MarginSwap V1

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4. Summary

1. Introduction

1.1 Blockchain

1.1.1 Bitcoin

Bitcoin was the first cryptocurrency which was invested in 2009. It allowed for permissional transactions across a decentralized network without the reliance on any centralized authority. This was done by using a distributed ledger system known as blockchain, which uses a network of computers each with a copy of the ledger to verify transactions and add it to the blockchain ledger in an append-only fashion.

1.1.2 Ethereum

Ethereum was invented in 2014 which is built off blockchain technology, but allows for more complex applications to be run on the blockchain rather than simply sending and receiving cryptocurrency. Essentially building a decentralized internet. It has a native currency called ETH which is used to pay gas fees to run applications on the Ethereum blockchain. The flexibility has opened the doors to a wide range of applications that can be run on the blockchain, rather than completed by a third party. The Ethereum network is also run on a distributed ledger across a network of computers each with a copy to ensure no bad actor has tampered with any one copy. Due to its rapid growth, the blockchain has become overloaded which resulted in expensive gas fees to run applications and slower confirmation times.

1.1.3 Binance Smart Chain (BSC)

Binance Smart Chain, or BSC for short is a protocol blockchain like Ethereum which allows applications to be built on top of it. Since the entire codebase of Ethereum is open and available to all, BSC copied the Ethereum code but changed the consensus mechanism to a more centralized model. BSC is run by the Binance brand and all its departments which has allowed the transactions to be an order of magnitude cheaper and also much faster. They do however plan on decentralizing operations over time. It also has a native currency called BNB which already has utility on their exchange which is the largest in the industry with billions of trading volume per day.

1.2 Decentralized Finance

Decentralized finance, or DeFi for short, makes use of blockchain technology to provide financial products and services that may be found in traditional finance. This may include trading one asset for another, lending and borrowing funds, margin trading, and derivatives.

Rather than relying on centralized third parties such as banks and other financial intermediaries such as in traditional finance, the operations of DeFi are done with code running on blockchains. This allows for a secure, permissionless, and transparent financial industry.

Due to the many benefits of DeFi, it has grown rapidly the past 12 months. The total value locked (TVL), a measure of how much an application is managing, has grown from 1 billion to 85 billion in the past 12 months. There is still a lot of innovation and applications to be built on top of the applications that are new and gaining traction.

1.2.1 Pancakeswap

Uniswap and PancakeSwap are both decentralized exchanges allowing users to trade one asset for another. Rather than a typical order book model which isn't very efficient to be run on the blockchain due to the number of separate transactions required for each trade which become expensive and slow. Uniswap and Pancakeswap make use of liquidity pools and automated market makers by pricing assets based on the ratio of assets in each pool.

Users can supply liquidity by depositing an equal value of each token in the trading pair to the protocol. For example $100 of BNB and BUSD. Traders can also take liquidity by depositing one currency, such as BNB, and receiving BUSD in return based on the ratio between the two pools of assets. The is automatically done on-chain without the user of an intermediary. If enough people supply BNB and receive BUSD, the price of BNB will go down since it will have a higher ratio relative to BUSD.

The primary difference between Uniswap and PancakeSwap is that PancakeSwap is built on top of Binance Smart Chain (BSC) instead of Ethereum. Because of this, PancakeSwap transactions are faster and less expensive, this is primarily due to the reduction in decentralization of the consensus protocol that secures the blockchain transactions. Ethereum has a more decentralized network that is more costly and slow to run.

Uniswap has 8B total value locked while

1.2.2 Venus

Compound and Venus are two lending and borrowing protocols. They allow users to lend assets by depositing funds, such as DAI, to the protocol and receive an interest

rate typically around 10%. That DAI is then lent out to users and charges an interest rate.

Because this is automatically done on a permissionless blockchain without an intermediary or requiring users to provide any personal information, borrowers must over-collateralized their loans to the contract. So a borrower must first deposit $100 to the protocol for example, and be able to borrow up to 70% of that value.

If the value of the collateral drops below the value of the loan, then the collateral will be liquidated and suffer fees.

The primary difference between these two protocols is Venus is built on BSC while Compound is built off Ethereum. Compound currency has 12B total value locked while Venus is at 10 billion and rapidly growing.

2. MarginSwap Protocol

2.1 Introduction

The MarginSwap Protocol is built on BSC and enables the creation of leveraged tokens providing up to 2x the price exposure of the underlying asset. This is accomplished by interacting with two of the top DeFi protocols on BSC - Venus and PancakeSwap.

