Investre Network

A protocol for disintermediated cross-chain collateral management

May 10, 2018

Abstract

Investre.Network is an open-ended decentralized platform for cross-blockchain financial products management. The Investre.Network may serve as a wallet but its paradigm is that **Investre.Network does not keep custody of its users' digital assets.** Instead, users keep their entire digital asset in Investre's cross chain wallet with transaction managed by protocols of smart contracts. Investre.Network provides cryptocurrency markets with an expanded range of financial services that go beyond simple buy and sell orders. Such products fall into three global categories: **loans, derivatives and crypto fund.**

Complex financial products are permitted for the first time through the use of **disintermediated collateral management guarded by Investre.Network community.**

By means of illustration, two major applications of Investre.Network include the ability to **short specific cryptocurrencies** and the ability to **synthetically buy a second cryptocurrency and receive its performance while remaining entirely within a different blockchain.**

Investre.Network's strong backing by founding members of existing exchange Bibox.com and experts from the areas of architecture, security, and financial engineering, gives it the know-how to build a best-in-class marketplace.

Investre.Network's IVT token ecosystem provides a medium for fees charged by guardians for facilitating collateral and trading specialists for their proprietary strategies and trading signals.

Contents

1 Services and Products

1.1 Background

The growth of the cryptocurrency markets has accelerated in the past 10 years since the introduction of the Bitcoin network in 2009. The acceleration is particularly fueled by the emergence of blockchain-based ventures and projects, which cover a wide spectrum of products, from messaging apps to healthcare to social causes to virtual identification. Currently, there are thousands of cryptocurrencies with a combined market value in the billions, with the peak market cap in December 2017 at $830 billion. In response, more and more investors have sprung up to support blockchain ventures and have begun to trade cryptocurrencies in the new token economy, including many heavyweights in the financial industry.

Currently, the crypto market is dominated by crypto to crypto spot trading and crypto to Fiat spot trading. However, as crypto market participator ourselves, we witness the impending needs of short selling, margin trading and token lending for professional traders as more and more first-class traders in traditional financial markets join in the crypto market. Exchanges such as OKex, Bitmetrex, and BitFinex are among the biggest exchanges which provide functions of futures, margins and short selling. However they are exposed to the risks of in house clearing such as the failure of the exchange, fraud, price manipulation, down time by technological issues, and hacking.

The prosperity of Token sales in 2017 bred a speculation tendency among the crypto investing community.The heat cooled down in the Q1 of 2018 as the market entered a bear market. However, we see more and more blockchain entrepreneurs come up with make-sense blockchain applications backed with resources and strategic partnerships. We foresee as more blockchain projects become applicable to everyday use, investors will diversify their portfolio from traditional stock, bond, fund market to crypto assets as the correlation is low between new blockchain and traditional financial products.

These emerging paradigms in cryptocurrency markets create an immediate need to facilitate investors to manage and transact cryptocurrencies, its derivatives and their crypto portfolios. **Investre.Network** aims at providing investors a decentralized and disintermediated platform to manage and trade diversified cryptocurrency financial products, such as loan, derivatives and portfolio through its proprietary cross-chain collateral management protocols.

1.2 One-stop shop for financial products and services

Investre.Network serves both active investors and passive investors through a decentralized and disintermediated platform providing various financial services with cryptocurrencies or crypto-related products. The services fall into three main categories.

The first service is crypto financing services resembling primary brokerage in traditional financial service industry but in a disintermediated manner without involvement of primary brokers, lending agents etc...

In the financing services, clients can borrow or lend cryptos through a platform resembling the disintermediated "electronic communication network" in stock trading. **Investre.Network uses cross chain collateral management protocol to ensure the maximum crypto security while eliminating the counterparty risk in collateral management.** In particular, Investre.Network allows both parties in any transaction to possess the loaned crypto and the collateralized crypto in their own wallets with the guidanceof the community. Investre.Network will help both parties to enforce a maintenance collateral ratio (or reverse maintenance collateral ratio) on the counterparty. Investre.Network will also help place limit orders to liquidate transacted crypto and terminate the transaction before any counterparty risk is materialized.

The electronic communication network and underlying cross chain collateral management protocol are also used in crypto derivative trading.

The second service is crypto management service resembling the buy-side asset management in traditional financial service industry but in a disintermediated manner without involvement of portfolio managers, financial advisors, financial planner, etc...

In this service, clients will be connected based on their risk profile, return expectation, strategy preference, etc. Each group can choose a broadly-defined trading strategy with users finalizing their trading strategies through peer-to-peer communication and collaboration. The trading strategy could be either passive or active.

For passive crypto asset management strategies, the smart contract/network could be defined by an index-linked strategy weighted by caps of selected cryptocurrencies, or a smart beta strategy filtered by momentum factor, or a fundamentally weighted smart beta strategy. Each user needs to commit certain amount of investing capital by sending it to the strategy smart contract. The trading history

and performance are then recorded on blockchain and can be freely accessed by authenticated users.

For active crypto asset management strategies, the broadly defined network/smart contract could be an event-driven trading strategy, a global macro trading strategy, etc. Unlike the design of passive crypto asset management, the design of active networks is not open-source given the proprietary nature of the active strategies, though it is still peer-to-peer based. In the network designed for active management, users do not share the details of their trading strategy and trading orders. Users do share the history of their trading performances implemented in the network. The share of performances help the best active managers stand out so that the other users can choose to invest in the active managers whom they view is the best. Thus, the design of active crypto asset management networks provides a channel for the active managers to promote their trading strategy in a trustworthy manner without going through the audited process. The technology of smart contract ensures the credibility of trading records without resorting to any auditing intermediaries as in the prototyped hedge fund industry.

The Third service is investing assistant tools. The first one is crypto trading service. It advises users to optimize order flows in timing and size and to execute crypto orders. It utilizes proprietary applications to optimally route orders to various DEX and CEX based on the expected price, liquidity, price impact, etc. The second one is investing research report portal.

1.3 A comparative analysis with other cross-chain financial service projects

There are a lot of projects working on the cross chain financial service area, with each one has different mission, technology solution and use cases. We compare Investre.Network with some ambitious ones in this arena.

WanChain

The mission of Wanchain is to connect digital assets and enables banking applications to be developed that guide their flows on-chain, removing centralized counterparty risk. Its products focus in lending, payment, exchange, and automated token sales. It constructs its own blockchain called Wanchain as the medium, and transfer asset among Wanchain account through lock in and lock out process. We are not fun of this solution. As in the status of lock in, users don't have access and

control of the original asset in the original chain. Instead, s/he owns a "certificate" of that original asset on Wanchain.

One distinguish difference is that we don't start with an assumingly workable starting-from-scratch technology. We are product oriented (we have fully defined financial products in our platform) and integrate proven technologies in a comprehensive way to achieve it.

ETHLend

ETHLend is a decentralized and secure financial marketplace for peer to peer lending agreements using Blockchain and Smart Contracts. It's a working platform. However, it's not user friendly as the whole lending process is carried on chain. Instead, Investre.Network use a 0x protocol like off-chain matching and on-chain settlement way. The all-chain process is also very gas consuming.

Another issue with ETHLend is currently it doesn't have whole life cycle collateral management. In a volatile context such as crypto, a loan could be easily goes under-collateralized, and bears the default risk. Investre.Network not only has the margin call for under-collateralization, but also has the reverse margin call as an option should the collateral increase in value so that borrower can better capitalize his/her digital assets.

DAEX

DAEX more focus in providing ubiquitous clearing service for all participating exchanges, CEX and DEX through ubiquitous user trading account. The solution is to hold private key on its own clearing chain. Derivative clearing is in its plan, but isn't detailed.

Conclusion

The similarity of the cross chain solutions of Wanchain and DAEX is to acquire the access (private key) of digital assets into its own chain. We deem it as a new type of centralization, the block chain centralization, i.e., one block chain is superior to other block chains. While on Investre.Network, we provide a light-weight solution. Counterparties of a transaction have final control of the digital assets while the process is under the guidance of the Investre.Network community.

1.4 Non-biased crypto financing

In traditional financial markets, investors are restricted from naked short. The borrower of a security usually borrows to sell and speculates in a down run of the security.

Same norm shall be established in crypto market as it's more immune from manipulation. However, the status in quo is that the crypto market lacks external clearing mechanism and is built on centralized collateral custody and therefore suffers from the failure of the exchanges.

For establishing the integrity and credibility in the crypto market, Investre.Network aims to build an infrastructure similar to security lending that upholds the short selling, and margin trading.

Lenders in traditional security lending market are usually executive officers of public companies who hold large stake in the company and need maintain their voting rights and ownership. They can lend out the securities on a revolving basis to synthesis cash out. Investment banks collect the securities and re-loan it to hedge fund or traders. However, for individuals, the cost of security lending can be as high as an annual interest rate of 150%. Also hedge fund has several days of grace period which exempts them from actual lending the security when entering a short position. That creates a large inequity between individual investors and institutional investors. Investre.Network will provide crypto financing services built with a cross chain clearing platform that is fully decentralized and disintermediated that:

1. Remove the likes of investment bank or broker in the transaction.
2. Not biased to larger investors and eliminate the inequity.
3. Prevent the centralized failure

With high risk-profit payoff and low correlation with stocks and bonds, crypto asset is the candidate for investors to further diversify their portfolio. Another trend is the tokenization of traditional securities brought by the efforts by projects such as Polymath and Harbor. They both incentivize the need to buy index funds and other passive funds.

