



 Plutus Capital
普利拓斯



Whitepaper

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Introduction To Decentralised Finance

03



With the advent of blockchain technology, decentralisation can become a reality in a multitude of industries. Decentralisation allows for a peer-to-peer network to create a distributed ledger such that there is no single point of failure, with identical records are kept across thousands of computers. Such networks can be permissioned or permissionless, and relies heavily on smart contracts to eliminate transactional and verification actions traditionally requiring middlemen.

While banks or payment processing companies can close the account of a customer, blockchains are censorship resistant. The introduction of blockchain to the public would allow people to be their own bank and be in control of their own finances. The decentralised ledger technology diminishes the need of a middleman and hence every individual can be responsible for their own finances, with power to set their own rules and manage their assets privately.

Problems in the Current Financial System

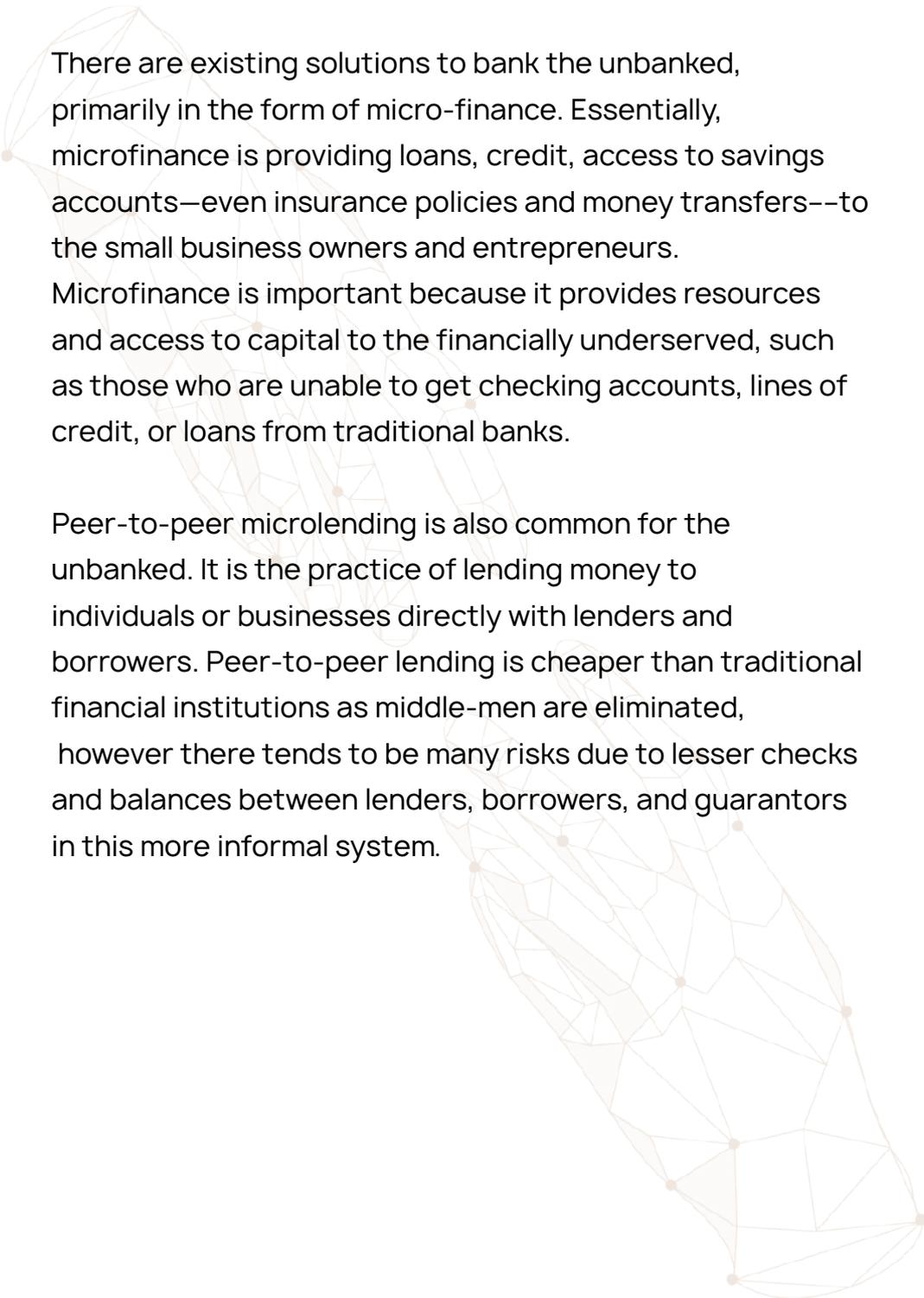
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The current global financial system has been inefficient in multiple aspects.

Firstly, the high number of intermediaries in the current system leave users open to countless security risks. According to CIODIVE, cyber criminals target financial services 300x more than other sectors and PWC analysts claim that 45% of financial intermediaries (such as money transfers, stock exchanges) suffer from serious cyber crimes every year. But the growing number of cyber attacks is not the only problem with the current financial system.

Secondly, the existing financial system deprives millions of people from basic financial services because of barriers such as location, wealth and status. Around 1.7 billion adults remain unbanked today - without an account at a financial institution or through a mobile money provider. Accenture estimates that banks could generate up to \$380 billion in annual revenues by closing the small business credit gap and including unbanked adults in the formal financial system. These groups remain unbanked due to several reasons - lack of money to open or maintain an account, privacy, lack of trust on the bank, problems with credit or former accounts, inconvenient hours and locations to name a few.



There are existing solutions to bank the unbanked, primarily in the form of micro-finance. Essentially, microfinance is providing loans, credit, access to savings accounts—even insurance policies and money transfers—to the small business owners and entrepreneurs.

