, all decisions taken are also politically informed. Looking at the different decisions that have been taken over time – which mitigation strategies are desirable, and which are less desirable – we see a political influence. I will give you an example. There has been a paper in Nature, a scientific journal, from ETH Zurich, which has studied alternative mitigation pathways, and has found that, for instance, if we would adopt a degrowth strategy, we grow less and we consume less, we would likely achieve 1.5-degree-compliant outcomes. However, governments ignore these pathways because they are politically not feasible. If you are a government and you need to tell people on the Saturday night prime time news, that they must travel less, eat less, move less, spend less... That would be a hard sell. So, political viability informs the decisions about which mitigation pathways are considered viable and which are not.

Once we approach this from an apolitical perspective, an entirely new spectrum opens. I as Harald, a Bitcoiner and climate-conscious person will look at what brings me climate impact and the possibility of economic return! Suddenly, we can start to discuss new mitigation pathways that have not been considered for the past 40 years because nobody digs deep into these UN reports, and we have been socialized to not think about the decision-making process.

But it is our responsibility as people who are in this privileged position to look at those cracks and those decisions, to re-examine them and ask were they good, were they right? As we now have better instruments to go back and tools to think about alternative mitigation pathways, I say we need to look at alternative mitigation pathways, too. These pathways need to assume realistic geopolitical boundary conditions – the fact that states are not necessarily each other's friends. So, we call that geopolitically "competitive" scenarios instead of "cooperative" scenarios.

Marcus Dapp:

This idea sounds logical – the international community must come together and cooperate and discuss and find solutions together, and compromise. Are you saying this basic assumption about the will to cooperate is the problem?

Harald Rauter:

Yes, because the cooperation is not real, and we see that the cooperative consensus is eroding over time. The intergovernmental panel for climate change (IPCC) has terminologies for this: "Shared Socioeconomic Pathways". The cooperative model SSP1 assumes certain cooperative and collaborative boundary conditions.

On the other end of the spectrum you have competitive scenarios, called SSP3, which assumes that states are egocentric, sacrifice long-term goals for short-term survival, emphasize on energy defense and deprioritize education and empowerment. Does that sound familiar? We also need to see the geopolitical realities evolving. What has worked potentially for the signing of the Paris Agreement in 2015 (SSP1) might not necessarily apply in 2023 (SSP3).

Cost of capital is playing a role in this. If a government can print its way out of problems, then they can avoid and procrastinate the resolution of conflicts that underneath the surface. We need a more robust pathway that works in cooperative scenarios but also works in competitive scenario, and Bitcoin is one of these pathways. One of Bitcoin's beautiful features is that it is for everybody, and nobody can hijack the system. It is a social infrastructure designed for an incentive-driven, competitive environment. We see the game-theory play on the individual level and increasingly on the institutional and state level.

Who comes first? Who feels the pressure to join the network first? Who needs to have and secure a part in the network? We see this game theory playing out, but the Bitcoin network then coordinates like a magnet those actions into certain outcomes. While I would assume that it has never been intentionally designed to create climate-positive outcomes, the irony is that Bitcoin actually does - and you cannot change it. It does not matter whether you believe in climate change or not, by investing and saving in Bitcoin, by contributing in one way or another to the network, you create net-positive outcomes both for society and for the climate.

Marcus Dapp:

Let's dig a bit deeper: Bitcoin's uniqueness is revolving around the mining process. Processing transactions, rewarding miners, and spending a lot of energy in the process is all to secure the network. What is special about the energy dynamics of Bitcoin mining in the context of climate change?

Harald Rauter:

There are a lot of beautiful innovations in the Bitcoin protocol. Immutable economics is very powerful, that leads to very net-positive social outcomes. In an inelastic supply, cooperation is rewarded. Your win is my win. Inelasticity, risk rewards, and cooperation are all extremely powerful.

As to mining, I think the real innovation happened in a combination of how the Bitcoin protocol has been designed: proof-of-work plus the difficulty adjustment. Those two are the key innovation elements and they create all these positive externalities. What do I mean? We know every four years, whatever you do as a miner, your block reward will be cut in half. That puts a lot of pressure on your operations and your economics as well. But at the same time, we have the "difficulty adjustment." We adjust every two weeks how much hash power is in the system. To really understand the dynamic of how this has been playing out, we need to go back to the days when difficulty adjustment was low, energy was abundant and energy price was not really an issue. You plugged in your GPU, you mined, and you had much wealth. Soon, many people had the same idea. What happened? The difficulty adjustment skyrocketed, and suddenly a very interesting dynamic came to play because mining is designed to be expensive from the start through the machines that you need to deploy to be competitive in the race, but also – and this is the main determinant – the operational costs under which you can run your machines.

