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Part Two: Wash Trading  
SEP 2023

# The 2023 Crypto Market Manipulation Report

Part Two:

## Wash Trading

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# Decentralized Exchange Liquidity Providers Have Wash Traded More Than \$2 Billion to Date

Wash trading is known to be common in incipient financial markets, and decentralized finance (DeFi) is no exception. Solidus [Trade Surveillance](#) data shows that since September 2020, liquidity providers (LPs) on Ethereum-based decentralized exchanges (DEXs) have wash-traded at least \$2 billion worth of cryptocurrency, manipulating the prices and volumes of more than 20,000 tokens. In aggregate, LPs have executed wash trades in 67% of the approximately 30,000 DEX liquidity pools [in our sample](#), and wash trading has constituted 13% of the total trading volume of these pools.

The liquidity pools we studied comprise just 1% of all pools [by count](#) and 0.3% of all pools [by volume](#) across every blockchain and DEX. As such, this is a lower bound estimate; the true amount of DEX-based wash trading that has taken place since September 2020 is likely an order of magnitude larger.

**\$2B+** worth of wash trading volume on DEXs

**20k+** tokens' prices and volumes have been manipulated

**67%** of the ~30,000 DEX liquidity pools we studied were manipulated by wash traders

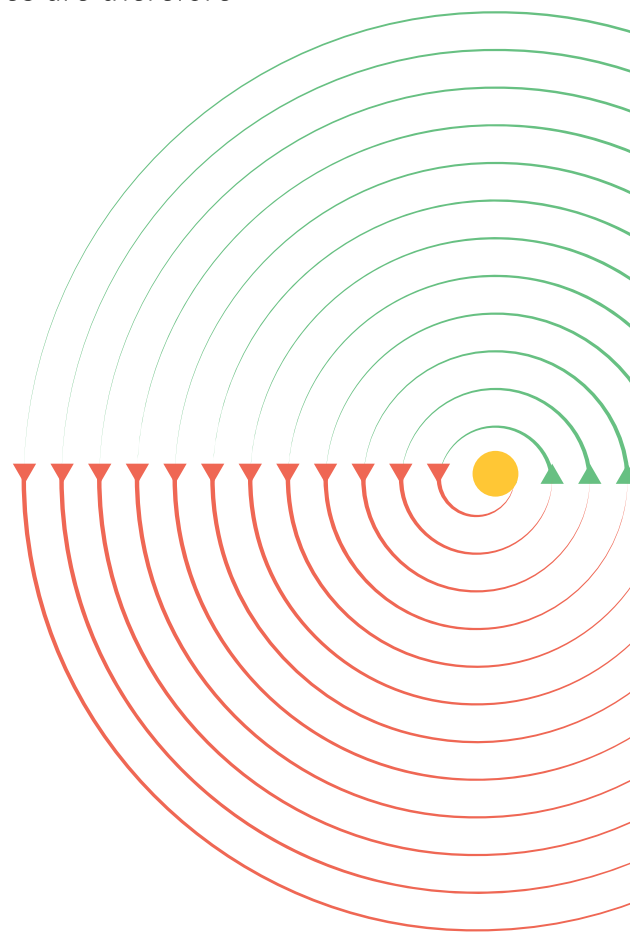


## What is wash trading, and why does it happen in crypto?

Wash trading is a form of market manipulation in which one entity simultaneously buys and sells the same asset, creating a false impression of market activity despite the trade reflecting no change in beneficial ownership. In crypto, liquidity is fragmented across a variety of centralized and decentralized venues, resulting in smaller markets that are easier to manipulate. A number of different entities are therefore known to execute wash trades:

- **Exchange and marketplace operators:** To report higher trading volumes to data aggregators, potential investors and prospective users
- **Crypto market makers:** To hit the order-to-trade ratio requirements set forth in their contracts with centralized exchanges & token issuers, or to anchor a token's market price above the strike price of a call option they may have negotiated with that token's issuer
- **Individual speculators:** To top the leaderboards that crypto exchanges and NFT marketplaces create to reward their most active users through token airdrops
- **Token deployers:** To trick traders into investing in rug pulls, qualify for listings on centralized exchanges, and/or mislead investors about their project's health

While centralized exchanges and market makers typically have the option to wash trade at a no cost or a lower cost on centralized venues where orders are matched and executed off-chain, token deployers – especially scam token deployers – have some of the strongest incentives to wash trade on decentralized venues that execute trades on-chain, where transaction fees are higher. This is because, as we illustrated in part one of our Crypto Market Manipulation Report, DEX liquidity pools are often their token's first listing venue. This means that a token deployer's ability to either get their token listed on a centralized exchange or rug-pull their investors for profit depends upon their skill in attracting speculators to the liquidity pool on which their token is traded. We find that many token deployers will resort to DEX-based wash trading to do so.