However, right now, crypto funds are mostly active managed funds and only accessible by high wealthy individuals. There are funds such as Melon fund, Iconomi, and Blackmoon. Funds will either be kept custodian by the backed team, or based

on tokens within one blockchain. Investre.Network will provide cross-chain crypto fund managed on chain and is equally available to everyone. Passive investors can also lend out token or sell call option to enhance the profit of long term token holding. We foresee most of the token lending will happen between active investors and passive investors.

To conclude, the crypto financing services provided by Investre.Network are designed to the following purposes:

1. to facilitate settlement of a crypto margin trade,
2. to facilitate delivery of a crypto short sale,
3. to finance the crypto, or
4. to facilitate a crypto loan to another borrower who is motivated by one of the above purposes.

1.5 The features of Investre.Network

Investre.Network has five key and unique features that distinguish itself from other similar products.

1. Investre.Network is a decentralized and disintermediated platform with zero interference and involvement of intermediaries or centralized agencies in cryptocurrency transaction and management. This feature avoids the prototype of financial intermediaries as in the traditional financial markets, such as fund managers, financial advisors, primary brokers, financial analysts, etc.
2. Investre.Network provides all services based on peer-to-peer interactions self-governed by users of Investre.Network. It eliminates any information asymmetry between Investre.Network and its clients and any information leakage which could cause front-running in any prototyped intermediary-based financial services. By this design, Investre.Network is committed not to gain any information advantage from its clients and not to sacrifice its clients, especially retail clients, to benefit its proprietary account or connected institutional accounts.
3. Investre.Network does not keep custody of its clients' digital assets. Instead, clients control their private keys and take the responsibility of safekeeping the keys themselves in their own wallets. This feature ensures Investre.Network's

clients maximum crypto security that has been a serious concern to any intermediated crypto services. It also differs Investre.Network from most current crypto financial service solutions such as Melon Protocol, Blackmoon, or Iconomi where clients entrust their assets in a third party smart contract acting as custodian, and, in turn, clients receive a tokenized share of the aggregate portfolio.

4. Investre.Network provides both standardized and well-defined products and non-standardized products tailor-made to clients' demand. The standardized products are provided to clients seeking liquidity in their transactions, and the non-standardized products are provided to clients seeking flexibility and specialized demands. Both kinds of products are transacted in a disintermediated manner.

5. Investre.Network provides a wide spectrum of crypto services and products, including crypto order execution, crypto borrowing/lending, crypto management on passive strategies, active crypto management, crypto research support, etc. At the initial stage, Investre.Network's primary focus is on the management of cryptocurrency products and the transactions from cryptocurrency to cryptocurrency. In the future, it will leverage on its unique technology on cross chain smart contracts to tokenize real assets and to expand the platform to include transactions between digital assets and physical assets (such as Fiat currency, gold, stock, etc.).

2 Technology

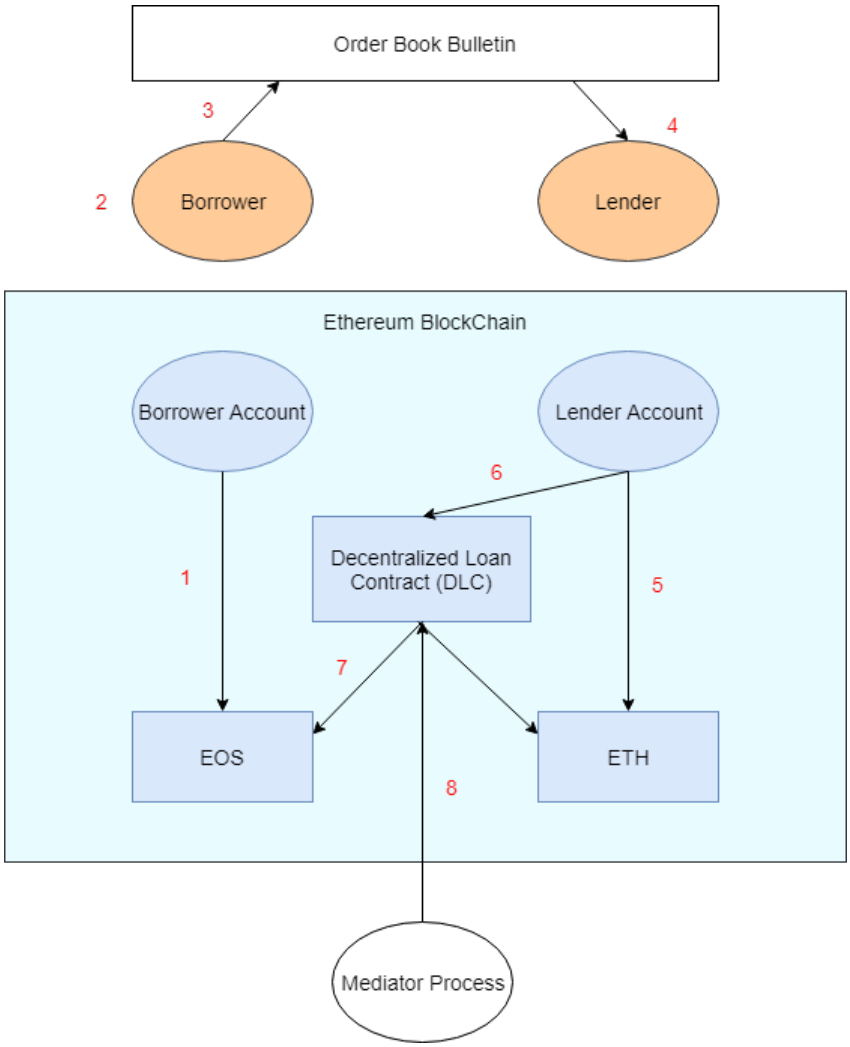
Quote from ETHLend, one of our competitors:

"ETHLend team's aim is to create decentralized solutions by pushing innovation further instead of falling back to centralized solutions."

However, the design philosophy of Investre.Network is to integrate blockchain wherever it's needed for a trustless framework, and provide the best user experience and safety, instead of a purely technological pursuing. There are two main technology infrastructures that stand as backbone of our platform. The first one is financial product exchange. It adopts the original ideas of 0x Protocol, i.e., off-chain order relay and on-chain smart contract settlement. The second core technology is cross-chain collateral management protocol, as collateral management is the vital component to fulfill the financial contract between counter parties, such as loan, derivatives etc.

2.1 0x Protocol like financial product marketplace

We reiterate the loan matching and processing steps here. The smart contract Decentralized Loan Contract (DLC) stands in the middle.



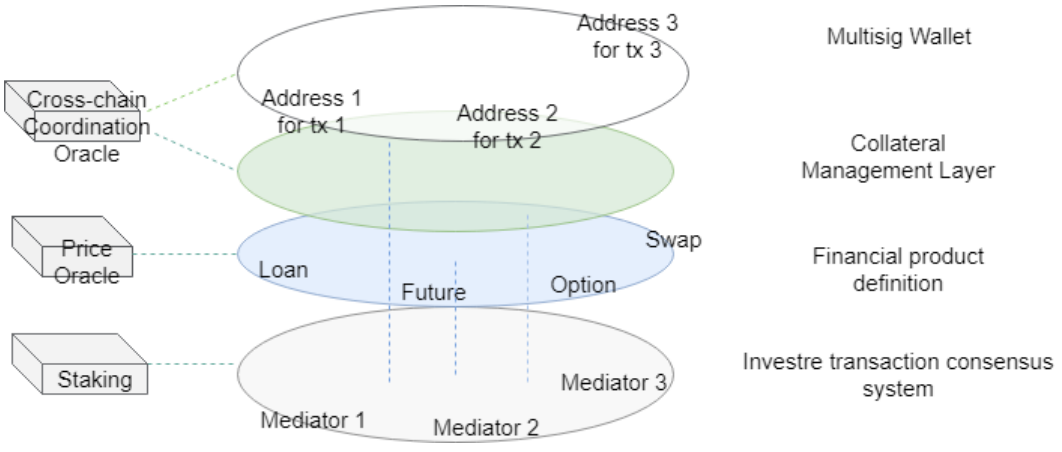
1. Borrower approves the Decentralized Loan Contract (DLC) to access their balance of 200 IVT as at maintenance ratio 50%.
2. Borrower creates an order to borrow 1 ETH at exchange rate 1 ETH = 100 IVT with maturity date in 30 days (the date to return the 1 ETH with 0.1 payment) and signs the order with her private key.
3. Borrower broadcasts the order to the off-chain order book bulletin.
4. Lender intercepts the order and decides that s/he would like to fill it.

5. Lender approves the Decentralized Loan Contract (DLC) to access their balance of 1 ETH.
6. Lender submits the borrower signed order to the Decentralized Loan Contract (DLC).
7. The DLC :
   (a) Authenticates borrower and lender's signature
   (b) Verifies that the order has not expired
   (c) Verifies that the order has not already been filled
   (d) Transfers 200 IVT from borrower account to contract escrow address (see more in the next section)
   (e) Transfers 1 ETH from lender account to borrower account

Until here the transaction successes and the Investre.Network cross-chain collateral management protocol will take over the control. In this matching process, the smart contract part is financial product specific. We have decentralized future contract for example.

