

Crypto Market Some Challenges

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1. Market characteristics

Correlations

- Strong correlation environment:
 - Almost all coins are highly correlated to BTC.
 - Almost absolute correlation on the downside:
 - Nowhere to hide when one needs it the most !
- Correlation with BTC increases when a coin matures:
 - After the “venture” stage it will likely follow BTC in lockstep.

Free-fall market

- There is no theoretical limit to the downside:
 - Known difficulty to fair value a coin.
 - The price can be anywhere:
 - BTC: 7k (Nov 2017) -> 20k (Dec 2017) -> 6k (Jun 2018).
- There is no central power to curtail the fall:
 - No such thing as the "Fed Put".
- Markets for hedging instruments inexistent or illiquid.

Sentiment indices

- Non-existence of standard sentiment gauges:
 - No equivalent of the VIX index. Not yet?
 - No equivalent of the Yield curve inversion. Never?

Hack

- Off-chain: exchanges, wallets:
 - Infamous Mt.Gox hack (2014, centralized exchange, 850k BTC) but also Bancor (2018, decentralized exchange).
 - The DAO hack leading to split ETH/ETC. 50m USD.
 - Parity (150m USD), MEW.
 - ...
- On-chain:
 - Double-spending (51% attack): Bitcoin Gold (BTG, a hard fork from BTC).

“Ca va de soi”

- Omnipresent price manipulation:
 - “Spoofing” visible with naked eye.
 - Somewhat accepted as part of the game.
 - Large public pump and dump groups on Telegram.
 - Rumoured to be also organised by exchanges.
- Unreliable liquidity (aka volume manipulation):
 - Thin liquidity at random times.
 - Fake liquidity, wash trading, front-run quoting:
 - one can see a quote in the orderbook but cannot fill an actual order matching the quote, etc.

“Ca va de soi (cont)”

- Very sensitive to news:
 - “FUD” can send prices south.
 - Regulation: ban, investigation rumour or news.
 - Negative comments from celebrities crashed the market:
 - Jamie Dimon: Bitcoin is a “fraud”.
 - Warren Buffet: Bitcoin is “probably rat poison squared”.

2. Market benchmarks

Tale of two (or three) numéraires

- Numéraires:
 - Financial mathematic jargon, means “unit of account”.
 - A currency can be considered as an unit of account.
- Crypto investors want to outperform two or three numéraires:
 - Their investment should return positively in USD term.
 - And return positively in BTC term.
 - And return positively in ETH term.

Tale of two (or three) numéraires (cont)

- Outperform USD:
 - Common sense.
 - If one can't, then just hold the USD and do nothing.
- Not as obvious:
 - Early buy and hold a “good” coin was a successful strategy in the past.
 - A prolonged bear market (such as 2014 and 2018) shows that timing and luck could play a part:
 - If you buy ETH on 25/08/2017 and hold until 25/08/2018, it's worse than just keeping your USD.

Tale of two (or three) numéraires (cont)

- Outperform BTC:
 - BTC becomes the de-facto numéraire for crypto investors.
 - The goal is to beat it (or you can just buy and hold BTC).
- Challenges:
 - Market indices (i.e. strategies in the "beta" family) perform quite similarly to BTC (high correlation).
 - It's known that beating BTC by actively trading it is difficult:
 - "Parabolic" upward moves can be so fast it penalizes any non or partial participation in the market.
 - The popular mantra "HODL" is enough to say finding any "alpha" in this market is out of reach for most people.

Tale of two (or three) numéraires (cont)

- Outperform ETH:
 - ETH becomes a standard measure of value since the ICO boom in 2017.
 - Most ICOs are ERC-20 token (smart contract) on the Ethereum blockchain.
- Challenges:
 - Most ICOs returned less than ETH so far (made clear during the summer 2018 sell-off).
 - Relies on heavy “coin picking” / venture investing.
 - Correlation ETH/BTC has increased significantly recently.

3. Wisdom from traditional finance

Indices

- Since the ETF boom, there is obsession to “index” everything.
- Methodology borrowed from mainstream market:
 - Without understanding of the different nature of the crypto market.
 - Most of the indices will behave similarly to BTC:
 - High correlation market.
 - High concentration in BTC (due to market cap).
- They fall short of expectation:
 - High or uncontrollable volatility.
 - High drawdown (can be as high as 70%-80%).
 - Long periods of negative performance.

Portfolio construction

- Optimal mean-variance portfolio construction (a la Markowitz) in a high correlation market is a hard problem:
 - Mathematically the weights can be unstable due to degenerated eigen spaces.
 - Moreover, estimation of mean and variance is difficult (see slides on free-fall market).
 - It could be no better than buy and hold a high performance coin. Again involves “coin picking” skill.

Portfolio construction (cont)

- Other popular and closely-linked methodologies such as risk parity or risk budgeting appears to be challenging to implement:
 - Strong presence of volatility clusters: realized volatility is dangerous to use:
 - A low volatility period, implying high leverage, can precede a sudden large market switch, resulting in big losses.
 - Frequent jumps (up and down) in prices:
 - Including or excluding the jumps can lead to very different pictures.
 - Which methodology to properly treat the jumps ?

Portfolio construction (cont)

- Summary:
 - Indexing:
 - Shortcut taken from traditional finance.
 - Delivers limited “alpha”.
 - Well-know diversification methods based on correlations:
 - Seems to be an unsuitable approach.

4. Summary

Summary

- Crypto market:
 - Presents a different set of characteristics hence challenges.
 - Tends to break most if not all of the standard assumptions:
 - Inefficient.
 - Unhedgeable single risk factor.
 - Free-fall.
 - Jumps.
 - ...
- Usual approaches appear unsuitable.

Summary (cont)

- Different way of thinking is needed to:
 - Re-questioning the conventional core concepts.
- Answer some questions of interest:
 - How to identify sustainable sources of alpha in an environment such as the crypto market?
 - How to construct a portfolio with good properties: weak correlation with the market, high capacity, low drawdown, low turn-over, etc.
 - Is it possible theoretically or practically to outperform two or three different benchmarks as the crypto investors desire?

Thanks !

References

- [1] Crypto market, A Technical study. [stratosphère](#) presentation (internal).
- [2] <https://files.stlouisfed.org/files/htdocs/publications/review/08/03/Poole.pdf>
- [3] <http://www.cboe.com/vix>
- [4] <https://www.investopedia.com/terms/i/invertedyieldcurve.asp>
- [5] https://en.wikipedia.org/wiki/Mt._Gox
<https://techcrunch.com/2018/07/10/bancor-loses-23-5m/?guccounter=1>
<https://www.coindesk.com/ethereum-classic-explained-blockchain/>
<https://paritytech.io/the-multi-sig-hack-a-postmortem>
- [6] <https://www.ccn.com/bitcoin-gold-hit-by-double-spend-attack-exchanges-lose-millions/>
- [7] <https://en.wikipedia.org/wiki/Num%C3%A9raire>
- [8] https://en.wikipedia.org/wiki/Modern_portfolio_theory
- [9] <https://medium.com/catalyst-crypto/markowitz-portfolio-optimization-for-cryptocurrencies-in-catalyst-b23c38652556>