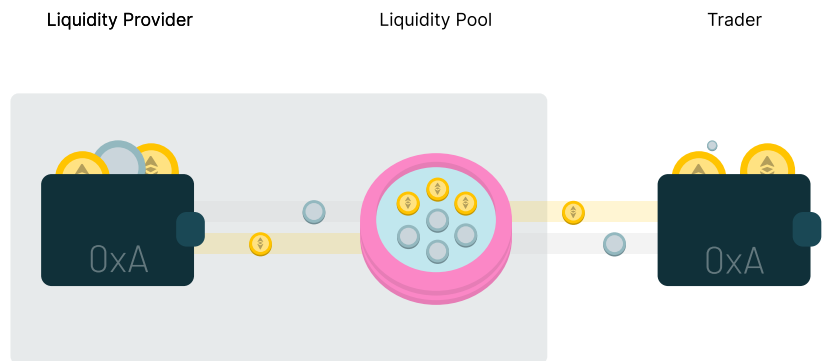


# How does DEX-based wash trading work?

DEX-based wash trading can be divided into two main typologies:

## 1. A-A wash trading

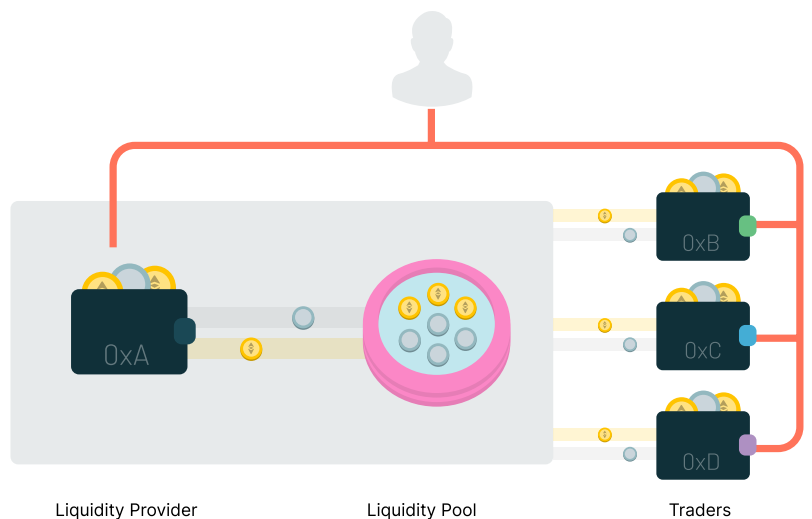
In A-A wash trading, a single cryptocurrency address (“0x1”) sits on both sides of the token swap. This means that 0x1 acts as both (a) the dominant liquidity provider in the pool and (b) the “swapper” exchanging token one for token two (or vice versa). Whenever these trades occur, no change in beneficial ownership takes place – and yet each swap manipulates the less-established token’s price and volume, creating an artificial market signal.



We have identified \$960 million worth of A-A wash trades since September 2020 in our sample of DEX liquidity pools.

## 2. Multi-party wash trading

In multi-party wash trading, the addresses of the liquidity provider(s) and the swapper(s) are different, but the addresses are controlled by the same entity. For example, 0x1 may act as the pool’s dominant liquidity provider while 0x2, 0x3 and 0x4 pretend to be distinct swappers, trading token one for token two (or vice versa) to drive up token two’s trading volume. This method is likely preferred by entities seeking to avoid detection and inflate the number of investors that appear to be buying or selling the token.