There's a big argument that mining uses an enormous amount of energy, the same amount as Argentina or whatever the country comparison is at the moment. But these absolute numbers are useless and misleading. They are irrelevant because you need to ask where this energy is coming from. In the past, when the operational costs for the kilowatt hour were on par, miners might have consumed energy that was competing with your toaster. Then you can decide: do I use the toaster, or do I use my miner? As an incentive driven individual, you will say it depends on what I want: to save or toast. Now, let us fast forward: difficulty adjustment increases, block reward decreases. Suddenly the economics and your incentive structure are changing. Because now, you deploy this amount of input energy, but you get way too few Bitcoin out of it to be economically viable. So you go for the toaster, and you are right. Yet, you still want to mine, you still want to save. What is the next logical step? Asking yourself: what is the next most accessible, non-demand competing energy source that I can tap into that the toaster cannot use?

Marcus Dapp:

Are you disagreeing with the common opinion that the energy Bitcoin uses is taken from other people who would need it?

Harald Rauter:

Yes, because the more difficulty adjustment increases, the lower the block reward gets. And the miners' capital expenditure (capex) is a bit of an inelastic measure, too, so it averages out the at a very reasonable price. The only variable that you can influence is the operational expenditure (opex) of your energy which determines your profitability. I am just looking for the cheapest. Once we understand that we can have a fantastic environmental conversation because now we shift gears: we focus on the design of energy systems. Our energy systems are typically designed in a very centralized way with a few big actors, because that reduces the complexity to better manage grid stability. Grid stability translates into reliability, and all incentive structures in an energy system are designed towards reliability. Costs do not really matter, reliability does.

However, over the past 15 years, we have seen a new game in town which is called renewable energies, and we have seen the price deflation of photovoltaics (PV), and we have seen the efficiency gains in terms of wind. There is a lot of wind and PV that is now cheap and accessible. This allows you to generate the kilowatt hour of power for less marginal cost than in the legacy system. If you take oil, for example, you need to dig deeper, build more complex infrastructure; you need to transport it, refine it, transport it again, and you need to store it. All that adds to the marginal cost of the kilowatt hour. We observe this divergence between cost depreciation for renewables and cost appreciation for fossil fuel.

Marcus Dapp:

Based on this insight, would you say it is correct to claim that Bitcoin mining fosters renewable energy sources because they are cheaper?

Harald Rauter:

That is one part of the equation. Let me dissect the different arguments that could come up here. First, the marginal cost of production for a kilowatt hour from a fossil energy source gets more expensive, renewables get cheaper.

Second, an argument that is brought up very often: there is a big advantage to the expensive energy that fossil fuels and natural gas can provide. It is “baseload“ energy because it is continuously available. We need this because if we are only on variable energy sources, this generates problems to stabilize the energy grid. So, fossil fuels have a particularly important role to play to provide the baseload energy that is necessary for a system to work, which is one of the major arguments against renewables, because obviously, you need wind to produce wind energy and sun to produce sun energy.

But now, we have a dilemma. We have energy generating infrastructure that gets cheaper and cheaper and cheaper. People and institutions want this energy. Not because it is environmentally friendly, nobody cares. It is incentive driven. It is economically driven that on your property in Switzerland, in Germany, in the Netherlands, you can have sovereign power based on those renewable energy sources that gets cheaper and cheaper. Yet we have this problem that it is an intermittent energy source.

Marcus Dapp:

You are saying there is a maximum percentage of renewable energy that can be feasibly integrated into the grid due to their intermittent nature despite their cost-effectiveness and environmental benefits compared to fossil fuels?

Harald Rauter:

That is a particularly good question. The answer is yes and no. We also need to think how this dynamic plays out over time. Let’s assume you are a miner, and you now identify that there is a lot of intermittent energy that the grid cannot use because it cannot handle the variability.

For example, the UK currently has about 100 gigawatts of wind energy infrastructure which is not online on the grid because the grid infrastructure is not able to handle it. Now, someone has incentivized building out this infrastructure. A pension fund that you and I are insured with, could be holding those projects on its balance sheet. But it is producing zero economic value! That is a problem. Not only now, but also for follow-up projects. What happened in the UK? They did not find any investors for the new wind infrastructures anymore because they were not willing to accept the minimal cost for the kilowatt hour, given the project risk and costs.