Microfinance is important because it provides resources and access to capital to the financially underserved, such as those who are unable to get checking accounts, lines of credit, or loans from traditional banks.

Peer-to-peer microlending is also common for the unbanked. It is the practice of lending money to individuals or businesses directly with lenders and borrowers. Peer-to-peer lending is cheaper than traditional financial institutions as middle-men are eliminated, however there tends to be many risks due to lesser checks and balances between lenders, borrowers, and guarantors in this more informal system.

Proposed Solution: Plutus Capital As A Decentralised Financial System

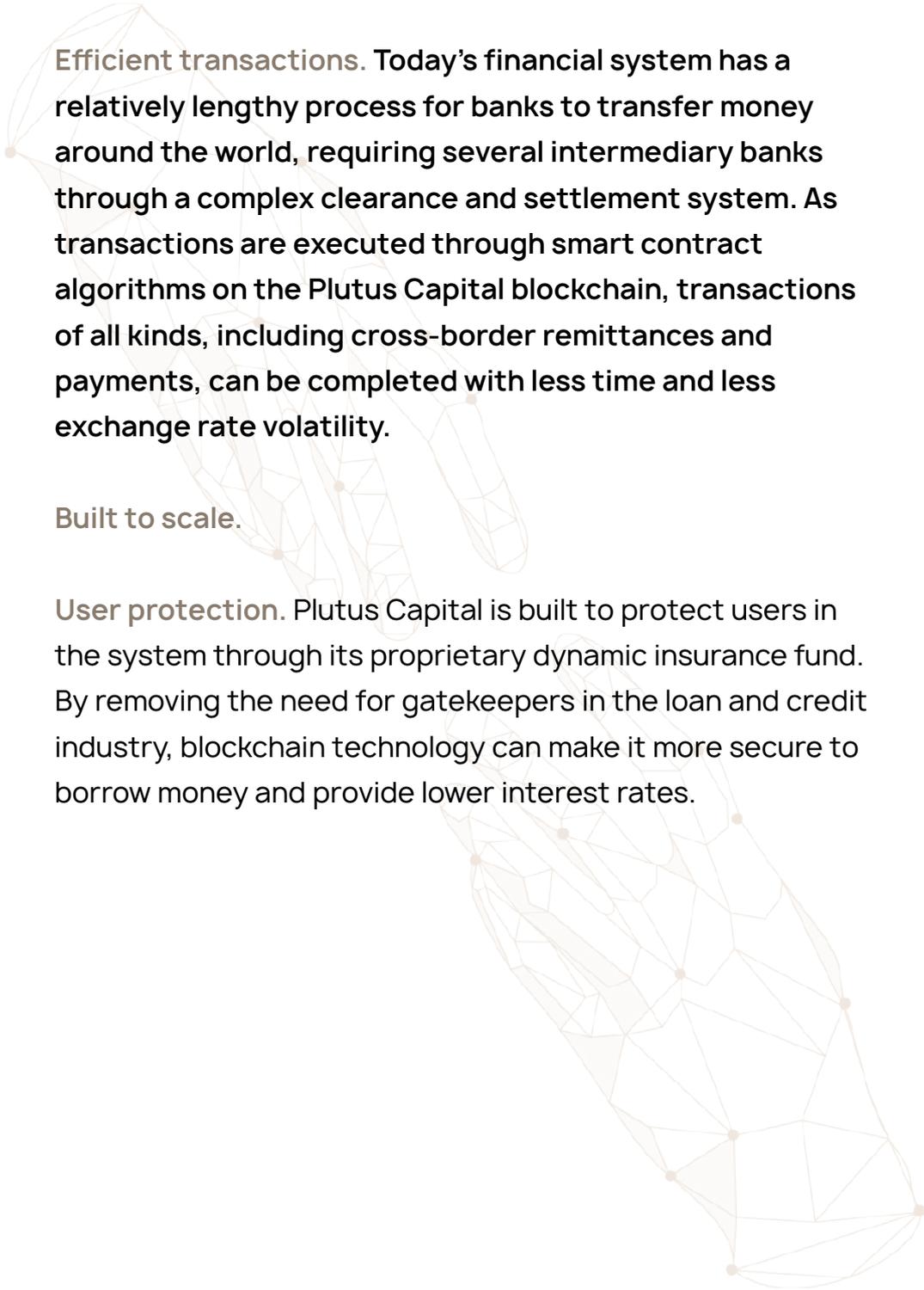


Plutus Capital is a revolutionary decentralised financial system built on a public blockchain, accessible to everyone, regardless of their credit history, geography, or income level. The financial system would rely on the tamper-proof nature of the ledger, as well as the various verification and incentive measures built into its smart contract to establish trust between parties.

The use of a distributed ledger technology would allow for several key benefits to the Plutus Capital system.

No middlemen. Smart contract algorithms that allow for automated transactions and verifications reduce the need for middlemen facilitating these transactions. Lenders, borrowers, and their guarantors will be able to interact in a trustless environment.

Minimal fees. The current banking system charges flat fees and additional fees e.g. foreign exchange fee for many transactions, particularly cross-border transactions. This is a highly profitable exercise for banks. As the number of middlemen and unnecessary transactions are reduced through the use of blockchain technology, Plutus Capital will be able to reduce the fees to a minimal. These cost savings are then passed on to the end user, such that they are able to enjoy cheaper, borderless payments.

