BITFINEX Alpha

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EXECUTIVE SUMMARY

The worrying news on inflation did not go away last week. Even in a market of now heightened inflation expectations, both the Producer Price Index report and the Consumer Price Index report came in higher than forecast. Core CPI, up 6.6 percent on the year, is at a 40-year high.

The Federal Reserve still has work to do, and really only one lever at its disposal: monetary policy.

The equity market is now experiencing volatility almost on a crypto scale. In two days, markets rose, and then fell, by more than two percent. In the bond market, the two-year yield hit a 15-year high; and with shorter-term treasuries higher than the longer-end, the yield curve remains resolutely inverted.

Our analysis of the Chicago Fed's National Financial Conditions Index, which measures financial conditions in the US money markets, debt markets, equities and in the traditional and shadow banking systems, confirms tighter than average conditions. Similarly, the Bond Market Option Volatility Index has exceeded levels reached during the 2020 flash crash, suggesting increasing stress in the bond markets.

The ongoing sentiment is that the Fed will keep raising rates and heaping pain on the markets until it is convinced inflation is tamed, or until something breaks. The interesting thing is: things do seem to be breaking in places like the UK and Japan. Are these early signs that the market is cracking under the austerity?

On Chain and in crypto markets, sentiment is also looking decidedly bearish. Open interest in Bitcoin perpetual contracts has doubled since Mid-April. On one reading this means more volatility is on the way, but as we look historically at BTC price trajectories, we believe it is on track with previous bear markets, but with a twist. Long-term holders are continuing to buy on dips, accumulating 500,000 Bitcoin in the last three months, in stark contrast to the weaker hands seen by retail investors and shorter-term holders.

For us the question remains that if we are in for a new period of intense volatility, will crypto emerge from such a stress test decoupled from other risk assets, or as we have seen to date, tied in lock step with them.

In a sign of the growing maturity of the sector though, Tether announced that it has now zero commercial paper in the reserves that back the world's first and largest stablecoin. It is a huge achievement that puts other stablecoins in the shade.

Last week saw again a major $100m plus hack of a Defi platform. We deep dive into the risks of Defi platforms in our *Learning Section* and the slow progress that is being made to fix some of their inherent vulnerabilities.

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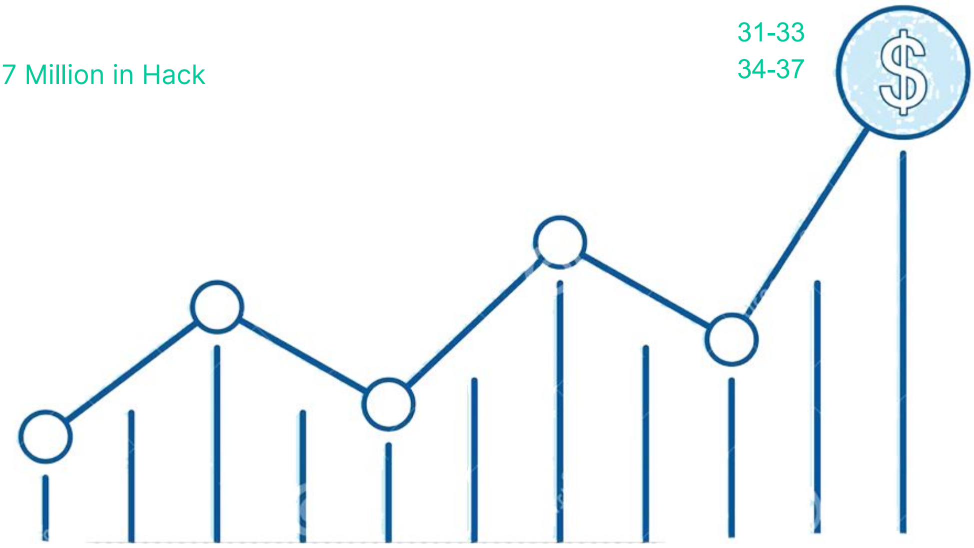

GENERAL MARKET UPDATE

CPI and PPI: Higher than Expected

Diving right into it, it was a week where a myriad of fresh economic data was reported. Despite repeated interest rate hikes, inflationary momentum is still persisting in the US Economy as both the Consumer Price Index and the Producer Price Index came in higher than expected.

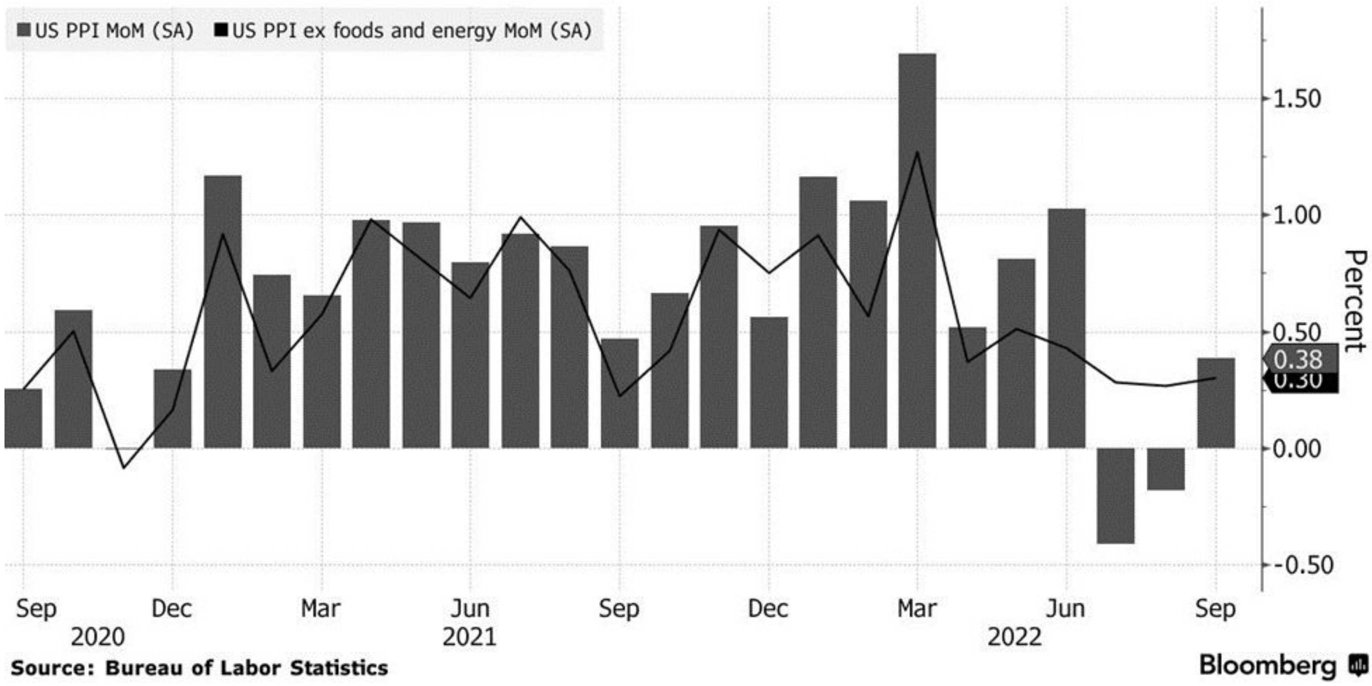

Figure 1. *Producer Price Index, Month-over-Month (Source: Bureau of Labor Statistics, Bloomberg)*

Last Wednesday's (October 12) data from the Bureau of Labor Statistics showed that the Producer Price index climbed by 0.4 percent in September, double the expectations of a 0.2 percent increase. This month-over-month change is up from the 0.2 percent decrease, reported in the previous month.

About two-thirds of this PPI increase was attributed to the 0.4 percent gain in services – a sticky inflation component. The Core PPI, which excludes volatile food and energy components, has increased by 0.3 percent for the month. The PPI prints came in higher than the month-over-month forecasts of 0.2 percent headline and 0.3 percent core.

On a year-over-year (YoY) basis, PPI grew 8.5 percent, slightly easing from the 8.7 percent increase reported in August. The core PPI increased by 7.2 percent YoY.

The Producer Price Index (PPI) is a group of indices that tracks the average change in selling prices received by domestic producers of goods and services over time. PPI measures price changes from the seller's standpoint. On the other hand, the Consumer Price Index (CPI) measures price changes from the customer's perspective. Government subsidies, sales and excise taxes, and distribution costs may cause price differences between sellers and buyers.

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	Date Time	Event	Period	Surv(M)	Actual	Prior	Revised
21)	10/13 08:30	CPI MoM	Sep	0.2%	0.4%	0.1%	--
22)	10/13 08:30	CPI Ex Food and Energy MoM	Sep	0.4%	0.6%	0.6%	--
23)	10/13 08:30	CPI YoY	Sep	8.1%	8.2%	8.3%	--
24)	10/13 08:30	CPI Ex Food and Energy YoY	Sep	6.5%	6.6%	6.3%	--
25)	10/13 08:30	CPI Index NSA	Sep	296.446	296.808	296.171	--
26)	10/13 08:30	CPI Core Index SA	Sep	298.300	--	296.950	--
27)	10/13 08:30	Real Avg Hourly Earning YoY	Sep	--	-3.0%	-2.8%	--
28)	10/13 08:30	Real Avg Weekly Earnings YoY	Sep	--	-3.8%	-3.4%	--
29)	10/13 08:30	Initial Jobless Claims	Oct 8	225k	228k	219k	--
30)	10/13 08:30	Continuing Claims	Oct 1	1365k	1368k	1361k	--
31)	10/13-10/21	Monthly Budget Statement	Sep	-$50.0b	--	-$64.9b	--

Figure 2. *US Consumer Price Index for September: Survey Forecast Result vs Actual (Source: Bureau of Labor Statistics, Bloomberg)*

The PPI news was quickly overshadowed by the CPI news the next day, October 13. Headline CPI came in at 0.4 percent, also double market expectations. Core CPI came in hot at 0.6 percent, higher than the 0.4 percent forecast. CPI grew by 8.2 percent at a year-over-year rate, higher than the consensus estimate of 8.1 percent.

