WeTrust

For the People, By the People

DRAFT WHITEPAPER

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Abstract

Social safety nets have functioned among humans for millennia since pre-historic times, starting from hunter gatherer societies[1]. In modern times, there are three primary forms of social safety nets: Government, Commercial, and Reciprocal.

While most people already know this, citizens in developed nations are also starting to realize that relying **only** upon Government and Commercial Aid may not be a viable in the long term. Government aid can come in the form of Social Security, Unemployment, Medicare, etc... Unavailable for most of the world citizens, it is also underfunded where currently offered (USA, countries in the EU, Japan, etc…), according to leading economists. Commercial aid comes in the form of purchased insurance or emergency loans, and is laden with high operating costs. More importantly, commercial aid has a shareholder-first mentality, often to the detriment of policyholders/ borrower, and has a precedent of taking risks that endanger the financial system (see AIG bailouts in 2008). Lastly, this form of safety net is simply unavailable to two billion adults and their dependents - 40% of the global population.

[1] Harari, Yuval N. Sapiens: A Brief History of Humankind. New York: Harper, 2015. Print.

Enter Reciprocal Aid. What is it? Simply put, it is a Mutual Insurance organization where voluntary participants play the role of both customer and shareholder. They exist in many forms around the world including rotating savings and credit associations (referred as ROSCA from hereon in this document, also known by different local names globally), mutual insurance groups, fraternal organizations, religious groups, and professional societies. In these organizations, the average participant receives what they contribute over the life of their membership, and self-reliance is a core attribute. Their decline in recent years is due to inability to scale efficiently, lack of transparency relative to Commercial aid, and the increased role of Governmental aid. While these organizations have proven to be sustainable for millennia, and is currently used by Billions of people globally across developing & developed economies, Reciprocal Aid is **not** a panacea. Instead, WeTrust views reciprocal aid as a critical leg to the three legged stool of protection against uncertainty, and serves a complementary role along with Government and Commercial aid.

Our vision at WeTrust is to increase transparency and financial inclusion through reciprocal aid organizations on the blockchain.

ROSCA, a simple reciprocal aid organization

Savings and lending is a foundational building block of modern society, serving as both funds in times of financial need and fuel for funding economic growth. Access to capital can have impact of historical proportion. Without access to capital, Columbus's expeditions to the Americas may not have occurred, and perhaps nor would the subsequent explorations of the "New World". Without proper financing mechanisms, neither the Industrial Revolution, nor the tech boom in Silicon Valley would have spread at such rapid speed. Both national and local economies are affected by the ease or difficulty to access capital.

Today, most of the developed world has access to savings, loans, and financial products and people with steady paychecks have access to credit via credit cards, student loans, auto loans, mortgages, etc… Despite this prevalence, **two billion adults and their dependants, or 40% of the world -** lack access to a formal bank account.

Attempts have been made to address the lack of structured financial institutions in recent years. Kiva.org is a well known non-profit that has brought peer to peer loans to developing countries, but its penetration and usage has been limited[2] due to high fees, multiple transaction steps, and lack of transparency. Lack of mature financial infrastructure such as credit scoring also prevents a structured way to improve access to capital in a self-sustainable manner. This is a primary reason why 40% of the world lacks access to credit[3] .

[2] T. (2014, February 11). The joys of pretending to help the poor: The Kiva Story. Retrieved October 12, 2016, from http://www.dailykos.com/story/2014/02/11/1276681/-The-joys-of-pretending-to-help-the-poor-The-Kiva-Story

[3] Tuck-Primdahl, M. (2015, April 15). Massive Drop in Number of Unbanked, says New Report. Retrieved October 12, 2016, from http://www.worldbank.org/en/news/press-release/2015/04/15/massive-drop-in-number-of-unbanked-says-new-report

Yet these were the individuals hardest hit by the recent 2008 financial crisis and collapse of formal financial institutions such as AIG, Lehman Brothers, Bear Stearns, etc… Society and technology today have thus far been unable to adequately address this lack of access and lack of transparency in our institutions.

Thus the first Dapp on the WeTrust Platform is a ROSCA, where anyone can create their private savings and credit community, on the blockchain, with transparency built-in.