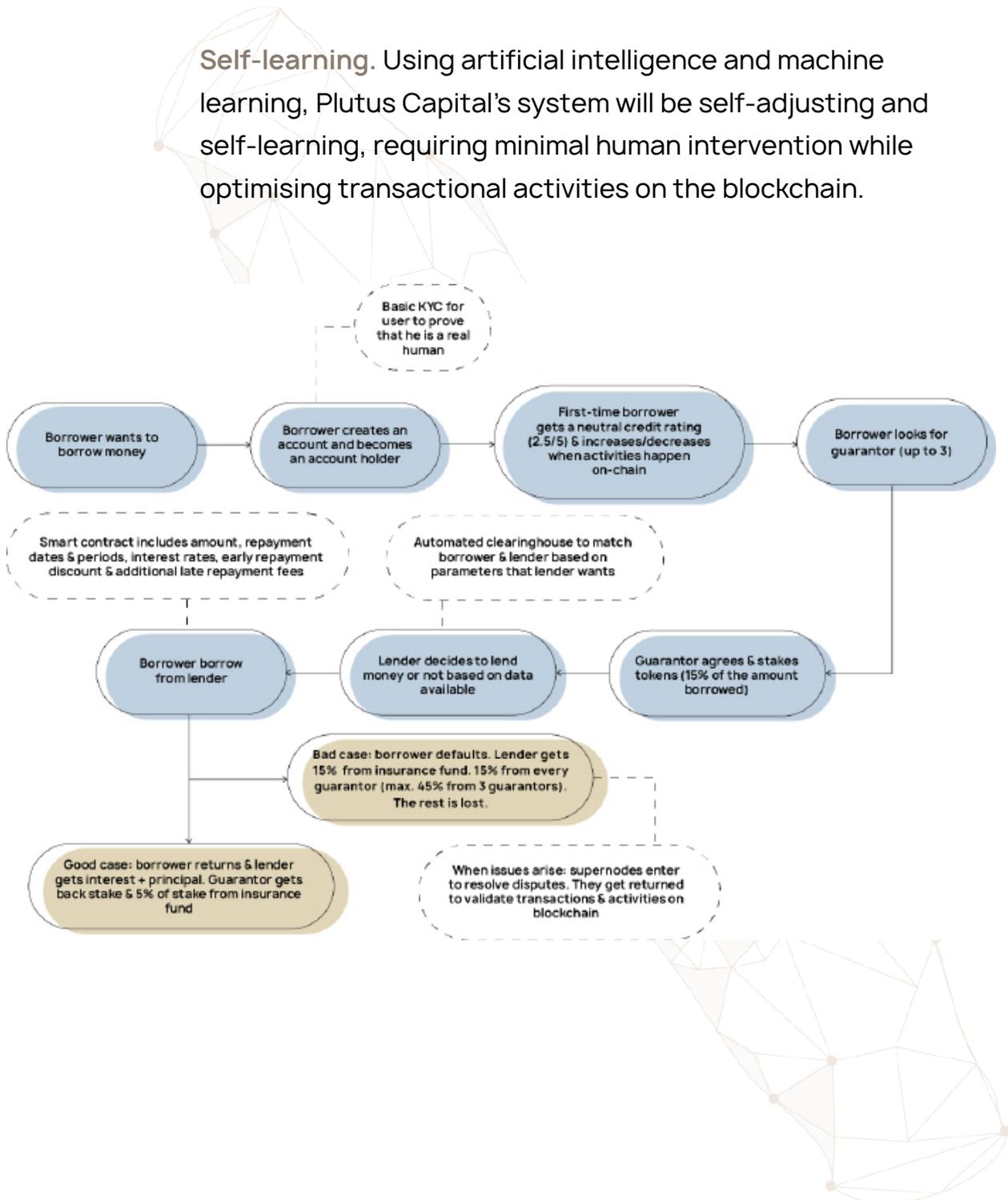


Efficient transactions. Today's financial system has a relatively lengthy process for banks to transfer money around the world, requiring several intermediary banks through a complex clearance and settlement system. As transactions are executed through smart contract algorithms on the Plutus Capital blockchain, transactions of all kinds, including cross-border remittances and payments, can be completed with less time and less exchange rate volatility.

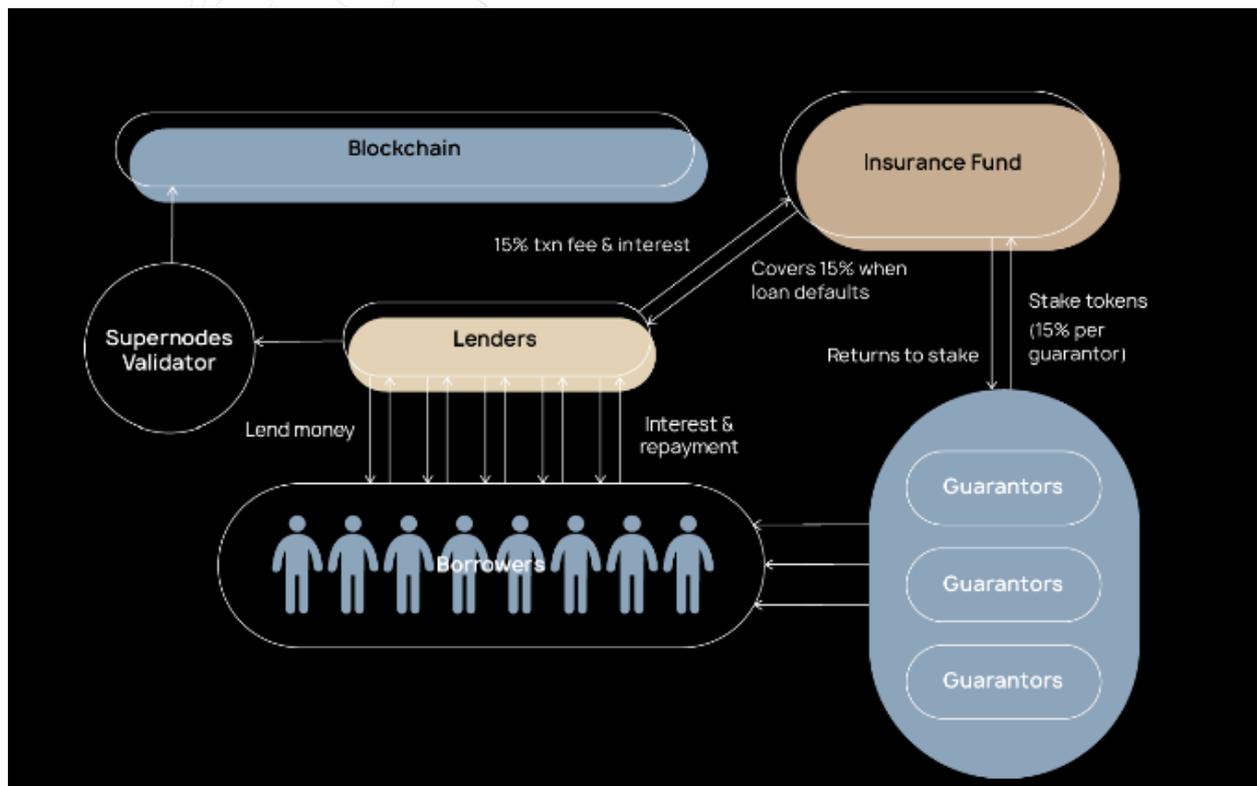
Built to scale.

