**Introduction to DeFi**

[Decentralized Finance](https://endofthechain.com/defi-portal/) or DeFi is the deployment of financial software on to the blockchain enabling a new form of banking; encompassing saving, borrowing, lending and all the other services a traditional bank would offer.

While it can be argued that all crypto is a form of Defi, Ethereum is primarily where most of the development and transactions occur.

Defi it leverages all the properties inherent to Ethereum:

* **Permissionless**: Any person can access all DeFi services without a third-party preventing interaction. A user does not have to seek permission to interact with a smart contract.
* **Censorship Resistant:**No person is restricted from using DeFi services due to any identifying characteristics such as nationality, gender, or political beliefs.  When a DeFi transaction is broadcast to the Ethereum Network, no one can stop it.
* **Programmable:**Any service which can be coded into a smart contract, can be introduced as a DeFi service.
* **Transparent:**All smart contracts are available for analysis and verification. Additionally, all user interactions can be tracked, making DeFi the first fully transparent bank.
* **Composability:**DeFi services can leverage each other to create new offerings and servers. [Bankless calls them "lego" blocks](https://bankless.substack.com/).
* **Trustless:**All transactions and interactions with the smart contract are visible on the ledger and secured by the underlying blockchain.

These properties enable every person to be their own bank, eliminating the need for intermediaries. Therefore, fees are reduced and DeFi is accessible 24/7. It's the open banking solution for the age of decentralization.

DeFi can be thought of as an open alternative to every financial service we use today — savings, loans, trading, insurance and more — accessible to anyone in the world with a smartphone and internet connection. While some of these concepts might sound futuristic like –automated loans negotiated directly between two strangers in different parts of the world, without a bank in the middle– many of these dapps are already live today.

As in the traditional world, most of the financial transactions revolves around currencies which are stable. Similarly, the financial transactions on a DeFi revolves around cryptocurrencies. Since most of the traditional cryptocurrencies like Bitcoin, Ethereum, etc are highly volatile & cannot be considered as an ideal candidate for such transactions. Therefore, much of the concept revolves around stablecoin, a cryptocurrency backed by an entity or pegged to fiat currency like the dollar.

**What is Stablecoin?**

Stablecoins are the class of crypto assets created to address the issue of price volatility in typical cryptocurrencies. Due to the highly volatile nature of traditional cryptocurrencies, it becomes inconvenient to use them in a day-to-day financial transaction.

The low-price volatility in the stable coins is the result of the price stabilization mechanism that has been adopted. These stabilization mechanisms can be classified in two primary categories i.e., Pegged /Collateral & non-collateral.

**Pegged/Collateral Stablecoins**

**Pegged Stablecoins**

Pegging is a way of controlling currency by trying it against another currency. This stabilization techniques are adopted by many countries to stabilize their currency by pegging it against a much stable currency for example USD (United States Dollar). These types of stable coins are pegged against fiat currencies or commodities (E.g.: Gold) or combination of both. Some stablecoins can also use a combination of different currencies. This provides insulation to stablecoin against shock to any one currency/commodity in the basket/group.  
  
Pegging using a group of different currencies could also prove to be harmful if one of the currencies in the basket prove much more volatile than the rest. On the other hand, using a currency/ commodity has its own disadvantage in terms of scaling. To address this issue various indexes can be used such as SDR (Special Drawing Rights maintained by IMF) or CPI (Consumer Price Index), but it will have its own such problems as these indexes are less frequently calculated. Additionally, determining what currency should be in the basket and its corresponding weight is another complex task.

**Collateral Stablecoins**

Historically, fiat currencies often make use of collateral such as gold to ensure that the circulating currency has a redemption value. One of the many challenges the issuers face is to ensure that the currency never trades at any other price than the original redemption value. Using a fiat-currency or commodity as a collateral also raises the question of centralization as it would be under the control of a single entity or organization, hence defying one of the basic principles of decentralization. Additionally, the problem of storage and scaling will also arise as more the currency scales the more collateral is required to maintain the original ratio of collateral to stablecoin.  
  