When a Margin Trader deposits a coin, such as BNB, to the MarginSwap Protocol, it will automatically send back the leveraged version of the token such as mBNB.

The Margincoin Protocol will then:
1) Post the deposited BNB as collateral on Venus,
2) Take out stablecoin loans against it
3) Trade the borrowed stablecoin for BNB via PancakeSwap

2.2 Architecture and Terms

2.2.1 General Architecture
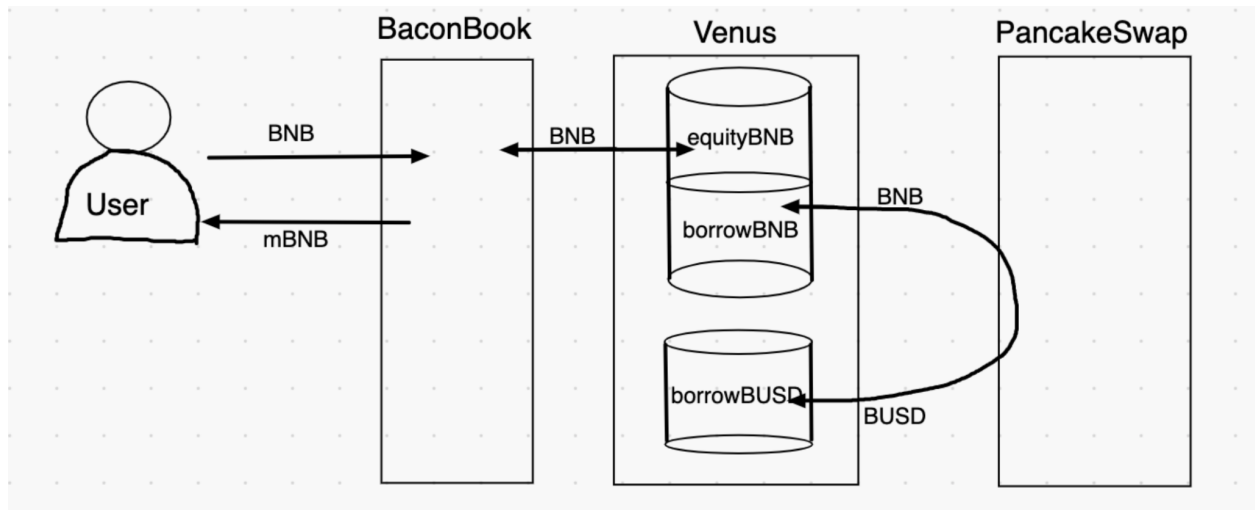
2.2.2 Terms and Definitions

Name	Type	Source	Description
collateralBNB	uint	Venus	Quantity of BNB as collateral on Venus
borrowBUSD	uint	Venus	Quantity of BUSD borrowed on Venus
priceBNB	uint	PSwap	Price of BNB/BUSD on PancakeSwap. From Oracle
equityBNB	uint	BBook	*collateralBNB* - *borrowBUSD*priceBNB*
borrowBNB	uint	BBook	*collateralBNB - equityBNB*
borrowRatio	uint	Venus	*borrowBUSD*priceBNB / collateralBNB*
leverageRatio		Venus	*collateralBNB / (collateralBNB - borrowBUSD/priceBNB)*
leverageTarget		Owner	Desired leverage ratio
ATHmBNB	uint	BBook	Highest price of mBNB as of last rebalance
collateralized	bool	venus	True if BNB collateralized switch on. Required.
liquidationRatio	uint	venus	borrow ratio at which collateral will be liquidated. From Venus

leverageTarget	uint	BBook	target leverage ratio, adjustable from Owner (gov token)
manageFee	uint	BBook	The % of funds that go to Owner per block (or per timestamp?)
performanceFee	uint	BBook	Adjustable from Admin. Max 20%.
availableCredit			Max $ allowed to be borrowed on Venus
depositedBNB			BNB Margin Trader (user) deposits to Baconbook
mBNBsupply			Total supply of the mBNB token
mBNBprice			(*collateralBNB-borrowBNB*priceBNB*) / *mBNBsupply*
rebalancer			EOA that calls the rebalalance( ) function
rebalanceAmount			Amount that needs to be rebalanced between collateraBNB and borrowBUSD. Positive if needs more loan
rebalancerReward			% share of performance and interest fees. Default 40%

2.3 Leveraged Tokens

2.3.1 Overview

mBNB is a token that represents ownership of *equityBNB,* which is a portion of the **collateralBNB** within the Venus protocol.