2.2 Cross-chain collateral management protocol

Here is the diagraph of the Investre.Network cross-chain collateral management protocol.



The lowermost layer is DApp on different blockchain in charge of transaction consensus with price feed from outlier world. The collateral management layer

responses to margin call request and handle the collateral management process. The blue layer is an abstract layer for financial product definition. Different financial products share similarity of collateral management process, but smart contract is financial product specific.

Before we dig into the collateral management process, we introduce the revolutionary mediator system driven by community, the Investre.Network transaction consensus system and the role of Multisignature three-party wallet in collateralization.

2.3 Investre.Network Transaction Consensus System

Mediators take the task of monitoring token price, calculate the current collateral ratio, and make decisions to make the margin call and reverse margin call if necessary. In a perfect world, when everything has transitioned to on-blockchain solutions, it will be easy to faultlessly track exchange prices for the purpose of calculating collateralization ratios and making margin calls. However, in accord with our practical philosophy, Investre.Network realize that centralized exchanges (CEX) will continue to coexist alongside decentralized exchanges (DEX) for quite some time yet, and to get a full picture both must be taken into account.

1. First, Investre.Network keeps the whitelist for the access to Investre.Network smart contracts through a standard vetting process. While it is not hard to get whitelisted, this would allow for banning and deterring malicious users.

2. It will be unscientific to have all users to monitor all transactions. Also for the purpose of saving the amount of calculations needed for users selection, for a periodic time, the Investre.Network smart contract randomly selects a group of users from the total user pool. This group of users is responsible for mediating the transaction with this time frame. The Investre.Network DApp monitors this selection, and should a user be chosen, they will automatically check token prices on a predetermined selection of centralized exchanges, through API calls to these exchanges.

   Based on the price, the user will send a request for a margin call to the Investre.Network Collateral Management smart contract. They then receive a fractional payout of the Investre.Network token fee which is paid out by the borrower when the trade was executed.

3. The Investre.Network smart contract aggregates these responses and initiates a margin call when a predetermined portion of users within the group approve this margin call.

To be noticed, for the consideration of gas saving, the IVT token rewarded to users will be kept and recorded within the smart contract, and be withdrawn to users' wallet on demand.

2.4 Multisignature three-party wallet collateralization

The way the smart contract designed is to have escrow smart contract and collateral management smart contract separated. The escrow smart contract is logically very simple, to avoid the risk that potential bug in the codes causing an on-chain asset black hole, in the case of the parity wallet.

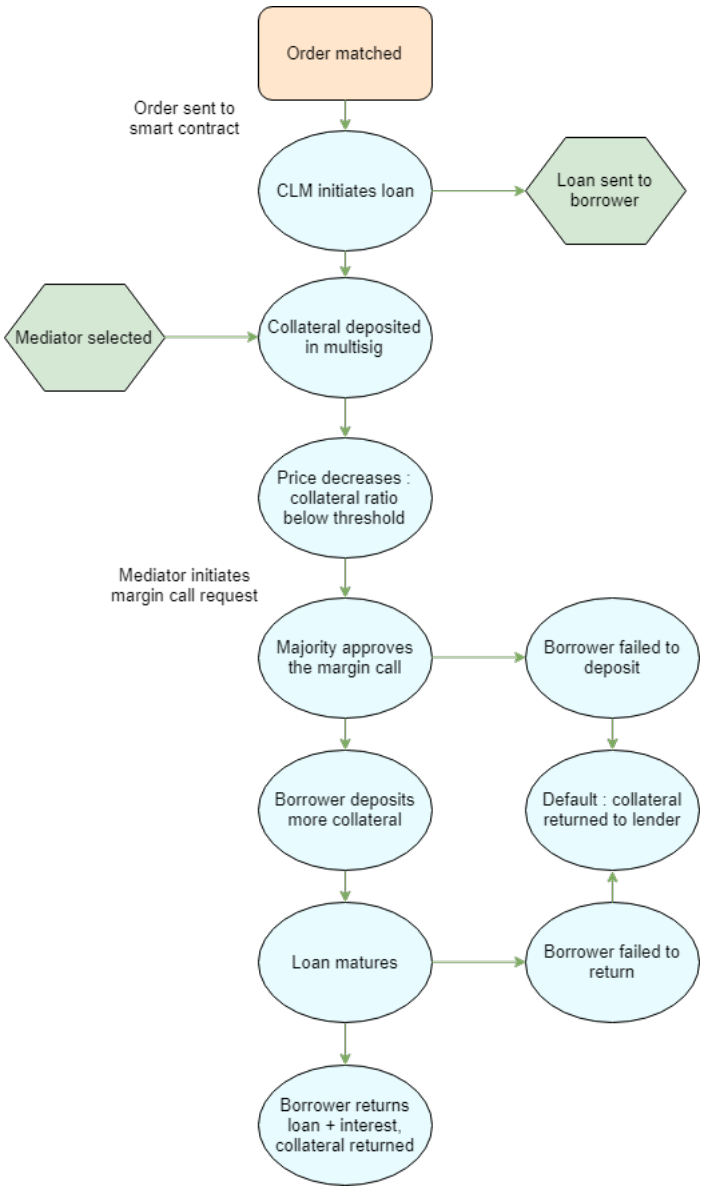
For every escrow account, a three party multi-signature wallet is created. The two parties of the transaction own private key of the multi-signature wallet, along with the third private key authorized by the user group selected from Investre.Network community. **Two out of three keys are required to access any crypto in the multi-signature wallet**. When Investre.Network collateral management smart contract initiates a withdrawal of the collateralized crypto into the wallet, at least one party of the transaction will be willing to approve.

Note, this also means the two parties can end the agreement early without Investre.Network's approval should they agree on a transfer of collateral, at which point Investre.Network will end the contract on its side as well.

2.5 The Collateral Management Layer

During the lifetime of the loan, future, and any other financial contract, a price feed of relevant tokens is monitored by Investre.Network community through **frontend** of DApp. The design is to transfer the calculation burden off-chain. While it remains a trustless framework as margin call requests will only be effective when majority approves it. The voting psychology effect is widely used in distributed framework as Vitalik Buterin put in an example: people around a table write numbers on a paper, the way to win the reward is to write the right number.

2.5.1 The Collateral Management for Loan



In the previous example in 2.1,

Scenario 1

Should the IVT collateral lose too much value:

1. A collateral margin call is made to the borrower. They must send extra IVT tokens to the smart contract within a predetermined period. A timer is set within the CLM (Collateral Management Smart contract).

2. If no collateral is deposited by the end of the period, after the timer expires, the loan is considered in default, and the CLM cancels the loan and initiate a transaction to send the collateral to the lender. The lender will approve this transaction. The borrower does not need to repay it since their collateral was liquidated.

Scenario 2

If the collateral does not lose too much value:

1. When the loan expires, in 1 month, the borrower has a short settlement period to send 1 ETH back to the smart contract, along with the 0.1 ETH interest payment. If the borrower fails to settle, the smart contract transfers the collateral to the lender, to the height of 1 ETH equivalent and keeps a penalty fee to the community. The remainder is transferred to the borrower.
2. If the borrower returns the ETH, the smart contract sends the ETH plus interest to the lender and unlocks the collateral which is sent back to the borrower.

2.5.2 The Collateral Management for Option

Through the Investre.Network platform, the user finds a seller willing to sell a CALL at 0.1 BTC/ETH, expiring in 1 month, settled in ETH, for an upfront payment of 0.1 ETH (the premium).

At the end of the month :

- If 0.1 BTC is now worth 0.5 ETH, the buyer has the right to pay 0.1 BTC for 1 ETH, a net gain of 0.5 ETH. The buyer accepts by default and receives 0.5 ETH.
- If 0.1 BTC is now worth 2 ETH, the buyer has the right to pay 0.1 BTC for 1 ETH, at a loss of 1 ETH. The buyer does not accept by default and the option expires with no action taken.

After the buyer and seller accept the premium offer, the following process is undertaken by cross chain smart contract.

1. The applicable collateralization method is applied (resp. smart contract, multi-signature or reverse collateral), and the seller transfers the collateral deposit (resp. to the smart contract, the multi-signature wallet) - here, for instance 0.1 BTC, a 100% ratio.

2. The buyer sends the premium to the seller.
3. (Optional:) a stop loss order for SELL 0.1 BTC is placed at 0.5 ETH.
4. The option contract is initialized.
5. At this stage, during the lifetime of the option, the buyer may sell the option to another user, or even back to the original seller. To help with liquidity on the secondary market, Investre.Network will list standardized options, though the contracts can be sold OTC as well.
6. During the lifetime of the option, if the collateral crashes, the applicable collateral call is made depending on the collateralization method, as described previously.
   (a) (Optional:) If applicable, the stop loss order triggers at 0.5 ETH, and Investre.Network automatically looks to trade 0.1 BTC into the best price available for ETH.
   (b) The collateral is paid out as applicable and the option is cancelled. The seller does not need to settle the option since their collateral was liquidated.
7. At maturity, if the collateral does not lose too much value:
   (a) When the option expires, in 1 month, if the BTC/ETH pair is above 0.1, for instance at 0.12:
      i. The contract immediately places a market order for the difference between the price and 0.1 (in our case, a market order SELL 0.02 BTC for ETH).
      ii. The seller retrieves the remaining BTC
      iii. The buyer receives the ETH
   (b) When the option expires, in 1 month, if the BTC/ETH is below 0.1, for instance at 0.08, the option expires with no action taken. The collateral is returned to the seller.

