Decentralized Exchanges

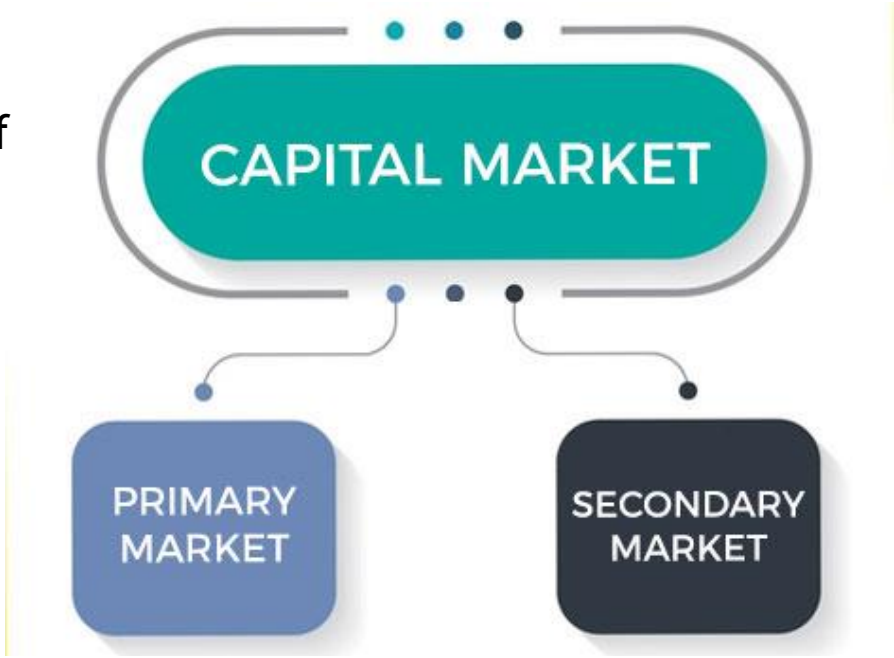
Exploring DeFi Sector – Dex

Financial Exchanges (Markets)

Stock exchange is a marketplace where stockbrokers, traders, buyers, and sellers can trade in equities products.
New York Stock Exchange (NYSE) is the largest stock exchange in the world, with an equity market capitalization of just over $27.7 trillion as of Dec 21

Financial / Capital Markets

- Whether you are trying to make a simple swap or actively trade, you will require the services of an exchange.
- Ideally, the exchange must have low latency and deep liquidity so that you have the best price execution and do not get impacted by price slippage.



Liquidity refers to the ease with which an asset can be converted into other assets without affecting its market price.
Low latency describes a computer network that is optimized to process a very high volume of data messages with minimal delay

Primary Vs Secondary Markets

Here are some key differences:

- **Prices**: security is issued at a fixed price in the primary market, while in the secondary market, the price of security varies according to supply and demand;
- **Place of purchase**: in the primary market, security can be purchased directly by the company, (ie. ICO) while in the secondary, investors buy and sell the securities to each other on dedicated platforms; (i.e. Binance)
- **Beneficiaries**: in the primary market, it is the company that benefits from the sale of the securities, while in the secondary market, it is the investor;
- **Number of sales**: in the primary market, the securities can be sold only once (or in phases), while in the secondary market, trading on the securities can take place an infinite number of times.

Primary Vs Secondary Markets

What is Market Capitalization?

Market Capitalization

- For a cryptocurrency like Bitcoin, market capitalization (or market cap) is **the total value of all the coins that have been mined**.
- It's calculated by multiplying the number of coins in circulation by the current market price of a single coin.

Why is market cap important

- Price is just one way to measure a cryptocurrency's value.
- Investors use market cap to tell a more complete story and compare value across cryptocurrencies.
- it can indicate the growth potential of a cryptocurrency and whether it is safe to buy, compared to others.

Traditional Financial Exchanges

To demonstrate, let's compare the market cap of two fictional cryptocurrencies.

- If Cryptocurrency A has 400,000 coins in circulation and each coin is worth $1, it's market cap is $400,000.
- If Cryptocurrency B has 100,000 coins in circulation and each coin is worth $2, it's market cap is $200,000.
- Even though the individual coin price of Cryptocurrency B is higher than Cryptocurrency A, Cryptocurrency A's overall value is double Cryptocurrency B's.
- Still, it's also important to note that many cryptocurrencies' market cap can swing dramatically due to their volatility.