User protection. Plutus Capital is built to protect users in the system through its proprietary dynamic insurance fund. By removing the need for gatekeepers in the loan and credit industry, blockchain technology can make it more secure to borrow money and provide lower interest rates.

Self-learning. Using artificial intelligence and machine learning, Plutus Capital's system will be self-adjusting and self-learning, requiring minimal human intervention while optimising transactional activities on the blockchain.



Economics of Plutus Capital



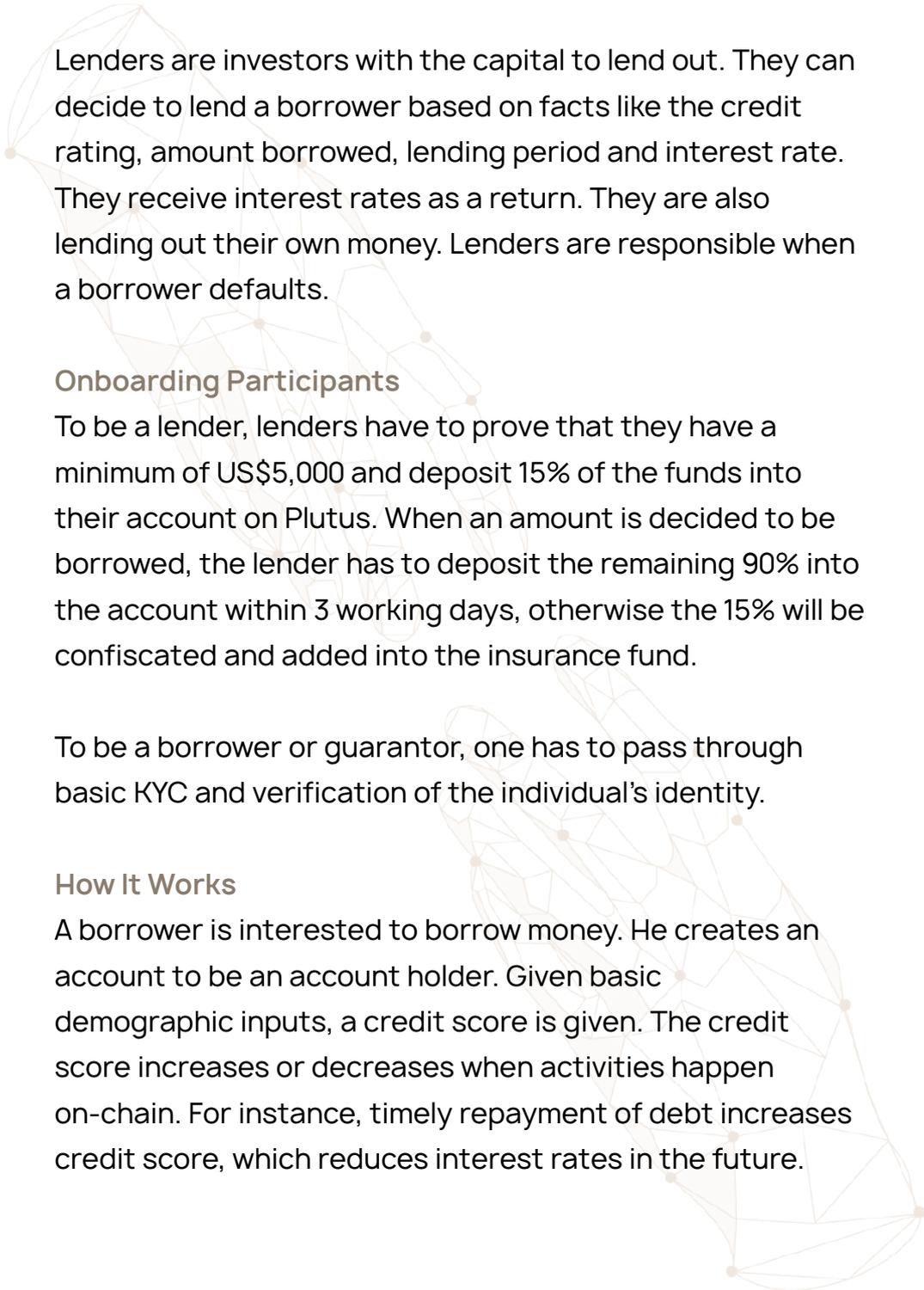
Plutus Capital consists of various participants, such as the validators (supernode) and various functions of account holders - guarantors, borrowers and lenders.

