BITFINEX Alpha

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INTRODUCTION

The inverse correlation between Bitcoin and the dollar is increasingly clear. A strengthening US dollar index has seen Bitcoin price weakness, and the reverse is also true - making it an important gauge to watch

The surge in the US Dollar Index throughout 2022 has had serious consequences on other weakening currencies too, especially the Euro with Europe's ongoing energy crisis. But the rise in Bitcoin last week, corresponds to a recent weakening in the US dollar. We believe a strong dollar cannot be sustained in the long-term without damaging the economy, and even some central banks are diversifying away from the dollar for this reason among others. However demand for dollar assets still remains strong and this will continue to put upward pressure on the dollar index - and have a negative effect on Bitcoin.

In our weekly on-chain analysis, we deep dive into a fair valuation metric for Bitcoin and note that the 'shrimps' (0.1-2 BTC-size wallets) are buying aggressively. And who is selling? The miners.

In a special *Learning Section* of this week's Bitfinex Alpha, we conclude that miners continue to play a very significant role across bitcoin's history. We deep dive into the dynamics at play around Bitcoin mining and how miners tend to behave through market cycles.

We also update on the latest market news; from California allowing crypto-denominated political donations to Tesla selling 75% of its Bitcoin holdings and Genesis emerging as the largest creditor to Three Arrows Capital.

In short, we continue to be in an uncertain macroeconomic environment which means that the outlook for all asset prices - including Bitcoin - remains unclear. However on a number of metrics, we are at or near historic bottoms, which should bode well for the market in the longer-term.

INDEX

GENERAL MARKET UPDATE

The Global Pain from the Dollar's Gain

Figure 1. US Dollar Currency Index Daily chart

The Dollar Currency index, an index of the dollar relative to other currencies such as the Euro is at a 20- year high, driven by inflation, the Fed's aggressive interest rate hikes and the current geopolitical landscape.

Figure 2. Euro/ US Dollar

Last week, the Euro and the Dollar reached parity, with the Euro at its lowest value since 2002. The ongoing energy crisis in Europe has weakened the currency, adding to ongoing pessimism about Europe's short-term economic prospects, and pushed investors to reallocate to stronger currencies.

The US dollar is the well-established invoicing currency of global trade. As it strengthens in value, it has significant knock-on effects for countries involved in international transactions. Countries with debts denominated in US dollars, will find paying back debt more expensive with a weaker domestic currency. The pain of more expensive debt is exacerbated by the higher cost of import of dollar-denominated commodities.

However, most analysts predict that the dollar's dominance cannot stay elevated for too long, due to a massive US trade deficit - which currently sits at $85 billion per month, inflation of 9.1% and federal debt at $30.5 trillion.

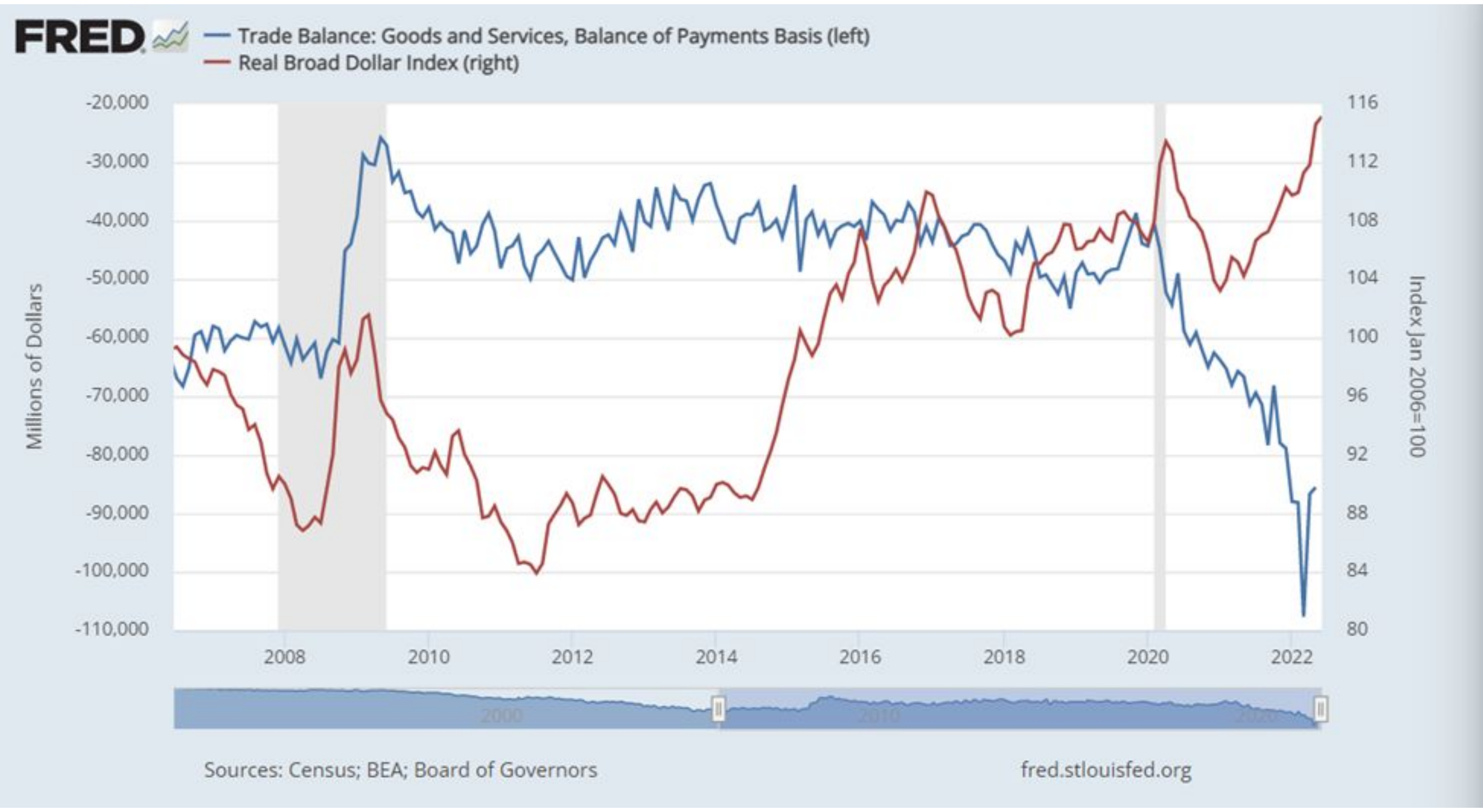


Figure 3. Dollar Index vs US Trade Balance (source: FRED)

The Trade balance is the difference between the amount a country exports and the amount it imports and a trade deficit is when a country's imports exceeds to that of its export. As the dollar becomes more expensive, other countries will buy fewer products from the US. On the other hand, it will make the cost of imported goods cheaper as the dollar appreciates. This however causes a deterioration in the trade balance, pushing the deficit further down. An increasing trade deficit hurts US manufacturing, and compresses the income of the US workforce.

A country's annual budget deficit and national debt, also increase with higher interest rates. As a result, the interest paid for national debt will grow more significant relative to other government spending, which could crowd out other priorities.

Finally, a continued rise in dollar strength worsens inflation. Many commodities are traded globally in dollars. When the dollar gets stronger, goods from other countries will cost more as they pay for input materials with a weaker currency. This results in higher prices for foreign-produced consumer goods. Combine this with a considerable trade deficit, imported goods, though cheaper when priced in dollars, may eventually see prices rise due to higher production costs for foreign manufacturers.

In summary, a stronger US Dollar as the global economy slows down will hurt foreign entities which have borrowed in USD and need strong trade and economic growth to service their dollar liabilities.

A strong dollar also affects US corporate profits.