The year-on-year core CPI rate of +6.6 percent is particularly concerning since it indicates that underlying inflation remains exceptionally high, making the Fed's work even more difficult. The annual core CPI rate currently sits at its highest point since 1982.

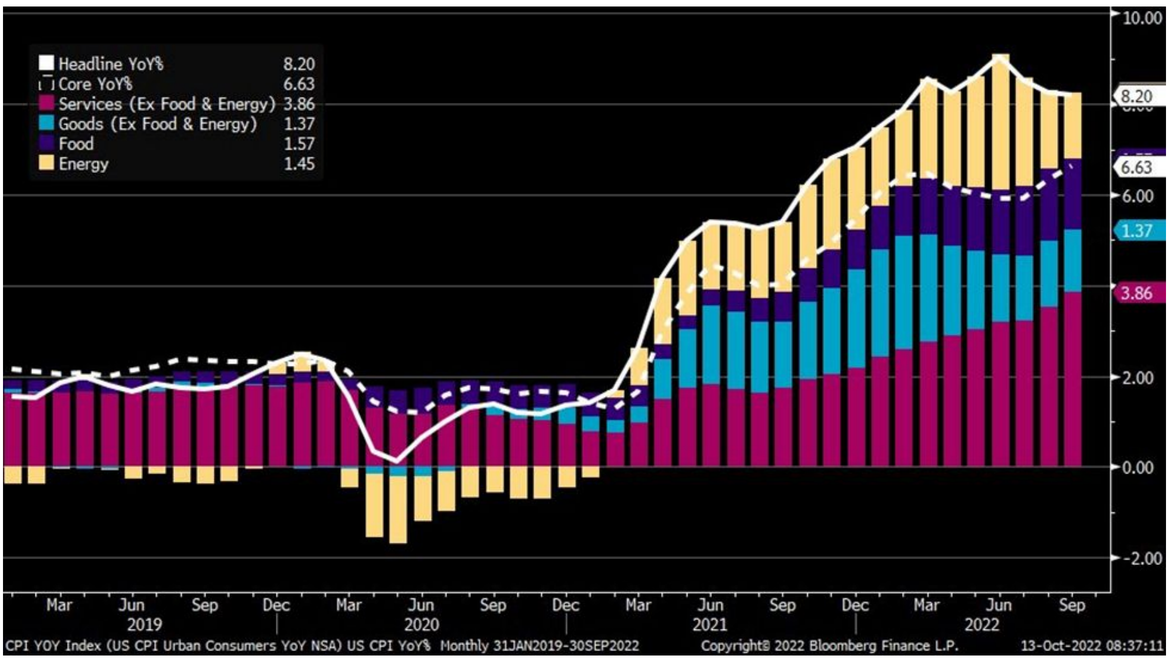


Figure 3. *US Consumer Price Index, Urban Consumers (Source: Bureau of Labor Statistics, Bloomberg Finance)*

Because consumer prices frequently trail producer prices, it is crucial to note that producer prices are generally regarded as a leading indicator of future increases in consumer prices. Before firms can pass on increasing expenses to their customers, they must bear those costs themselves.

A rise in producer prices may spill over into CPI in the future, implying that consumers will face additional price increases in the coming months as businesses pass on at least some of their costs to customers.

Figure 4. *US Core Consumer Price Index in the last three decades (Source: Bureau of Labor Statistics, Bloomberg)*

Inflation has clearly changed the economic outlook for every category of investor or policymaker this year and threatens to alter the path of economies worldwide in the years to come. The chart below shows the percentage change in the consumer price index from January 2020 to September 2022.

The stimulus check that was issued to all Americans at the height of the COVID pandemic re-inflated the economy, but the supply chain has been struggling to catch up with the surge in demand ever since. Russia’s invasion of Ukraine added to the pressure on prices.

The most significant rise is the prices paid for food at home. Fertilisers, an essential input in most food products, rose sharply after shortages in natural gas, a key component for fertiliser production. The rise in fertiliser prices has pushed prices for food products much higher.

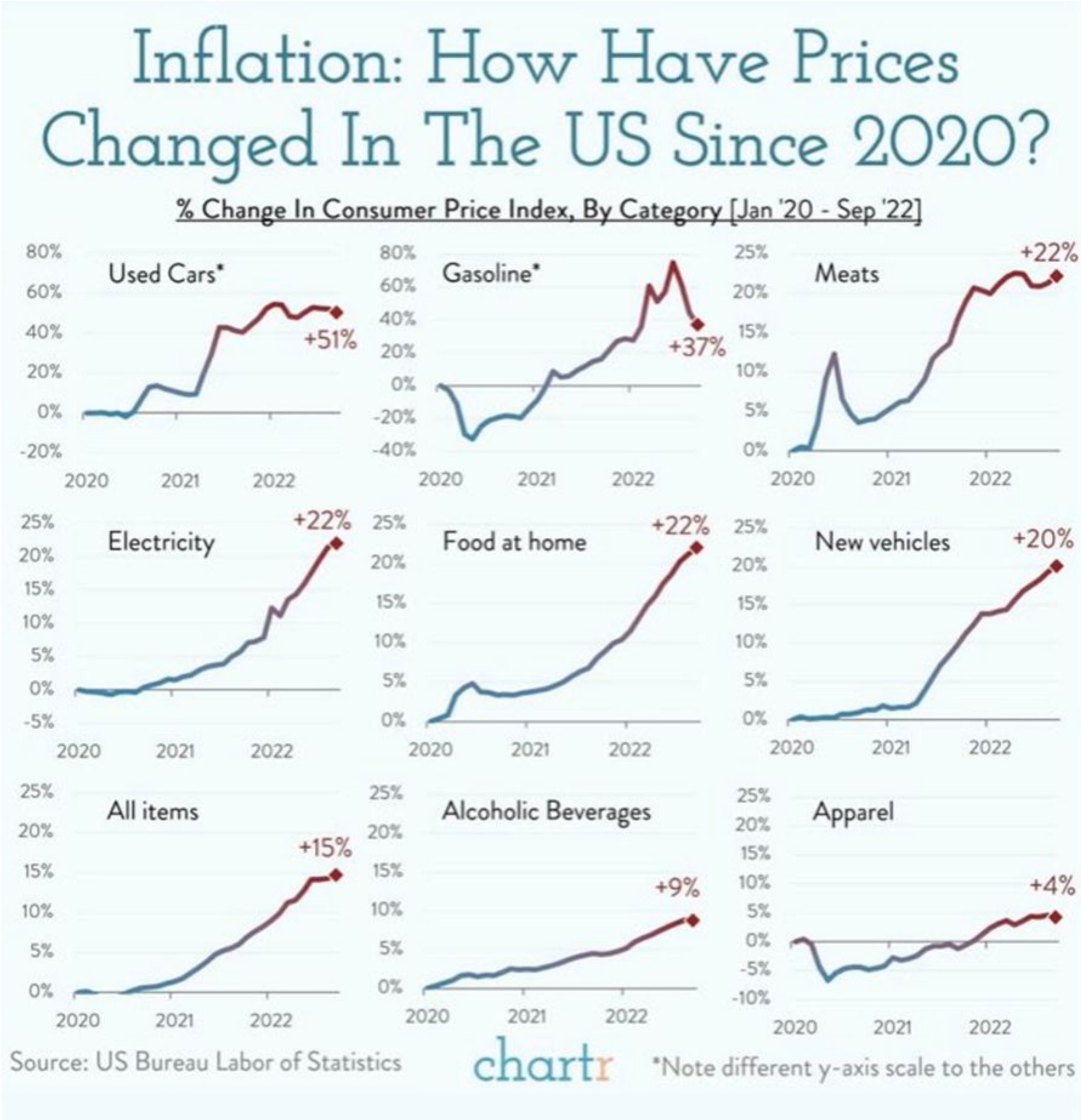


Figure 5. *How Prices have Changed in the US Since 2020 (Image source: Tweet from https://twitter.com/MacroAlf)*

The prices of used cars also saw a sharp rise, given new cars are now increasingly hard to buy. A global shortage in semiconductors and supply chain disruption for materials like aluminium has limited the supply of new vehicles. This has shifted the market to used cars, which has driven up used-car prices.

As prices continue to soar with no clear sign of abating, central banks continue to raise rates. Accordingly, economic analysts are lowering expectations for growth, and investors anticipate volatility in the market.

US Stocks Reacted with Volatile Swings

Last week, we saw rocky price action across the stock market. US stocks erased their early gains on Friday, 14 October, with prices taking a U-turn for equities after a week of volatile swings in both directions.

The US market closed the day red, giving up initial gains over a reversal in the United Kingdom's publicly contested tax proposals, as ongoing fears about inflation and consumer sentiment overwhelmed any positive sentiment.

According to a preliminary survey from the University of Michigan, consumers' predictions regarding the future course of prices worsened between September and October. The survey's consensus forecast for inflation in October 2023 jumped to 5.1 percent, up from 4.7 percent in September. Simultaneously, respondents' expectations for inflation five years from now became more pessimistic. These findings came just one day after the Bureau of Labor Statistics reported that the annual Consumer Price Index remained high in September.

Pessimistic inflation expectations can become self-fulfilling if individuals buy more today in anticipation of rising prices tomorrow; this in turn increases the likelihood that the Fed will maintain its stance on tight monetary policy.

Figure 6. *S&P 500, Dow Jones Industrial Average, Nasdaq Composite (Source: Tradingview)*

When the hotter-than-expected September inflation report was released on October 13, the S&P 500 index rose significantly, starting the day 2.4 percent lower and ending at 2.6 percent higher than open. But markets took a round trip the following day, as mentioned previously. The two-day swing highlights the volatility prevalent in the equity market. The Dow Jones Industrial Average decreased 404 points (1.3 percent) to 29,637. Nasdaq Composite tumbled 328 points (3.1 percent) to 10,321.