Marcus Dapp:

Are you saying that the barrier in the transition to renewables is economics?

Harald Rauter:

Yes, 100%. We have the same situation for photovoltaics. We have an enormous amount of photovoltaic infrastructure in Europe. The problem is that across Europe the sun shines at about the same time. That means we have a surplus of generation which coincides around lunchtime right when demand is the lowest because we’re at work: we’re not consuming, not watching television, not using our toaster and so on. So, high demand in the mornings and evenings and high supply around lunchtime. This leads to a demand-supply mismatch: the energy produced and generated at lunchtime needs to be consumed there and then! The first law of thermodynamics says energy cannot be destroyed, only converted.

If you cannot bend physics, what is the only variable you can shift? It is economics. If I hold a hot potato in my hand and ask you to hold it for me, but I want twenty cents for it, you will say: no, I am not taking the hot potato. Then I change tactics and say, take it and I give you twenty cents. You still decline. So, how about one hundred cents? Okay, you take it for one hundred. So, I need to have the costs of generation and distribution, which is self-cannibalization. That puts a natural limit on the scalability of the rollout and deployment of renewable infrastructures.

This is where Bitcoin mining comes in. For me as a biochemist, miners are like mushrooms: If you have a hostile environment, the first species that comes to pioneer this hostile environment are mushrooms and algae. They prepare the ground, prepare the soil, so higher species can come to live there. When the higher species die in the end, the fungi come in again and regenerate the carbon of the higher species to make it accessible again for new life. And so, fungi have this enormous role in biology to make carbon cycles circular and get the most out of the chemical properties of the carbon itself.

Bitcoin miners have the same role in electricity cycles. They are not competing. They are pioneering, for instance, the wind farms in the UK. But once these wind farms get access to the grid, higher utility purposes will come in. Demand that is willing to pay more than a miner is ever able to pay, so they will marginalize the miner out. Then, the miners can come in again and say, you do not have to pay me anything, I do not have to pay you anything. I just take your energy, and it is even more economically viable than any other form of economic action you could think of.

Marcus Dapp:

Does that mean the strategy for renewables in connection with Bitcoin mining is to increase the build-out much more, so we have much more capacity in renewables?

Harald Rauter:

Yes. Renewables are still intermittent, but we will raise the bar and have much more capacity, because that will help us to have a higher degree of renewables in the overall mix and still have as few black-outs as possible.

This is where the longitudinal component becomes so vital. Contrary to the climate narratives that say we will need less energy in the future, I say: We will need much, much more energy in the future! Even if it is for productive energy only: we need more houses, more roads. Humans consume energy, and we will be more humans. So, we will need more energy. The narrative, we will be more people and live of less energy, is not viable.

The question is how much more do we think we will need? If we want to service all the utility needs in terms of energy, then we have a different conversation. Only renewable intermittent energy on the grid will not do. But we have hydro and nuclear, which the IPCC sees as an integral technology to climate change mitigation, contrary to what is discussed out there. I am convinced that nuclear will, as the economics become clearer, serve as baseload energy, and play an integral role in climate change mitigation.

But the fraction of the intermittent renewable energy will grow. Not because we think it's so great, but because the economics drive us there. Mining can play a critical role in unlocking the scaling mechanism that keeps the economics and the scalability of the technology linear.

The more photovoltaic build-out you have, and the more you compete with supply in low-demand times like noon, the more the economics will bend, and even go back because some will capitulate and say, this is not a good business, I am out. We need to find unlocking mechanisms that help us to grow the build-out steadily and Bitcoin mining will and can unlock this.

Now, a critique may say: "Why use the 'useless' Bitcoin mining? Let us make green hydrogen instead." Well, countering this is easy: have you looked at the economics of how much energy and reliability you need? Have you looked at the capex of a green hydrogen plant? Have you looked at the final cost of sales for a ton of green hydrogen? You will see that the economics do not play out. You need something that is more flexible in terms of demand when demand is needed or can be curtailed at the benefit of some other demand.

We need a demand that is flexible enough to co-locate with these energy production sites. Once you examine the different potential demand types, you will find that there is only one that provides the necessary economics, scalability, technological robustness, and incentive structure to make it work. And that's Bitcoin mining over time.

