Discussion of A Luna-tic Stablecoin Crash

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Motivation

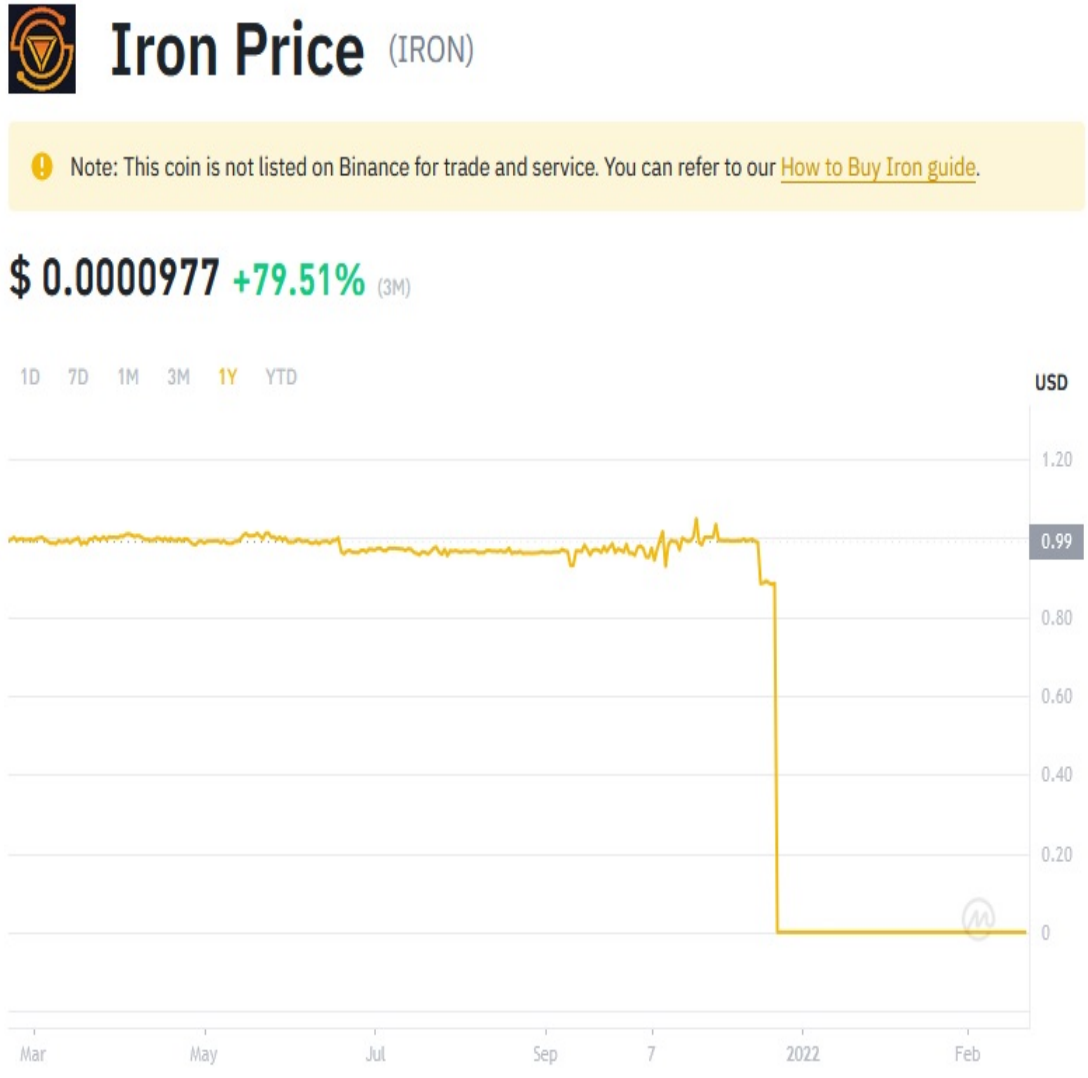
- **Stablecoins** pegged cryptocurrencies (typically to USD, EUR)
  - act as stores of value and financial bridges across (DeFi) platforms
- Recent collapse of Terra-Luna, however, has raised concerns about their stability (e.g., Briola et al. (2023))
- Unlike reserve-backed stablecoins (e.g., Tether, USDC), Terra-Luna a novel algorithmic stablecoin arrangement
  - Terra stablecoins anchored by native token Luna
  - can always burn 1 Terra token for \$1 of Luna tokens at prevailing price and vice versa
- Idea: there is a risk-less arbitrage if US Terra is knocked off its peg
  - resilient for *small* shocks
  - destabilizing for **large** shocks (Luna price fluctuates after conversion)