2.6 Crypto Electronic Communication platform

Similar to the philosophy of 0x Protocol, the Investre.Network is an open-ended, third party marketplace that can incorporate with Investre.Network's cross-chain collateral management protocol. Investre.Network will also have an in house financial product marketplace for loan and derivatives.

Investre.Network designs the off-chain relay similar to "electronic communication network" in stock trading. Counterparties anonymously enter their desired trading parameters to the financing platform, such as type of crypto, quantities, directions (borrow or lend), and maturity (term or open) in the case of loan. All the entries are transparent to all members of the platform. Counterparties can revise and update their entries any time.

The platform searches over all the entries continuously. When it finds a match, it contacts the counterparties and places them in a virtual meeting room, where they can (anonymously) engage in multi-attribute negotiation. The attributes to be negotiated are maturity, interest rate, collateral ratios (initial and maintenance), etc. The design of the platform also allows the negotiation parties to reject the counterparty's initial proposal and suggest another, and so on, indefinitely.

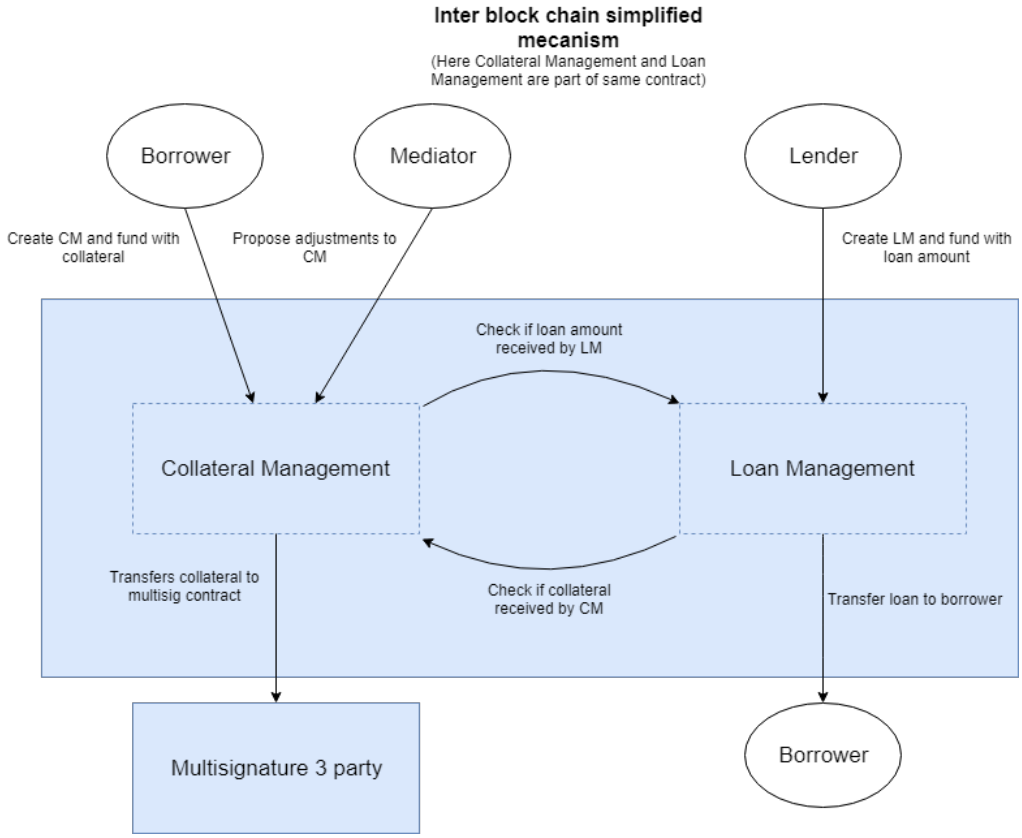
Negotiation is a difficult, error-prone, ambiguous task if performed under time pressure. To facilitate negotiation, for example Investre.Network provides research support on recommended collateral ratios for each crypto pair, recommended interest rate for each maturity, etc. for loan, which the lender and the borrower can use in finalizing their transaction.

Investre.Network also provides another trading alternative to counterparties similar to "crossing networks" in equity trading. In the case of loan, borrowers and lenders can enter their desired requests specifying type of crypto, quantities, directions, and maturity, as well as agreeing to use Investre.Network's pre-specified recommendation on the other attributes to complete the transaction. In a crossing, our platform matches borrowers and buyers with interest rate and collateral ratios following the pre-specified recommendation by Investre.Network. Eight crossings are scheduled each day. The exact time of a cross is partially random.

2.7 Intra Blockchain versus Cross Blockchain mechanism

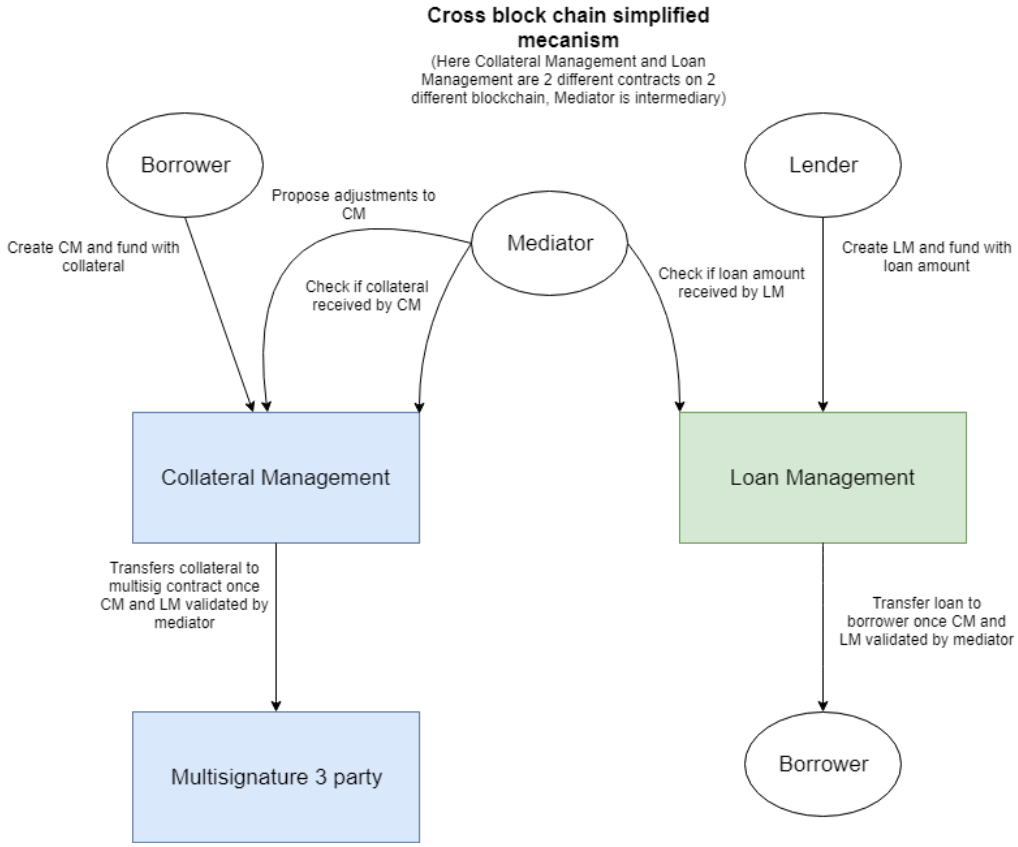
Intra Blockchain

In intra blockchain mechanism, Collateral Management and Loan Management are part of the same contract as they can directly communicate together. So when global contract is funded, he can send loan to borrower and fund the multisignature contract.



Cross Blockchain

Collateral Management and Loan management need to be separated for cross blockchain mechanism (blue blockchain on the left and green blockchain on the right). In this configuration, Community (through Mediator) will verify that both Loan and Collateral have been received by Loan Management and Collateral Management contracts respectively. This way loan is being transferred to borrower only after borrower has sent collateral requirement to Collateral Management contract.



3 Token economics

3.1 The Investre.Network token

To offer our services, Investre.Network is building the Investre.Network token (IVT). The IVT is an ERC-20 token that can be exchanged peer-to-peer as an integral part of the Investre.Network platform, while remaining unobtrusive in an effort to promote liquidity.

3.2 Token use

IVT are required as payment for services through the Investre.Network platform. An analogy can be made between IVT which powers Investre and other tokens used to power a blockchain, such as ETH.

Crucially, **loans and derivatives are traded for a transaction fee in IVT**, and wealth management strategies are offered by users for a fee payable in IVT.

As fees are user designed, this allows them to adapt quickly to the changing value of the IVT. This provides the ecosystem with a stabilizing feedback loop.