Figure 7. *The shape of the USD yield curve relative to annual remittances to the US Treasury. (source: Steno Research)*

The US 2-year yield hit its highest mark since 2007. The yield curve should continue to invert as short-term rates keep rising with rate hikes.

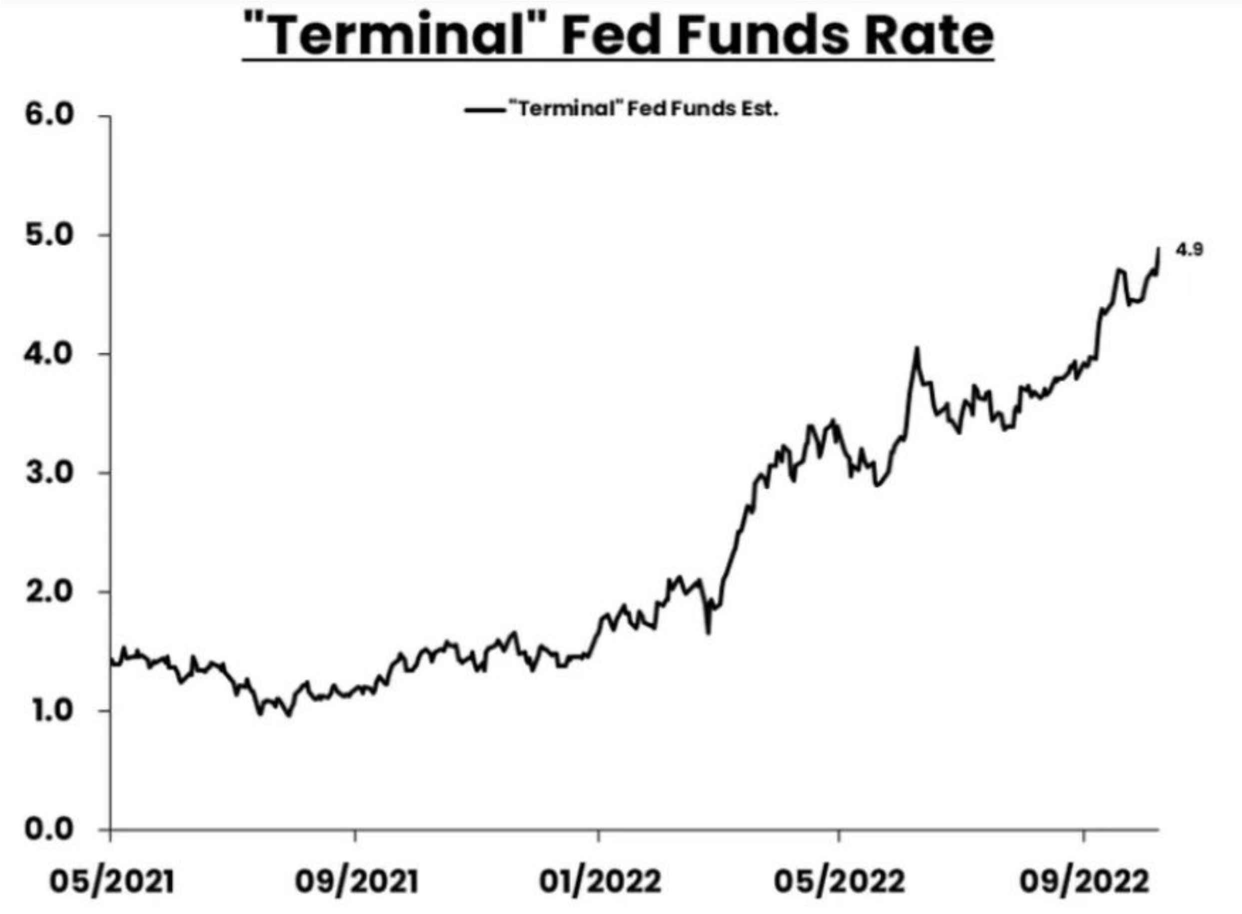


Figure 8. *"Terminal" Fed Funds Rate (Source: WallStreet Journal, YahooNews)*

The Fed fund futures market is now pricing a peak federal funds rate of nearly 5 percent, a significant upward revision from a terminal rate of 4.65 percent, ahead of the inflation report. The 10-year Treasury yield could drift slightly higher, but the expectations of rate cuts should limit the upside for long-duration bonds when considering 2023. However, in the short term, yield inversion is expected to deepen further.

The Carnage Spreads

As inflation remains persistent, the Fed has been aggressively hiking interest rates and is expected to hike more in the remaining FOMC meetings this year (November 2nd and December 14th). The effective borrowing rates from Fed rate hikes have shaken financial markets. The carnage has spread among stocks, bonds, currencies (ex-US dollar) and commodities. The dollar has been the main beneficiary, with the dollar index (DXY) up by 18 percent from the start of the year, reaching levels last seen two decades ago. In contrast, US equity and bond markets have declined by $57.8 trillion in less than a year.

Figure 9 *: Drawdown in Total Market Capitalization of US Equity and Fixed Income (Source: Bloomberg, Gavekal Research/Macrobond)*

The Chicago Fed's National Financial Conditions Index (NFCI) provides a comprehensive weekly update on US financial conditions in money markets, debt and equity markets and the traditional and “shadow” banking systems. The National Financial Conditions Index has been progressively climbing this year, approaching the zero bound, indicating tighter-than-average financial conditions. The move signals increased stress in financial markets as a result of central banks' monetary tightening.

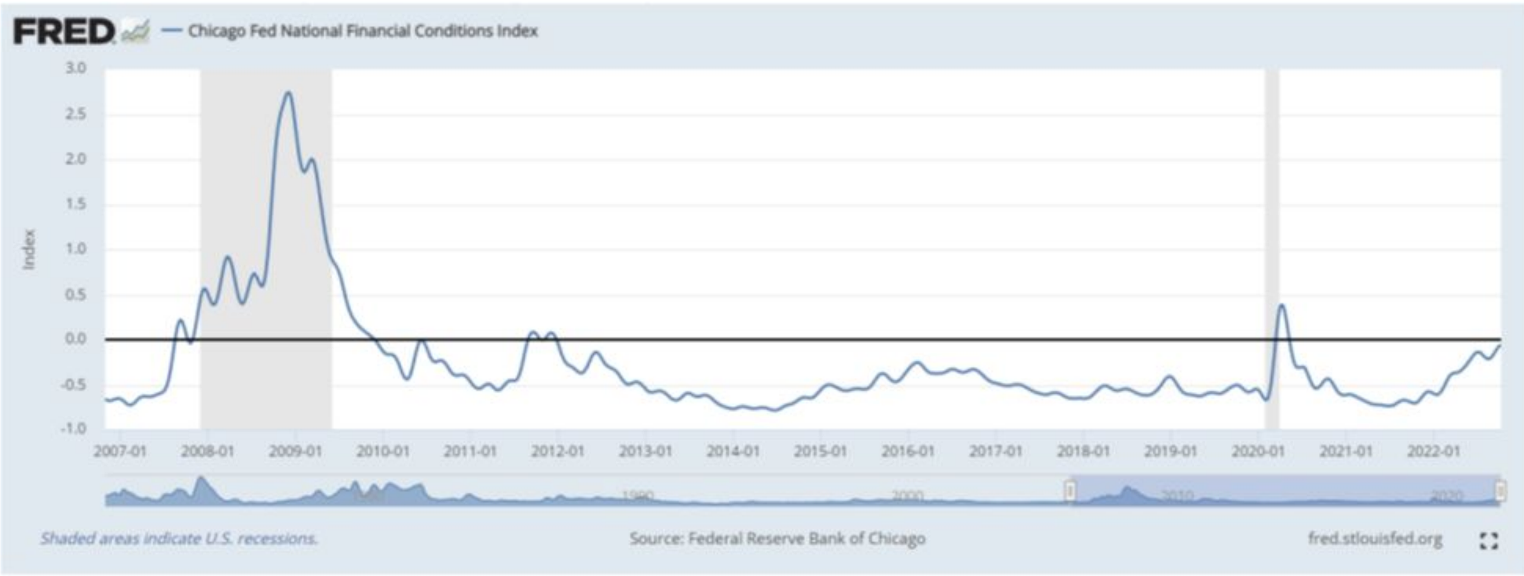


Figure 10. *Chicago Fed National Financial Conditions Index, NFCI (Source: Federal Reserve Bank of Chicago)*

Likewise, the U.S. Bond Market Option Volatility Index, or MOVE Index, is registering higher levels than the 2020 flash crash, equaling levels last experienced in 2010. The pace and span of this change are exceptional and suggest increasing stress in bond markets.