This Paper

- Build a novel framework for understanding Terra-Luna crash
  - minimal structure: law of motion for Luna price Q_t from burning rate
  - forward-looking Luna price internalizes Terra burning in the future
  - can recover market-implied probability λ_t of recovery
- Incorporate heterogeneity in UST holder beliefs to construct demand curve of UST tokens (based on perceived probability of recovery)
- Provide organizing "quantitative interpretation" methodology for bringing theory to data
  - average Luna price (and market cap) for 2-hour observation interval
  - measure Luna price declines using forward-looking max measure of future Luna prices
  - infer beliefs λ_t fixing exit market cap n_t and vice versa for plausibility
- **Suggestion:** Use quantitative interpretation to provide plausible bounds for λ_t and n_t
  - model-based inference difficult to assess with data alone

(Un)Stablecoins: Iron Finance

- Iron Finance an algorithmic stablecoin that failed in June 2021
  - a two-token system backed by TITAN token



A New Theory of Slowly Unfolding Crashes

- Terra-Luna Crash often compared to a "bank run" in paper
- Several theories of delayed crashes
  - coordination failure (e.g., Caplin and Leahy (1994), Morris and Shin (1998), Abreu and Brunnermeier (2003))
  - heterogeneous beliefs with short-sale/lock-up constraints (e.g., Hong, Scheinkman, and Xiong (2006), Geanakoplos (2009))
  - lack of common knowledge of fundamentals (e.g., Sockin (2015), Gao, Sockin, and Xiong (2022))
- What is *"slowly unfolding"* in context of model?
  - Terra-Luna crashed over several days (is that slow compared to dot-com crash in March 2000?)
- Suspicions of **strategic attack** on Terra-Luna
  - Luna Foundation depleted 80,000 Bitcoin in reserves
  - can we use model to evaluate alternative theories?

Importance of Self-Confirming Beliefs

- Arguably, Terra-Luna a crash in an intrinsically worthless asset
  - highly reliant on (self-confirming) beliefs (e.g., Samuelson (1958))
- Algorithmic arbitrage mechanism for stablecoins similar to ETFs but with no fundamentals
  - lack of fundamental makes it vulnerable to being careened off peg
  - Luna Foundation at first tried to defend this peg
- How did Foundation's (failed) intervention impact market beliefs?
  - important to understand how policy impacts market perceptions λ_t
  - was defending the peg with reserves *credible*?
- Collapse strategic uncertainty into a first-order belief P_t
  - feedback from P_t to λ_t through burning b_t?
  - role of higher-order beliefs?

Implications for Policy

- **Algorithmic** has different economics from reserve-backed stablecoins
- Reserve-backed akin to high-risk money market funds
  - (implicitly) backed by treasuries, commercial paper, Ethereum
- Algorithmic fuses economic incentives with technological constraints
  - (implicitly) backed by *deep-pocketed* arbitrageurs and devotees
  - constrained by blockchain protocols and burn rates
- Financial stability oversight has to adapt to the new risks of DeFi
  - e.g., Smart Contracts, Automated Market Maker, Flash loans...
  - new issues: misdirecting oracles, algorithmic liquidity cascades...

Thank You!