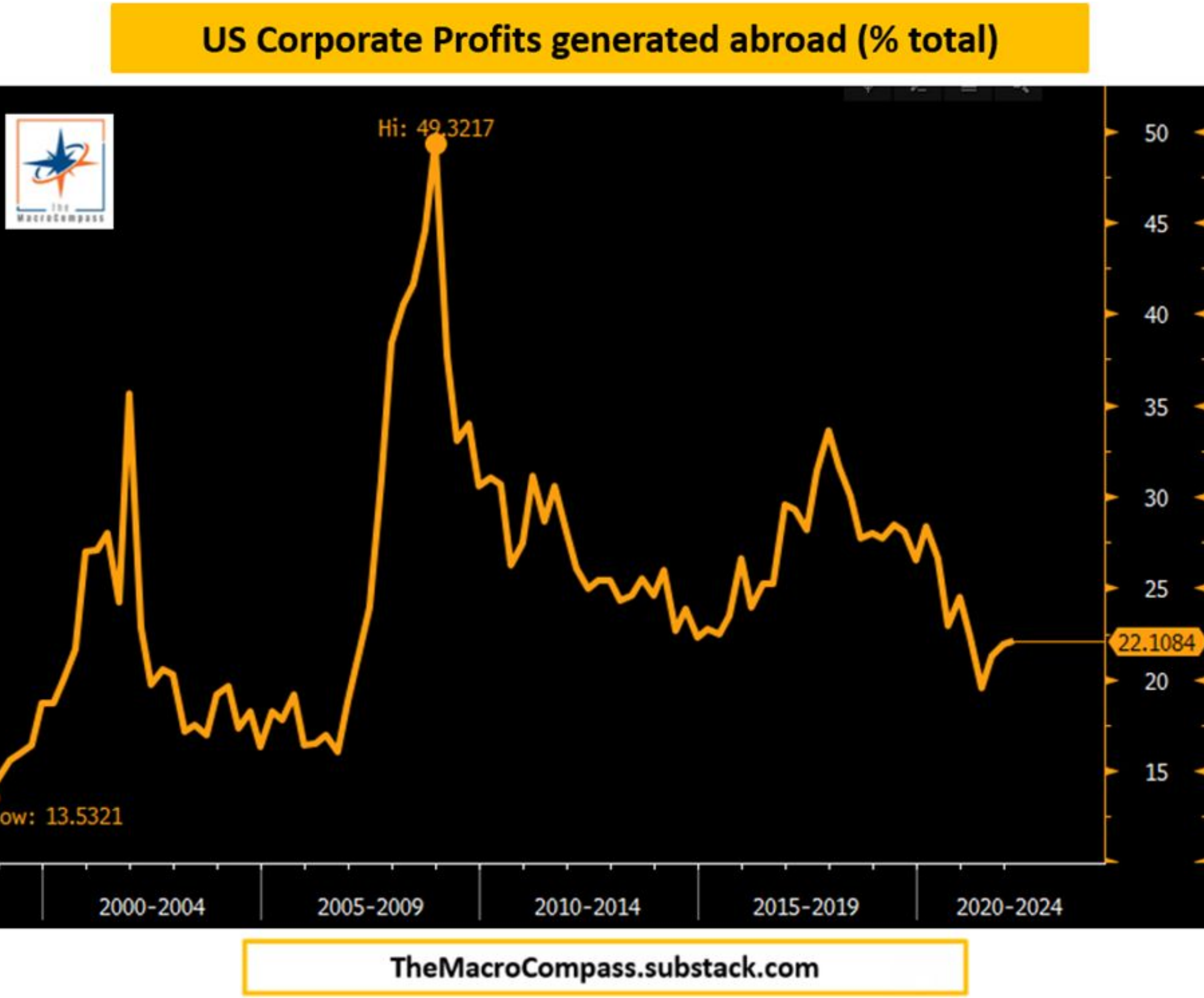


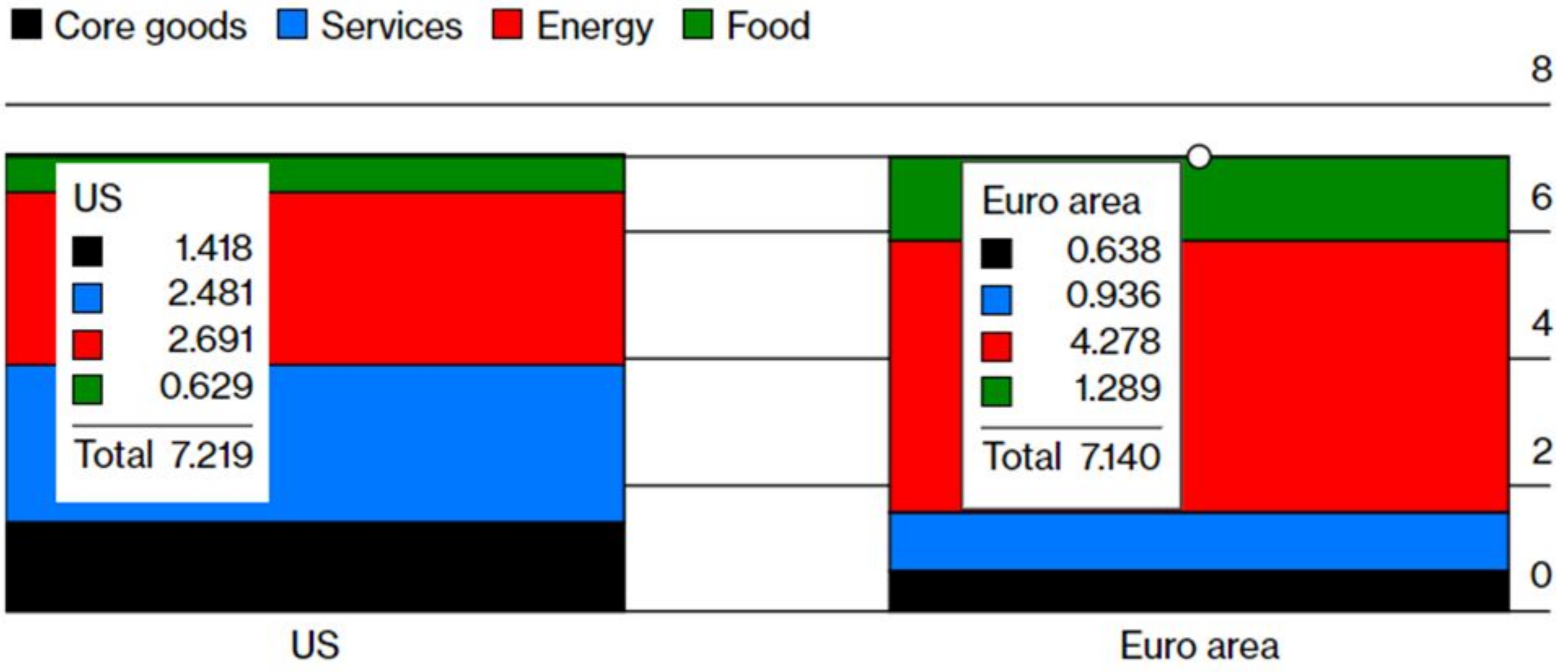
Figure 4. US Corporate Profits generated abroad. (source: TheMacroCompass)

Over the last 20 years, US companies have expanded the volume of sales and corresponding profits they generate abroad. A stronger USD hurts this non-negligible source of income for American corporations.

More than half of the publicly traded entities in the US are multinational corporations. For a multinational corporation based in the US, its average overseas income is about 40% of its aggregate sales. This includes most of the US' most prominent tech companies, for whom a considerable percentage of their income is generated outside the US.

For example, Microsoft generates half its profits outside the US, and saw its quarter-on-quarter sales fall by $302 million. When earnings fall, the tangible impact is felt in the stock market, and especially in the share prices of companies with substantial foreign exposure.

Europe's Energy Crisis



Source: Bloomberg Economics based on data from Bureau of Labor Statistics, Eurostat

Figure 5. Consumer Price Index Components : US vs Euro Area

Headline inflation in the Eurozone was running at 8.6% in June - not as high as in the US. However, inflation in Europe is much more sensitive to rising energy prices, which has been caused by the Russia-Ukraine conflict.