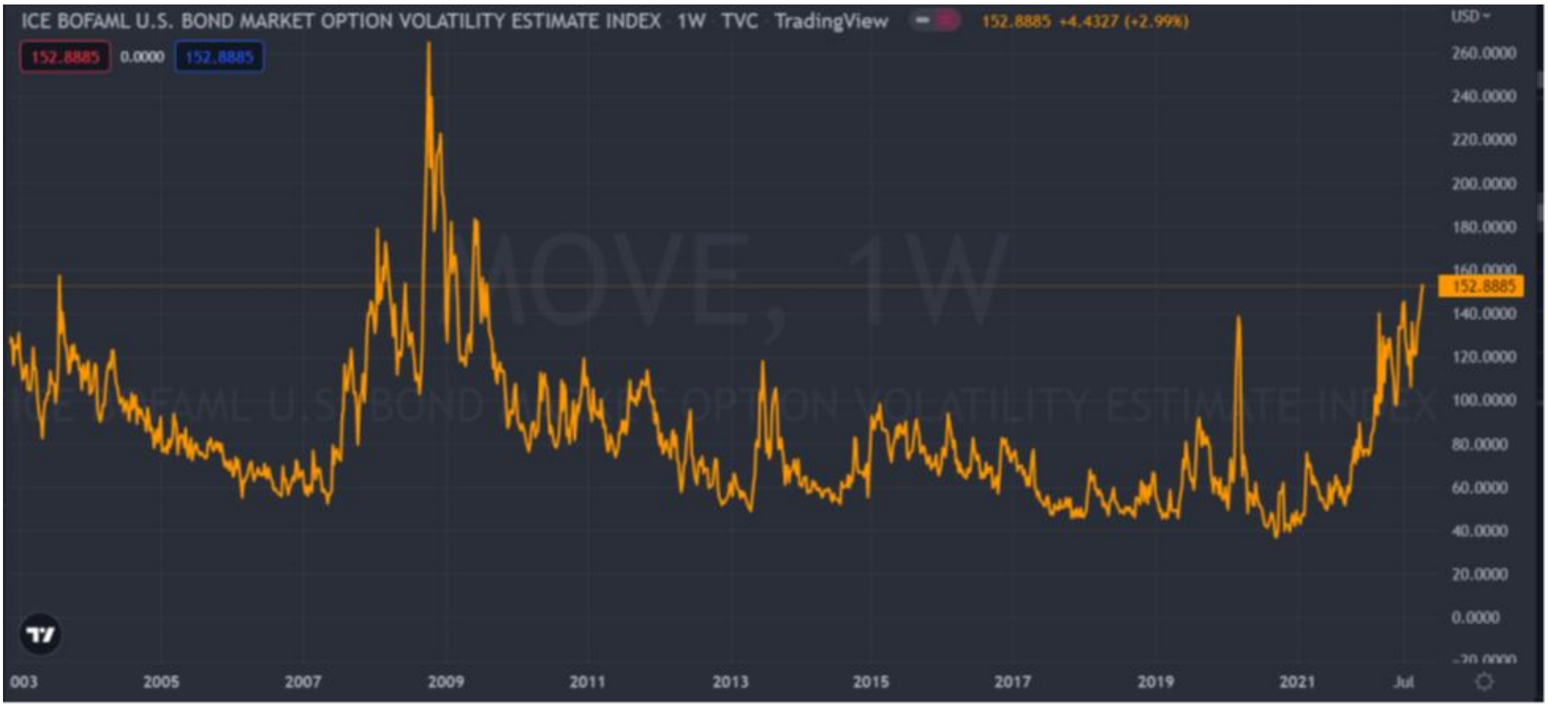


Figure 11 . *ICE BOFAML US Bond Market Option Volatility Estimate Index (Source: Tradingview)*

Amidst the tight financial conditions, the markets are anxiously awaiting signs that might lead to a Fed pivot that would ease monetary policy. However, the Fed has been unceasingly firm on its aggressive stance and has been clear that it will not rest until it sees convincing evidence that inflation is tamed. Economists predict that the Fed will continue to tighten monetary policy until something breaks. But for those who can put pieces together, things appear to have already started breaking. The problems have occurred in countries like the UK and Japan.

United Kingdom

On September 28, the Bank of England (BOE) announced the purchase of long-term bonds until October 14 after UK Gilts rose significantly (Details reported in our Issue #24, dated 10/03/2022 (link here).

The BOE was forced to operate in this manner because falling bond prices threatened the stability of liability-driven investment funds (LDI), which had been used widely in the UK pensions sector to correct asset-liability ratios, so that they can pay out pensions. Long-term Gilts are heavily invested in by LDI funds, frequently with high leverage. The BOE's action was necessary to prevent the collapse of pension funds invested in LDIs and the subsequent threat to UK financial stability.

Japan

In early September, the Bank of Japan (BOJ) announced its intervention in the Forex market for the first time in 24 years by purchasing Yen. The move follows a sharp drop in the Yen versus the US dollar to levels last seen in 1998 - which was the last time the BOJ intervened. The BOJ has maintained extremely low-interest rates, to stimulate growth, which contributed to the Yen's weakness, but has been compelled to sell USD or USD-denominated assets.

A strong dollar compels foreign central banks to sell USD reserve assets to protect their currencies, meet financial obligations, and maintain adequate dollar liquidity. As they sell USD-denominated assets like US Treasuries, Treasury rates climb, further strengthening the USD against foreign currencies.

While a strong dollar seems to be good news, that's not always the case. We consider the premise of the dollar doom cycle. As manufacturing, commodities prices, and global trade all plunge, worries about global growth set in and yet, America's got a robust dollar which seems to be great news to citizens. However, that is bad news for the world economy, particularly the US economy, in the long run, as it slows demand for US products and services.

Foreign nations experience worsening economic problems when the US dollar is strong. As exchange rates widen, nations like China, Japan, and the UK see a decline in value. To put it another way, it costs more of their designated currency to produce one US dollar.

The stronger dollar also hurts US investors investing in international and emerging markets funds, which are purchasing securities in the local currency. The local currency used to buy the securities becomes weaker through a stronger dollar. As the local currency becomes cheaper, the value of their current holdings decreases.

It results in lost revenue for nations whose goods and services are denominated in local currency and US dollars. Less purchasing power translates into lower revenue, and nations never want to have less purchasing power.

A strong dollar also hurts US businesses that sell or purchase goods and services abroad. They lose a lot of money while selling their goods and services in other nations because the majority of their costs are in US dollars.

Dollar dominance has been skyrocketing this year, imposing stress on foreign economies. In developed countries, this drives up import prices, such as crude oil. This worsens inflation and forces central banks to respond with rate hikes. The effect is harsher in developing countries. Aside from more expensive food and energy imports, they face reversals of foreign capital inflows (which makes financing imports harder) and increasing difficulty servicing their already burdensome dollar-denominated debts.

Nonetheless, the Fed will definitely maintain its current policy for two reasons. First, the Fed will prioritise what is best for the United States, as this is the only way to bring US inflation under control. Excessive fiscal and monetary stimulus fueled demand for goods, services, and labour. Thus the Fed must tighten and raise unemployment to slow wage and price gains. Suppose the Fed does not move aggressively enough. In that case, inflation will grow more entrenched, compelling the Fed to act even more forcefully later, with even more severe effects on the US and global economy.

Second, the Fed is mandated by Congress to achieve maximum sustainable employment while maintaining price stability in the US economy. Congress says nothing about what is best for the rest of the world. The Federal Reserve does consider international events like the conflict in Ukraine, but only if they have a bearing on the US economy. The Fed explains its policies to its foreign counterparts, but it doesn't change course if those partners aren't happy. This is a common practice for central banks all over the world. What’s different is that the US Federal reserve is deemed as the “world's central bank" because its monetary policy affects everyone else.

Summary

- The Producer Price Index for September rose by 0.4 percent, double the 0.2 percent projected increase, according to data released by the Bureau of Labor Statistics.
- On an annual basis, PPI rose 8.5 percent. This was down slightly from 8.7 percent in August but still indicates significant price pressures at the wholesale level.
- The headline and Core CPI for September arrived came in much higher than consensus estimates.
- A spike in producer prices may spill over into CPI down the road, meaning consumers could see more price hikes in the months ahead.
- The Fed Funds terminal rate is now closing in on 5 percent, up 0.3 percentage points from before the CPI data.
- Unprecedented losses to equity and bond markets result in exceptional volatility and stress to financial markets.
- Foreign central banks are beginning to intervene in markets to maintain stability, including the Bank of England and Bank of Japan.

WHAT'S ON-CHAIN THIS WEEK?

Bitcoin Perpetual Open Interest Nears 500k.

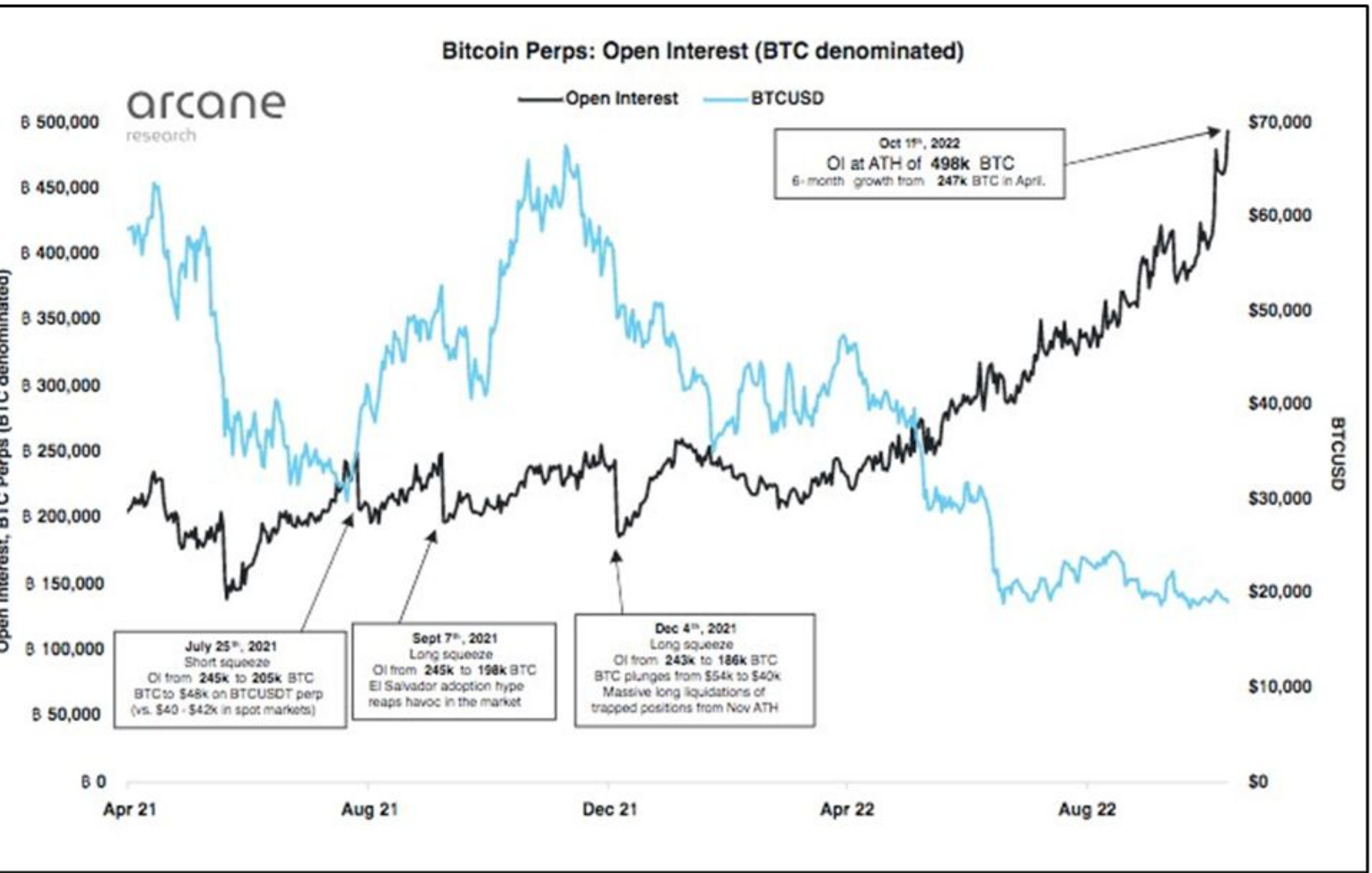


Figure 12 . *Bitcoin perpetual swaps' open interest by Arcane Research. (Source: Laevitas)*