Participants of Plutus Cap

Validators are supernodes. They act as the functioning governance layer to validate the information in the ecosystem for it to be added onto the blockchain. There is always a fixed amount of supernodes, 30 validators. To be a validator, one must stake an amount of tokens. The system will then pick 30 validators out of the pool of validators (maximum 1000 validators) to validate the information at each period.

Guarantors are mini-validators, as they validate the borrowers in the system by vouching for them. A minimum of one guarantor is needed for each borrower group and a maximum of 3 is allowed. They are required to deposit 15% of the amount borrowed per guarantor, which goes into an insurance fund. They will receive a 5% of the amount deposited, when the loan is paid in full. When the borrower defaults, the 15% will be lost and given to the lender. A guarantor can vouch for a maximum of two borrowers in various borrowers group.

Borrowers are account holders that borrow money. They are rated with a credit rating score, which determines the interest rates they are entitled to. They can choose to borrow as an individual, pair or in groups up to five individuals. Borrowing in group reduces the interest rate, but increases the risk of them being blacklisted, should any one in the group default on the loan.



Lenders are investors with the capital to lend out. They can decide to lend a borrower based on facts like the credit rating, amount borrowed, lending period and interest rate. They receive interest rates as a return. They are also lending out their own money. Lenders are responsible when a borrower defaults.

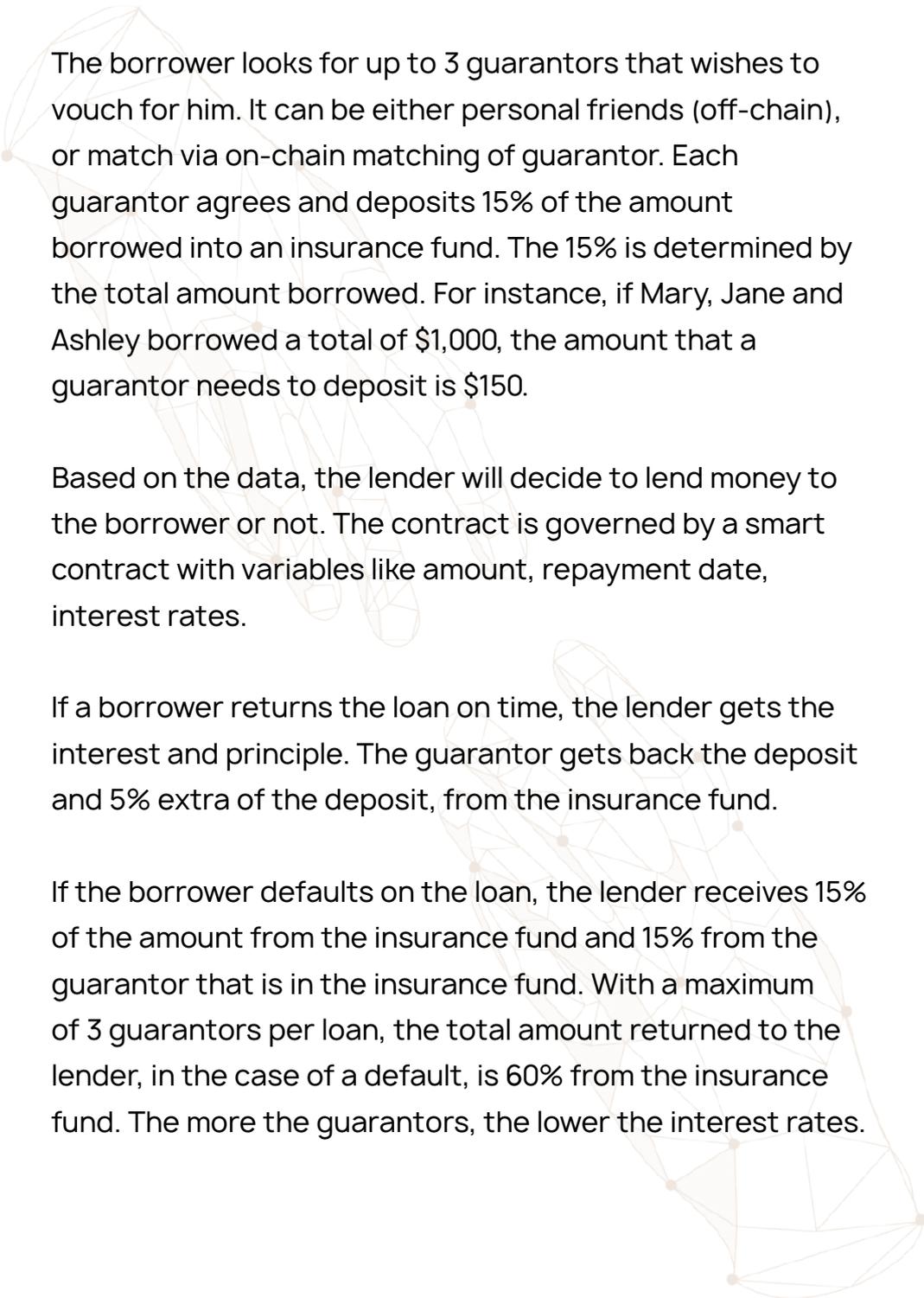
Onboarding Participants

To be a lender, lenders have to prove that they have a minimum of US\$5,000 and deposit 15% of the funds into their account on Plutus. When an amount is decided to be borrowed, the lender has to deposit the remaining 90% into the account within 3 working days, otherwise the 15% will be confiscated and added into the insurance fund.