One way to avoid these issues is to use cryptocurrency as a collateral. This has the advantage of decentralized operation and the potential for diverse backing assets. However, since cryptocurrencies are highly volatile makes it hard to use it to guarantee any type of redemption value. Additionally, stable coins backed by cryptocurrency needs to have an additional mechanism to manage large fluctuations in backed cryptocurrency’s value.

**Non-Collateral Stable coins**

The third type of stable coin deals with the volatility of the collateral/ pegged assets by not collateralizing the currency at all. The main disadvantage behind the pegged/collateral stable coin is its dependance on physical assets. The economy is continuously expanding and at a rate faster than it will soon outgrow to be backed amount of physical assets available. One such example is the US dropping the gold standard to achieve more flexibility that gold standard can provide. Similarly, the crypto economy is expected to expand beyond what can be collateralized with physical assets.

These type of stable coins hopes to achieve this stability with the help of algorithms hence these coins are also known as Algorithmic Stable Coins. This has many advantages such as following:

* No need to store collateral.
* Cheap to operate as it does not require to keep real assets at hand.

Additionally, if this type of stable coin works it can scale infinitely without need of any backing physical asset. However, there are some major uncertainties with this approach as follows:

* Algorithms used to maintain the stability are gamey, un-tested and there is no set approach to it. Several approaches have been tried which were unsuccessful yet (Terra, NuBits), others are still in development.
* The value of this type of currency largely relies on issuing mechanisms or the people’s belief.
* One flaw in design or change in market sentiments can lead to a catastrophic fall which may be irrecoverable as there is no inherent redemption value.

**Case Study: Terra Money**

**Introduction to Terra**

Terra ecosystem was created in 2018. It is an opensource blockchain protocol for algorithmic stablecoins and several different financial applications. At the core, it has two basic principles which is to provide stability and promote adoption as a meaningful alternative to fiat-currencies to support different financial transactions and to store the digital currency as well.

Terra runs on Proof of Stake algorithm and is aimed to provide financial infrastructure so that different DApps could be created on it. Luna is the native token in the Terra ecosystem and represents mining power in the same way how a miner’s hashing power represents the odds of generating a block in the bitcoin network.

**Terra Money**

Even though US dollar has dominated in international trades and forex operations terra recognized it is of no use for the domestic consumptions. This is because US dollar exhibits a significant amount of volatility when talking about consumption in a specific reason.

It is because of this reason that terra launched a family of cryptocurrencies that are pegged to each of the world’s major currencies i.e.: USD, EUR, CNY, JPY, GBP, KRW, and the IMF SDR (International Monetary Fund’s Special Drawing Rights). TerraSDR is the flagship currency, given that it exhibits lowest volatility against any one fiat currency. It is because of this reason TerraSDR is the currency in which transaction fees, miner rewards and stimulus grants will be denominated.

To maintain stability, it is important for all these different currencies to share liquidity among themselves. It is because of this the system support atomic swaps among Terra currencies at the applicable market exchange rate. This allows all the Terra currencies to share liquidity and macroeconomic fluctuations: a fall in demand in one currency can be consumed by another.

**Stability Mechanism**

Terra money follows the same rule of demand and supply to maintain its stability:

* When the price falls below the target price it keeps on reducing the money supply until it reaches its target price (Contraction).
* When the price increases above the target price the supply of money is increased until it reaches normalcy (Expansion).

Contracting the supply of money incurs cost to acquire money back from the market. Terra miners plays a vital role in this aspect and controlling the volatility of the currency. The miners absorb volatility in the Terra supply in the following way:

* The miners absorb the contraction cost through the dilution of mining power (LUNA). Or in other words the system mints and auctions more mining power to buy and burn back Terra.
* In long term miners are compensated with the increase in mining reward.