The IVT ecosystem includes a deflationary mechanism: every time a user purchases a trading strategy, the majority goes to the strategist, with a small portion for Investre.Network to sustain the platform, **and a small portion is burned.**

In the long term, Investre.Network will propose premium trading services for a small fee in IVT, of which a portion will also be burned.

3.3 Token staking

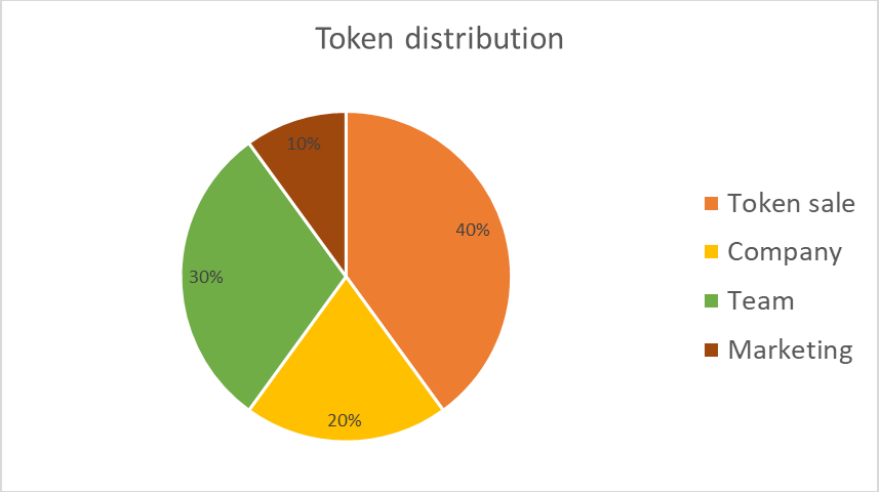
As Investre.Network is a cross-blockchain platform, it relies on its userbase to verify and confirm transactions. The full process is described above.

Users who act as mediators are rewarded by receiving a piece of the IVT fee that was charged when the trade occurred. These rewards are paid out, similar to mining rewards, **proportionally to how much IVT the user stakes for mediation.**

Users are also proportionately more likely to be chosen as mediators when they stake larger amounts.

3.4 Token distribution

Investre.Nework will issue 1 billion IVT token in total. The consideration is that the token is used for transaction fee. Hence the face value is small.



4 A deep dive into counterparty risk management

There exists counterparty risk to both the lender and the borrower in crypto lending/borrowing transactions. This risk is especially amplified by the high volatility of crypto prices.

The major counterparty risk to a lender is "borrower default", i.e., a borrower fails to return the crypto borrowed from the lender. In the event of borrower default, if the value of the collateral delivered is insufficient at the time of default to recover the cost to repurchase the loaned crypto, the lender would suffer a loss. This situation could happen either because the borrower is experiencing financial hardship or because market conditions change such as with an increased price of the loaned cryptos and/or a decreased price of the collateralized cryptos. For example, consider a borrower who had provided collateral of 1,400 ETH to borrow from a lender 100 BTC, valued at 0.085 ETH/BTC. When the borrower defaults at 0.07 ETH/BTC, the cost of repurchasing 100 BTC would be 1,428.6 ETH. In this case, the lender would suffer a loss of 28.6 ETH.

Investre.Network uses both collateral ratios and limit orders to manage the counterparty risk for the lender. Collateral ratio defines the amount of extra collateral beyond the value of the loaned crypto that the borrower needs to deposit.

Collateral ratio = Market value of collateralized cryptos deposited by the borrower/ Market value of loaned cryptos lent by the lender

Collateral ratio serves as the first buffer to avoid the possibility that the value of collateralized crypto falls below the value of loaned crypto. Limit order serves as the second buffer to terminate the transaction and liquidate collateralized crypto to loaned crypto when extreme volatility occurs to the prices of either collateralized or loaned crypto so that the buffer provided by collateral ratios are insufficient to protect the lender.

The major counterparty risk in a crypto lending transaction to a borrower is "lender default", i.e., a lender fails to return the collateralized crypto deposited by the borrower with the lender. This risk would not occur in an intermediated transaction since a financial intermediary possesses collateral on the lender's behalf and returns collateral to the borrower at the end of transaction. However, it becomes a concern in a disintermediated transaction. In such a transaction, if the lender possesses over-collateralized crypto, s/he has an incentive to default and profit from the over-collateralization. Take the same example that a borrower provided collateral of 1,400

ETH to borrow from a lender 100 BTC with the price at 0.085 ETH/BTC. This transaction is rightly over-collateralized with the value of collateral ETH exceeding the value of loaned BTC by 223.5 ETH or 19 BTC. If the lender possesses the whole amount of collateralized ETH, s/he can default with a profit of 223.5 ETH or 19 BTC.

While it is in the lender's interest to strategically default and walk away with over-collateralized crypto, this behavior could result in severe damage on both his/her reputation and future trading opportunities with other counterparties. All historical trading record of any borrower (and any lender) is transparent and fully disclosed to all participants. Any deviation from the socially accepted norm in previous trades would cause the borrower to lose credibility in future trades.

In addition to relying on the implicit cost of strategic default, Investre.Network also uses "reverse collateral ratio" to manage the counterparty risk for the borrower. All the crypto lending/borrowing transactions are over-collateralized to protect the lender. However, Investre.Network possesses a fraction of the collateralized crypto in an escrow account, while the lender possesses the remaining fraction. The fraction possessed by the lender should have a value less than 100% of the value of the loaned crypto. It is defined and maintained by reverse collateral ratios:

Reverse collateral ratio = Market value of collateralized cryptos possessed by the lender / Market value of loaned cryptos lent by the lender.

In the following, we discuss the mechanisms of collateral ratio and reverse collateral ratio in crypto lending/borrowing transactions.

4.1 Collateral ratios and limit order to protect the lender

Collateral helps the lender manage the counterparty risk. Every crypto lending is over-collateralized. The collateral is marked-to-market daily and adjusted to reflect any changes in the prices of both loaned cryptos and the collateralized cryptos. At a transaction's initiation, a borrower must post collateral of cryptos at an **initial collateral ratio**. Throughout the maturity of the transaction, the borrow needs to maintain the value of deposited collateral at a pre-specified **maintenance collateral ratio**. In the event that the collateral ratio of the collateralized crypto falls below the maintenance collateral ratio, Investre.Network will make a collateral call to the borrower so that the borrower needs to deposit additional collateral to meet the maintenance collateral ratio. If the borrower does not deposit in a timely manner,

the lender can liquidate the collateralized cryptos for the value sufficient to cover the crypto lent by the lender to the borrower.

A limit order (stop-loss order) can also be placed by the lender to liquidate the collateralized cryptos in the presence of extreme price changes. The price of the collateralized crypto in the limit order is between the price corresponding to the maintenance collateral ratio and the price corresponding to a 100% collateral ratio. Thus, in the extreme event when the crypto prices fluctuate violently during the time of the collateral call, the lender can use the limit order to minimize the borrower default risk that is not protected by the collateral call.

For example, consider a borrower who wishes to post collateral of ETH to borrow from a lender 100 BTC at a price of 0.085 ETH/BTC. The initial collateral ratio is 140% and the maintenance collateral ratio is 125% with which the borrower must comply. At the initiation of the transaction, the borrower needs to deposit 1,647 ETH as collateral to satisfy the initial collateral ratio of 140%.

Suppose that on the second trading day, the price falls to 0.075 ETH/BTC. This price change results in a decrease in collateral ratio to 1,647 * 0.075 / 100=123.5%, which is below the maintenance collateral ratio. The lender makes a collateral call, requesting the borrower to deposit at least 19.6 ETH to meet the 125% maintenance collateral ratio. Failure to deposit 19.6 ETH in a timely manner constitutes a borrower default, at which point the lender can liquidate the existing collateral of 1,647 ETH.

The lender can also place a limit order at a price at 0.062 ETH/BTC. Thus, during the time of collateral call, if the ETH price falls further from 0.075 ETH/BTC to 0.064 ETH/BTC, the limit order will be triggered and all collateralized ETH will be liquidated to BTC. Note that the lender will incur a loss if the price decreases below 0.0607, at which the value of collateralized ETH will be lower than the value of loaned BTC.

The maintenance collateral ratio and the limit order provide "safety cushion" to lenders in the event that a borrower fails to return the crypto that is out on loan. Lenders are free to use any collateral ratios and the limit order price, with considerations on the liquidity and the volatility of both loaned and collateralized cryptos, as well as the borrower's financial situation. To help manage the risk in collateral management, Investre.Network will recommend minimum maintenance collateral ratios and limit order prices for the major pairs of crypto lending transactions based on the historical trend of liquidity and volatility of cryptos. For example, Investre.Network

recommends the following minimum maintenance collateral ratios for transactions with BTC as collaterals :

1. For loaned cryptos listed as large cap in Bibox: 140% of minimum maintenance collateral ratios and a limit order price corresponding to 102% of collateral ratio.

2. For loaned cryptos listed as medium cap in Bibox: 200% of minimum maintenance collateral ratios and a limit order price corresponding to 105% of collateral ratio.

3. For loaned cryptos listed as small cap in Bibox: 330% of minimum maintenance collateral ratios and a limit order price corresponding to 110% of collateral ratio.

Investre.Network can also provide tailor-made recommendation on maintenance collateral ratio and/or limit prices for any crypto lending transaction with any pair of cryptos or baskets of cryptos.

