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UST - Terra stablecoin

Timeline of events

May 2022

Authors:

Sabrina McNeil

Marie-Chantal Leduc

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What is a stablecoin?

While relatively new, the stablecoin market expanded rapidly in early 2021, growing from US$12.2 billion in July 2020 to US$109.3 billion in July 2021. While today in 2022, the stablecoin market is equivalent to US$155.5 billion[1]. It is thus no surprise that stablecoins have received so much attention from regulators over the past 6 months.

A stablecoin is a type of digital asset (cryptocurrency) designed such that its value is tied (pegged) to another currency, commodity, or financial instrument.[2] Originally, stablecoins were developed to serve as a potential substitute of fiat currency, to minimize the price volatility of cryptocurrencies which made them "less suitable for wide use transactions." They are currently used as a bridge between crypto and traditional money, facilitating the on/off chain, but also for crypto trading, via cryptocurrency trading pairs - such as bitcoin - tether or ether - tether.

To provide some context on stablecoins, more generally, and the events leading to UST crash that occurred in May, we herein briefly present/discuss:

- A broad overview of the four main types of stablecoins, which differ in their ways of maintaining their peg: fiat-backed, crypto-backed, algorithmic, and commodity-backed.
- An explanation of UST's pegging mechanism.
- A detailed timeline of events that contributed to the crash of UST, the fall of Terra, and [some of] the impact on other stablecoins.
- The stability (or lack thereof) of stablecoins.

Sources: 1 BTC tools (2022); 2 Investopedia

What are the different types of stablecoins?

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Fiat-backed stablecoin

Fiat-backed stablecoins are the most popular type of stablecoin by market cap. They are backed 1:1 by a fiat currency, such as USD. The fiat currency remains in a reserve, which is held by independent custodians and is audited regularly.

Main inconvenience: Centralisation, risk that the issuer goes bankrupt, need the trust of a custodian for the storage of the assets
Main benefit: Stability of the currency

Crypto collateral

Crypto collaterals are backed by another cryptocurrency as collateral. The process implies the use of smart contracts where the user's crypto is stored, and they receive a stablecoin in exchange equivalent to the value of their crypto.

Main inconvenience: Complexity of the mechanism
Main benefit: Fully decentralized and transparent

Algorithmic stablecoins

Algorithmic stablecoins do not hold any reserve, but involve the use of specific algorithms and smart contracts to keep their price stable. The algorithms automatically establish a balance between the stablecoins and a partner coin, which act like the Central Bank would normally do..

Main inconvenience: Complexity of the mechanism and risk for bank run
Main benefit: Fully decentralized and transparent

Commodity-backed stablecoin

Commodity-backed stablecoins are backed with physical assets like gold, real estate, oils, etc. This type of stablecoin was developed to facilitate investments in commodities that are out of reach for certain investors.

Main inconvenience: Centralized and require trust of an entity
Main benefit: Provide an access to certain commodities, such as gold

Sources: BlockZero analysis (2022), CoinDesk (2022), CB Insights (2022)

How does UST work?

UST is an algorithmic stablecoin that works with complex mechanisms based on the Terra blockchain. UST aims to maintain its peg to the U.S. dollar through a network of arbiters, that is investors who buy and sell Terra's native token, Luna. For instance the arbitrage behavior between Luna and UST, work as follow:

Arbitrage Behavior around Luna and UST [1]

1. If **1 UST is trading at 1.01 USD**, users can use the market swap feature of Terra Station to **trade 1 USD of Luna for 1 UST.**