One example for co-location: AI rendering centers. Do you want this query rendered in chatGPT, but don't mind if it's now or in 5 hours? Do you just want to have the answer by evening time? Now the cost structure changes again, instead of 3 cents in 5 hours you pay nothing - this is desirable. We want Bitcoin mining to come first, pioneer it. But then there should be higher value services that can be built on top, which marginalize the Bitcoin miners again and force them due to difficulty adjustment, decreased block rewards, and higher pressure on their operational costs, to seek for new stranded energy, electricity that they can use and develop to productivity.

Marcus Dapp:

Usually, Bitcoin miners go to places where the energy is cheapest: that is, not to Switzerland, but different and difficult places, politically and/or socially. Are you saying that a mining facility and an energy provider, both located in Switzerland, could cooperate in an economical way?

Harald Rauter:

100%. You know, we have different vox populi decisions in Switzerland that signal that the population wants to embark on a renewable future in different ways. So, the question is: how can energy reliability and energy abundance be combined with the challenges of decreasing marginal returns? However, the intermittent nature of renewables is the same for Switzerland as it is for any other country.

The cool thing is the challenges are the same, but predicaments are a bit different in every country, but we have a protocol that works on one standard globally. We have an enormous richness of learning, of how we can tap into the different ways how Bitcoin mining can play a role in this build-out, in this pioneering phase of unlocking the economic potential. When marginalization of Bitcoin miners in favor of better and more competitive demand plays out, we can learn and share knowledge and achieve a faster, more robust build-out than if we were to do this alone.

Marcus Dapp:

In order to make this happen, we need to reallocate capital resources in a different way. Tell me about your ideas. If this is a viable path, investments into Bitcoin mining domains will change. What do you see in terms of investment and capital allocation needs?

Harald Rauter:

That's a very good question. I think we can build right on what we have just discussed and give very concrete examples. Bitcoin miners look for the cheapest source of electricity. One paradigm shift that has happened over the past 2-2.5 years was to go from stranded electrical energy, essentially arbitrage market inefficiencies in the electricity markets, to building economic pathways with stranded chemical energy.

Miners were forced to look for non-competitive and non-competing sources of energy. One source of energy that nobody has ever looked at was methane, methane from landfills or methane as a side product of oil and gas production. Previously, we have just vented that methane into the air, because in the classical language, methane is considered waste. As a scientist, I tell you, it's not a waste! It's chemically bound energy and you can, in a controlled way, harvest that gas. You can purify it, combust it, and drive a turbine. You transform it into electricity which you can use for any appliance you can possibly think of.

But not everything works well, because I do not know how much gas will vent off from a landfill. As it is a chemical transformation, depending on the composition of the feed stock, it changes with temperature. Bitcoin miners, however, do not care. They can easily co-locate with a landfill, extract the gas, purify it. It is all off-the-shelf technology. No secret, no magic. But they can provide a demand that is flexible enough to use this variable energy when it's available, and when it's not, no problem. If my cost of electricity is virtually zero, I don't mind if my miner gets shut off half the day, because the other half of the day I am profitable.

Plus, there is another argument we should not forget. Because you have this extremely efficient access to electricity, you can ask yourself, what can I do to reduce the capex? Well, you are not looking at the most modern mining rigs, but you are looking at inefficient older rigs. Why? You get them for free! Now you have reduced your capex to zero and you have almost reduced your opex to zero. So, it doesn't matter whether you mine half a day, 3 hours, or 5 hours. The return and the break-even of the capex that you needed for the piping, and everything that you need to do up front, is clear.

Marcus Dapp:

Are you saying, the lifecycle of Bitcoin mining equipment will be extended as a side effect? Would that address the e-waste issue if we can make use of old mining rigs – which we switch off today because of the difficulty?

Harald Rauter:

Exactly, let us look at the environmental side of things. As a miner, I look at methane only from the perspective of chemical energy which I can translate into Satoshis. But the climate looks at methane as a greenhouse gas, which is 25 to 80 times more potent than CO2. So, by burning one molecule of methane, I have technically eliminated 24 molecules of CO2. This is not only good for the climate, but it also offers new alternative revenue streams by issuing high quality carbon credit certificates, and we will need those.

Now I want to put a disclaimer here which is important to me: Burning and combusting methane in that approach gives us time, but it does not solve the terminal CO2 problem! That is much harder to solve than just burning methane. There is an enormous net-positive effect of how miners pivot forever cheaper ways of generating their Satoshis while creating economic and climate-positive impact. But we need to be honest where the limitations of those methods are as well.