To be a borrower or guarantor, one has to pass through basic KYC and verification of the individual's identity.

How It Works

A borrower is interested to borrow money. He creates an account to be an account holder. Given basic demographic inputs, a credit score is given. The credit score increases or decreases when activities happen on-chain. For instance, timely repayment of debt increases credit score, which reduces interest rates in the future.



The borrower looks for up to 3 guarantors that wishes to vouch for him. It can be either personal friends (off-chain), or match via on-chain matching of guarantor. Each guarantor agrees and deposits 15% of the amount borrowed into an insurance fund. The 15% is determined by the total amount borrowed. For instance, if Mary, Jane and Ashley borrowed a total of \$1,000, the amount that a guarantor needs to deposit is \$150.

Based on the data, the lender will decide to lend money to the borrower or not. The contract is governed by a smart contract with variables like amount, repayment date, interest rates.

If a borrower returns the loan on time, the lender gets the interest and principle. The guarantor gets back the deposit and 5% extra of the deposit, from the insurance fund.

If the borrower defaults on the loan, the lender receives 15% of the amount from the insurance fund and 15% from the guarantor that is in the insurance fund. With a maximum of 3 guarantors per loan, the total amount returned to the lender, in the case of a default, is 60% from the insurance fund. The more the guarantors, the lower the interest rates.

When issues arise, the supernodes will enter to resolve disputes. Supernodes will also get a return when they validate transactions and activities on blockchain.

For every transaction that happens, 15% of the transaction will be added to the insurance fund as transaction fees, which will be rewarded to participants when necessary.

Financial Management

1. Insurance Fund

In a case of a default, the maximum amount of loans covered by the insurance fund is 60%. That includes 15% each of the 3 guarantors and 15% from the insurance fund.

The insurance fund keeps 15% of all loans by the borrower, supported by each guarantor. 15% of all transaction fees also goes into the insurance fund, such as validation by supernodes, interest rates incurred on all loans.

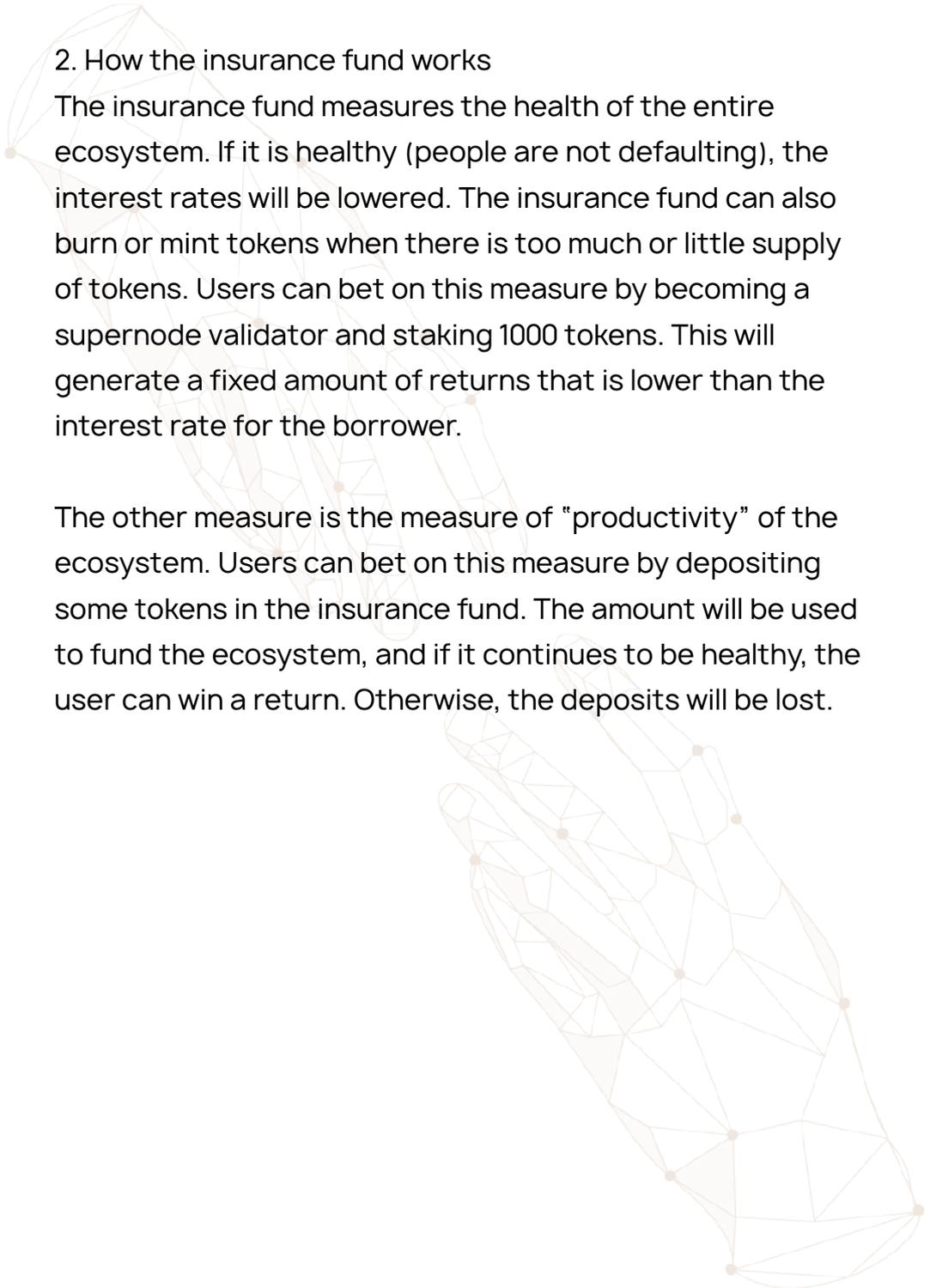
The fund is used to cover 15% of loans defaulted and pays 5% of the amount deposited by guarantors, if the borrower paid the loan.