WeTrust ROSCA Dapp

WeTrust ROSCA is powered by smart contracts and blockchain technology. The savings and credit platform allows users to lend and borrow from each other at self-determined interest rates, with minimal friction. The immediate purposes that WeTrust ROSCA will serve:

- *Create an affordable path for two billion "unbanked" to obtain and track savings & credit*
- *Create a competitive alternative asset class for savers*
- *Facilitate group savings as a more effective way to reach individual saving goals*[4]

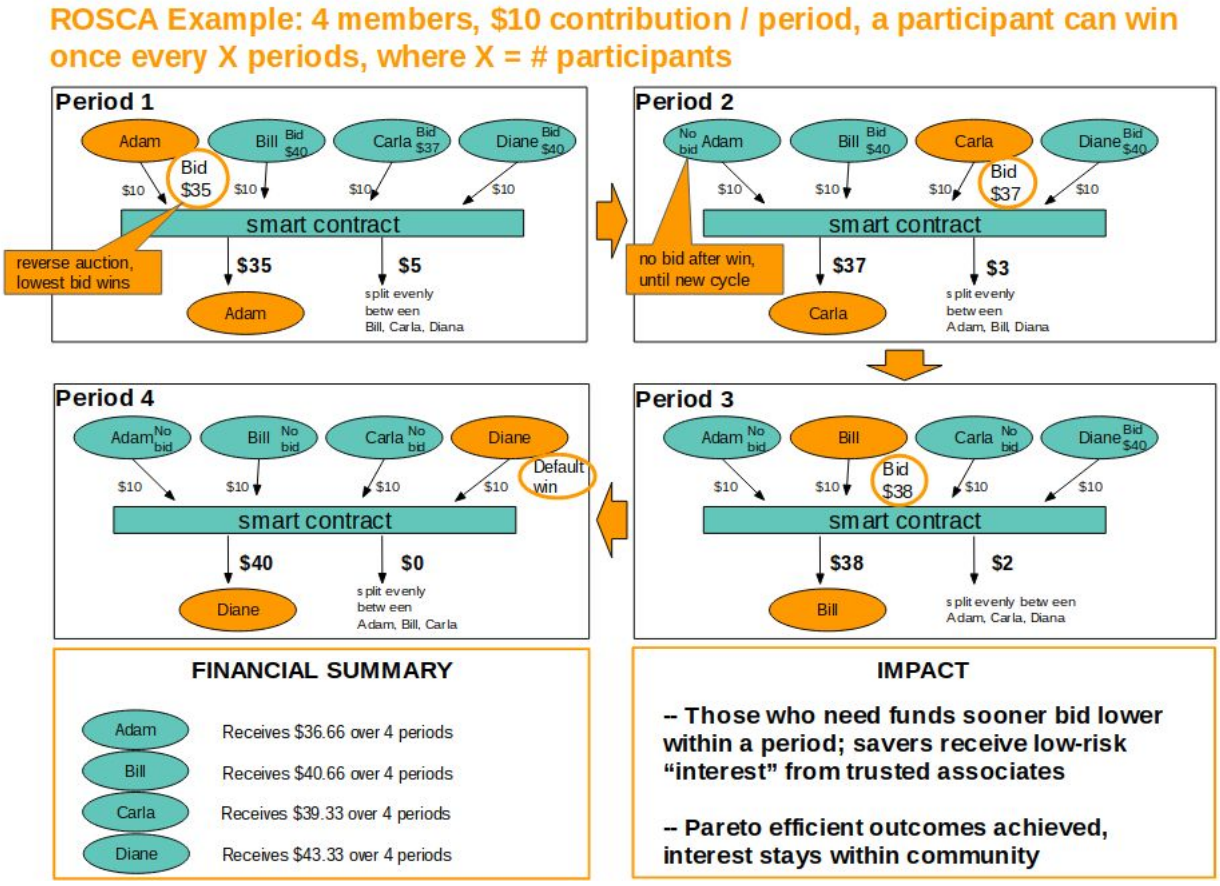
This product will serve multiple audiences, but the main audiences are a) the unbanked who need access to credit and b) those who do have access to formal financial institutions, but desire alternative solutions to saving and credit.

What is a ROSCA?