2. The market **burns 1 USD of Luna** and **mints 1 UST**.

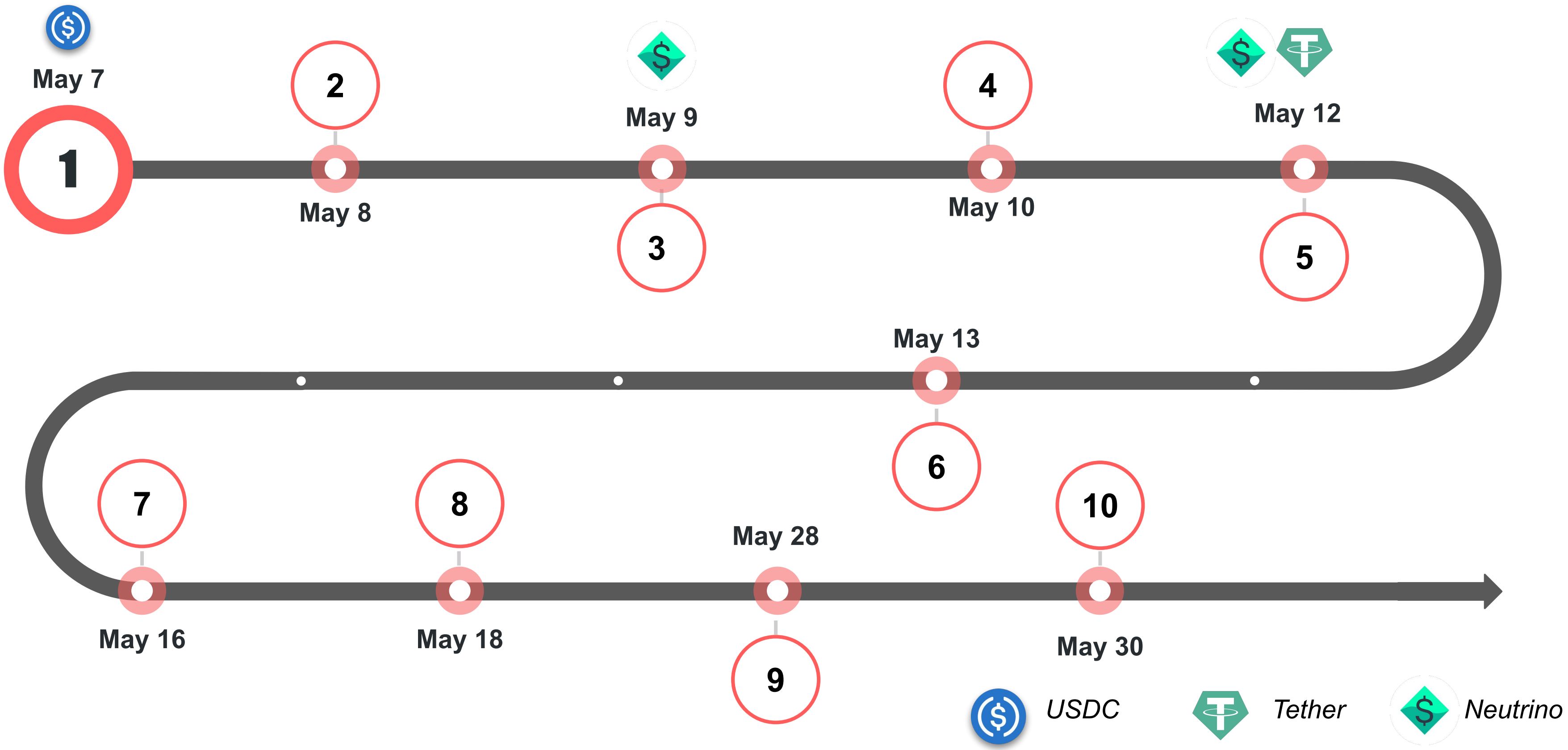
3. Users can then **sell their 1 UST for 1.01 USD**, profiting .01 USD through arbitrage, adding to the UST pool.

4. This arbitrage continues **until UST price falls back to match the price of USD**, maintaining Terra's peg.

The UST is backed by the adoption of the UST, and by the usage of Terra's network.

Sources: BlockZero analysis (2022), Inspired from Terra Website (2022); 1 The Tie Labs (2022)

Timeline of key events from the UST crash (1/3)



Sources: BlockZero analysis (2022), CoinDesk (2022), Trading View (2022)

Timeline of key events from the UST crash (2/3)

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1. **May 7:** One investor swaps 85 millions **UST** tokens for 84.5 millions of **USDC** tokens on Curve, a decentralized exchange, which puts tremendous pressure on the UST's dollar peg. The same day there were also massive withdrawals from Anchor Protocol, a lending platform that offered high yield for UST deposits. For instance, the UST deposit fails from $14 billion to $11.2 billion.

2. **May 8:** The **UST** lost its peg for the first time falling to $0.987.

3. **May 9:** The **UST** lost its peg for the second time failing as low as 35 cents. The same day the FED published its financial stability report addressing the stablecoin vulnerabilities to run risk. **Neutrino**, another algorithmic stablecoin, started to loose its peg.

4. **May 10:** Janet Yellen, U.S. Treasury Secretary, called stablecoin a risk to financial stability and renewed her call for stablecoin regulation by expressing hope that a regulatory framework for stablecoin will be created this year.