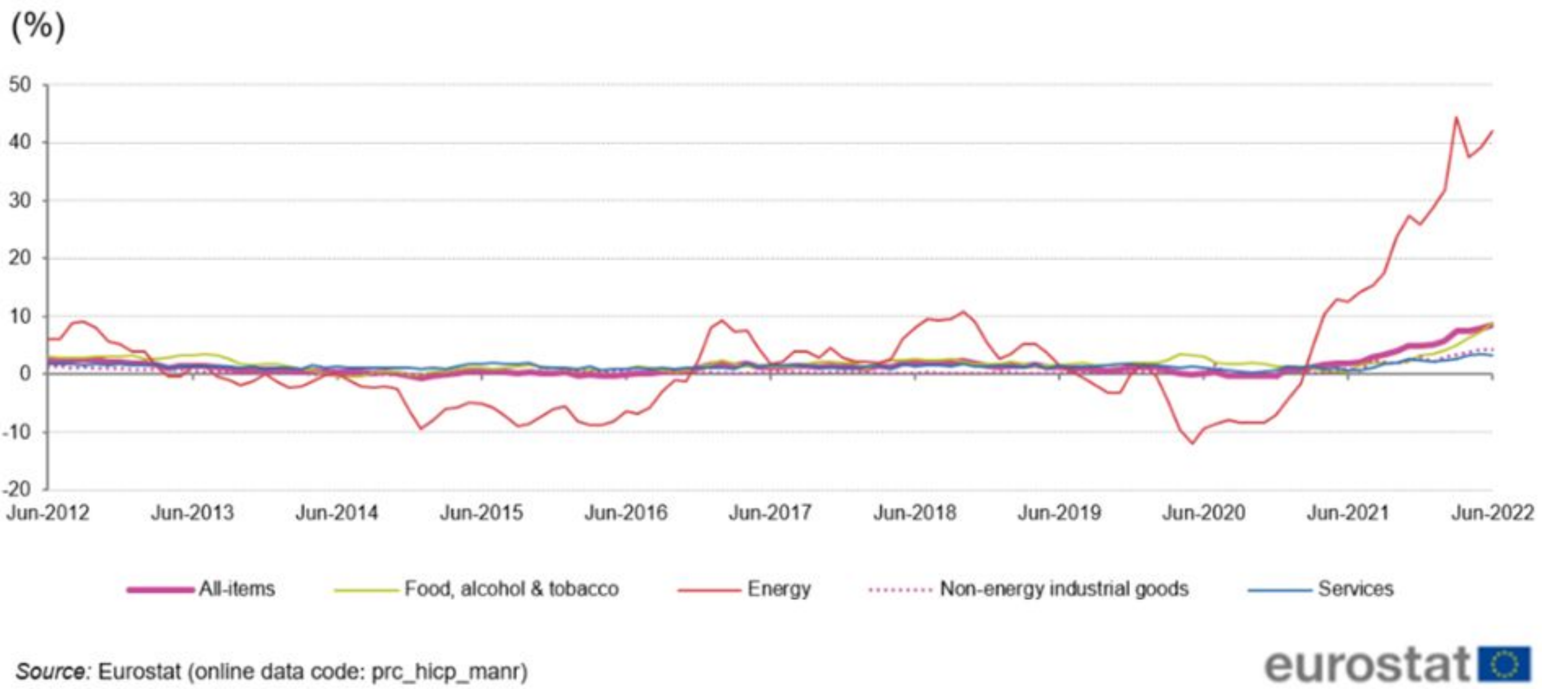


Figure 6. Euro area annual inflation and its main components, June 2012 - June 2022

In our previous issue (link: https://bit.ly/3PPScOF), we broke down all the components of inflation and their respective contributions to US CPI numbers.

Since June 2020, the contribution of energy to Europe’s inflation has risen steeply and is now sitting above 40% as of June 2022. Most of Europe’s gas supply is from Russia. Countries like Germany rely on Russia for one-third of its supply and are seeking alternatives such as LNG from the US and Asia which happen to be priced in dollars. Higher gas prices, denominated in dollars and paid with a weaker Euro, is increasing the burden on inflation. In response, the European Central Bank raised interest rates by half a percent last week, but this is still lagging behind the aggressive US Federal Reserve hikes that continue to push US Dollar dominance higher.

The irony is that while everyone is pessimistic about the future of the global economy, investors seek a safe haven in dollars, thereby strengthening it further. The stronger dollar will then negatively impact the economy. This is a self-fulfilling cycle called the Dollar Doom Loop.

In this Dollar Doom Loop however, foreign manufacturing companies are willing to compete with lower prices in exchange for a more valuable currency making imports of commodities cheaper. This may give some breathing room amid red-hot inflation. To some extent, the strong dollar is itself doing the Fed’s work in taming inflation.

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Nations Offloading US Bonds

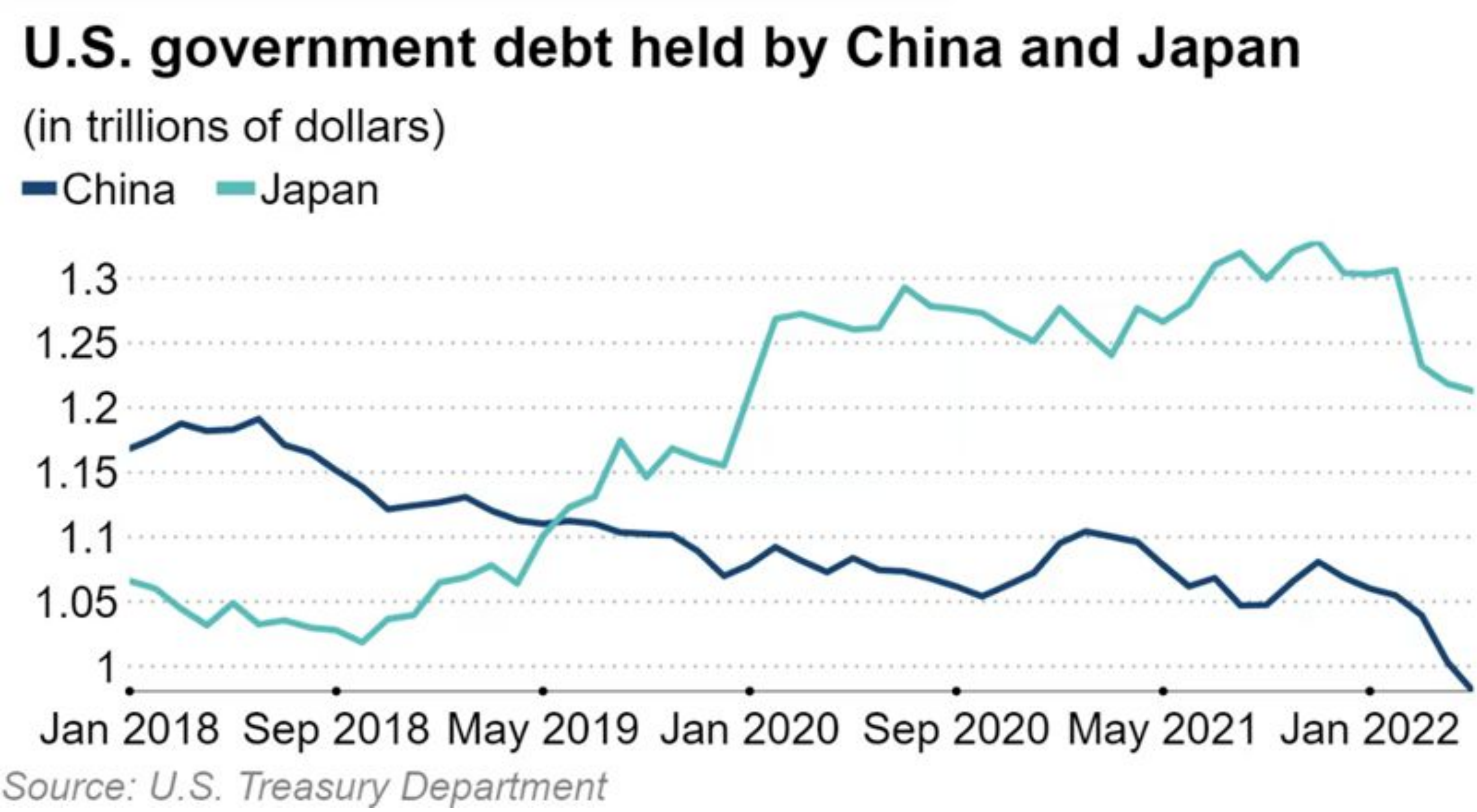

Figure 7.

While the US dollar is seeing solid upward momentum, some nations are offloading their holdings of US Treasury Bonds. Japan and China, the two largest US bondholders, have been reducing their holdings for three and six month-tenor paper respectively. Other countries like Brazil and Vietnam have also sold some US assets. With stronger dollar dominance, nations are trying to cushion the value of their currencies by selling an appreciated US dollar. Though a weakened local currency benefits exports, it compresses imports. With elevated prices of energy, food and other commodities, countries in Europe and Asia are under pressure.

Despite some countries selling off US Treasury bonds however, the dollar's dominance has still fundamentally remained the same. Investor's preference of US treasuries is apparent in private holdings of US Federal debt rising, despite the decline in foreign holdings.