In the future, there will be other use-cases for the insurance fund and to create other risk management products. That will depend on the activities and demand when the project is live.

2. How the insurance fund works

The insurance fund measures the health of the entire ecosystem. If it is healthy (people are not defaulting), the interest rates will be lowered. The insurance fund can also burn or mint tokens when there is too much or little supply of tokens. Users can bet on this measure by becoming a supernode validator and staking 1000 tokens. This will generate a fixed amount of returns that is lower than the interest rate for the borrower.

The other measure is the measure of "productivity" of the ecosystem. Users can bet on this measure by depositing some tokens in the insurance fund. The amount will be used to fund the ecosystem, and if it continues to be healthy, the user can win a return. Otherwise, the deposits will be lost.



3. Dynamic Interest Rate

The interest rates reflect the risk of default. The score is given by various factors like credit rating of guarantor, number of guarantors, credit rating of borrower, amount borrowed, size of lending group and duration of the lending. The method to calculate the interest rate is proprietary trade secret information.

4. Guarantor's Return to Stake

5% of the amount deposited by the guarantor will come from the insurance fund.

In the future, the returns (currently at 5%) can depend on other variables like amount staked, credit score of borrower and amount of loan.

5. Credit Score

Credit score is calculated based on the demographic information and on-chain activities. The method of calculating the credit score is proprietary trade secret information.

6. Worst Case Scenario and Solutions

What happens when a borrower defaults?

- 15% of the amount comes from insurance fund goes to the lender. The amount staked by the guarantor (in insurance fund) goes to the lender (15% each, up to 3 guarantors).
- Rest will be losses incurred by the lender (40%).
- If there's 3 guarantors for the loan, 45% of the amount staked by the guarantors (in insurance fund) goes to the lender, and 40% will be the loss incurred by the lender.

How to reduce defaults?

- Lend to people in groups, for those with credit score under 4.5/5
- Incentive to return earlier: discount on interest is returned earlier
- Punishment if return later: blacklist, more payment

World collapse & GFC 2.0: smart contract will stop lending money, emergency shutdown and money cannot be moved off-chain. Repayment in 24 hours will be given a discount premium.

Tokens in Plutus Cap

Lenders deposit digital assets (currently accepting USDT, BTC, ETH) into a smart contract. The smart contract mints PLT-tokens in accordance to the amount of collaterals. The smart contract will maintain a 150% collateral (minting only 66% of the value of the collaterals) and a top up is mandatory if the value of the collateral falls. 1 PLT is pegged at 1USD (for now). The tokens are added to each lender's account balance. It should represent a minimum of 15% of the total amount that the lender is willing to lend out. The smart contract is responsible for minting and burning the tokens via the deposit.

Tokens are generated via the smart contract. There is no limit to the amount of tokens available. Tokens can also be freshly generated for privacy issue, similar to that of Z-Cash.