According to recent data, the Open Interest (OI) in Bitcoin increased from 428,000 BTC to 498,000 BTC over the past week. The recent growth in open interest is "parabolic," despite the significant drawdown BTC has witnessed this year and shows no signs of stopping. Notably, this trend is not new. The growing open interest in the market has been a trend since June this year and has only escalated more recently. Open Interest has more than doubled since mid-April.

In trading, Open Interest serves as an indication of the strength of the market, showing whether a particular market is trending higher or lower. Please note that we are denominating Open Interest in terms of the underlying asset rather than the USD-denominated value of the asset, which is the convention. The reasoning behind it is that as per research spread across various issues, we have noted how whale-sized wallets which are conventionally dormant have recently seen activity. It is important that we correlate that alongside the amount of dormant BTC suddenly being moved with futures OI.

Now that the Bitcoin OI is at all-time highs, this level of leverage is unusual in perpetual swaps history. The Merge resulted in Ether OI exceeding BTC for the first time in the asset's history. Similarly, we must note that currently there have also been similar extremes in ETH derivatives. However, BTC has regained its lead in Open Interest and Ether is down 22 percent, compared to BTC following the Merge.

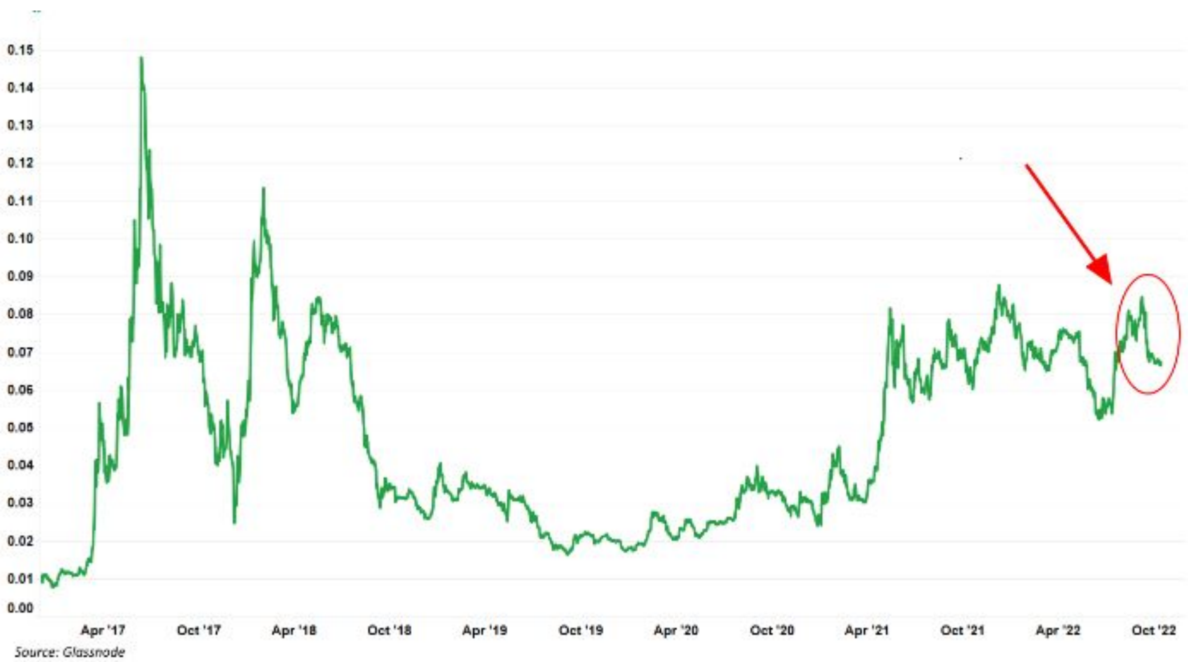


Figure 13: *ETH/BTC chart while highlighting the recent drawdown. (source: glassnode and Blockware)*

There are different outlooks where amidst a season of drying liquidity, we have a sustained uptick in futures Open Interest. The data suggests that more volatility is yet to come. In this climate, avoiding adding risk through leverage in the market might be prudent. Choppy price movements coupled with this unprecedented growth in Open Interest hints at a lot of absorption in the orderbook. Historically, this has meant that a liquidation cascade is likely on either side, whether it's to the upside or the opposite remains to be seen. This is to be expected if the data suggests a lot of leverage in the futures markets without significant price swings, which it currently does.

Bitcoin is on track with previous bear market trajectories

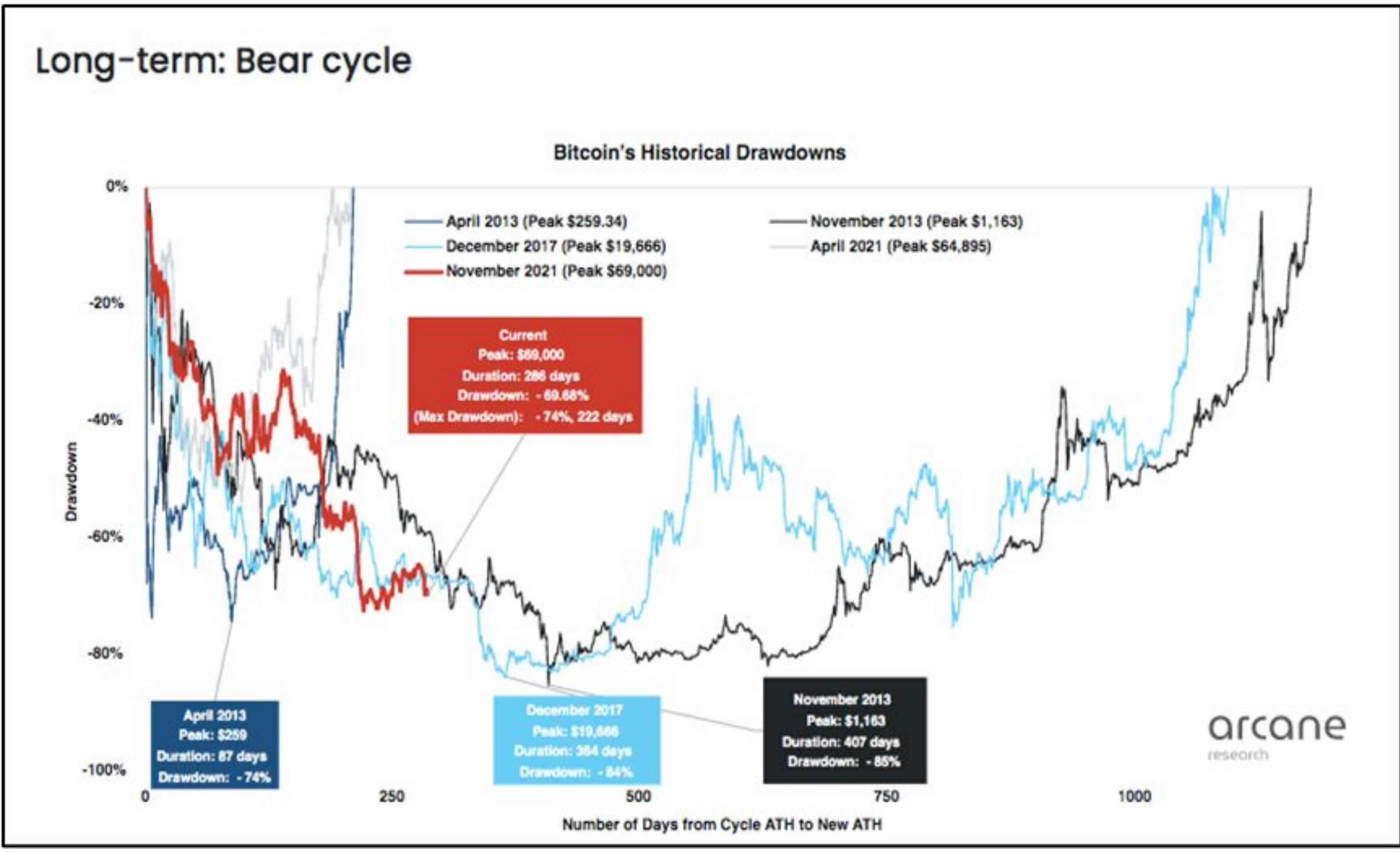


Figure 14: *Number of days from cycle ATH to new ATH by Arcane research*

Bitcoin is on track with previous bear market trajectories. While technical analysts might disagree with the statement based on fractals and time periods spent under certain percentage points, we state the above as we've witnessed a 70% drawdown from Bitcoin's November ATH.