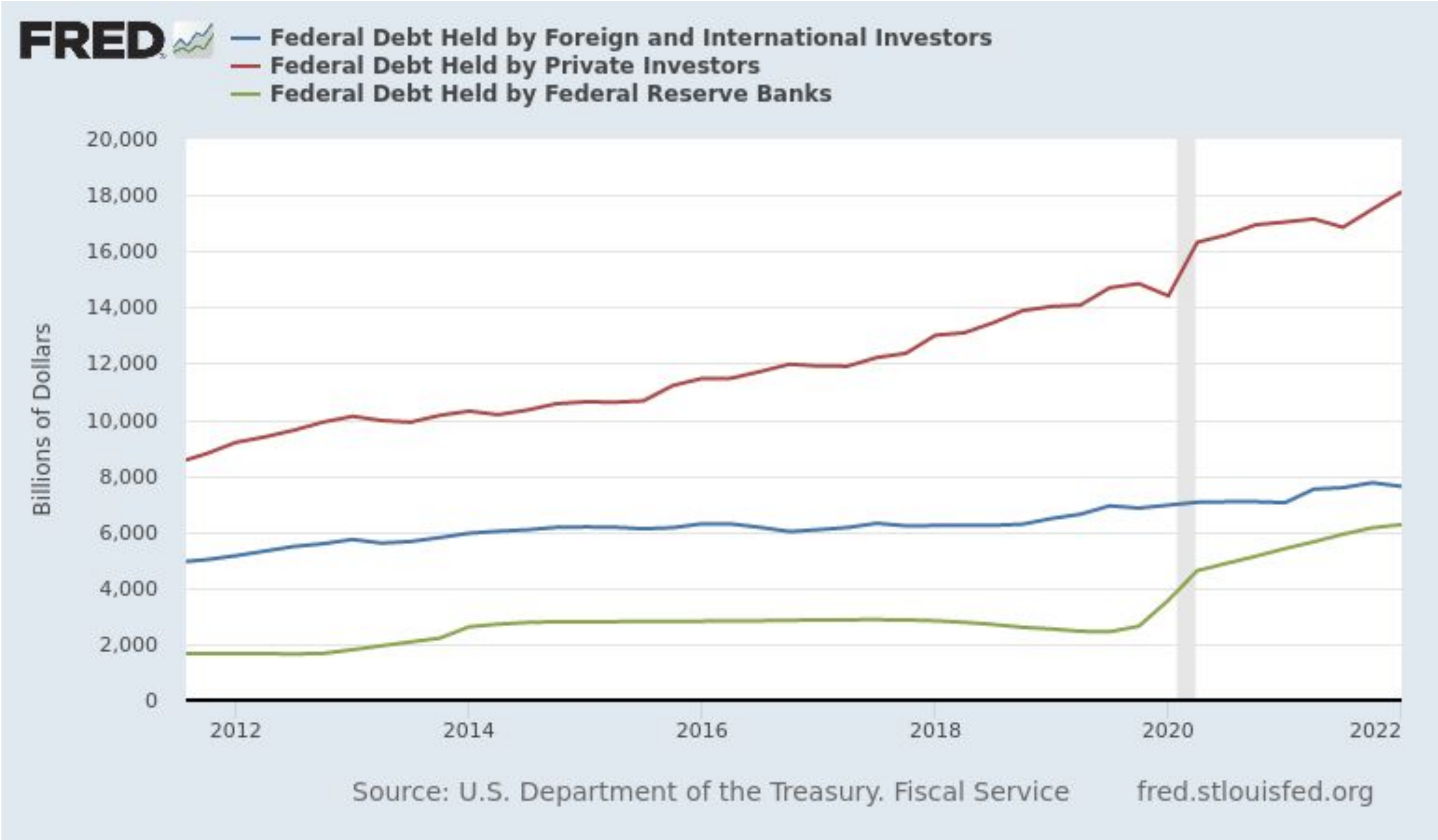

Figure 8. Federal Debt Held by various entities. (Source: FRED)

With persistent inflation and a volatile equities market, some investors are still buying US debt. In May 2022, a total of $34 billion worth of Treasury bonds were sold. Nonetheless, the decline in foreign countries' US government bond holdings tells us that central banks worldwide are diversifying away from the dollar.

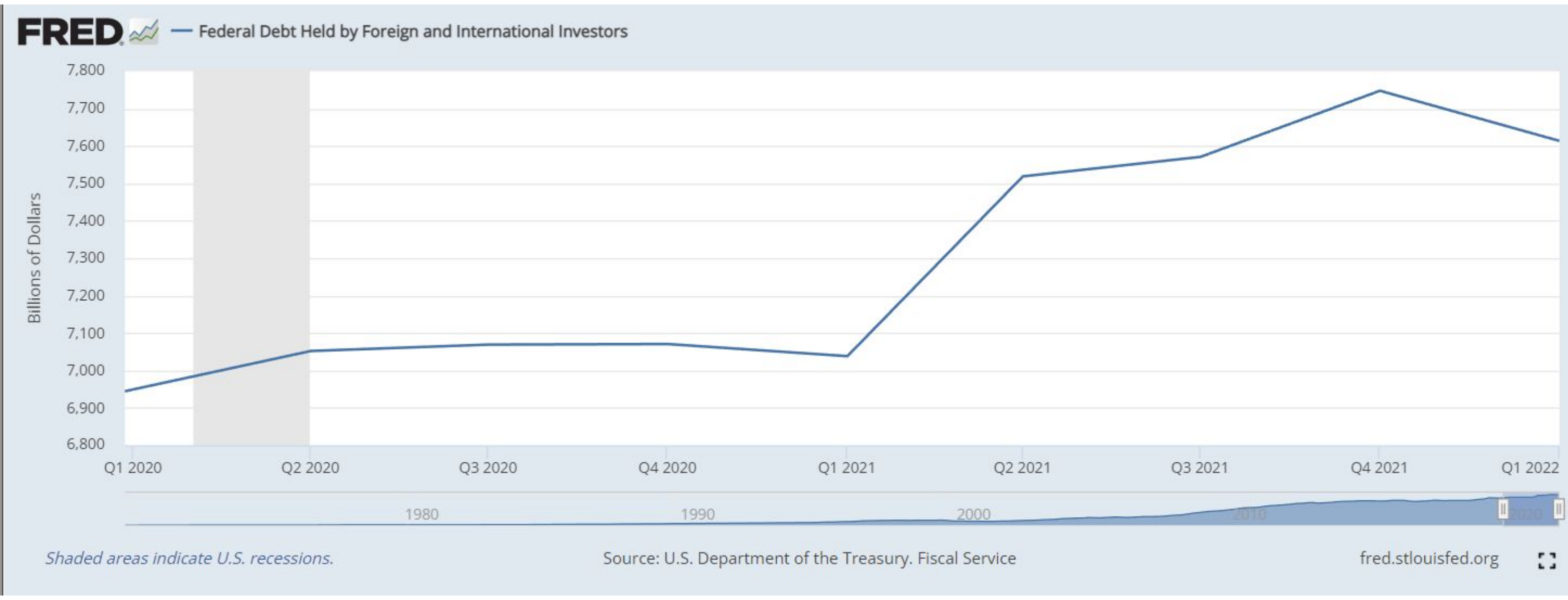

Figure 8.1. Federal Debt Held by Foreign and International Investors (zoomed in)

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Flight to Safety

***Figure 9.** Daily chart of US Government Bonds 10 Year Yields.*

As buyers increase their demand for treasury bonds, it drives the prices up and consequently pulls rates down. The 10-year treasury bond yield declined 14 basis points to 2.8% following the European Central Bank's higher-than-expected rate hike last week.

Shortly after the dollar reached parity with Euro on July 12, the Dollar Dominance Index (DXY) has been on a steady decline and has come down by 2%. This coincides with foreign countries' reduction in dollar holdings in their reserves. Amidst the threat of recession and rising yields of US treasury securities, for foreign countries, accumulating dollar reserves is like building a pile of combustibles that can ignite at any time.

Nevertheless, nothing has changed fundamentally. Most international bank transactions and commodity prices are in dollars. As discussed earlier, in the dollar doom loop, the consensus among analysts is that the dollar will stay elevated in the near term given the Fed's aggressive stance on rate hikes; and we therefore still expect to see an increase in returns and continued demand for higher-yielding dollar-denominated securities.

The Equities Market Update

Figure 10. NASDAQ 100 Index Daily chart

The market is looking forward to both the Federal Reserve's mid-week monetary policy meeting, and continued earnings reports from S&P 500 companies.