What can you do with market cap?

Market cap allows you to compare the total value of one cryptocurrency with another so you can make more informed investment decisions.

Cryptocurrencies are classified by their market cap into three categories:

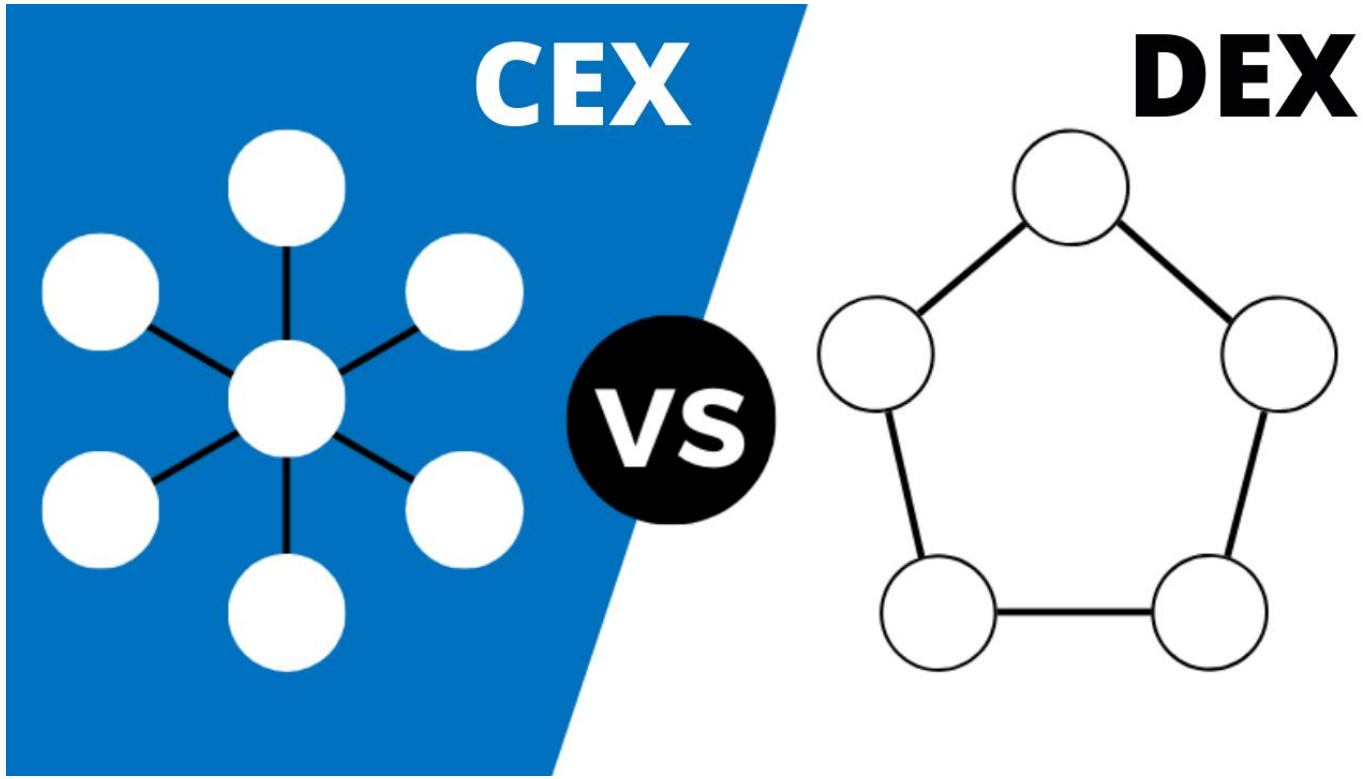
- **Large-cap cryptocurrencies**, including Bitcoin and Ethereum, have a market cap of more than $10 billion. Investors consider them to be lower risk investments because they have a demonstrated track-record of growth and often have *higher liquidity*.

- **Mid-cap cryptocurrencies** have market caps between $1 billion and $10 billion – they generally are considered to have more untapped potential upside but also higher risk.

- **Small-cap cryptocurrencies** have a market cap of less than $1 billion and are most susceptible to dramatic swings based on market sentiment. (due to less liquidity)

Higher liquidity – meaning they can withstand a higher volume of people cashing out without the price being dramatically impacted.