For the long-term outlook, BTC is on track with previous bear market trajectories, as we've seen a 70% drawdown from its November ATH. While previous bears have pressured us lower from peak to trough, and this bear might be pushed lower as well, the data presented below increases confidence in more aggressive incremental purchases in the current state of the market.

Why?

The Long Term Holders with whale-sized wallets are not just holding through drawdown but they are accumulating as well. In the last 3 months, these wallets have added half a million BTC (2.3% of the total supply) to their stacks. Whales have demonstrated an incredible conviction in holding their preferred asset class. In contrast, miners, shorter-term holders and retail investors have all capitulated at some point over the course of the year.

Figure 15. *Large Wallet Inflows on spot BTC markets*

Recent inflow activity on BTC has surged after a dry spell as is evident from the chart. The white line is the price action while the size of the bubble indicates the amount of BTC flowing into whale-size wallets for the day.

Volatility may continue to surge

This week, the market's level of leverage grew significantly more. This was unaffected by Thursday's temporary decline below $19k. Watch out for either a short squeeze or a cascade of liquidations very shortly. This analysis works in tandem with the amount of Futures Open Interest as we discussed in the previous sub-section.

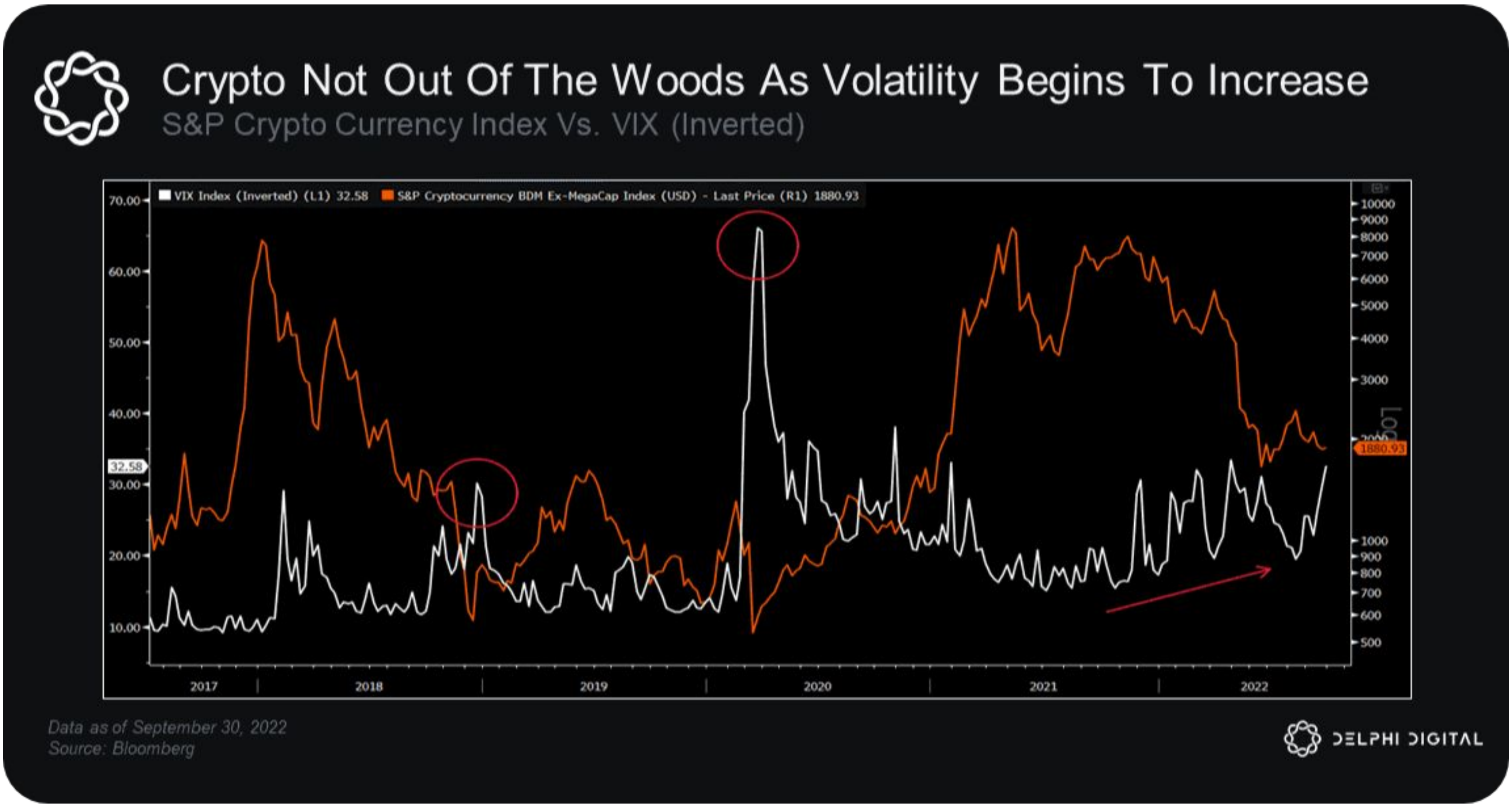


Figure 16. *S&P Crypto Index vs VIX (inverted). (source: Delphi Digital)*

For most of the past year, traditional risk assets have been inextricably linked to the cryptocurrency markets. To be fair, everything has been reduced to a single large macro trade. Equities appear to be approaching another significant test, and there has not yet been enough proof to conclude that cryptocurrencies and traditional assets are truly decoupling from one another.

The volatility index for Bitcoin is relatively low yet it has gained upward momentum recently. How cryptocurrencies will do in the event of another surge in volatility and a selloff in stocks will be the true stress test. It is unclear whether this marks the beginning of a decoupling trend or if cryptocurrency will again align with conventional risk assets.

The thesis's core question is whether or not it is still true in our opinion. In challenging times in the past, the crypto market has been unable to defy macro trends, and implied volatility is beginning to rise.

NEWS FROM THE CRYPTO-SPHERE

Tether - the world's largest stablecoin, cuts its commercial paper holdings to zero.

Figure 17. *Tether strengthens its stablecoin reserves.*

Tether, the world's largest stablecoin by market cap, has reduced its commercial paper to zero, replacing them with U.S. Treasury bills (T-Bills), the company announced in a blog post on Thursday. Tether has been standing firm among a multitude of stablecoin failures during this bear market.

According to the post, the move is part of tether's "ongoing efforts to increase transparency" and back its tokens with "the most secure reserves in the market" in the ultimate hope of ensuring investor protection.

Tether had $20 billion in commercial paper in May. By late June, this sum was cut down to $8.5 billion. Earlier this month, Tether Chief Technology Officer Paolo Ardoino tweeted that the company had reduced its commercial paper holdings to less than $50 million.

The company has been gradually replacing its commercial paper holdings with U.S. Treasury bills until Paolo's latest tweet where he revealed that Tether now has zero commercial paper.

Valkyrie Funds to liquidate Bitcoin-related ETF by late October

Figure 18. *Valkyrie's CEO Leah Wald (centre), and chief investment officer Steven Mcclurg (left)*

Crypto asset management firm Valkyrie Funds has announced plans to liquidate its Balance Sheet Opportunities ETF (VBB) by the end of October.

The fund, which offer the opportunity for investors to gain exposure to crypto equities, will be liquidated, and then delisted from Nasdaq where it has traded since December 2021.

Ahead of the Bitcoin ETF liquidation, shareholders are allowed to sell their shares before October 28. By October 31, investors with shares will receive a cash distribution equal to the net asset value of their stake. Upon liquidation, the fund will also be delisted from the Nasdaq Exchange.

Notably, Valkyrie's ETF has not attracted much interest from investors, despite popular firms like electric vehicle manufacturer Tesla (TSLA) and MicroStrategy (MSTR) being major components of the ETF.

Solana-based DeFi platform Mango Markets hit by potential $100 million exploit

Figure 19.Mango confirms the exploit in a tweet on Tuesday

Mango, a decentralised finance platform hosted on the Solana Blockchain, appears to have been exploited for over $100 million (see our *Learning Section*).

The exploit was first identified by blockchain security firm *OtterSec*, which tweeted that the exchange had been drained of over $100 million due to the attacker manipulating the value of its MNGO native token collateral, then taking out "massive loans" from Mango's treasury.

The Mango Markets team tweeted soon after, warning users not to deposit funds until "the situation was more clear" and asking the attacker to contact them to discuss a bug bounty.

Mango's token MNGO was down over 42% in the 24 hours following the exploit. We have covered this in extensive detail in our *Learning Section* and the inherent risks associated with DeFi and DEXes in particular.

Huobi founder sells 100% stake

Figure 20. *Justin Sun has denied his participation in the deal. (source: TheBlock)*

Huobi Global's majority shareholder Leon Li has agreed to sell his entire stake in the crypto exchange to Hong Kong-based investment firm About Capital, reportedly spearheaded by Tron founder Justin Sun.
About Capital's buyout arm will control Li's stake upon completion of the transaction, the company said in a statement on Saturday. Li will no longer be involved in Huobi's operations. The terms of the deal were not disclosed. (link - https://bit.ly/3rZwzSk)

Huobi claims that the transaction has no effect on its core operations or management team, but that it will now focus on commercial expansion and worldwide brand marketing initiatives. This includes Sun's current position on its newly formed worldwide strategic advisory board.

Sun has previously experimented with cryptocurrency exchanges, and previously purchased the cryptocurrency exchange Poloniex in 2019 from stablecoin issuer Circle as part of a different investment group.

Binance Launches $500 Million Lending Pool for Bitcoin Miners

Figure 21. *Binance Pool is launching a $500million lending project to support crypto miners and digital infrastructure providers. (Source Binance)*

Binance announced on Friday that it was launching a $500 million pool for bitcoin miners as a combination of energy costs, low Bitcoin prices, and higher-than-ever mining difficulty strains the sector.

The crypto exchange said that this was in an effort “to help maintain a healthy digital asset ecosystem.” And provide “secure debt financing services to both public and private blue-chip Bitcoin (BTC) mining and digital asset infrastructure companies globally.”