Stocks have been rising, with S&P 500 and Nasdaq on track to a two per cent and three per cent gain respectively and earnings bolstering economic sentiment. Companies have surprised the market, with S&P 500 earnings expectations growing 6.2% as of Friday based on actual reports, an increase of 0.6% compared to a week earlier. Tesla (TSLA) shares surged 9.8% after it released better-than-expected quarterly earnings. Amazon (AMZN) and Apple (AAPL) also increased by 1.5% ahead of both companies' earnings on July 28. The July rally provides a respite for beaten-down portfolios.

What about the markets going forward and how do we get a gauge on the situation? We must understand that changes in equity valuations are correlated to risk-free interest rates.

Large, multi-asset investors don't look at asset classes in isolation; their investment thesis is not "invest monthly savings in four blue chips". They analyse the real return of the most liquid, risk-free investment they can make, which is treasuries, and compare that against other assets with higher risk. As the return on US treasuries change, the marginal appetite to buy risky assets changes too.

Alfonso Peccatiello talks about how stock prices are the net present value of all future (inflation-adjusted) cash flows whose value is discounted to today. If you change the real discounting factor, the stock price will change too.

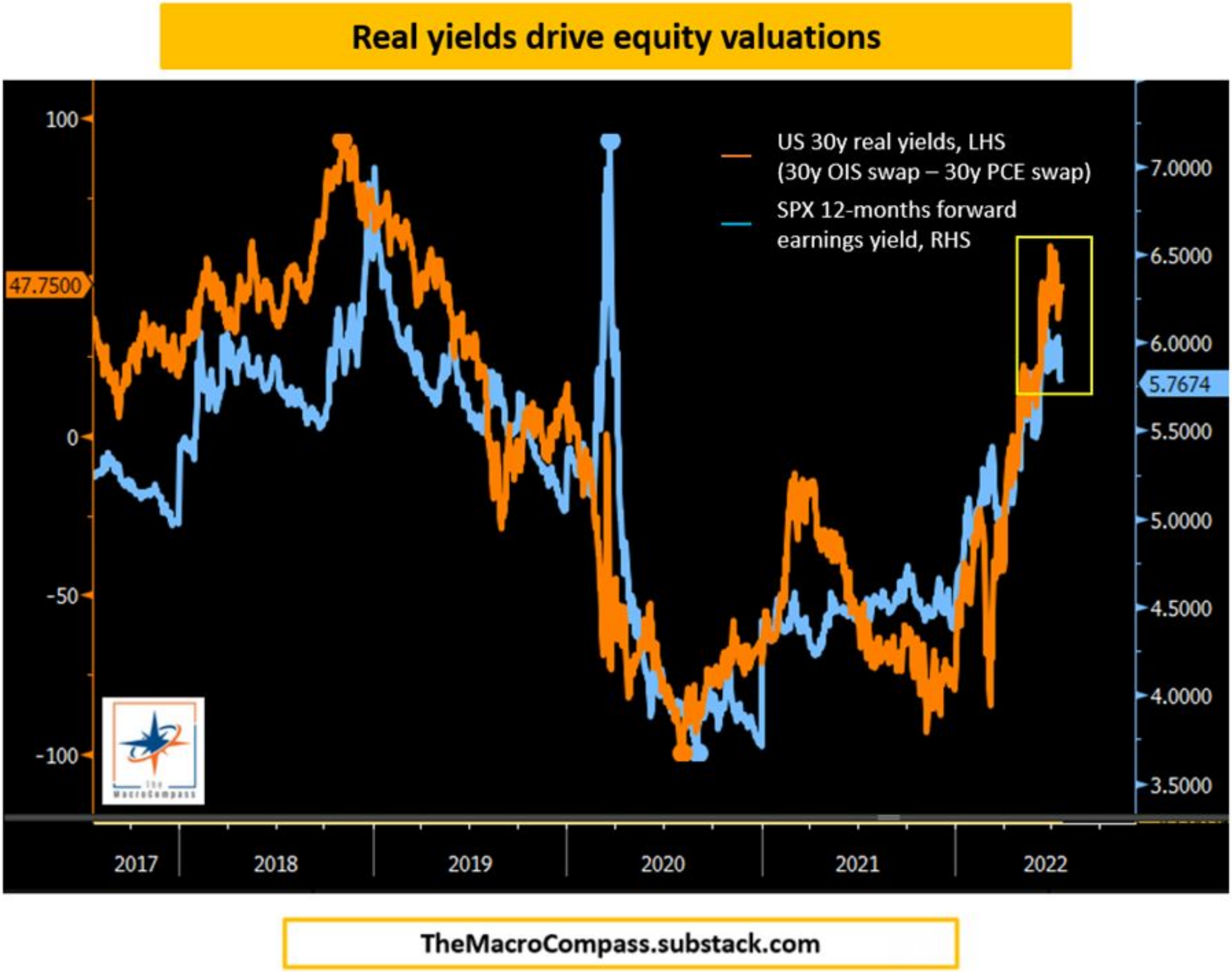

Figure 11. US 30-year yields against the SPX forward earnings yield (source: TheMacroCompass)

The US 30Y yields (chart: orange) saw a massive rally throughout 2022 before stabilising and then slightly dropping recently. As evident from the chart, this has helped the 12-month forward S&P 500 earnings yield (chart: blue) drop from 6.1% to 5.8% - corresponding to forward P/Es expectations rising from 16.4x to 17.3x and this explains most of the rally seen so far.

Cryptocurrency

As discussed in last week's Newsletter, the strong inverse correlation between the dollar dominance and Bitcoin suggests that cryptocurrency moves with the current woes of the economy and a strong dollar continue to put pressure on bitcoin price.

Recently, however, as the dollar takes a step down on the lower time frames, Bitcoin is getting some relief. The Bitcoin price climbed to around $ 24,000 this week – levels that we have not seen in more than a month. Though far from its peak last November, this is a significant rally from last week when bitcoin's price was below $20,000.

We expect that the correlation of bitcoin to other risky and volatile assets to continue.

CRYPTO NEWS SECTION

California approves Bitcoin payments for political campaigns.

Since 2018, bitcoin and other cryptocurrency donations to political campaigns have been prohibited in California. Concerns about funds being used to dodge contribution limitations and restrictions were one of the primary reasons for the ban's implementation. Additionally, foreign entities funding campaigns were another concern.

However, a state regulator, the Fair Political Practices Commission, has been examining adjustments to the policy, and has decided to allow donations of digital currencies such as Bitcoin.

The 'Bitcoin to Fiat Conversion' Pitfall

Crypto, however, cannot be held by the contestants. It will have to be converted to fiat currency. This lessens the volatility risk of the value of the crypto donated. According to a recent Los Angeles Times story, "...candidates may take bitcoin donations as long as they quickly convert the digital money into US dollars."

Legalising cryptocurrency: "Greater Fools Theory" and the Philippines' Predicament

Figure 12.

Felipe Medalla, Governor of the Philippine Central Bank (BSP), stated in an exclusive interview with *Forkast* that he does not wish to outlaw cryptocurrency. Medalla said that a crypto prohibition in the Philippines is not on the cards. (link: https://bit.ly/3PRH7fX)

Nonetheless, Medalla does not consider the asset a currency due to the limited payment channels and price volatility. According to Medalla, crypto assets can be helpful in nations where there is volatility in the local currency or traditional financial systems are not functioning.

Another advantage of crypto, according to Medalla, is the ability to avoid government monitoring. However, he feels that avoiding government does not benefit society.

The Philippine crypto dilemma

Although Medalla expressed some enthusiasm for cryptocurrency, the governor has previously described crypto speculators as adherents of the "greater fool doctrine." According to the hypothesis, asset values rise because investors sell overpriced items to other investors. Medalla argued that investors acquire cryptocurrencies believing they would be purchased at a more excellent price by someone else. He called this "extremely dangerous."

On one hand, the governor of the BSP does not wish to outlaw the asset class. On the other hand, it regards the industry as dumb. Medalla appears to be perplexed about his position on cryptocurrency as a result of this.

Genesis gave Three Arrows Capital a loan for $2.36 billion.

Figure 14.

Genesis Asia Pacific Pte Ltd, a part of Digital Currency Group's crypto lender, loaned $2.36 billion to the defunct hedge fund Three Arrows Capital (3AC).

Earlier reports revealed that Genesis faced a potential nine-figure loss due to its exposure to 3AC, but the actual value of the debt was not disclosed until recently.