4.2 Reverse collateral ratio to protect the borrower

Investre.Network designs a unique reverse collateral ratio for the borrower to manage the counterparty risk. Every crypto lending is over-collateralized, but the lender only received a fraction of collateralized crypto defined by initial reverse collateral ratio. Investre.Network will possess the remaining fraction of collateralized crypto in an escrow account. The reverse collateral ratio is marked-to-market daily and adjusted to reflect any changes in the prices of both loaned cryptos and the collateralized cryptos. At a transaction's initiation, a lender receives collateral of cryptos at an **initial reverse collateral ratio.** Throughout the maturity of the transaction, Investre.Network will ensure the fraction of collateralized crypto possessed by the lender to be no lower than the initial reverse collateral ratio. Investre.Network will rebalance the collateralized crypto possessed by the lender through the escrow account daily if the reverse collateral ratio at the end of the trading day is less than the initial ratio.

The lender also needs maintain the possession of the deposited collateral at a pre-specified maintenance reverse collateral ratio. In the event that the reverse collateral ratio (of the collateralized crypto possessed by the lender) falls below the **maintenance reverse collateral ratio**, a reverse collateral call will be made to the lender so that the lender needs to return additional collateral to the escrow account maintained by Investre.Network to meet the maintenance reverse collateral ratio. If

the lender does not return collateral in a timely manner, the borrower can terminate the transaction. In this case, Investre.Network will transfer the collateralized crypto in its escrow account to the borrower and the borrower can maintain the permanent possession of the loaned crypto.

Consider the same example that a borrower who wishes to post collateral of ETH to borrow from a lender 100 BTC at a price of 0.085 ETH/BTC. The initial reverse collateral ratio is 80% and the maintenance reverse collateral ratio is 90%. At the initiation of the transaction, the borrower deposits 1,647 ETH as collateral (see the calculation in Section 2.1.1), of which the lender possesses 941.2 ETH (100*80%/0.085) in his/her own wallet and Investre.Network possesses 705.9 ETH in an escrow account.

Suppose that on the second trading day, the price decreases to 0.08 ETH/BTC. This price change causes the value of the collateralized ETH possessed by the lender to decrease from 80 BTC to 75.3 BTC, corresponding to a decrease in reverse collateral ratio from 80% to 75.3%. At the end of the second trading day, Investre.Network will re-balance the lender's collateralized crypto by transferring 58.8 ETH (worth 4.7 BTC) from its escrow account to the lender to keep the lender's reverse collateral ratio no smaller than 80%.

Or suppose the price on the second trading day increases to 0.1 ETH/BTC. This price change causes the value of the collateralized ETH possessed by the lender to increase from 80 BTC to 94.12 BTC, corresponding to a decrease of reverse collateral ratio from 80% to 94.12%. The increased reverse collateral ratio is higher than the maintenance reverse collateral ratio of 90% so that Investre.Network makes a reverse collateral call, requesting the lender to deposit at least 41.2 ETH (worth 4.12 BTC) to Investre.Network's escrow account to meet the 90% maintenance reverse collateral ratio. Failure to deposit 41.2 ETH in a timely manner constitute a lender default, at which point the borrower can possesses permanently 100 loaned BTC and all ETH in the escrow account.

5 Crypto Financing Service: Lending/borrowing

In a crypto lending/borrowing transaction, one party transfers a crypto or a basket of cryptos to another party for a limited period of time, in exchange for ownership of collaterals in the form of another type or types of cryptos. The borrower pays a fee to the lender for the use of the loaned crypto or the loaned basket of cryptos. The borrower also needs to deposit collateral with the lender. The collateral could

be either a different type of crypto or a basket of different types of cryptos. Upon receiving the collateral of cryptos, the lender can reinvest or re-lend the collateral in another borrowing/lending transaction or use the collateral in any trading.

The maturity of a crypto lending/borrowing transaction could be fixed or open. In the case of fixed maturity (term crypto lending), the length of the maturity is specified in one week or the multiple of months. In the case of open maturity (open or on-demand crypto lending), the length is not specified and open ended.

In the closed crypto lending, interest accrues monthly and is compounded (i.e. there is interest earned each month on interest accrued over previous months). Accumulated interest is paid off at the end of maturity in the same crypto being loaned, together with the full amount of the loaned crypto.

In the open crypto lending, the loaned cryptos are subject to a right of recall by the lender. When a recall occurs, the lender can recover the loaned cryptos from the borrower in a pre-specified time period. The open crypto lending could also be terminated by the borrower provided the borrower gives notice before an agreed daily deadline.

Until the transaction is terminated by either the lender or the borrower, the open crypto lending automatically rolls over each day. Interest accrues daily but is not compounded (i.e. there is no interest earned each day on interest accrued over previous days). Accumulated interest is paid off every week/month in the same crypto being loaned until the transaction is terminated or on the day when the transaction is terminated. The interest rate stays the same throughout the transaction and do not change subsequently until the borrower and the lender agree to reset the rate.

5.1 Demand for crypto financing services

The crypto financing services provided by Investre.Network are designed to the following purposes:

- to facilitate settlement of a crypto trade,
- to facilitate delivery of a crypto short sale,
- to finance the crypto, or
- to facilitate a crypto loan to another borrower who is motivated by one of the above purposes.

Accordingly, there are a number of drivers of demand for our crypto financing services. The examples of the drivers are as follows:

1. Market-making by broker/dealers in crypto trading – The broker/dealers serving as market makers of a crypto are required to continuously provide both bid and ask prices for the crypto. Market-makers do not hold in their inventory every cryptos for which they make a market. Instead, they often perform their market-making function by borrowing cryptos to settle buy orders from their clients.

2. Collateralization – In any crypto lending/borrowing transactions, the lender often requests the borrower to deposit high quality and liquid cryptos as collateral. Thus, there is usually a high demand by investors to borrow high quality cryptos in order to collateralize other transactions. For example, an investor has XCP and wants to borrow DEX from a lender who requires ETH as collateral. The investor does not have sufficient number of ETH so that s/he needs to borrow ETH to collateralize this transaction. Thus, the investor could enter another crypto lending/borrowing transaction to borrow ETH with XCP deposited as collateral.

3. Arbitrage – Arbitrage strategies exist to take advantage of discrepancies between prices or markets. Take crypto exchange arbitrage as an example. There could exists discrepancies between prices of a crypto listed on more than one exchange. An investor could sell short the crypto in an exchange with the higher price and purchase the crypto in another exchange with the lower price. The investor could profit subsequently if the gap between prices in these two exchanges eventually closes. To implement this arbitrage, the investor needs to borrow the crypto in the exchange with the higher price in order to sell short.

4. Short selling – In many investment strategies, the ability to short a crypto is part of a broader strategy. There are also pure directional short strategies in the expectation that the crypto price will fall. In both strategies, the short seller needs to obtain the crypto s/he is selling. This demand necessitates securities lending/borrowing transactions in order for the investor to borrow the crypto for his/her short selling.

5. Liquidity enhancement – An investor could hold an illiquid crypto and is in need of funding in USD in the short run. The investor could participate in a crypto lending/borrowing transaction to borrow liquid crypto with his/her

illiquid crypto as collateral. The investor could subsequently exchange the liquid crypto USD to satisfy his/her funding need.

6. Diversification – Investors with a large undiversified position in a crypto may desire to diversify their crypto holdings to reduce the idiosyncratic risk of their undiversified holdings. This is especially the case for founders of blockchain ventures, who have both their jobs and their undiversified holding of crypto linked to the success of the venture. For these founders, the optimal investment strategy is to reduce the holding of the venture-linked crypto and diversify into other kinds of cryptos. Such a diversification strategy could be implemented through crypto lending/borrowing transactions.

7. Voting rights – Some cryptos entail voting rights on their respective platform. Investors holding this type of cryptos may wish to trade (e.g., diversify exposures) to other cryptos while retaining the ownership to exercise the voting rights if needed. This trade could be implemented through cryptocurrency lending/borrowing transactions.

5.2 Disintermediation in crypto financing services

Crypto financing services by Investre.Network are decentralized and disintermediated. Its design helps reduce or eliminate not only the service fee or commission charged by financial intermediaries but also the indirect costs in information leakage and crypto security risk. Our crypto financing services uses blockchain and smart contracts to replace the role financial intermediary in reducing information asymmetry and enhancing trust between transacted parties.

