UXD Protocol
An Algorithmic Stablecoin 100% Backed by a Delta Neutral Position

Kento Inami
kento.inami@uxd.fi

Abstract. An algorithmic stablecoin 100% backed by a delta neutral position using perpetual swaps will enable individuals and organizations to exchange value in a familiar accounting unit without the need to interact with the banking system.
The stablecoin is pegged to fiat currencies by connecting to a derivatives dex. Arbitrage ensures that the price of the stablecoins does not deviate from the price of fiat currencies. Any user will be able to issue and redeem the stablecoins for a decentralized cryptocurrency at par value.
Users can verify that the reserves equal the amount of stablecoins in circulation by checking the blockchain.
Since the collateral backing the stablecoin is not held by a centralized third party, the collateral is not at risk of being seized by a hostile third party.
The stablecoin will have the censorship resistant properties of cryptocurrency and the price stability of fiat currencies.

Introduction

There is a wide range of stablecoins circulating in the crypto ecosystem such as Tether, USD Coin, Paxos Standard, Dai, etc. But fiat backed stablecoins suffer from censorship and audit problems. Cryptocurrency backed stablecoins are capital inefficient and can be unstable during extreme market volatility. Algorithmic stablecoins are susceptible to a collapse in confidence by holders of the stablecoin, and are at risk of bank runs. UXD Protocol proposes to solve these problems by eliminating the need to convert to fiat currencies and to be stable under any market volatility. UXD Protocol is also more capital efficient than cryptocurrency backed alternatives, since UXD Protocol does not require an excess of funds to back the stablecoin.

We will use bitcoin and USD in the following explanations but other cryptocurrencies and fiat can be substituted. The UXD Protocol will support multiple cryptocurrencies as collateral and other fiat stablecoins will be issued.

Flow of Funds

Step1
The user deposits BTC worth 100 USD to the vault of UXD Protocol. (We will use an oracle to calculate the price of BTC.)

Step2
UXD Protocol will mint 100 stablecoins (100 UXD). Total USD value of BTC deposited by the user = amount of UXD issued to the user.

Step3
Users can transact with UXD. The user can transfer, exchange, and store UXD.

Step4
UXD Protocol transfers the BTC to a derivative dex and creates a delta neutral position to hedge.

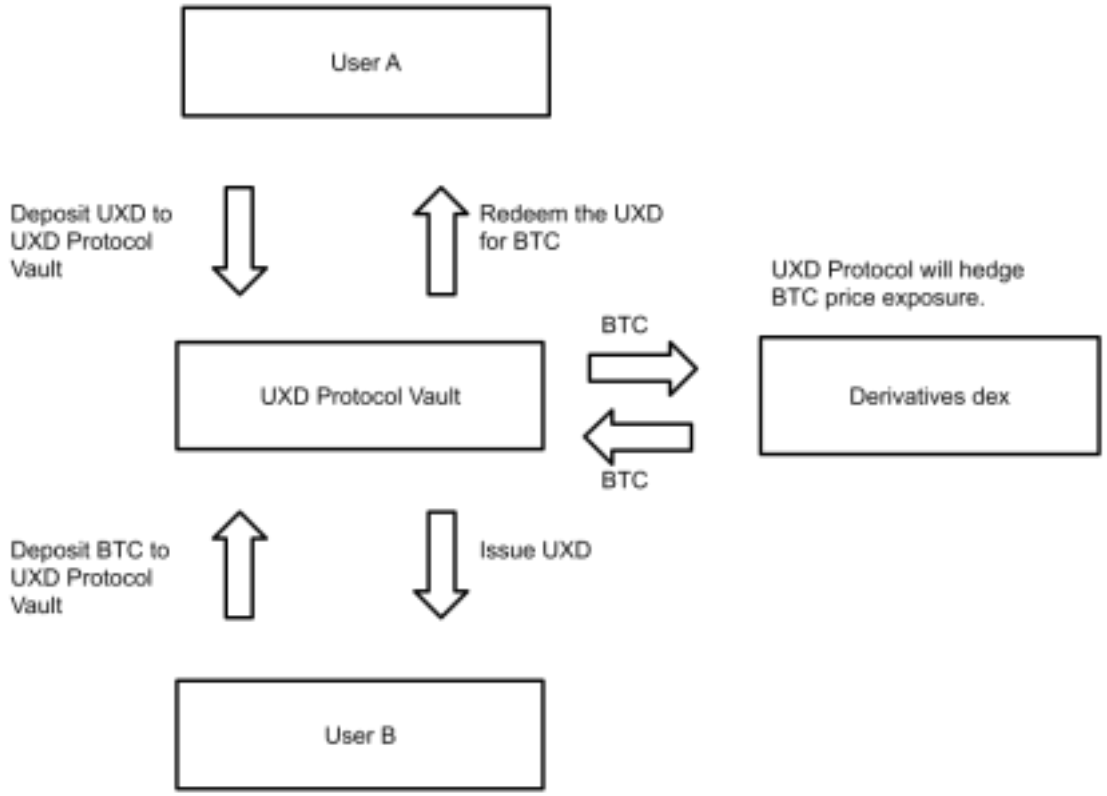
Step5
The user deposits 100 UXD to the UXD Protocol vault for redemption into 100 USD worth of BTC.