Eligible borrowers will have access to loans on an 18 to a 24-month term, with interest rates ranging from 5% to 10%. They will also have to offer collateral in the form of mining hardware or cryptocurrencies that will have to be deemed “satisfactory to Binance.”

However, it remains to be seen if mining businesses are financially distressed enough to accept Binance's loans and risk losing their hardware or hodl'd coins, as the Bitcoin hash rate is close to all-time highs despite falling prices.

Learning Section

Is DeFi Still Safe?

With the use of cryptocurrency, we have the power to regain control over our finances, thereby acting as our own banks. However, as many rely on third-party wallet providers, the security of their cryptocurrency depends on the safeguards and security measures put in place by the provider.

Over time, hackers have taken advantage of flaws in these third parties, directly attacking the cryptocurrency protocols and using flash loans to their advantage. Since 2011, to date, this has seen them steal the equivalent of over $7.7 billion.

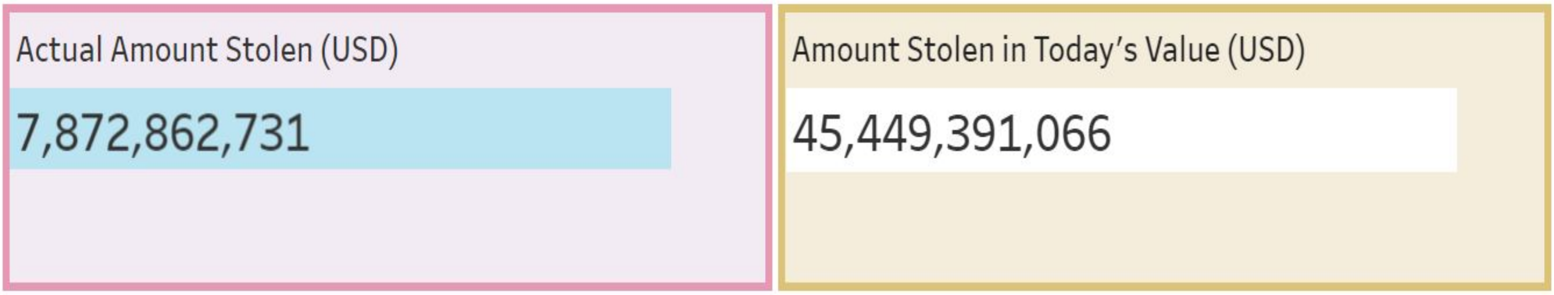


Figure 22. *Total value of cryptocurrency lost to known exploits.*

However, the value of various cryptocurrencies have surged. Even with the bearish market conditions, we still stand at hyper-inflated prices compared to previous valuations dating back several years. This means that hackers would have amassed wealth worth more than $40 billion if they had kept all of the cryptos they had stolen and cashed in today. We reach this figure by taking the amounts of various cryptocurrencies stolen and multiplying them with their current market prices. This figure during the 2021 bull market would have been even higher.

The years 2020/2021 witnessed the 'DeFi' season, with a multitude of layer one and other new protocols emerging, but it was also accompanied by a surge of crypto exploits. In 2021, there were almost three times more the number of crypto thefts, compared to the previous year, with 132 known thefts and 2022 has already surpassed that number, with most of Q4 yet to come.

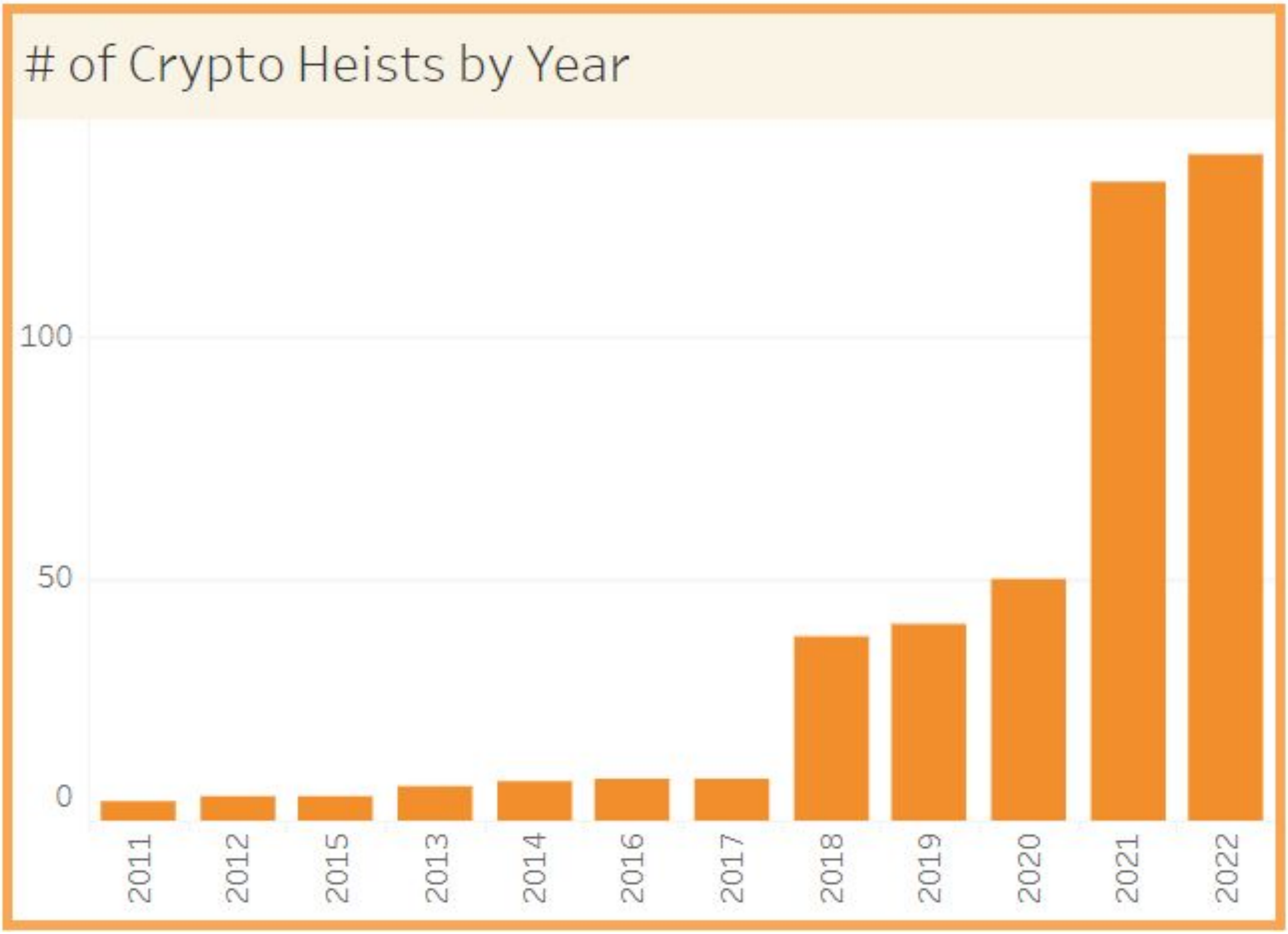


Figure 23. *Number of crypto heists per calendar year. (source: comparitech.com)*

Mango Markets lose $117 Million in Hack:

On October 12th, Solana blockchain's decentralised finance (DeFi) trading platform, Mango Markets, was hacked for $117 million. This is the second crypto hack in less than a week totalling over $100 million in assets lost following the Binance Chain hack. According to a tweet from Mango Markets, price manipulation of the native MNGO coin was central to the attack.

How did the attack take place?

Security audit firm *OtterSec* explained that the hacker temporarily raised the value of MNGO collateral, and then borrowed money from Mango Treasury. *OtterSec* said that the attacker manipulated the price of native token MNGO across several exchanges, borrowing against their unrealised MNGO gains to drain the protocol.

The hacker used two accounts to carry out the attack, trading short on one and hedging his position on the other. Before initiating a substantial long position, the attacker put 5 million USD Coin (USDC) into the network. He purchased 438 million Mango tokens and swiftly made $420 million in unrealised profits. The price of MNGO surged by about 1,000% as his purchase was executed, increasing the collateral value of the hacker's account. He exploited the system by stealing more than $116 million in liquidity from all outstanding tokens. He executed what is popularly called a "flash loan" attack. A flash loan attack is a decentralised finance attack where a cybercriminal takes out a flash mortgage — a non-collateralised loan from a lending protocol — after which he/she manipulates the worth of a crypto asset (now having access to a large amount of the underlying tokens without adequate collateral posted) on one exchange to take simultaneous favourable positions on another. This is also what can be referred to as 'bad debt', analogous to the bad debt in traditional finance.

Mango Markets has offered the attacker a bug bounty in exchange for recovering the funds if they contact them at blockworks@protonmail.com. The hacker has offered a settlement, urging users who support it to agree to pay the bounty, settle the "bad debt" with the treasury, renounce all claims against accounts with bad debt, and forgo any criminal investigations.

Since then, Mango DAO has debated on the DAO's forum on how to proceed. In a twist, the thief apparently proposed their solution for returning the stolen funds through the DAO's governance forum, using the same tokens they stole to vote in the proposal's favour.

The thief's demands cite "bad debt" that resulted from a bailout executed by Mango Markets and fellow Solana platform Solend in June. In the demand, the thief asks Mango to use the 70 million USDC in its treasury to pay off this bad debt.