> **equityBNB = collateralBNB - borrowBUSD/priceBNB**

As the price of BNB increases, the quantity of BNB within **equityBNB** will increase, therefore giving added exposure to BNB price changes. Vice versa as the price of BNB decreases.
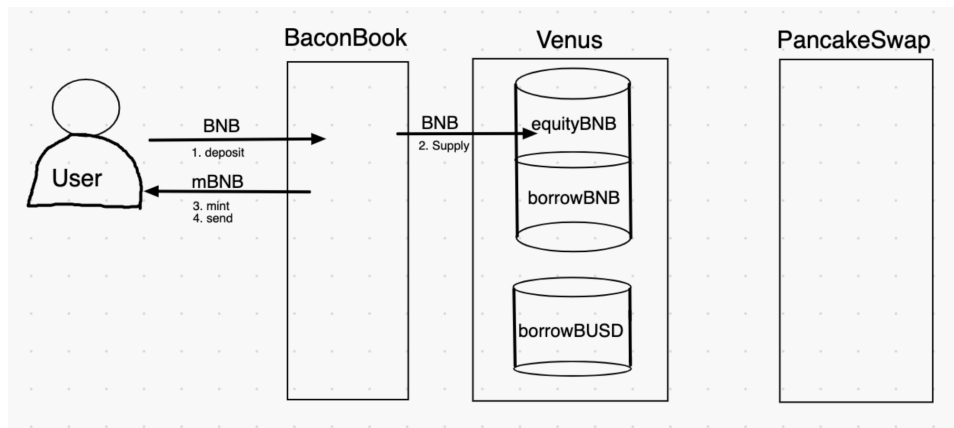
BNB is interchangeable with mBNB based on the ratio of mBNB supply and equityBNB. The exchange rate is as follows:

> **mBNBprice = equityBNB / mBNBsupply**

2.3.2 Deposit BNB
- Calculate mBNB price before or after collateral added?

Margin traders who wish to gain added exposure to the price of BNB can deposit BNB to the Margincoin protocol.
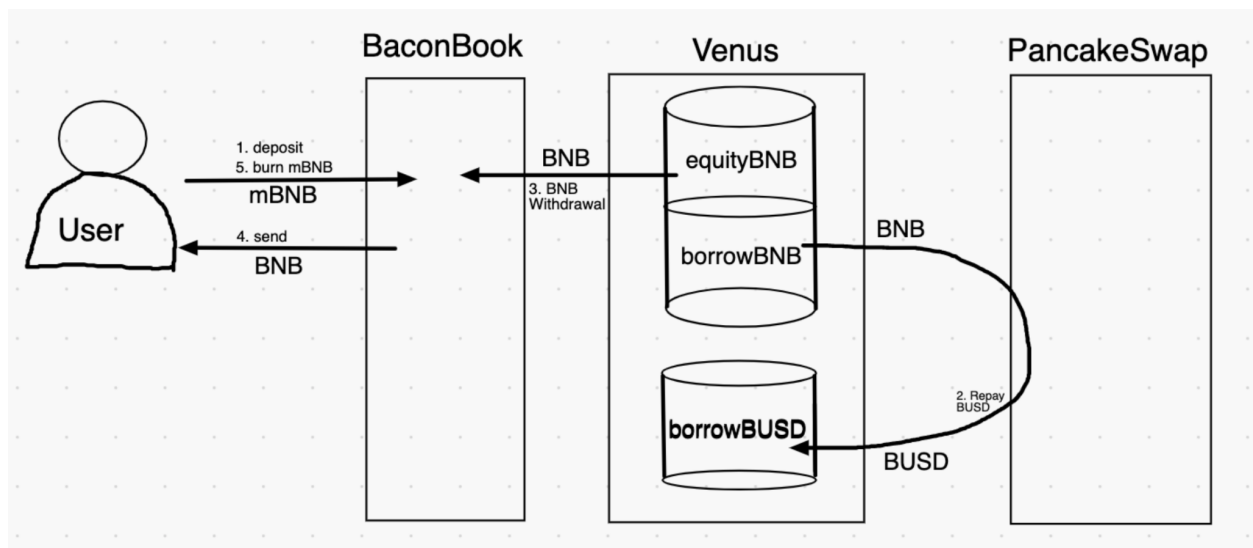

In return, the protocol will mint and send mBNB to the Margin Trader based on **depositedBNB** and **mBNBprice** as follows:

mBNB to mint and send = **depositedBNB * mBNBprice**

2.3.3 Deposit mBNB

If Margin Traders wish to redeem their BNB share of **equityBNB**, they can deposit mBNB to the Margincoin Protocol.