Centralize Vs Decentralized Exchanges



CEXs Vs DEXs

Centralized Exchanges (CEXs)

- Historically, CEX have provided better liquidity and have facilitated most large trades.
- However, they carry several weak points - the most notable being users of centralized entities do not hold custody of their assets.
- For example, in September 2020, KuCoin suffered a $281 million hack after a security breach.CEXs could also halt trading and block users from withdrawing their funds at any time.

Decentralized Exchanges (DEXs)

- In 2020 and 2021, **DEX** have grown rapidly and have started to rival their centralized counterparts.
- DEXs have reported more than $1 trillion in trading volumes in the year 2021 - The Block Research

Crypto Market New (All time high) ATH at $2.53 trillion on 12th Nov 2021 (Top 30 cryptos)

What is Decentralized Exchange(Dex)

- A DEX is a platform that enables trading and direct swapping of tokens without the need for an intermediary (i.e., centralized exchange).
- You do not need to go through the hassles of Know Your Customer (KYC) processes nor are you subjected to jurisdictional limits.

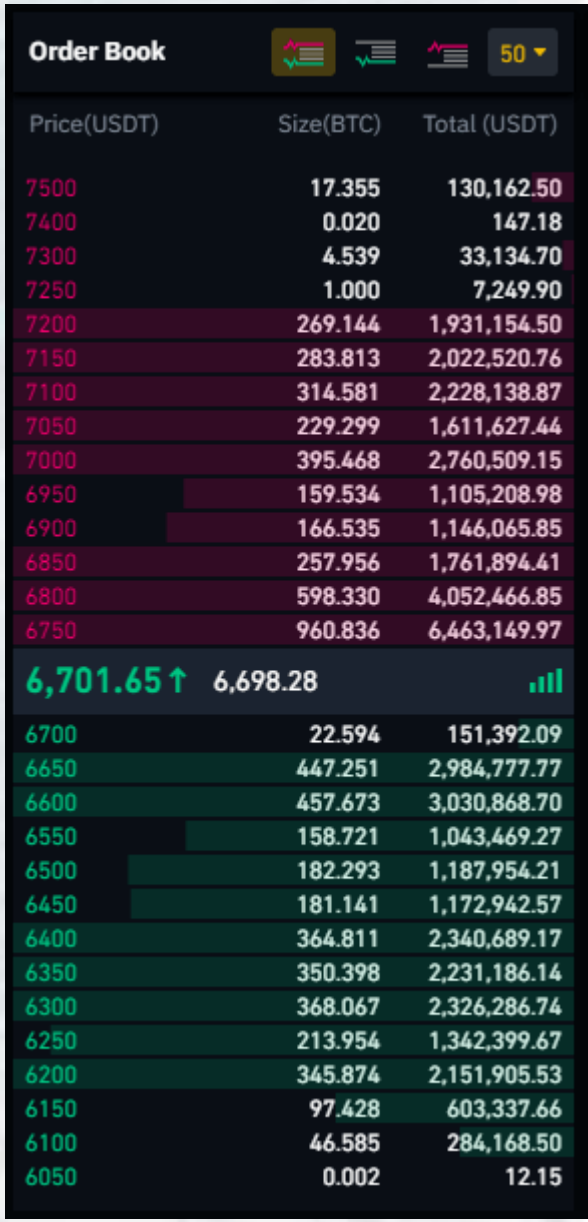
Type of DEX

1. Order Book Based-DEXs

- Order Book is a list of buy and sell orders for a particular asset at various price levels.
- Order book-based DEXs like dYdX, Deversifi, and Loopring operate similarly to CEXs where users can set buy and sell orders at either their chosen limit prices (limit Orders) or at market prices (Market Orders).
- Main difference is that in CEXs, assets for the trade are held on the exchanges' wallets, whereas for DEXs, assets for the trade are held on users' wallets.