As per the information reported by *Decrypt*, the counter proposal from the DAO lists the assets and the amounts stolen, asking the thief to return them based on an agreement with the DAO, including 799,155 mSOL, 761,577 SOL, 281.498 BTC, 2,354,260 SRM, 226 ETH, 11,774 FTT, 608 BNB, 152,843 GMT, 98,295 RAY, 1809 AVAX, 32,409,565 MNGO, and 10,000,000 USDC. (link - here)

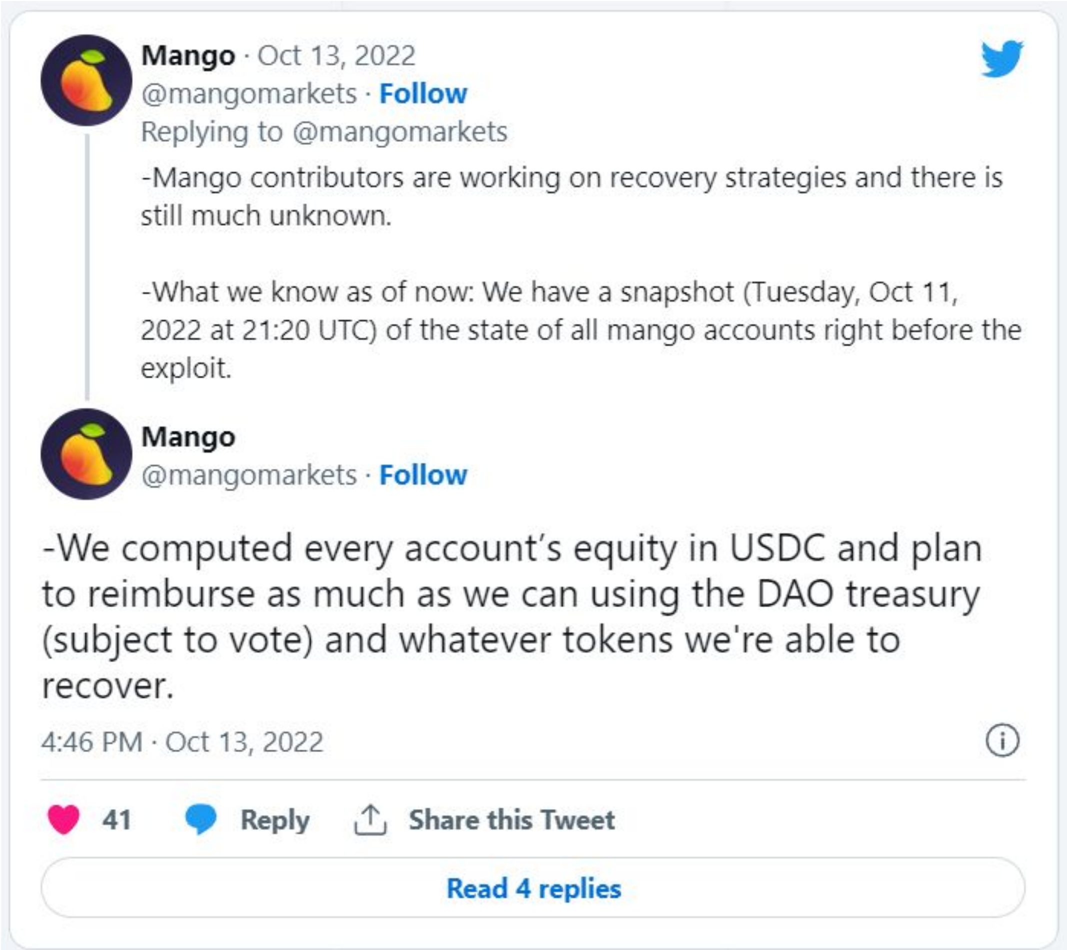


Figure 24. *An update on the situation from Mango Markets' official Twitter account.*

The proposal demands that the thief send most of the funds to a wallet owned by the Mango Upgrade Council. The DAO's proposal says it will not pursue criminal investigations or freeze funds once the tokens are returned as agreed.

Latest update: After allowing the hacker to keep about $US50 million of the cash, the community of the Mango DAO received a share of the about $US100 million that was taken this week.

The agreement ends days of contentious discussions between the hacker and Mango, whose token holders collectively run the platform and decide on any changes via the DAO.

Inherent Risks With DeFi, especially DEXes.

In the *Learning Section* of our 19-09-2022 Issue (link here),, we discussed DeFi, its capabilities and possibilities. In this section, we pay close attention to the risks. DeFi came about as a solution to the inherent problems of the financial system: inefficiency, centralised control, transparency, limited access and lack of interoperability.

But will DeFi bring an end to traditional finance? Not so easily. With new solutions come new types of risks, and can be classified to:

1. Smart Contracts

2. Oracle

3. Custodial

4. Regulatory

Smart Contracts

Smart contracts are used to carry out transactions on decentralised finance trading platforms. Because there are no intermediaries, hackers use this vulnerability to steal money from the system. In the case of Mango Markets, the hacker couldn't have manipulated the price of the Mango token if it were in a centralised crypto exchange. When a trader places a high bid on one asset in a centralised exchange, its price increases everywhere, so there is no way to make a significant profit suddenly.

Recent hacks have been a testament to the lack of expenditure on safety by DeFi platforms. Formal verification must become compulsory, but doing so is expensive and time-consuming. Hence, it leaves in place insecure contracts whose code can be interpreted in ways that the author did not intend because it is turing complete, like the majority of EVM-compatible smart contracts that use Solidity or other similar smart contracting languages.

Oracle

Up to 90 percent of the potential benefits of using smart contracts can only be realised if they interact with the actual world. Oracles are intermediaries that link the blockchain to the real world. Oracles act as a bridge between off-chain, non-deterministic data and the data stored on the blockchain itself. The "oracle dilemma" describes one of DeFi's most pressing issues: relying on a trusted third-party service to incorporate data from outside the blockchain.

Blockchains cannot pull data from or push data out to any external system, and thus require an Oracle. Only after being added to the distributed ledger, does the data retrieved by oracles is considered immutable. This begs the question, whose responsibility is it to verify the accuracy of the information fed into the blockchain?

Oracles maintain considerable power over smart contracts since the data that oracles provide determines how the smart contracts execute. A certain level of trust is therefore placed on the third party to carry out the verification. This is where the essential problem of oracles originates from.

Self-Custody Risks

Self-custody in the form of a digital wallet safeguards access to crypto assets via the user's private key. A misplaced or stolen key, on the other hand, can be disastrous. "If you lose your private key, you lose all of your cryptocurrency."

The custodial alternatives which are safer than self custody open the door for regulatory risks discussed below, as custody of someone else's funds almost always means regulatory oversight. This is also true when users continually trust protocols and services, which lacking the required security controls to ensure custody of their funds.

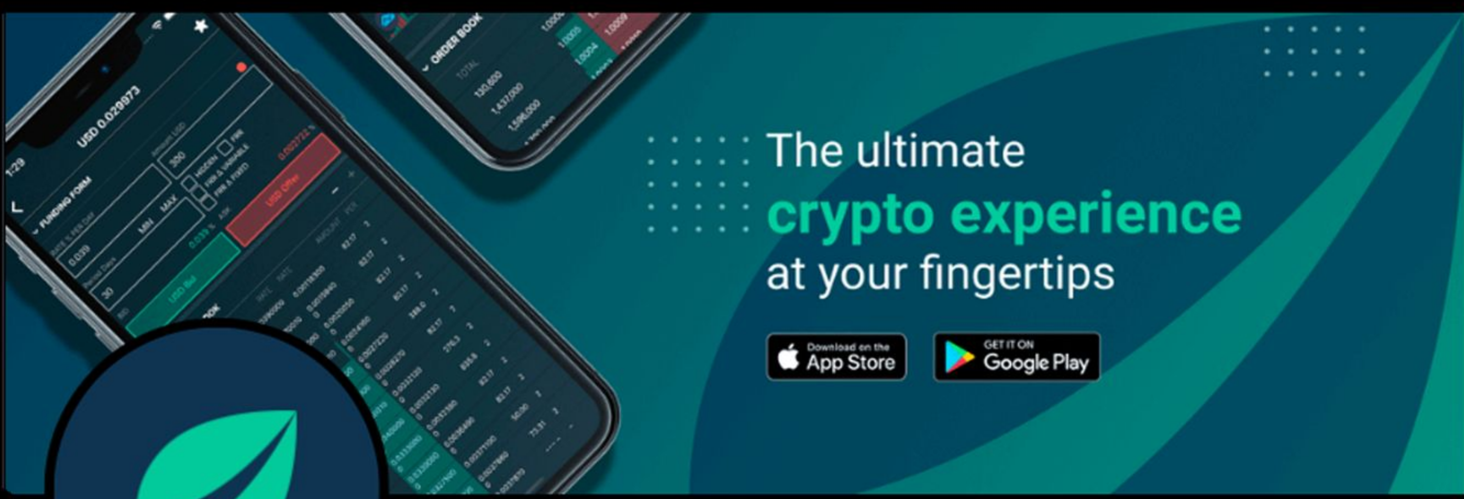
Regulatory Risks

Regulators have not come up with clear methods for how to regulate the space. Public authorities still struggle to interface with DeFi's inherent governance structures. Simply put, the situation could easily change in DeFI regulation and it is impossible to predict how any new government regulations might affect a DeFi project.

The case of Tornado Cash is an example of how DeFi projects are not immune to regulation. On August 8 this year, the Treasury Department's Office of Foreign Assets Control (OFAC) issued sanctions targeted to Tornado Cash for processing more than 1.5 billion on behalf of illicit actors, including North Korean cybercriminals.

No investor will ever want to risk their money in a DeFi project that will end up blocklisted by regulatory bodies. Defi developers and participants in the ecosystem therefore need to work on regulatory compliance for their projects to succeed. What happened to Tornado Cash is a reminder of the cost of not factoring in regulation into the project's growth. Blockchains that can be regulated have a regulatory attack surface which can broaden at any moment at the whim of regulators. Any blockchain protocol that has a centralised entity (company, founder, foundation, etc) can be vulnerable to regulatory attack, or state level adversaries.

DeFi is not a fix to the current financial system but a rebuild from the bottom up. Attackers have learned to exploit DeFi's vulnerabilities with the growing cryptocurrency market. Though integration of DeFi into the mainstream is inevitable, there is a lot of work that needs to be done to mitigate the risks. Moreover, DeFi is a rather young technology and we still don't know the unknown risks that have not yet come to light.



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