I do not think that we will have time to go into the details today but there are also extremely interesting and encouraging developments that help us to use Bitcoin as an unlocking mechanism to service the terminal goal as well. Bitcoin and proof of work have a role to play but for every approach that we are discussing, we need to be honest about the advantages and the shortfalls.

To give you an extension and an idea of how important that is: One of the biggest threats to us as a society issocietyhas, that we come to a methane inflection point where the earth has warmed enough so that it defrosts the permafrost in the Arctic. Permafrost holds so much soil carbon, which would then be released as methane and suspended into the air. One of the tipping points is that we warm the earth enough so that the permafrost defrosts and emits enormous amounts of methane into the air. We need to slow the defrosting, but we are already on a trajectory that we cannot revert, at least in the short term.

However, we now have an economically viable option to say: who wants to live and build a business somewhere in the Arctic? You can have a fully automized mining center there which harvests methane, purifies it, combusts it and drives economic value while mitigating a climate threat at least over a certain period and give us more space and time to think about structural ways of how we can mitigate the broader problem of CO2.

It is a very complex conversation. But one of the things that I find so intriguing is that if we accept that climate change is real, if we accept that current political top-down approaches are not working because they are building on the wrong premise, and if we broaden our lens, there are new technologies and approaches emerging that work towards climate impact and economic impact.

And Bitcoin is the instrument for that. Suddenly, we have an unlocking mechanism for climate change mitigation. That is the story that I want to tell. You know, the capital for the transition exists anyway. I am working to build a venture capital vehicle that allows capital that understands this theory of change to identify and invest in companies that do exciting stuff with Bitcoin mining, knowing that it will create climate-positive outcomes, which they can use economically. Suddenly we built a climate change mitigation thesis around Bitcoin.

What really drives it home for me is to think that the thesis is independent of language and jurisdiction and builds on an open monetary layer which is globally accessible, permissionless, and immutable. So, climate change mitigation agents are the entrepreneurs that build on this standard around the world.

I am taking a future trade in terms of capital allocation that is not looking for the crowded trade in terms of the "fifth Soy milk and the sixth dairy-free milk", because they will not cut it. By chance Bitcoin has this ability and these properties to impact the different sectors that matter most for climate change. And as it is exponentially growing, I am looking at exponential economic and climate returns. This story needs to be told, also by building bridges to existing institutions, to help them understand the value of this infrastructure and this technology, and what it can do for the purpose that concerns us all the most.

Marcus Dapp:

While Michael Saylor's "Bitcoin is hope" statement is based on the monetary narrative, inflation hedge against fiat, you just opened an entire new narrative.

If Bitcoin would not exist today, what would be the solution to the climate change problem?

Harald Rauter:

That is an immensely powerful question for me because … I would not know. Because all the challenges that we see in terms of limitations of building out stranded energies, linearity of value chains, are very much linked to the observation that we do not have answers for these things.

Knowing that we have this technology that sits as a standardized, immutable thing in the heads of creative venture builders and educators and core developers is extremely powerful because in our chaotic world, it's a coordinating thing, and it all caters to the same outcomes.

This is what I find so fascinating. If you stack Bitcoin, you help someone be a better agent for the climate. If you withdraw supply, you make Bitcoin more desirable, which means that you help someone to build the methane mitigation plan in Utah, in Africa, or in Siberia.

So, you are a climate activist. You are a climate change mitigator the moment you hold Bitcoin, and it is so crazy if you think about this. Whatever our motives are for holding Bitcoin, for giving this thing value, we incentivize and reward new experiments around what proof-of-work can do to get this transition from a high carbon economy to a low carbon economy done.

And all that while preserving the things that we value so much as liberal societies, freedom of speech, self-sovereignty, and privacy. There is an environmental context and a social context that makes Bitcoin this powerful ESG tool.

Marcus Dapp:

If an investor comes to you and says: "I really like Bitcoin. I read about its monetary properties, and the problems with fiat money. I am keen to invest, but there is this energy problem with Bitcoin mining that holds me back". What do you answer these people in short, easy language?

Harald Rauter:

I would say: I appreciate your concern, because it shows me that you are concerned about the future of our society and what it could mean to live a regenerative and sustainable future for us as humans on this planet. I applaud you for that and because you think like that, I encourage you to study – you need to study a little – what is driving this transition economically? What are the challenges that arise from this irreversible trend? And then study what are meaningful solutions to this challenge.