Analysis of Existing Solutions

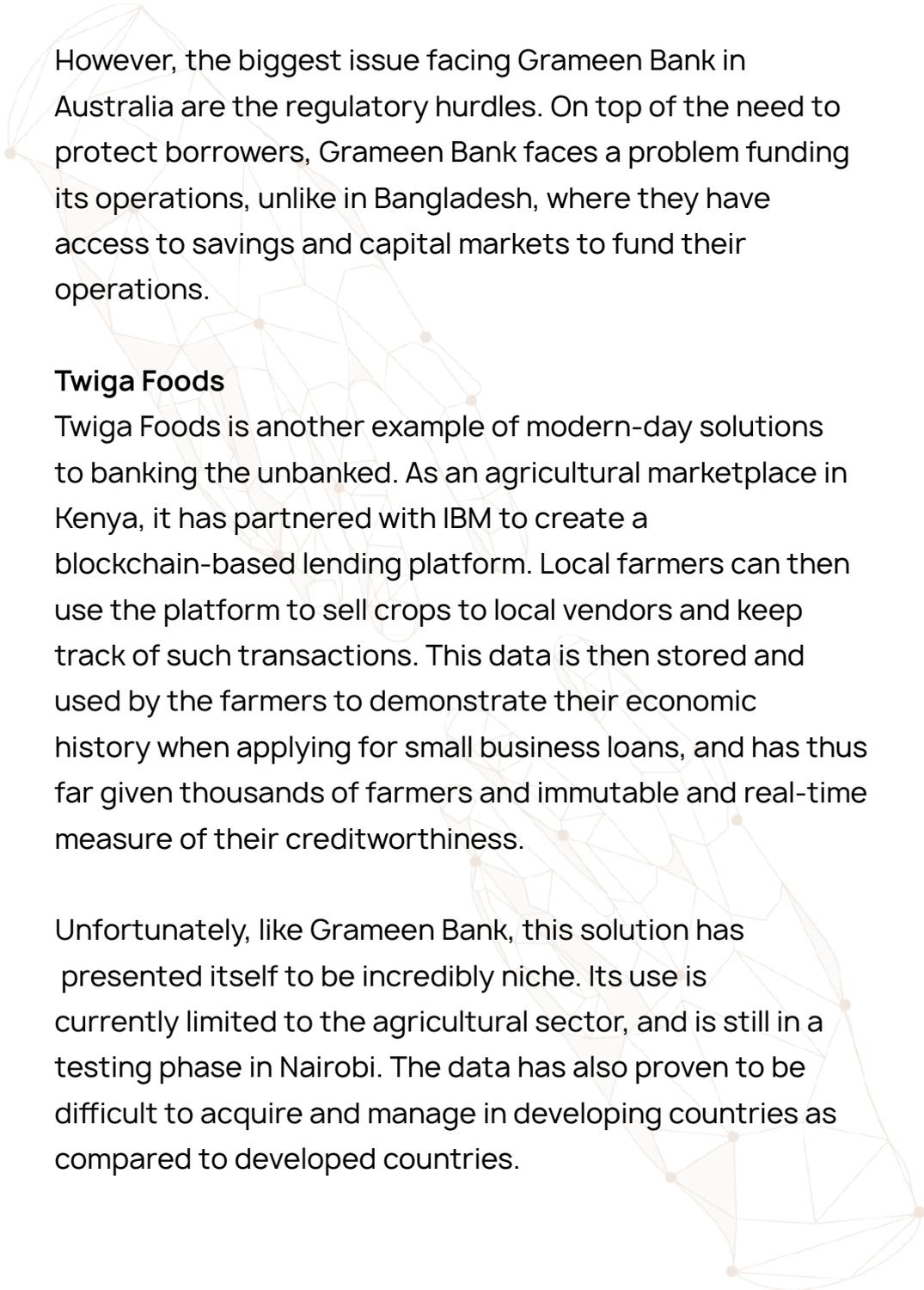


Grameen Bank

One of the most popular microfinance solutions has been Grameen Bank, as it has grown rapidly in the last 16 years of its existence. There are several advantages: it offers loans at low interest rates, its borrowers hold most stake in the bank, and it has high repayment rates. It disbursed US\$20.92 bn in microloans since its inception, and has over 8 million borrowers in Bangladesh. It operates by making small loans to the impoverished without requiring collateral. Of the bank's total equity, the borrowers own 94%, and the Bangladesh government owns the remaining 6%.

However, Grameen bank's success in Bangladesh did not translate to success in other countries. Grameen Bank has had some success in the [United States](#). However, this success has come in niche areas, with many [customers](#) being illegal immigrants, [Latino communities](#) and those who are historically persecuted.

In Australia, Grameen Bank's success is less apparent. Australia has few illegal residents, and not many Indigenous Australians live in the rural hubs that Grameen Bank has been targeting.



However, the biggest issue facing Grameen Bank in Australia are the regulatory hurdles. On top of the need to protect borrowers, Grameen Bank faces a problem funding its operations, unlike in Bangladesh, where they have access to savings and capital markets to fund their operations.

Twiga Foods

Twiga Foods is another example of modern-day solutions to banking the unbanked. As an agricultural marketplace in Kenya, it has partnered with IBM to create a blockchain-based lending platform. Local farmers can then use the platform to sell crops to local vendors and keep track of such transactions. This data is then stored and used by the farmers to demonstrate their economic history when applying for small business loans, and has thus far given thousands of farmers an immutable and real-time measure of their creditworthiness.

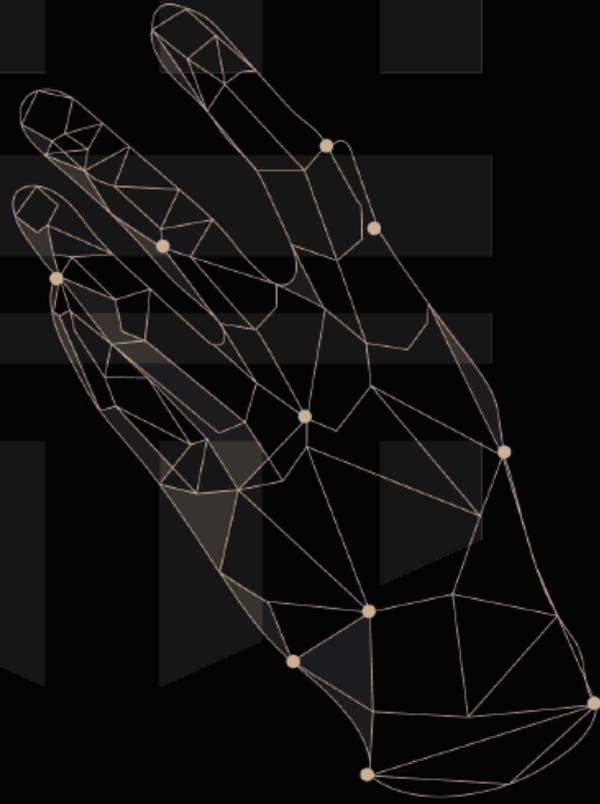
Unfortunately, like Grameen Bank, this solution has presented itself to be incredibly niche. Its use is currently limited to the agricultural sector, and is still in a testing phase in Nairobi. The data has also proven to be difficult to acquire and manage in developing countries as compared to developed countries.

Sikka

Sikka is an application funded and created by World Vision's Nepal Innovation Lab, which allowed 73 people in Sindhupalchowk, Nepal to receive 583,000 Nepali Rupees (approximately US\$5,500) in April 2018. This was done through the development of a smart contract using blockchain technology, based on the Ethereum protocol, allowing users to exchange their tokens on the Ethereum mainnet via SMS (as users' wallets were associated to their mobile numbers).¹

The focus of this platform has been on fund transfers, as opposed to a lender-borrower system, thus providing aid (not loans) to the financially marginalised through means of an NGO.

¹ <https://globalfindex.worldbank.org/>
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