According to bankruptcy documents that have been filed, 3AC owes Genesis $2.36 billion in outstanding loan balances. The said documents also reveal that the debt is undercollateralized and that Genesis attempted to collect part of its loans by initiating arbitration procedures against 3AC in New York last month through the American Arbitration Association (AAA).

On the other hand, Genesis appears to have halted the arbitration procedure following the late June engagement of consultancy company Teneo to handle 3AC's liquidation. On July 1, 3AC filed for Chapter 15 bankruptcy in New York.

"Both the DCG and Genesis balance sheets remain healthy," a DCG spokeswoman is quoted as saying. Genesis is well-capitalized, with no lingering exposure to Three Arrows Capital, and its activities continue as usual."

Teneo, the firm designated last month to manage 3AC's liquidation, released the specifics of the 3AC loans in a 1,157-page court document posted online on Monday.

Three Arrows Capital was founded in 2012 and initially focused on trading conventional currencies in emerging nations. They gradually shifted their concentration to stocks and crypto, finally focusing completely on crypto in 2018.

The company had net assets of $703 million at the end of 2020; it's also worth noting that it had $1.8 billion in loans outstanding at the time.

THREE ARROWS CAPITAL, LTD

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Statement of Assets and Liabilities

December 31, 2020
(Expressed in United States Dollars)

Assets		
Investment in digital assets, at fair value	$	1,196,316,260
Investment in private equity, at fair value (cost: $39,139,334)		39,139,334
Investment in derivative financial instruments, at fair value		16,382,462
Unrealized gains on digital assets (Notes 4 and 5)		652,572,825
Unrealized gains on private equity (Notes 4 and 5)		30,615,714
Unrealized gains on open derivative financial instruments (Notes 4 and 5)		16,030,083
Due from brokers and exchanges (Note 3)		46,799,677
Lending receivables		646,072,848
Prepaid expenses and other receivables		425,415
Dividend receivables		641,339
Total assets		2,644,995,957
Liabilities		
Unrealized losses on open derivative financial instruments (Notes 4 and 5)		44,779,833
Loan payables		1,779,354,712
Interest payable		12,899,840
Accounts payable and accrued expenses		18,784,697
Due to brokers and exchange (Note 3)		86,290,222
Total liabilities		1,942,109,304
Net assets	$	702,886,653

Figure 15. Statement of Assets and Liabilities Three Arrows Capital in December 2020

According to the records, the firm's net assets under control reached $3 billion in April 2022. Notably, 3AC had $600mm of LUNA/UST exposure prior to May 9th, 2022, and this is what drove them into eventual liquidation proceedings.

Tesla dumps 75% of its Bitcoin holdings after Musk said he doesn't dump Bitcoin.

Figure 16.

Tesla Inc. liquidated a huge portion of its Bitcoin holdings- a highly significant act as it was Tesla's original purchases that were seen as helping to broaden the appeal of bitcoin.

According to its shareholder letter, the company has converted nearly 75% of its Bitcoin, adding $936 million to its balance sheet. On a conference call with analysts, CEO Elon Musk stated that the firm sold because of uncertainty about when the Covid shutdowns in China will be lifted, and the needed for added liquidity.

"This should not be interpreted as a decision on Bitcoin," Musk stated. "We were concerned about the company's overall liquidity in light of the Covid shutdowns in China."

Tesla's relationship with Bitcoin has been hot and cold: Tesla acquired around $1.5 billion in Bitcoin in early 2021, driving the cryptocurrency's value to skyrocket. For sometime the company also allowed its customers to pay with Bitcoin, but that policy was quickly abandoned too; in a May 2021 tweet, Musk stated that the company would no longer accept Bitcoin payments due to "concerns about the rapidly increasing use of fossil fuels for Bitcoin mining and transactions, particularly coal." At a recent earnings conference, Musk also stated that Tesla is "absolutely open to increasing [its] Bitcoin holdings in the future."

WHAT'S ON-CHAIN THIS WEEK?

The macro movements in the market have been relatively less frantic, as compared to the volatility that came with the 9.1 % CPI print. As shown with Bitcoin's negative correlation to the dollar, the Bitcoin price is influenced by the geopolitical and global economic landscape. The US dollar index (DXY) has moved southward since last week and has been supportive of BTC's upward move. A continuous upward move will bring us to the next closest resistance at $29000, the 0.382 Fibonacci retracement resistance level.

Figure 17. BTC 1D chart

Bitcoin had been moving underneath a descending resistance line since April 5, with the last rejected price on June 6 that brought bitcoin to a local low of $17000 on June 18. Since then the price has been moving upwards and broke resistance on July 18.

Moreover, the daily RSI supports the upward continuation. RSI has moved above 50, a sign of a bullish trend and still hovers above the ascending support line.

Fair Valuation for Bitcoin

Investors use the "fair value" of an asset to assess whether an asset's current price is overvalued or undervalued. The MVRV-Z score is usually used to assess a crypto asset's fair value. It is the ratio of the difference between a market cap and realized cap, divided by the standard deviation of the market cap. It shows by how many standard deviations the market value deviates from the realized value.

$$MVRV\ Z - Score = \frac{Market\ Cap_{USD} - Realized\ Cap_{USD}}{Standard\ Devation_{MarketcapUSD}}$$

Figure 18. Bitcoin MVRV-Z

The red zone denoted points when the Bitcoin price is in a overheated market cycle which eventually is followed by a price drop. The green zone on the other hand indicates that market value is below the realized value.

For the past four bear markets, the MVRV-Z Score has correctly signaled the bottom. The table below shows the number of days the MVRV-Z spent in the green zone before starting a bull rally. The green zone shows when Bitcoin is “undervalued”

Bear Market	No of days in the green zone
2012	212 days
2015	300 days
2019	133 days
2020	20 days

Figure 19

Just like any other metric, MVRV-Z Score is not without faults. It cannot accurately predict the number of days bitcoin should remain in the undervalued zone before correcting. In 2020, it only stayed undervalued for 20 days and immediately started a bull rally. This was influenced massively by the economic situation where people panic-sold during the pandemic that caused a sharp drop in Bitcoin's price and was quick to recover as soon as the government started printing money in a form of stimulus relief checks. The situation is no different now as Bitcoin is again driven by global macro sentiment. For certain though, these levels are buy areas especially to those who plan to hold it in the long term.

Who is Buying Bitcoin?

Despite the current market condition, the Bitcoin shrimps, or small-sized BTC addresses are growing in numbers, and have been since 2021. Since mid June this year, the growth has accelerated significantly. The chart below shows the 90-day supply change in wallets holding 0.1-2 BTC.

Figure 20. Holdings by Entity Size

There is a huge spike held by shrimps that have surpassed the levels of the peak of 2017 bull market. This is interesting because with the current market situation and after dropping by more than 70% from its November 2021 peak, the shrimps are behaving as if it were at the extreme greed phase in the bull market of 2017. This indicates that shrimps are buying Bitcoin in this undervalued zone with conviction despite the fear and uncertainty in the economy. Since the end of 2021, there is an upward trend in the number of shrimps and this trend surpasses that of 2018 to 2021. If shrimps are accumulating Bitcoin at a fast pace after a huge fall from it's all-time high, who is selling to them?

Miners Capitulate

Whales are unlikely to off-load their bitcoin holding as smart money does not sell during extreme fear in the market. Hence it is worth looking at the miner's recent behaviour.

Figure 21. Difficulty Ribbon Compression

The difficulty ribbon is a graph of simple moving averages on mining difficulty. This ribbon shows the impact of miner's sell pressure to the price of Bitcoin. When network difficulty reduces its rate of climb, it means miners are going out of business, leaving only the strong miners in the game. Strong miners are efficient and sell less which gives room for a bullish price action.

The difficulty ribbon compression adds a standard deviation to help determine market bottoms. Historical data shows that values between 0.01 and 0.02 signal the bottoms. Currently, the value sits and 0.0162, interestingly lower than the last three cycle bottoms. In 2015, we had a market bottom of 0.024, 2018 bottom was at 0.019 while the recent, 2020 bear market bottom had a value of 0.020. Based on the previous bear markets, the difficulty ribbon compression suggests that Bitcoin is close to a bottom.

Figure 22. Bitcoin Hash Ribbon

The hash ribbon indicator uses the hash rate or mining computational power, to determine if the miners have reached capitulation. Miner Capitulation happens when the cost of mining is greater than the rewards. In the chart above, a light red area is shown when the 30-day (green) moving average cross below the 60-day (blue), and turns darker in a bullish cross. Historically, the dark red area is followed by a strong upward move.