Step6
The delta neutral position is unwinded at the derivative dex and the BTC is withdrawn to the UXD Protocol vault.

Step7
UXD Protocol will destroy the UXD and an equivalent amount of BTC will be withdrawn to the user's wallet.

Users will also be able to obtain UXD through centralized and decentralized exchanges, and other third party services. Once the UXD is in circulation, it is freely traded.

Flow of Funds Diagram



Delta Neutral Position

For UXD Protocol to always be able to issue/redeem UXD at par value, UXD Protocol will short BTC/USD perpetual swaps on a derivatives dex(decentralized exchange) to an equivalent amount of the UXD in circulation. As a result, the position will be delta neutral and UXD Protocol will be protected from price fluctuations of BTC.

Example
Let's assume that BTC/USD is trading at $10,000.
A user issues 10,000 UXD in exchange for 1 BTC.
Then there is 10,000 UXD in circulation. UXD Protocol will then have a 1 BTC short position using the 1 BTC as collateral on a derivatives dex.
The position is delta neutral and the value of the position + collateral will always be worth $10,000 which can be seen from the simulations below.

If the price of BTC increases to $20,000, the value of the collateral increases from $10,000 to $20,000 and the PnL is $10,000. The PnL of the short position is 1 BTC*($10,000-$20,000) = -$10,000. The total PnL is $0.
If the price of BTC decreases to $5,000, the value of the collateral decreases from $10,000 to $5,000 and the PnL is -$5,000. The PnL of the short position is 1 BTC*($10,000-$5,000) = $5,000. The total PnL is also $0.

Interest Payments

When the funding rate is positive, the positive interest will accrue to the insurance fund. When the funding rate is negative, the negative interest will be paid out from the insurance fund.

Insurance Fund

The insurance fund is set up so that the holders of UXD will not have to pay interest when the funding rate is negative.
Let's define the USD value of the insurance fund as INSusd.
Then,
if INSusd > 0, the negative funding rate can be paid out from the insurance fund. if INSusd < 0, UXD protocol will do an auction of governance tokens(UXP) to the public and replenish the insurance fund until INSusd > 0.

Besides the auction of UXP, there will be a constant positive flow of funds to the insurance fund when the funding rate is positive, since the positive funding rate will go to the insurance fund.

Arbitrage

If the price of the stablecoins deviates from the price of fiat, arbitrageurs will step in to issue/redeem the stablecoins and make a risk free profit. This will peg the price of stablecoins.

Example
Suppose that UXD/USD is trading at 0.99. Traders can buy UXD with USD and redeem UXD for 1 USD worth of bitcoin. This will net the trader 0.01 USD of profit.
If UXD/USD is trading at 1.01, the trader can issue UXD with bitcoin and sell the UXD for 1.01 USD. This will net the trader 0.01 USD of profit.

This type of risk free transactions will be arbitraged very quickly and UXD will be pegged to the value of USD.
Verifiable

The amount of stablecoins in circulation and the amount of bitcoin backing the stablecoins can be verified by checking the blockchain.

The following equation will always hold.
The USD value of bitcoin as collateral + The USD value of the delta neutral position = The

total amount of UXD in circulation.

As a result, UXD holders will always be able to redeem their UXD for bitcoin.

Conclusion

UXD Protocol is an algorithmic stablecoin that has censorship resistance, price stability, and is capital efficient. Holders of UXD will receive interest from the funding rate, which makes UXD also an attractive store of value.
People who are excluded from the banking system will now be able to store and transact in a stable currency without censorship.