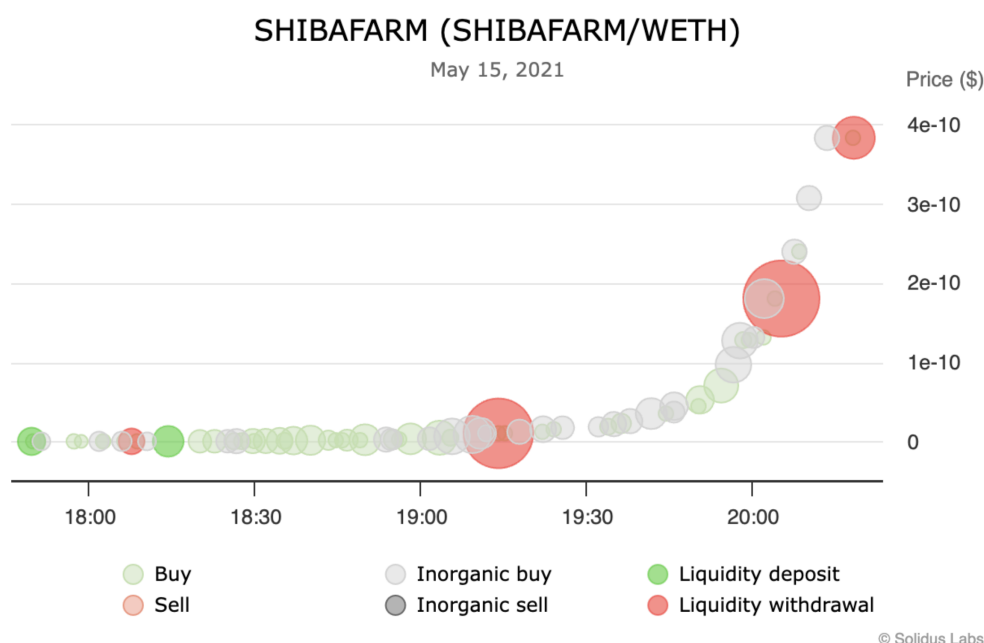
We have identified approximately \$1.1 billion worth of multi-party wash trades since September 2020 in our sample of DEX liquidity pools.







Using these two deceptive techniques, 0x9e8 engineered a hockey-stick price chart for SHIBAFARM. This chart – which we’ve recreated below to include liquidity withdrawals (in red) and a distinction between organic buys (in light green) and inorganic buys (in light gray) that decentralized market data providers do not – appears to have tricked more than 50 other traders into investing in SHIBAFARM.



The result: in the span of two hours on May 15th, 2021, 0x9e8 made off with profits of approximately \$2 million — all without “selling” SHIBAFARM once. As the sole liquidity provider in the pool that paired their scam token with ETH, 0x9e8 was the main counterparty in every one of the other traders’ ETH-to-SHIBAFARM swaps. To take profit, 0x9e8 simply had to withdraw two-sided liquidity from the pool, which pool now consisted of much more ETH (worth about \$3,700 at the time) and less SHIBAFARM (effectively worthless) than before.