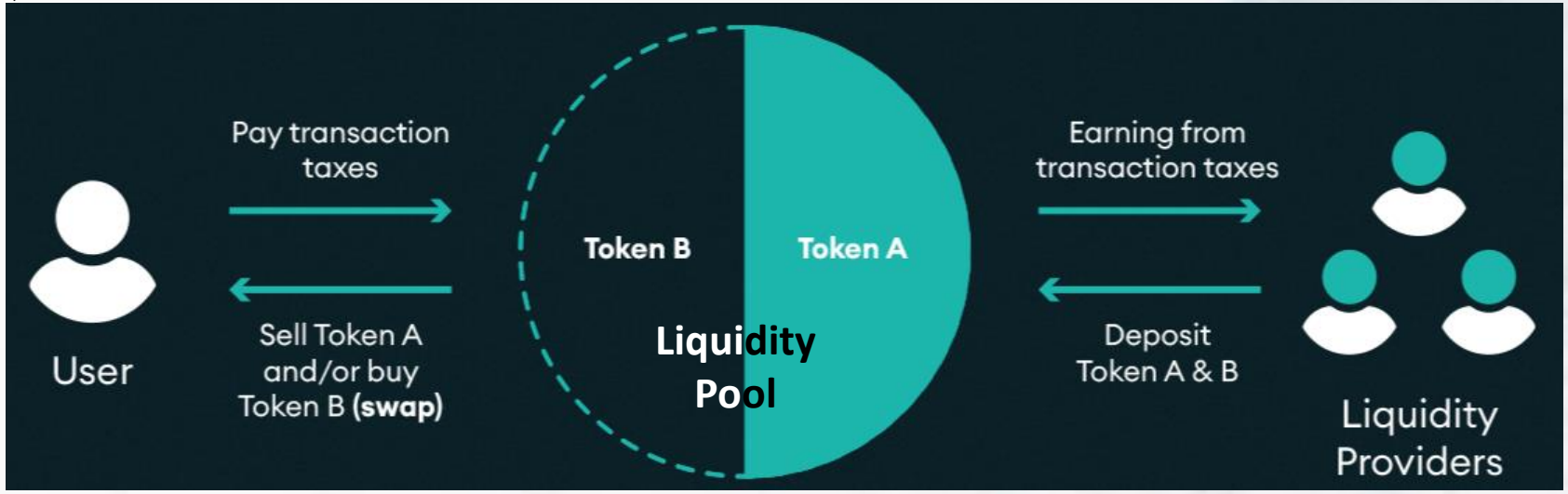
Order books for DEXs can either be on-chain or off-chain.

- **On-chain** order book-based DEXs have all orders recorded on the blockchain. However, this is no longer feasible on Ethereum due to high gas prices. That said, this is still doable on Ethereum Layer 2 solutions like xDai or high-throughput Layer 1 blockchains like Solana.
- **Off-chain** order book-based DEXs have trade orders recorded outside the blockchain. The trade orders remain off-chain until they are matched, at which point the trades are executed on-chain. Although this approach has lower latency, some may argue that DEXs that utilize this method are considered semi-decentralized.



2. Liquidity Pool Based-DEXs

- Liquidity pools are token reserves that sit on DEXs' smart contracts and are available for users to exchange tokens with.
- Most liquidity pool-based DEXs make use of Automated Market Makers (AMM), a mathematical function that predefines asset prices algorithmically.
- AMM is one of the most innovative inventions from DeFi in recent years. It enables 24/7 market hours, higher capital accessibility, and efficiency.
- There are various types of AMMs, and different DEXs have implemented the various 'flavors'. The majority of DEXs that launched recently are AMM-based DEXs such as Uniswap, SushiSwap, Curve, Balancer, and Bancor.