In particular, Investre.Network's lending/borrowing platform is an off-chain electronic trading platform and on-chain clearing protocols. The electronic trading platform anonymously brings together borrowers and lenders to reduce searching costs arising from information asymmetry. It also allows borrowers and lenders to negotiate privately and to eliminate the involvement of financial intermediaries such as brokers and dealers. The nature of smart contract ensures trustworthiness between borrowers and lenders and ensures the implementation of transactions. In Investre.Network's lending/borrowing platform, borrowers and lenders will enjoy the minimum transaction costs including **minimum commission and price impact, no risk of information leakage, no risk of front running, and no risk of crypto hacks.**

6 Crypto Financing Service: Derivatives

The cross chain collateral clearing protocol will be extended to support the clearing of crypto derivatives. The derivatives supported on Investre.Network are:

- Cryptocurrency options and CFD (Contract For Difference): Options (settled in the underlying cryptocurrency) or CFDs (settled in the cryptocurrency of your choice) are the cornerstone of hedging cryptocurrency risk. Investre.Network lists standardized strikes and maturities on the largest cryptocurrencies. The options and CFDs can be exchanged between users directly, facilitated by Investre.Network's cross chain solution.
- Volatility options: One of the main characteristics and attraction of cryptocurrencies is their high volatility. As the industry matures, we may see a reduction in volatility, but in the meanwhile there are several attractive products that can help reduce exposure to volatility. Investre.Network will publish a mathematically defined volatility index based off of Gemini and Coinbase prices, and list options on this index that are settled in a variety of major cryptocurrencies, with standardized maturities and strikes. These options can also be exchanged directly between users.
- Swaps: Swaps are contracts to exchange payments in one cryptocurrency for payments in another cryptocurrency. The payment is netted. Investre.Network will list standardized contracts for payments of a fixed percentage of notional between major cryptocurrencies, and just one net payment at the end of the contract. The swap contracts can also be exchanged between users.

6.1 Cryptocurrency options and CFD (Contract For Difference)

Going forward, we will refer to options and CFDs solely as options, as this term is more widely known. CFDs have the same profile as options, but are the more general use case as they can be settled in any cryptocurrency, rather than in the underlying cryptocurrency.

CFDs provide investors with the all the benefits and risks of owning a security without actually owning it. Since there is no ownership of the underlying asset, there is no borrowing or shorting cost. As long as counterparty is found, the long/short positions can be opened at the same time, without being subject to the ownership of the underlying tokens.

Options and **CFDs** are the cornerstone of hedging cryptocurrency risk. Investre.Network lists standardized strikes and maturities on the largest cryptocurrencies.

It is impossible to overstate how important this is to the cryptocurrency space - users will be able to not only go long but also go short on any cryptocurrency, without needing to move away from their blockchain of choice.

These option contracts can also be exchanged between users.

What are options for ?

There are many use cases for options :

- They can be used as a pure play: for example, to go short a cryptocurrency, or to go long a cryptocurrency without ever leaving their blockchain of choice.
- They can be used as a hedge: for example, the user is planning an token sales in ETH and would like to protect themselves against downward movements in the price of ETH.
- They can be used in volatility arbitrage, more on that in the next section.

Sample pricing

To aid in pricing, implied volatility levels will be given through the Black-Scholes formula [1] for the last traded premium.

6.2 Volatility options

One of the main characteristics and attractions of cryptocurrencies is their high volatility. As the industry matures, we may see a reduction in volatility, but in the meanwhile there are several attractive products that can help reduce exposure to volatility or provide direction trades based on the trader's intuition of the right market volatility levels.

[1] Black, F. och M. Scholes, 1973, "The Pricing of Options and Corporate Liabilities", Journal of Political Economy, Vol. 81, pp. 637-654 - the writers won a Nobel prize for this work.

6.2.1 Volatility strategies based on options

Many trading strategies rely on the aforementioned options and CFDs. Here are two examples:

- Long Straddle trade: The user believes the market has been unusually quiet, and volatility levels will be increasing drastically in a short period of time. A long Straddle means the user buys both a call and a put option at the same strike. The trader stands to profit if the price of the underlying moves away from the strike by a larger amount than the premium paid.
- Long Butterfly trade: The user believes volatility will decrease, and the price of the underlying will remain in a narrow range. A long Butterfly around a strike X means the user buys a call at (X-a), sells two calls at X and buys another call at (X+a). If the price stays in a narrow range the user makes a profit, and if the price moves away at worse the user loses the net premium paid.

6.2.2 Volatility index options

To allow more direct pure plays on volatility, Investre.Network will publish a mathematically defined volatility index based off of Gemini and Coinbase prices for major cryptocurrencies, and list options on this index that are settled in a variety of major cryptocurrencies, with standardized maturities and strikes.

Mathematical definition of volatility

Rigorously defining volatility is beyond the purview of this whitepaper. We will discuss a few methodologies below, and give the reason for our chosen methodology for defining volatility.

One way to define volatility is via the volatility implied by the options in the previous section. The advantage of this methodology is it gives instantaneous forward-looking volatility as given by a market price. The disadvantage, however, is that the volatility level will not be very accurate if the options market is not liquid. While there are relatively large option markets on BTC, the same cannot be said of most cryptocurrencies.

Another methodology is simply to calculate trailing standard deviation of the logarithmic returns of the price of the cryptocurrency for which we are calculating the volatility. In general, this method is not very preferable, as it produces backwards facing volatility.

Investre.Network will publish a volatility level based on a blend of these two methodologies. The methodology for each underlying will be rigorously defined using industry standard sources such as Coinbase and Gemini, for any third party to double check. Should users not look to trade these options, Investre.Network will develop alternative methodologies through a peer-to-peer mechanism.

6.3 Swaps

Swaps are contracts to exchange payments in one cryptocurrency for payments in another cryptocurrency. The payment is netted. Investre.Network will list standardized contracts for payments of a fixed percentage of notional between major cryptocurrencies, with payments occurring at the end of the contract, or at standardized dates for constant maturity swaps.

For example, this instrument allows the user to synthetically purchase BTC without ever stepping outside of the Ethereum network - at payment dates, if BTC outperforms ETH, the user receives a payment in ETH, and conversely, the user makes a payment should ETH outperform BTC.

Eventually, these swap contracts will also be exchangeable between users.

7 Crypto financing service: asset management

Investre.Network's crypto asset management service provides clients with more economy of scale in diversification and more investing options than they would have by themselves. Investre.Network matches clients to appropriate investment pools that match their financial objective and investment philosophy. Each investment pool is formed and managed on the peer-to-peer basis following specific guideline of a broadly defined trading strategy, such as growth at a reasonable price (GARP), smart beta with momentum filter, crypto long short, etc. Clients in each investment pool can pool their investment following one or several trading strategies agreed upon jointly by all clients in the pool. Investre.Network monitors the performances of trading strategies in all investment pools and discloses the performance report monthly to all clients.

Investre.Network will provide the following functions for crypto asset management service:

- Form investment pools corresponding to various broadly defined trading strategy

- Advise potential clients in the range of investment pools matched with their investment philosophy and objective
- Enroll new clients into various investment pools
- Facilitate peer-to-peer communication in finalizing and executing trading strategies in each investment pool
- Provide monthly statements of client accounts, performance information, etc.

Investre.Network will not provide the following functions in its crypto asset management service:

- Manage investment accounts on behalf of clients
- Possess crypto in its own wallet on behalf of clients
- Participate in funding various investments
- Advise investors on formulating final strategies
- Invest in any P2P based investment pool
- Using any trading strategy developed by clients for proprietary investment

7.1 Process in crypto asset management service

Investre.Network designs crypto asset management services with the following process.

The first step of the process is to formulate investment policy: Investre.Network will use a proprietary application to understand clients' needs for return, risk preference, liquidity, ESG (environmental, social, and governance) concerns, investment philosophy or the overarching beliefs of investment, etc. With this understanding, Investre.Network will help each client define investment goals, acceptable investments, and portfolio limitations. Overall, Investre.Network will establish investment policy parameters for each client in this first step of the process.

The second step of the process is to match between clients and investment pool: Investre.Network recommends several investment pools to clients to choose based on the investment policy parameters established in the first step. Investre.Network identifies relative value between pools to facilitate clients to make a choice on the investment pools they want to participate.

Investre.Network organizes investment pools so that the clients with similar investment philosophy and investment needs can jointly design and execute their trading strategy. The formulation of investment pools considers all demands and investment philosophy from investors. The investment pools consist of both passive and active investment strategies.

The examples of active crypto management pools are

- Event driven: Trade on news of a wide range of events that can move a venture's crypto price significantly in the short run. An "event" could include an token sales, a merger or an acquisition, a product development, etc.
- Long short crypto: buy cryptos that are expected to outperform and sell cryptos that are expected to underperform. Long/short portfolios can either be market neutral or have a net long bias or a net short bias.
- Short-only crypto: only short cryptos, usually in an overall bear market with expectation of a fall in crypto prices.
- Long-only crypto: only long cryptos, usually from a long-term perspective.
- Absolute return: Use various hedging techniques, such as derivatives and/or short exposures, to achieve stable returns with moderate volatility.
- Distressed crypto: invest in cryptos that are facing potential restructuring or liquidity or funding issues.
- Quantitative: Utilize technology-based algorithmic modeling on quantitative analysis to make investment decisions.
- Relative value arbitrage: Take advantage of perceived price discrepancies between highly correlated cryptos or between crypto exchanges.

The passive crypto management pools consist of both the return-based strategies but also recent risk-based strategies seeking beta returns:

- Index investing: Replicate the performance of an index as closely as possible by investing in the same securities and in the same proportions as an index. The different investment pools of index investing depend on the index to follow.

- Smart beta: use alternative methodology by strategically choosing, weighting and rebalancing the companies built into an index based upon factors or characteristics other than market capitalization. The different investment pools of smart beta depend on the factors/filter to be used. The examples of smart beta strategies are fundamental weighting, volatility weighting, dividend weighting, momentum filter, liquidity filter, size filter, etc.