In 2015, the cross was place for 40 days and bottom was reached 25 days after the cross formed. The rest of the cycle bottoms are shown in the chart above. On March 2020, the bottom had formed before the cross. On June 7, a bearish cross start to show and the current bottom formed on June 18.

While we see shrimps are buying and miners appear to be selling, what are the long-term holders doing?

In a cycle bottom, the long-term holders provide price support for Bitcoin. We have explored metrics used to determine cycle tops and bottoms but *Glassnode*'s Realized Cap HODL waves shows which entity sizes are holding bitcoin at cycle bottoms and the quantity. The metric represents active supply bands and the colored band shows how much Bitcoin is circulating that was moved within a certain time frame, weighted by it realized price.

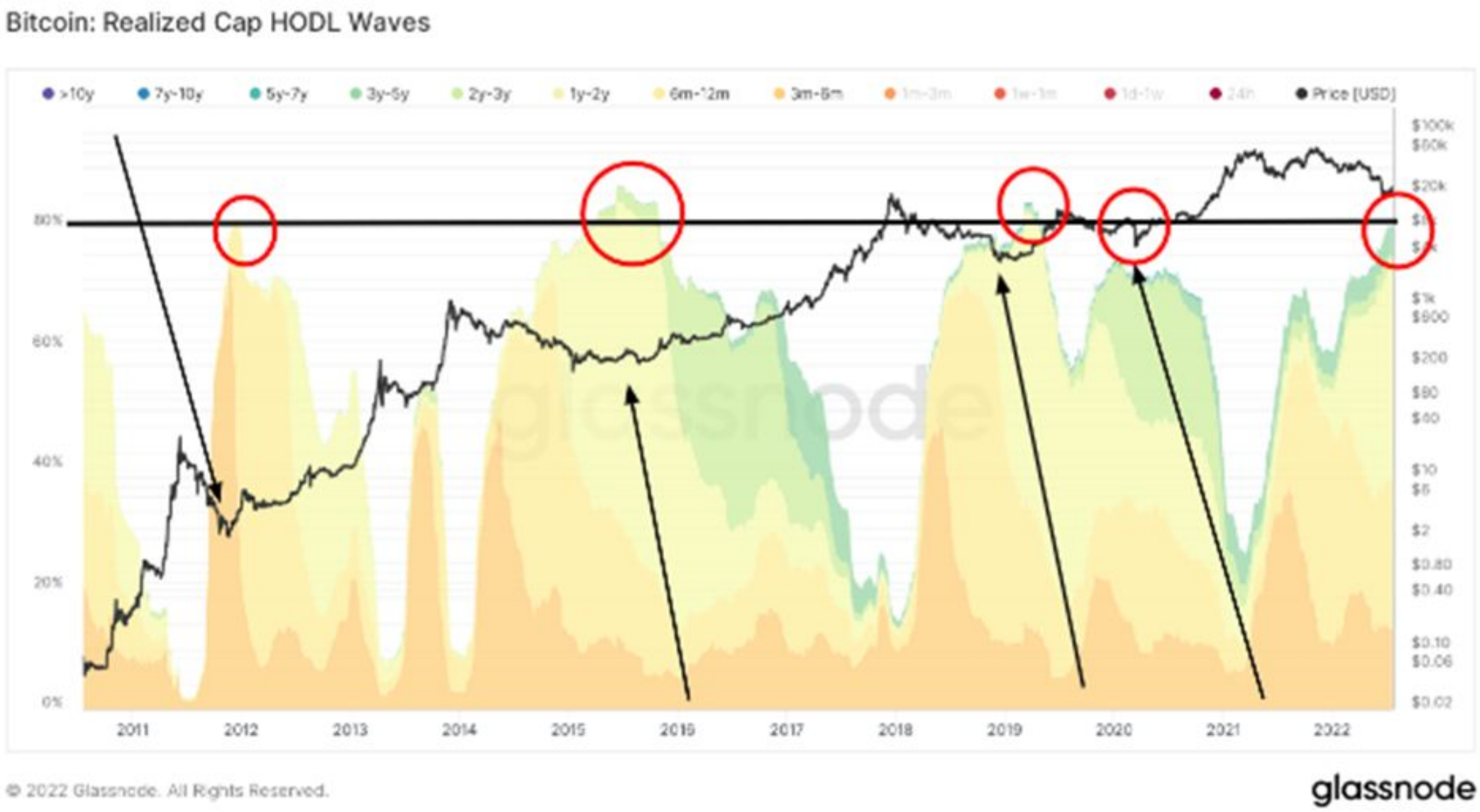

Figure 23: Realized Cap HODL Waves for Bitcoin

The chart above shows that 80% of Bitcoin's circulating supply is held by long-term holders (LTH), these are users that have been holding bitcoin for at least six months. The long-term holders have historically been seen to accumulate during tough market conditions and also the ones who take profits in a bull market. The previous bear market bottom supports this, as each time the market hits a cycle bottom, the long-term holders have limit buying orders to give bitcoin a strong support.

Bitcoin Cost of Production

The cost to produce Bitcoin is now at $13,000, down from $20,000 at the start of June as miners race to increase mining efficiency to increase profitability in the bear market. If Bitcoin continues to have upward momentum, there will be much less selling pressure from miners, which further supports Bitcoin's bull thesis.

In the next section we provide a deep dive on the factors that affect Bitcoin's profitability and its cost of production.

LEARNING SECTION

Bitcoin's Profitability and Cost of Production

The current bear market has lead to the decline of Bitcoin miners' profitability as mining cost is catching up with Bitcoin's market price.

The miner's profitability has been declining since late 2021 and this month, it is now at its ten-month low. Data from *Bitinforcharts* shows that Bitcoin mining profitability as of July 1 is at $0.07 per day per 1 terahash per second (Thash/s), lowest since October 2020.

Figure 24. (source: BitInfo charts)

Bitcoin mining involves production of bitcoin using computing power of GPU-based miners or more specifically, ASIC miners. Miner's profitability is a measured based on several factors including mining difficulty, energy cost, type of mining hardware and the price of bitcoin.

Miners sell bitcoin as long as it is profitable to do so. They reduce the rate of selling in bullish conditions when the trend is up. Miners have historically proven to be extremely price sensitive.

High price→sell a little bit or not at all.

Low price and price in downtrend → panic sell as much as possible.

Miners do not usually sell at a loss. They just collateralise their machines and facilities to buy more machines or keep the operation going till the BTC price goes back above cost of production. Hence, large selling pressure is "turned off" when BTC goes below cost of production.

1. Bitcoin Price and Block Rewards

At a fixed production cost, Bitcoin's price is the most evident factor that influences mining profitability and miners are at the greater risk of losing profits when the price of Bitcoin approaches their production cost.

The block reward or the amount Bitcoin miners receive for mining one block of Bitcoin is also important. Previously, the block reward was as much as 50 BTC. The current block reward Is 6.5 BTC after three halvings. Bitcoin halvings are a major feature of the Bitcoin protocol as it aims to decrease the rewards and hence the quantity of new Bitcoins entering the network, that is, halving the rewards every 210,000 blocks which is approximately every four years.

Figure 25.

2. Hardware Characteristics

Bitcoin's cost of production depends on the type of Bitcoin mining device, their hash rate and electricity consumption.

The miners' processing power is called hash rate, measured in hashes per second (H/s). Higher hash rates means it can solve mining puzzles faster and more Bitcoin is mined in a given time. Bitcoin hash rate is constantly breaking new highs as mining manufacturers produce new mining devices that support higher hash rates.

Bitcoin mining devices will also have different energy consumption levels and their ability to be more efficient is essential for profitability. Moreover, the price of mining rigs is also important in terms of investment capital or cost for miners. Both GPU and ASIC miners have become cheaper during the bear market, but brand new devices still cost about $11,000.

Figure 26.

3. Hash rate and Mining Difficulty

The mining difficulty measures how hard it is to mine each Bitcoin per block which means higher difficulty requires higher computational power in verifying transactions to mine new Bitcoin. Since 2022, the network mining difficulty has been rising at higher rates and is breaking new all-time highs. Bitcoin is programmed to self-adjust in order to maintain a block time of 10 minutes so difficulty adjusts every 2016 blocks or about every 2 weeks.