5. **May 12:** **UST** drops to as low as 0.60 cents again, while Luna drops 96% in one day, pushing it to less than 10 cents. Recall that Luna was priced around $120 in mid-April. **Tether**, the world biggest stablecoin, lost its peg to reach $.0.97. **Neutrino** dropped to a low of $0.75 on May 12

Sources: BlockZero analysis (2022), CoinDesk (2022), Trading View (2022); Federal Reserve 2022; The Wall Street Journal (2022)

Timeline of key events from the UST crash (3/3)

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6 **May 13:** Various exchanges, such as Okx and Binance have decided to suspend withdrawals from Luna and **UST** by mentioning network congestion.

7 **May 16:** The Luna Foundation Guard (LFG) has confirmed that it has used its bitcoin (BTC) reserve in an attempt to save the **UST** peg, going from 80,000 BTC to 313 BTC. On the same day, Do Kwon, the co-founder and CEO of Terra, proposed a forking of the Terra blockchain without the UST, where the current chain would be called the Terra Classic.

8 **May 18:** Terra's community is mainly against the hard forking of Terra's blockchain. Binance CEO Changpeng Zhao mentioned that the fork won't work.

9 **May 28:** The Terra 2.0 was set to launch on May 28, with a Luna airdrop. Several exchanges, such as Binance and FTX have confirmed that they will offer the new Luna Token. However, other major exchanges such as Coinbase will not participate.

10 **May 30:** For now, the Luna token is reborn and stands at a price of $6.

Sources: BlockZero analysis (2022), CoinDesk (2022), Trading View (2022); The Block Crypto (2022); CoinMarketCap (2022), Decrypt (2022)

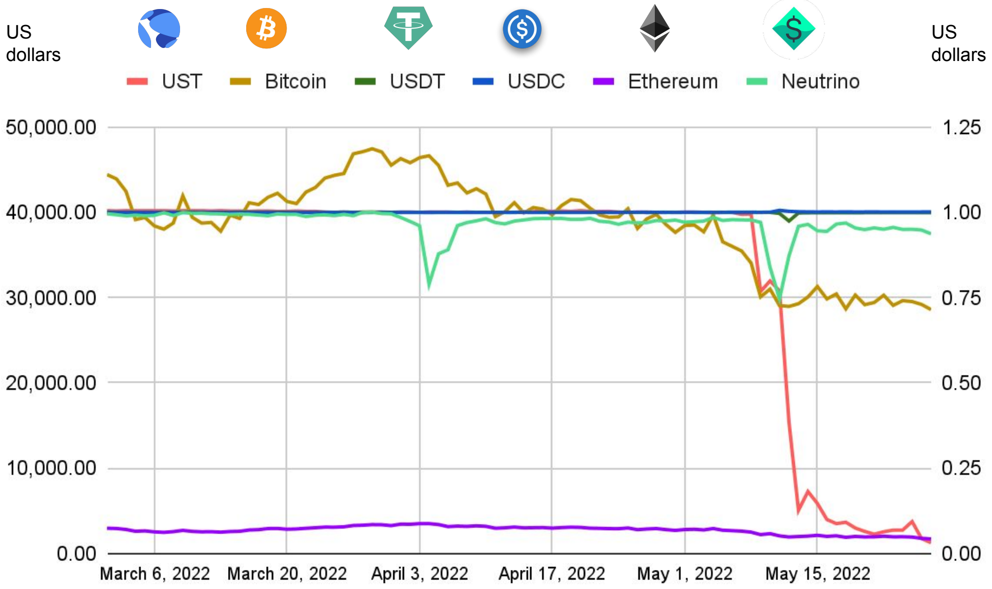
What about other stablecoins?

As discussed in BlockZero's May Newsletter, UST stablecoin's depegged in May has repercussions on the cryptocurrency market as a whole, which has been trending downward since its high of november 2021. In fact, the market capitalization of crypto, which is largely dominated by Bitcoin and ethereum has more than halved since then.

Generally, as UST lost its peg, investors fled to assets considered safer (crypto or not), and similarly fled away from "similar" assets considered as risky.

- Tether stablecoin (fiat-pegged; backed by a "secret" mix of cash, Treasuries, and corporate debt) lost its peg on May 12th, and had not yet recovered by the end of the month;
- Neutrino stablecoin which is also algorithmic lost its peg too and around the same time, going as low as $0.75;
- USD coin (fiat-pegged; backed 100% by cash or Treasuries for which regular audited reports available) maintained its peg.

Four stablecoins price during the last three months vs Bitcoin and Ethereum



- Bitcoin price, which had been falling the months prior, also dropped on May 7th, and thereafter on May 12th, to only slightly recover.
- Ethereum suffered a similar fate.