The third step of the process is to design, finalize, and execute trading strategies in each investment pool. All strategies are based on investment in any range of investment vehicles in the crypto markets, including long, short, margin transaction, derivative products such as options and futures. They consist of both strategic allocations to build portfolios and tactical adjustments on short-term insights. More importantly, all strategies are developed through peer-to-peer communications without Investre.Network's advisement.

In the passive crypto investment pools, participants share programs, codes, or any nuances of their trading strategy, with full transparency. In particular, they jointly and collaboratively back-test all directions, revise trading strategies for each other, and converge to one or several finalized trading strategies. They also pool their funds to invest jointly on the finalized trading strategy or strategies. The cost and the profit from the joint trades will be distributed and shared in proportion to each participant's investment. Overall, the design of the peer-to-peer mechanism in the passive crypto investment pools is characterized by open source and shared trading.

In the active crypto investment pools, participants do not share programs, codes, or any nuances of their trading strategy. They develop, back-test, and finalize their trading strategies by their own. However, any trades based on their trading strategies need to be reported to and recorded by the corresponding investment pool. The performance of each trade will be calculated and shared to all participants of the investment pool with full transparency. Any participants, after comparing the performances of various strategies, can choose to copy the trades of certain strategies designed by other participants by paying a fee. Overall, the design of the "compare and copy" mechanism in the active crypto investment pool is characterized by the marketing and sales of active trading strategies. It is also a disintermediated design in that it uses the technology of smart contract to bypass the auditing of historical trading record by any intermediaries. Instead, the technology of smart contract directly helps certify the credibility of the record to all participants, so that the best active strategy prevails in each investment pool.

The fourth and the last step of the process is to monitor and benchmarking reporting. Investre.Network constructs appropriate index/benchmark for each investment pool. It conducts periodic performance monitoring and provides monthly performance reports. Investre.Network also maintains and report trading strategy and historical trades for passive crypto pools.

7.2 Disintermediation in crypto asset management service

Investre.Network designs crypto asset management services with a unique disintermediation feature. This feature distinguishes Investre.Network from other asset management services both in the traditional financial markets and in the crypto markets, where multiple intermediaries participate in an investment management transaction. There are several potential concerns with the participation of any intermediaries. First, potential conflict of interest could exist between intermediaries and their clients buying services. Intermediaries seek profit maximization for themselves. Thus, they could show favoritism and offer the most attractive risk/return propositions to large, more sophisticated clients while ignoring non- sophisticated retail clients. Such favoritism could maximize intermediaries' commission revenue for a given constraints of client attention and effort. Second, intermediaries could also privilege their long-term relationship clients at the cost of other clients, in exchange of maintaining long-term relationship or obtaining future business from these privileged clients. Third, when balancing between two comparable investment opportunities, an intermediary enticed by investment management kickbacks could recommend the opportunity most lucrative to itself, even at the expense of its clients' best interests, especially so for non-sophisticated clients. Lastly, in the extreme cases, intermediaries could commit fraud and conduct illegal scheme to transfer wealth from their clients to themselves. The above moral hazard concerns have recently amplified by many scandals in the traditional intermediated asset management industry, such as the Madoff scandal. They are also the focus of rumors of "cutting leeks" rationalizing the crashes of China's stock markets. Accordingly, investors have been demanding greater transparency and increased scrutiny in asset management industry.

However, even with the well-documented issues with intermediated asset management, obstacles exist for non-sophisticated investors to abandon the intermediaries in traditional asset management. First, non-sophisticated investors are constrained by their investment expertise, capacity in research time, and attention span to cover all investment vehicles. Consequently, it is prohibitively costly for these

investors to conduct due diligence and back-test competing strategies to generate optimal strategies. Second, non-sophisticated investors also lack financial resources and economy of scale in their investments to implement their strategies.

Investre.Network aims at disrupting the intermediation chain by overcoming these obstacles and providing maximum transparency and fairness even to the least privileged investors. Investre.Network has no intention to centralize and serve as an intermediary or a central counterparty in its crypto asset management service. Instead, it provides platform for clients to jointly evaluate, finalize, and execute trading strategies with all relevant information made available to all. In particular, Investre.Network relies on peer-to-peer mechanism to leverage on expertise and capacity of all participants. It also pools the investment of all participants in limited strategies to achieve economy of scale. Finally, it relies on the technology of smart contract to achieve transparency and credibility in all disclosed information.

8 Appendix

8.1 Crypto lending/borrowing versus securities lending/borrowing

The crypto lending/borrowing transactions resemble the securities lending/borrowing transactions in the traditional financial markets. The key difference is that the underlying assets are cryptos in crypto lending/borrowing while they are securities in securities lending/borrowing. Also, unlike the collateral being cryptos in crypto lending/borrowing, the collateral in securities lending/borrowing could be either securities or cash. The crypto lending/borrowing transactions are also similar to the traditional repo transactions. However, repo transactions typically are motivated by the need to borrow and lend cash, though a 'specials' segment of the repo market could also be driven by the demand to borrow particular securities. In comparison, crypto lending/borrowing is always driven by the need to borrow cryptos with no involvement real assets like cash.

The traditional securities lending/borrowing transactions are commonly arranged and managed by securities lending agents and prime brokers. A lending agent is not a principal to a securities loan, but is retained by the lender to manage its securities lending. Most of securities lending agents are custodian banks, and in some cases third party lending agents. Some asset managers such as BlackRock, Fidelity, and Vanguard can also offer securities lending agency. Prime brokers are

investment banks and securities firms offering prime brokerage to help borrowers borrow securities from agent lenders.

Agent lenders and prime brokers earn service fees ("spreads") on financing the client's margined long and short security positions, managing the process including valuation and collateral calls, or providing the counterparty default indemnification. They also earn returns from rehypothecation of collateral posted by borrowers, and accordingly compensate borrowers either through a lower cost of borrowing or a rebate on fees.

Thus, in the traditional securities lending/borrowing transactions, prime brokers and lending agents serve as financial intermediary to match between the lender and the borrow and to facilitate the transaction. The financial intermediary role is necessary in the traditional securities lending/borrowing transactions considering the information asymmetry and the lack of trust between lenders and borrowers. Prime brokers and agent lenders could mitigate the information asymmetry with their institutional knowledge and their long-term relationship with both the lender and the borrow clients. They could certify the trustworthiness of the lender and the borrower by leveraging on their institutional reputation.

The model of financial intermediary in securities lending transactions would lead to significant costs to crypto lending transactions. The direct cost comes from the service fees charged by the intermediary in facilitating the lending/borrowing transactions. The indirect costs come from the possibility of information leakage and the crypto security risk. First, the existence of financial intermediary in between any transactions could cause information leakage, especially from prime brokers. Transacted parties could suffer from the information leakage and be front-run by the other investors in the crypto markets. The information leakage and insider trading happened between commercial banking clients and proprietary trading during the Great Depression, which resulted in Glass Steagall Act and the financial regulation after 1933. It happened again between investment banks' client accounts and proprietary accounts before the 2008 financial crisis, which resulted in Volcker Rule and the separation of proprietary trading from investment banks after 2010. Information leakage could still be happening, evidenced by many cases charged by SEC and DOJ. The magnitude could still escalate to another crisis in the future. Second, crypto accounts are gradually more vulnerable to hackers. More than 3 million bitcoins could be lost forever according to a CNBC report. The concern of crypto security reached a new height after the report that hackers stole $530 million of digital money from Coincheck, a Tokyo-based exchange. Any intermediary-centered

model could inevitably be subject to the risk of crypto security, since any crypto transfer through financial intermediaries could risk being attacked by hackers as happened to Coincheck.

8.2 Options listed on Investre.Network

All options listed are American options (they can be executed at any time prior to maturity).

8.2.1 Option premium

This is always a parameter that is input by the user. Buyers (resp. sellers) are matched according to the highest (resp. lowest) premium they are prepared to accept, through an order book mechanism.

8.2.2 Pairs listed

To help with liquidity, only a limited number of options are listed. OTC transactions can also be designed using the same contracts, but it may be harder to find a party looking to take the opposite side of the contract.

8.2.3 Tenors listed

- 1 week (ends on the next Sunday)
- 1 month
- 2 months
- 3 months

Ends on the first day of the month each time. Other maturities can be selected by the user, but liquidity may be lacking.

8.2.4 Strikes listed

- At-the-money
- 2 strikes on either side, along with psychologically relevant levels ($10,000 BTC, $1,000 ETH, 0.1 ETH/BTC, $1 XRP, etc)

8.3 Volatility options listed on Investre.Network

8.3.1 Underlying

- BTC (settled in BTC, ETH, XRP)
- ETH (settled in BTC, ETH, XRP)
- XRP (settled in BTC, ETH, XRP)

8.3.2 Tenors listed

- 1 month
- 2 months
- 3 months

Ends on the first day of the month each time.

8.3.3 Strikes

- At-the-money, to the nearest 10%
- 2 strikes on either side, to the nearest 10%

8.4 Swaps listed on Investre.Network

8.4.1 Swaps strikes on Investre.Network

This parameter is always input by the user.

8.4.2 Tenors listed

- 1 month (no reset)
- 2 months (payment every month)
- 3 months (payment every month)
- Constant maturity (payment every month)
- Always based on a 1 BTC payment/month on the BTC side.