BNB will be withdrawn to the mBNB depositor from **collateralBNB**. This will increase the **borrowRatio** because the **collateralBNB** will decrease while **borrowBUSD** remains the same.

To avoid attacks from flash loans causing a liquidation event due to the **borrowRatio** exceeding the **liquidationRatio** during withdrawals, the Margincoin Protocol must first repay the appropriate amount of BNB to establish the desired **borrowRatio** for after the BNB is withdrawn to the mBNB depositor.

Since the equityBNB portion of collateralBNB will decrease by the amount withdrawn, an equal amount of borrowBNB must be reduced. This is done by selling BNB and repaying BUSD loans.

The protocol will return BNB to the user, minus a redemption fee, as follows:

BNB to send = **depositedmBNB * (1 - redemptionFee) / mBNBprice**

BUSD repaid = (BNB to send) * **priceBNB**

The **redemptionFee** is to pay for trading costs associated with selling BNB to repay BUSD. The fee will remain in the collateralBNB pool.

After BNB is returned to the user, the deposited mBNB will be burnt and removed from the supply.

2.4 Rebalance Mechanism

A rebalancing mechanism will be used to ensure that the **borrowRatio** of 0.50 is accomplished. This means that **borrowBUSD** is equal to 50% of the BNB collateral value. This is below the **liquidationRatio** of 0.80. BUSD borrowed from Venus is used to purchase BNB, which is posted as collateral in Venus. As the **borrowRatio** approaches 0.50, half of the BNB in collateral will be from borrowed funds, therefore providing 2x exposure to the price changes of mBNB holders.

The **rebalance()** function is made public so anyone is able to call it. **Rebalancers** will receive a percentage of the fees incurred at each rebalance based on **rebalancerReward**, which we will go into in the fee section.

Once the **rebalance()** function is called, it will fetch the **collateralBNB** and **borrowBUSD** values from Venus and compute the following formula:

$$rebalanceAmount = collateralBNB * priceBNB * [(leverageTarget - 1) / leverageTarget] - borrowBUSD$$

Net deposits or withdrawals and BNB price variations influence the **rebalanceAmount**. Depending on the rebalanceAmount value, the protocol will either sell BNB to repay BUSD, or it will borrow BUSD to purchase BNB.

Repay BUSD

Upon **rebalance()**, if the value of **rebalanceAmount** is negative then the Margincoin Protocol will repay BUSD by amount **rebalanceAmount**. This could either be from the decrease in value of BNB or net withdrawals. By decreasing the risk exposure of BNB while the price decreases, it protects the mBNB holders from their BNB being liquidated.

BNB from collateralBNB will be sold for BUSD via PancakeSwap, and used to repay borrowBUSD by amount rebalanceAmount.


Repay BUSD: if borrowBUSD > collateralBNB*priceBNB*(1/2)
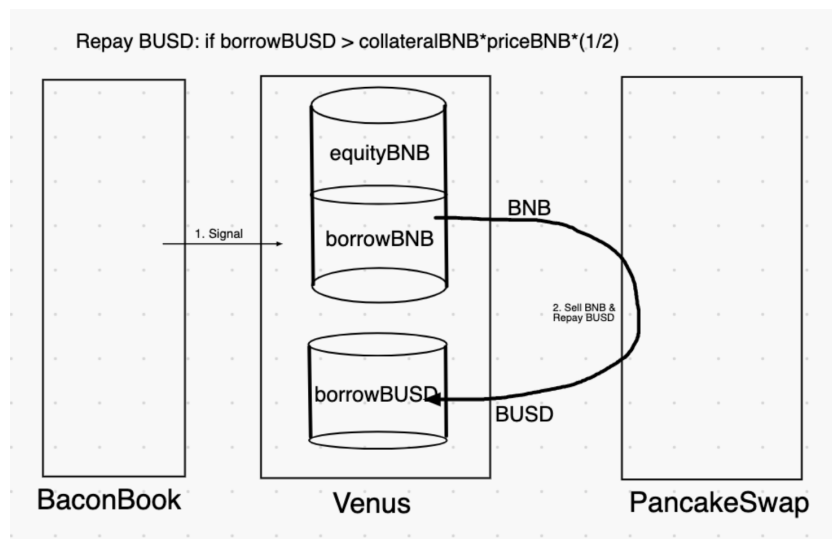
Borrow BUSD

Upon rebalance(), if the value of rebalanceAmount is positive then the Baconbook protocol will borrow BUSD by amount **rebalanceAmount**. This could either be from the increase in value of BNB or net deposits.