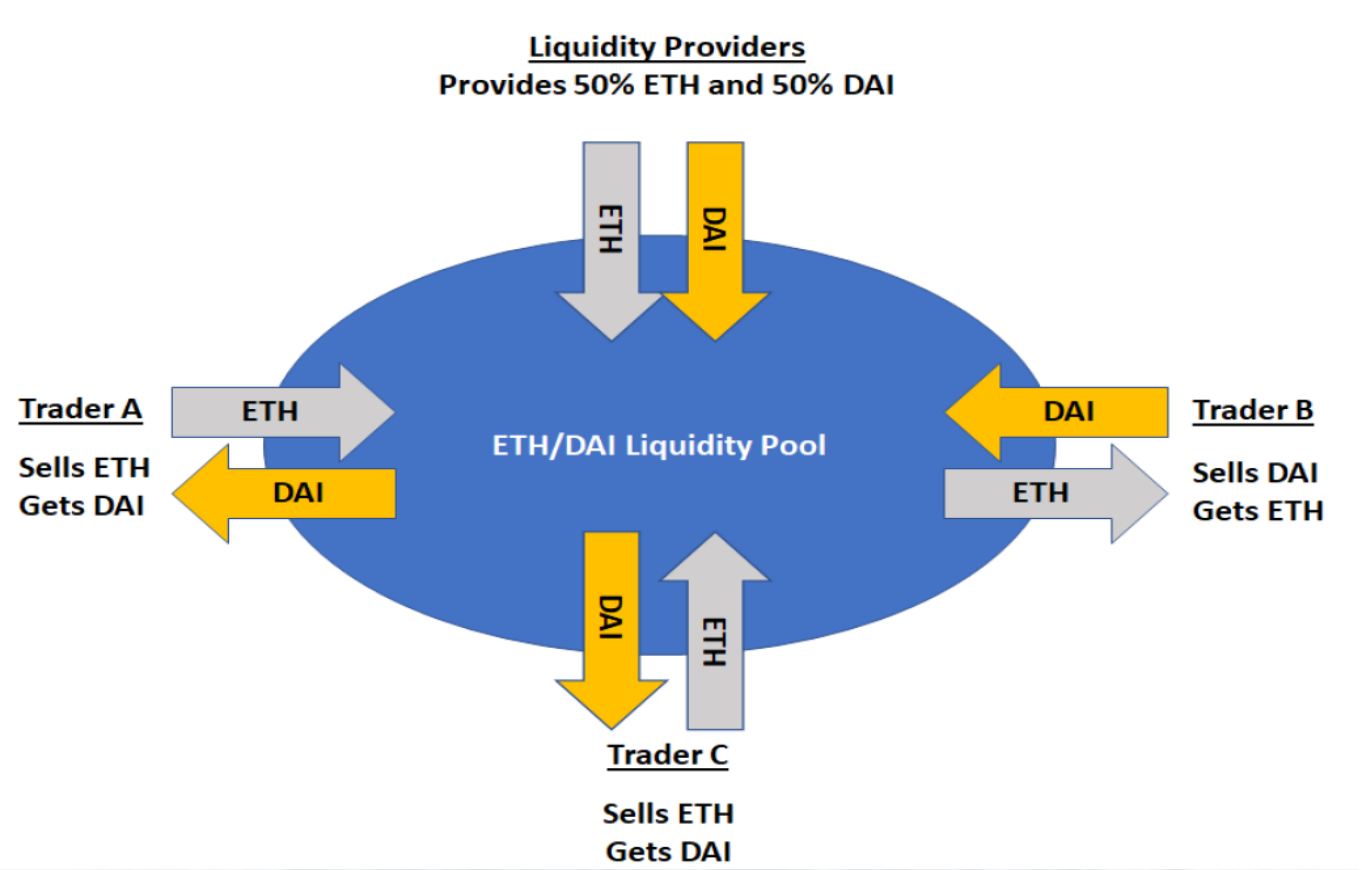


How AMM Works

Unlike centralized exchanges, which have bids and ask orders placed on order books, AMMs do not have any order books.

Instead, it relies on liquidity pools. Liquidity pools are essentially reserves that hold two or more tokens that reside on a DEX's smart contract that are made readily available for users to trade against.

With AMMs, traders can have their orders executed seamlessly without the need for a centralized market maker providing liquidity on a centralized exchange like Coinbase or Binance. Instead, orders are executed automatically via a smart contract that will calculate trade prices algorithmically, including any slippage from the trade execution. You may thus consider order book-based exchanges as following the peer-to-peer model while AMMs follow the peer-to-contract model.



Liquidity Pool

- You can think of liquidity pools as just pools of tokens that you can trade against.
- If you wish to swap ETH to DAI, you will trade on the ETH/DAI liquidity pool by adding ETH and removing an amount of DAI determined algorithmically from the liquidity pool.
- Depositors, known as Liquidity Providers (LPs), seed these liquidity pools. LPs deposit their tokens into the liquidity pool based on the predefined token weights for each AMM (in Uniswap's case - 50% for each token).
- LPs provide funds in liquidity pools because they can earn a yield on their funds, collected from trading fees charged to users trading on the DEX. Anyone can become an LP and automatically market-make a trading pair by depositing their funds into the smart contract.