Algorithmic Stablecoins and the TerraUSD Crash

May 16, 2022

What Are Algorithmic Stablecoins?

Stablecoins are a type of cryptocurrency that aim to maintain a stable value. There are several classes of stablecoins that each use different methods to try to achieve this, one of which is *algorithmic stablecoins*. While no precise definition captures all of their features, algorithmic stablecoins typically use an algorithm or smart contract to manage the supply of tokens and guide their value to some reference asset (for example a fiat currency, such as the U.S. dollar). Algorithmic stablecoins generally do not attempt to achieve value by holding a reserve of fiat-denominated assets with a value in a 1:1 relationship with the value of the stablecoin. Instead, algorithmic stablecoins use different mechanisms to control the supply or value of the stablecoin, including the minting or burning of coins, rebasing, and arbitrage.

What Happened with TerraUSD?

TerraUSD (UST) stablecoin uses an arbitrage mechanism typical of some algorithmic stablecoin arrangements consisting of *two* coins or tokens: the stablecoin, in this case UST, meant to maintain a stable value or "peg," and a balancer token, in this case, LUNA, the value of which can fluctuate. An algorithm manages the relationship between these two coins to attempt keeping the stablecoin pegged to the reference. If strong demand pushed the price of UST above its peg, arbitrageurs could buy $1 worth of LUNA, trade it for 1 UST (worth more than $1) and sell UST for a gain. If UST falls below $1, someone can buy $0.99 worth of UST and trade it for $1 worth of LUNA. In both instances arbitrageurs net a profit and ostensibly maintain the peg.

Over the past week, UST lost its peg to the dollar (**Figure 1**), and both UST and balancer coin LUNA were dropped from various cryptocurrency exchanges. UST hit a low of $0.12 at 9 a.m. on May 16, 2022.

Figure 1. TerraUSD (UST)

U.S. Dollar Value of UST as of May 16, 2022, at 9 a.m.

Source: CoinMarketCap.

There are two other factors relevant to this incident. First, Terraform Labs, the UST stablecoin manager, established Anchor, a decentralized lending protocol in which UST holders could park their UST for a reported 20% annual percentage yield. This protocol attracted demand for UST because of high yields. However, Anchor experienced sizeable UST withdrawals late last week foreshadowing the depegging.

Also, in early 2022, Terraform Labs began purchasing bitcoin to hold in the Luna Foundation Guard (LFG) in response to some concerns about the peg. The LFG could sell bitcoin to prop up the stablecoin and defend the peg, which it claims to have done during the selloff but about which there is some skepticism.

Policy Issues Relating to the "Run" Risk

UST had a market capitalization of more than $18 billion in early May. Some observers voiced financial stability concerns because of UST's contagion effects on other crypto assets and the crypto ecosystem's interconnectedness with the traditional financial system. The sudden drop in UST's prices reflects a classic "run-like" scenario, where a large number of investors withdraw their investments simultaneously, triggering negative feedback loops and contagion effects.

Some argue that stablecoins could be subject to runs if coin holders have suspicions about the reserve assets backing the par value. The run-like behaviors already occurred for algorithmic stablecoins during relatively calm market conditions. In contrast, vulnerabilities like this are generally expected to possibly cascade and become more influential during broader market distress.

The UST event is not the first time an algorithmic stablecoin displayed run-like behavior. The Iron Titanium (TITAN) token faced a run-like scenario in June 2021 and saw its price crash to near zero within one day. Similar to how UST functions with LUNA, the algorithmic stablecoin Iron is partially supported by TITAN. Because Iron is structured using TITAN and USD Coin, when TITAN's price collapsed, Iron was trading off the peg by more than a quarter (**Figure 2**).

Figure 2. IRON Stablecoin and TITAN Price

U.S. Dollars, 2021
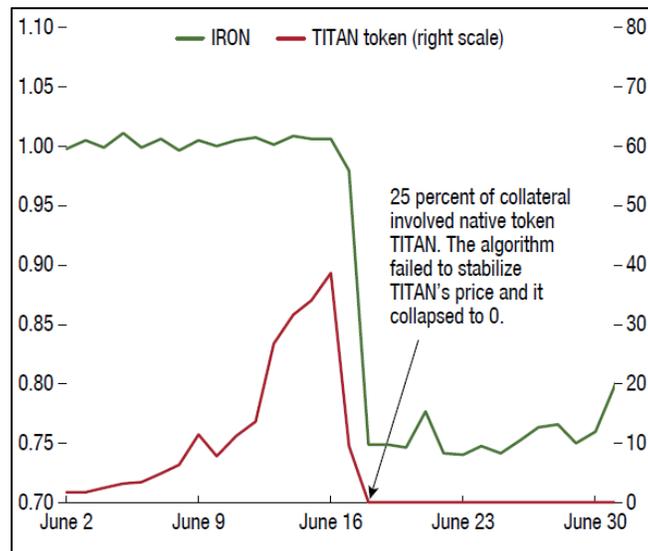
Source: International Monetary Fund, Global Financial Stability Report.

Many observers consider the stablecoin industry as not adequately regulated. While in the traditional financial system, a run-like scenario could be somewhat mitigated by regulatory safeguards and backstops, the stablecoin industry has not incorporated such measures. For example, in the traditional financial system, bank deposit insurance and liquidity facilities could reduce market participants' incentives to have a run. For more background, see CRS products on *Stablecoins: Background and Policy Issues* and *How Stable Are Stablecoins?*

Policy Proposals

Recent legislative proposals have considered what entities should be allowed to issue stablecoins, the reserves needed to back a stablecoin, and the disclosures that stablecoin issuers should have to make available. Committees in both the Senate and House have held hearings on stablecoins where the reserves backing these digital assets were a central issue.

With respect to reserve disclosure and composition, there have been a few recent legislative proposals. In March 2022, Representative Hollingsworth introduced H.R. 7328, which would establish auditor-verified reporting requirements for stablecoin issuers and restrict the assets that could back a stablecoin. Senator Hagerty introduced a Senate version of the bill, S. 3970, in May 2022. There have also been some discussion drafts in the House and Senate. These discussion bills provide a possible framework for stablecoin issuers. For example, while these drafts differ in their approach, they would establish institutions eligible to issue stablecoins, create disclosure requirements for the assets backing stablecoin, provide standards for the composition of those reserves, and consider avenues for financial backstops for stablecoins.

Regulators have also taken measures to address the risks associated with stablecoins. For example, in addition to the President's Working Group report on stablecoins, the banking regulators have jointly participated in "policy sprints" focused on crypto assets, including stablecoins. Additionally, last year, the Basel Committee on Banking Supervision released a consultative document on prudential treatment of crypto exposures for public comment, and they are expected to finalize their consultative framework this year. The Department of the Treasury is reportedly working on a report on TerraUSD.

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