BUSD will be borrowed from Venus, sold for BNB via PancakeSwap, and posted again as collateral. This in return will increase the amount of borrowBUSD allowed since collateralBNB has increased. Assuming all else is equal (no price changes or net deposits/withdrawals), there will be a positive rebalanceAmount at the next rebalance and therefore further borrowing until the borrowRatio of 0.50 is achieved.

Rather than rebalancing for the desired borrowRatio, the protocol could have been rebalanced for the leverageTarget. But this could result in borrowRatio temporarily exceeding liquidationRatio. For example, assume the first depositor deposited $500 with no current borrowBUSD. To achieve a leverageRatio of 2.0, $500 of borrowBUSD would need to borrowed, sold for BUSD, and posted as collateral. This would result in a borrowRatio of 1.0 before the BNB from borrowBUSD was posted as collateral. Instead, by rebalancing for borrowRatio Baconbook would borrow $250 from the $500 in collateral and post that BNB in collateral for a new total of $750. This would fee up more borrowBUSD which can be used to borrow more.
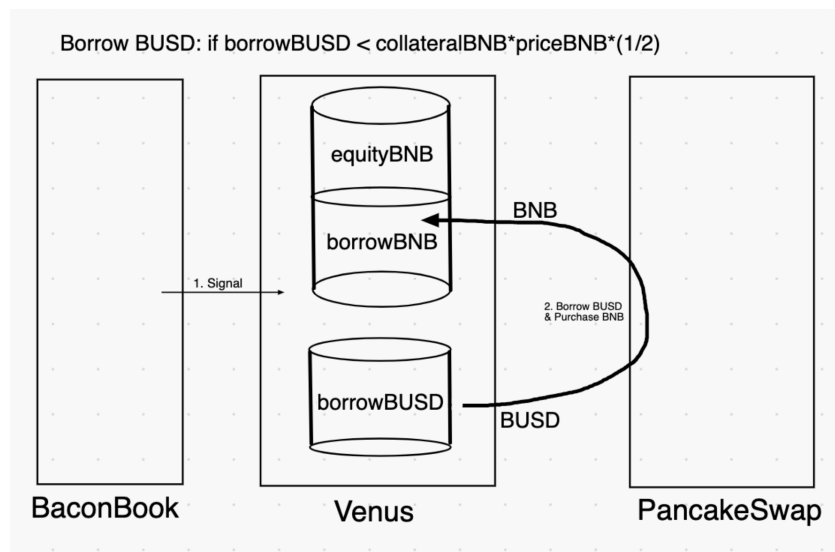
Once that is established, 50% of the collateral BNB will be from users' equity positions and the other 50% from borrowed BUSD. As the price of BNB increases or decreases the borrowBUSD amount will remain the same.

Since **equityBNB = collateralBNB - borrowBUSD/priceBNB**, as the price of BNB decreases, the amount of BNB in equityBNB will increase.

- What if its fully liquidated? Would need to create a new one?

3.6 Price Oracle (Taek write it)
- Ideally should be the same price Oracle as Venus

https://github.com/VenusProtocol/venus-protocol/blob/master/contracts/PriceOracle.sol

3.7 Fees (or add within?)
- Might need a function to sell BUSD stuck in Baconbook contract

- Make sure APY with VXS

- Withdrawers performance rebalance fee?

Performance Fee
- Upon rebalance
If priceNow > ATHmBNB:
$$(priceNow/ATHmBNB - 1)*borrowBNB*priceBNB$$

Interest Fee
- Protocol earns interest from Venus in XVS due to BNB collateral.
- At each rebalance, half of the XVS since the last rebalance will go to Owner and the other half to **rebalancer**

Trading Fee
- Trading fee of 0.50% of the trading volume for BNB and BUSD.

Redemption Fee
- 1%, remains in collateral

3. Governance

Version 1 of the Baconbook protocol will be governed by its creators. Future versions may incorporate a governance token such as other popular DeFi protocols such as….

The creators can govern:
- leverageTarget
- New leverage coins (such as mBTC)
- PerformanceFee
- TradingFee (initially 0%)
- RedemptionFee

Info
- Name: BaconBook
- Symbol: BACON (or BCNB)
- Max supply 100,000
- BEP20 token

Distribution

- Distribute 1000 based on every BNB sent to users!

The BACON token
- Token awarded to rebalance volunteers (40% to Owner)
- Also to depositors? Might be manipulated to buy/sell

Govern

- Choose the **leverageRatio (exposure/borrow)**
- **Add new coins**
-

4. Summary