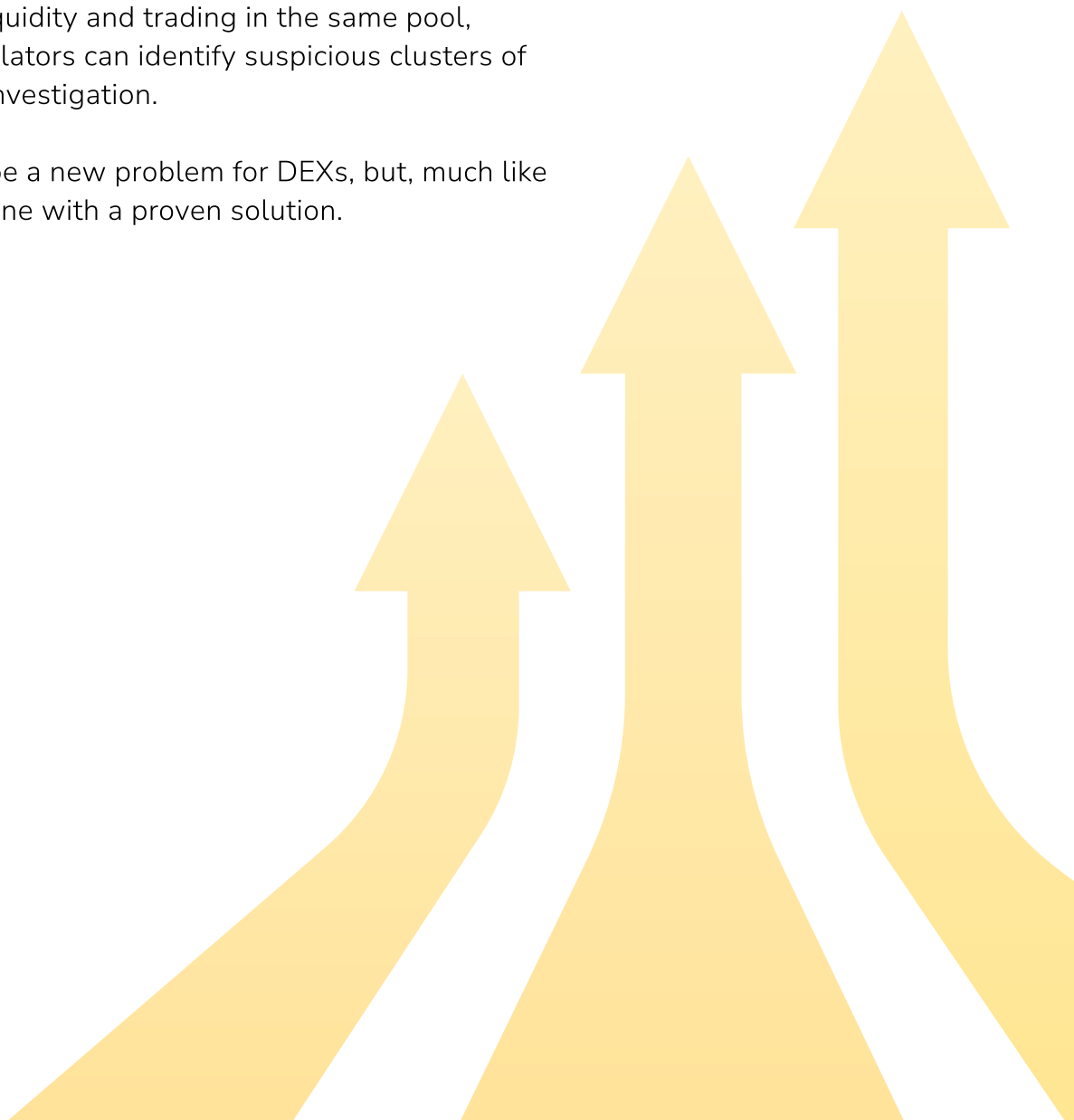
Two nights later, SHIBAFARM’s deployer created a new token, [SHIBASWAP](#), and repeated this process from scratch. Since 2021, SHIBAFARM’s deployer has created and manipulated the prices of more than 50 scam tokens.



## Wash trading prevention and detection: A proven path to fairer markets

In DeFi, a regulatory question remains regarding who is responsible for wash trading prevention and detection. However, there is no question that fairer markets are essential for sustainable growth. As we've demonstrated in this report, DEX-based wash trading is detectable — and in many cases even preventable. In traditional finance, self-trade prevention functionality (STPF) is built into modern exchanges. Applied to DEXs, such functionality could prevent the millions of A-A-type wash trades we detected. Multi-party wash trading is similarly addressable. By tracing token flows between wallets providing liquidity and trading in the same pool, exchanges and regulators can identify suspicious clusters of wallets for further investigation.

Wash trading may be a new problem for DEXs, but, much like insider trading, it's one with a proven solution.



# Methodology

We focused our analysis on Ethereum-based DEXs that leverage constant product market maker (CPMM) models and that do not support concentrated or one-sided liquidity provision – although the threat of wash trading on such DEXs is also present, but with different mechanics. Within this DEX subset, we further narrowed our sample to include only the liquidity pools of those DEXs that met the following additional criteria:

1. The pool's first liquidity provider provided the vast majority of liquidity – more than 90% of both token one and two – at all times during trading
2. The pool's liquidity was never locked
3. The pool facilitated more than five, but less than 10,000 swaps
4. At least one of the following statements held true:
  - a. one of the tokens in the pool contained malicious code
  - b. the ratio of trades relative to traders that swapped tokens using the pool was greater than or equal to two

All notional U.S. dollar amounts were calculated using the average daily ETH-USD price at the open from September 1st, 2020 to August 31st, 2023 — \$2,028.

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# Enabling Safe Crypto Trading

Solidus Labs is the category-definer for crypto market integrity solutions - trade surveillance, transaction monitoring, and threat intelligence.

Our mission is to enable safe crypto trading throughout the investment journey across all centralized and decentralized markets. As the founder of industry-leading initiatives like the Crypto Market Integrity Coalition and DACOM Summit, and in everything we do, Solidus is deeply committed to ushering in the financial markets of tomorrow.

Crypto exchanges, financial institutions and regulators globally rely on Solidus HALO - our real-time market integrity platform - to safeguard their platforms, investors and consumers.

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