Maybe think back a hundred years. We moved from a horse to the car, it was an irreversible trend from organic energy, horse meat, to carbohydrates. Today you can make the same argument with your car. You can ask: what happens if your car breaks down, if you are out of energy? Well, this is true, but we will solve that. The hopeful message is: Yes, we had a hydrocarbon-based economy which served us well, but there's a new kid in town. Technology has advanced and it has valuable properties on many fronts. And it is true, we have a couple of challenges that come with this transition. Once we accept that, we know that we can solve it.

Then you understand that Bitcoin is not using too much energy, it is using too little energy to become relevant as this stabilizer in all these ways and in the magnitude we need. It needs to become much bigger. So, if you are interested in that proof-of-work innovation around the environmental use cases, study Bitcoin!

If you are an investor mostly in for the returns, not minding good environmental outcomes… study Bitcoin! If you are an investor who cares about nothing else but Bitcoin's monetary properties, still study Bitcoin! Because, again, in an inelastic system every withdrawing of supply creates a new price balance with increasing demand. The economics drive those use cases, not politics, not regulation, not subsidies. It is pure economics, incentives, and human ingenuity… and slowly but steadily, we will start to see how this creates a picture that serves humanity better on the social layer, but also incredibly well on the environmental layer.

I would advocate for these financing institutions and services like custody, easy access, but also infrastructures like the one on which I am working. These use cases can create a portfolio that gives us an idea of how a congruent picture can look like that tells the story how climate change mitigation can happen through Bitcoin at scale.

Marcus Dapp:

Thanks for this insightful conversation, Harald.

Scan to watch
the full video interview

Authors' bios

Dr. Marcus Dapp

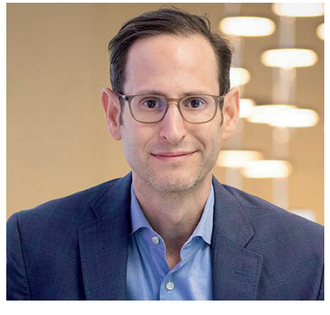
Marcus Dapp joined Bitcoin Suisse AG as Head of Research in September 2021. He spent most of his professional life in academic research at ETH Zurich, Uni Berne, TU Munich, fotiss Munich) and teaching with side trips to the public and NGO sector. Marcus studied computer science and technology management at ETG Zurich and received his PhD in 2009.

Dominic Weibel

Dominic Weibel joined the Research department of Bitcoin Suisse AG in March 2022. Previously, he was a research fellow and PhD student at the Technical University of Kaiserslautern where he explored the ultrasonic fatigue behavior of carbon fiber reinforced polymer composites. The emergence of distributed ledger technologies and their potential impact on future societies made him change professions. He went down the rabbit hole starting in 2017.

Denis Oevermann

Denis Oevermann is an Investment Analyst and Crypto Researcher at Bitcoin Suisse since 2022. He has more than 5 years of experience in crypto, with prior publications on crypto asset valuation and quantitative DeFi valuations. He has a background in Economics and Finance, holding a Master of Finance degree in Asset Management and Quantitative Finance from the University of Amsterdam.



Matthew Sigel

As Head of Digital Assets Research and Portfolio Manager for the VanEck Smart Contract Leaders Fund, Mr. Sigel helps guide VanEck's digital assets strategy and sits on the investment committee of several of the firm's private funds. Prior to VanEck, Mr. Sigel worked as a research analyst and portfolio strategist at CLSA, an analyst and portfolio manager at AllianceBernstein (where he covered technology and other sectors under Cathie Wood), and a journalist at Bloomberg, CNBC and NHK Japan Broadcasting, where he covered finance. Mr. Sigel is a CFA Charterholder and has a BA from Harvard University.

Harald Rauter

Since discovering Bitcoin in 2016, Harald Rauter has been focusing on developing the investment case for Bitcoin as a mechanism for achieving superior economic- and environmental returns. Harald Rauter advises ESG-sensitive capital pools like foundations, HNWI and enterprises in developing tailored investment strategies that leverage Bitcoin's unlocking potential for higher risk-adjusted returns while simultaneously achieving unrivaled CO2 emission reduction. For the past 10 years he has been an investor and portfolio manager for climate-positive investments both in the public- as well as the private sector. Harald Rauter holds a PhD in Natural Sciences from ETH Zürich and a master's degree in economics from the Vienna University of Economics.

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