Bitcoin hashrate dictates how much computing power is required to verify and add transactions to the blockchain. This is also testament to the strength of the Bitcoin network as it would take more miners as well as more energy (and time) to take over the whole network.

Figure 27.

4. Energy Cost

Bitcoin mining requires electricity and costs vary in different areas, and is also affected by local crypto mining regulations. Bitcoin mining can be powered by different energy sources, both renewable and non-renewable. Bitcoin miners are recently paying attention to renewable sources due to soaring energy prices and supply issues of non-renewable fossil fuels.

Figure 28.

5. Pool Fees

When miners are not mining solo, they join in mining pools to combine their computing power and increase the chances of finding a block thereby mining Bitcoin faster. There are small expenses that are taken up by pool admins that host the software for this type of mining which is generally 1 to 3 percent of the miner's individual reward.

Figure 29.

Bitcoin miners have differences in production costs but all miners have come under pressure in this bear market. *Glassnode* has outlined this stress using the Puell multiple. This mathematical model measures the overall income of miners, where, when the metric is low, it means the miners are earning less on average and hence more likely to sell their bitcoin. Recently, it shows that miners are earning 49% of the one year average, significantly less than in the past. Important economic events like the COVID crash, China's crypto ban and the recent price action influenced by Fed rate hikes all correlate with low Puell multiple and a broad miner capituation.

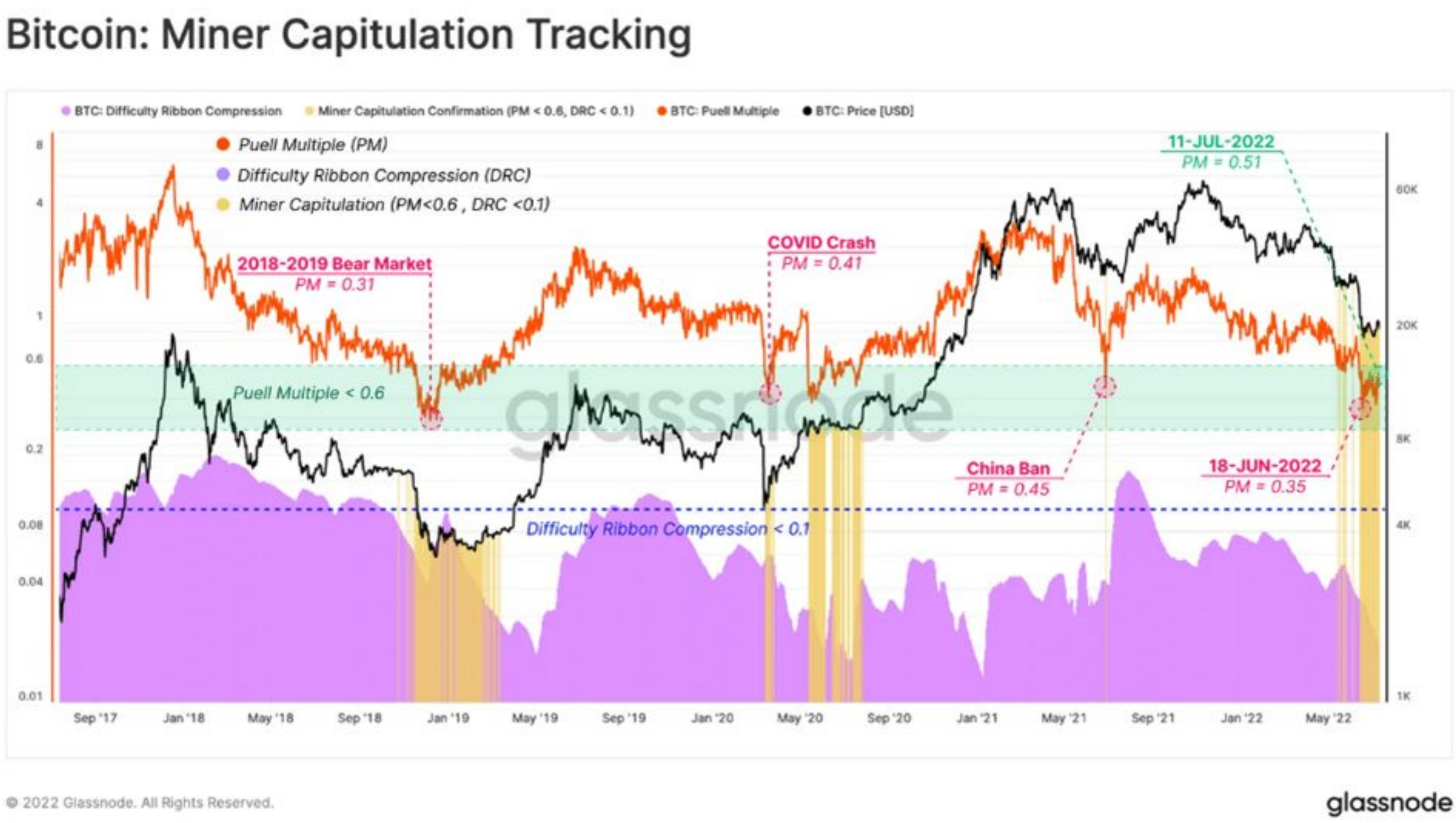
Bitcoin: Miner Capitulation Tracking
BTC: Difficulty Ribbon Compression
Miner Capitulation Confirmation (PM < 0.6, DRC < 0.1)
BTC: Puell Multiple
BTC: Price [USD]
Puell Multiple (PM)
Difficulty Ribbon Compression (DRC)
Miner Capitulation (PM<0.6 , DRC <0.1)
2018-2019 Bear Market
PM = 0.31
COVID Crash
PM = 0.41
11-JUL-2022
PM = 0.51
Puell Multiple < 0.6
China Ban
PM = 0.45
18-JUN-2022
PM = 0.35
Difficulty Ribbon Compression < 0.1
8
4
1
0.6
0.2
0.08
0.04
0.01
60K
20K
8K
4K
1K
Sep '17
Jan '18
May '18
Sep '18
Jan '19
May '19
Sep '19
Jan '20
May '20
Sep '20
Jan '21
May '21
Sep '21
Jan '22
May '22
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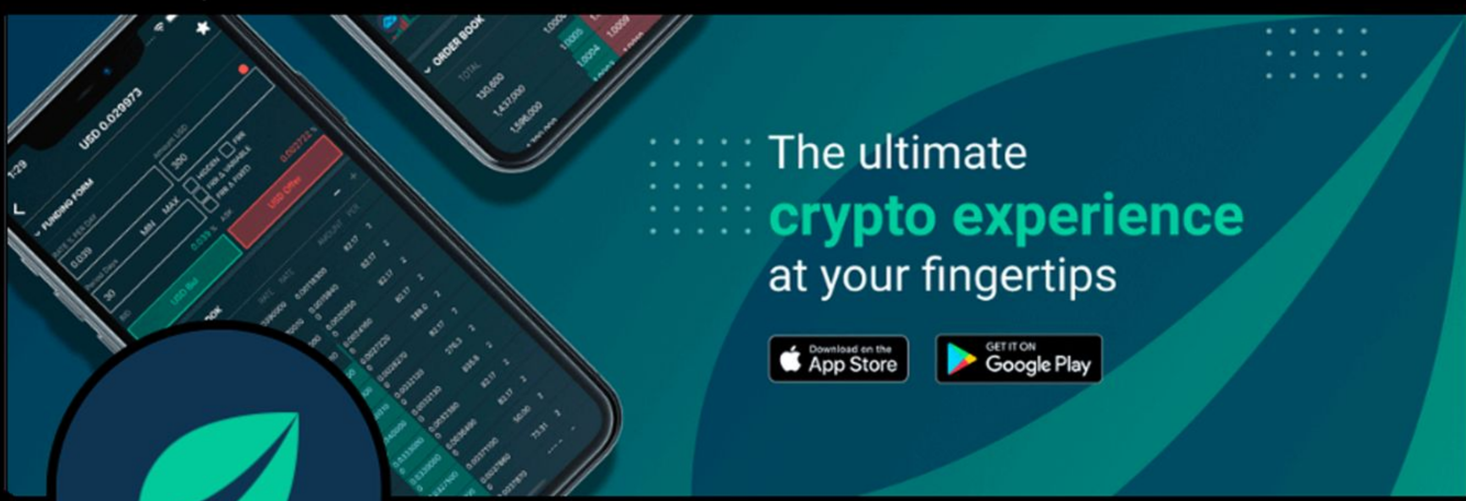
Figure 30.



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