Sources: BlockZero analysis (2022); Data from investing.com (2022)

Are stablecoins stable?

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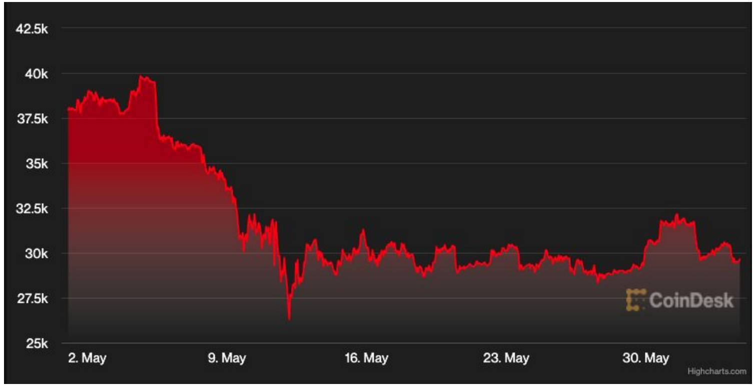
At a time when there is increased interest from governments around the world to regulate the crypto market, including and particularly stablecoins given their “peg” to fiat currency, and the associated risks to financial stability, and in light of the events of May, the question of whether stablecoins are stable has never been more pertinent.

On the volatilities of stablecoins, recent academic research suggests that stablecoins are not stable. Not only is Bitcoin volatility a fundamental factor affecting volatilities of stablecoins, (Baur and Hoang, 2021), it could account for as much as 50 per cent of stablecoins volatilities (Grobys et al., 2021). Also, Grobys et al.’s findings indicate that contrary to Bitcoin volatility processes, stablecoins volatility processes are not stable statistically speaking. This occurs probably due to a constrained volatility with risks latently growing. In particular the inherent fragility of algorithmic stablecoins has been explained (Clements, 2021), and exposed with the UST crash. More research is needed to determine other factors affecting stablecoin volatilities.

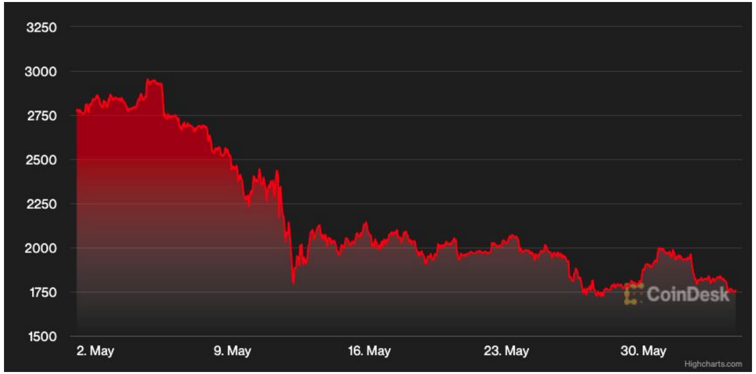
Bitcoin and other cryptocurrencies’ correlation with traditional risky assets has increased over time, and more so in times of stress. In a context of war, rising inflation, and therefore greater economic uncertainty, one must question the impact of non-crypto elements on the volatility of stablecoins and on the UST stablecoin crash.

Moving forward, and sooner rather than later, it will be critical to understand better these influencing factors and the relationships between crypto and non-crypto related factors - for both governments and stablecoins issuers. Several tools, tests and regulatory requirements already exist to minimize idiosyncratic and systemic risks. The difficult questions remain which ones and how to use these without hindering innovation.

Bitcoin price 1 month



Ether price 1 month



Sources: BlockZero analysis (2022); CoinDesk (2022); Baur, D.G., Hoang, L.T. (2021); Grobys, K., Junttila, J., Kolari, J.W., and Sapkota, N. (2021)

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Authors:

Sabrina McNeil

Consultant, BlockZero

sabrina.mcneil@blockzero.ca

+1 514-442-6841

Marie Chantal Leduc

Director, BlockZero

mcleduc@blockzero.ca

+1 514-799-8310

Contact us at: contact@blockzero.ca
Visit our website: https://www.blockzero.ca/

About BlockZero:

BlockZero is a boutique consulting firm specializing in the evolution of the financial infrastructure through digital assets, digital currency, stablecoins and Central Bank Digital Currency (CBDC).

BlockZero advises global financial institutions, central banks and financial technology companies in the exploration, experimentation, technical implementation and rolling out of digital asset-based infrastructure.