Rotating Savings and Credit Associations (ROSCA) have been used by communities around the globe for thousands of years, as a grassroots form of financial institution. A ROSCA is "a group of individuals who agree to meet for a defined period in order to save and borrow together, a form of combined peer-to-peer banking and peer-to-peer lending." [5] ROSCAs are commonly built along clan, geographical, social, or professional networks. In countries around the world, ROSCAs have a variety of different names such as: *susus* (Ghana/ Caribbean Islands), *tandas* (Latin America), *hui* (China), chits (India), *cundinas* (Mexico), etc...[6]

Here is an example of the detailed mechanics of a ROSCA in action:

[4] Reyes, B., Lopex, E., Phillips, S., & Schroeder, K. (2013). *Building Credit for the Unbanked: Social Lending as a Tool for Credit Improvement*[Pamphlet]. San Francisco, CA: San Francisco State University.
[5] Rotating Credit And Savings Association (ROSCA)." Investopedia. Investopedia US, 12 October 2016. Web. 12 October 2016.
[6] Bouman, F.A.J., "ROSCA: On the Origin of the Species" *Savings and Development* Volume XIX, No.2, 1995, pp. 129



Individuals contribute a fixed amount for a set duration at regular intervals, and the money is distributed each interval to individuals via either a lottery or a bidding process (the example above shows bidding, whereas a lottery is a random selection). ROSCAs produce results where all participants are individually better off[7] (or no more worse off) than not participating in the group (pareto efficient[8]).

The lack of modern credit scores is substituted efficiently by reputation, trust, social ties, and any issues that arise will be resolved by the participants of the respective ROSCA. Throughout history, ROSCA funds have been successful because they are formed around personal reputation and circles of trust.

ROSCAs have their own set of advantages and disadvantages compared to modern banking institutions, including the following.

Advantages of current ROSCAs vs formal banking:

- Interest rates are fair and based on supply/ demand from savers/ borrowers
- Multiple proprietorship – proprietorship lies not with one or two persons, but the group as a whole

[7] IFMR LEAD. (2015, March 31). *Chit Funds: Financial Inclusion Tool in India* [Video file]. Retrieved from https://www.youtube.com/watch?v=IQxx86yyI3o

[8] Pareto efficiency, also known as "Pareto optimality," is an economic state where resources are allocated in the most efficient manner, and it is obtained when a distribution strategy exists where one party's situation cannot be improved without making another party's situation worse. Pareto efficiency does not imply equality or fairness. (Investopedia US, 12 October 2016)

- No collateral – collateral and guarantees of repayment are typically ensured by social ties and desire to maintain reputation; social ties range from clan, geographical, occupational, etc… and result in lower default rates compared to lending from institutions
- Group saving is proven to be more effective to achieve individual savings goals due to accountability - akin to group exercise

Community benefits from using ROSCAs:

- Facilitates reciprocation of credit disbursal. The give-and-take attitude helps increase social bonds, as borrowing and returning money is the ultimate sign of trust.
- Avoids exorbitant interest and fees that funnel towards fragile centralized institutions thousands of miles away, and keeps capital within the community, encouraging growth in the local economy
- Encourages community participation in other fields of development – the participatory approach of informal initiatives is easily replicable to a wide range of community development issues.

Disadvantages of ROSCAs

- Informal ROSCAs are sub-scale and difficult to increase in size due to nature of having manual points of contact, resulting in less efficient lending supply/ demand matching
- Informal ROSCAs have zero tracking or credit-building, therefore no additional financial products can be built on top of one's successful history interacting with a siloed ROSCA
- High setup and handling fees charged by state run ROSCAs (e.g., 5-10% of distributions, in India, the Kerala State Company employs thousands and has billions in operational costs[9])
- High effective interest rates due to operational cost and transaction costs between institutions

Why put a ROSCA on the blockchain?

ROSCAs have many strengths and weaknesses that can be respectively be amplified and diminished by technology. A blockchain based ROSCA reduces the friction (high fees, low liquidity, accounting records, potential fraud from organizer) and automates an existing concept already proven in communities worldwide. It is also very difficult to scale a ROSCA beyond 10-20 people due to the need to physically collect cash at a regular interval, and collect bidding information. WeTrust offers significant upgrades to the current experience in the form of transparency, automation, and additional utilities such as credit reputation, so users can access increasingly powerful financial products based on building a high trust reputation.

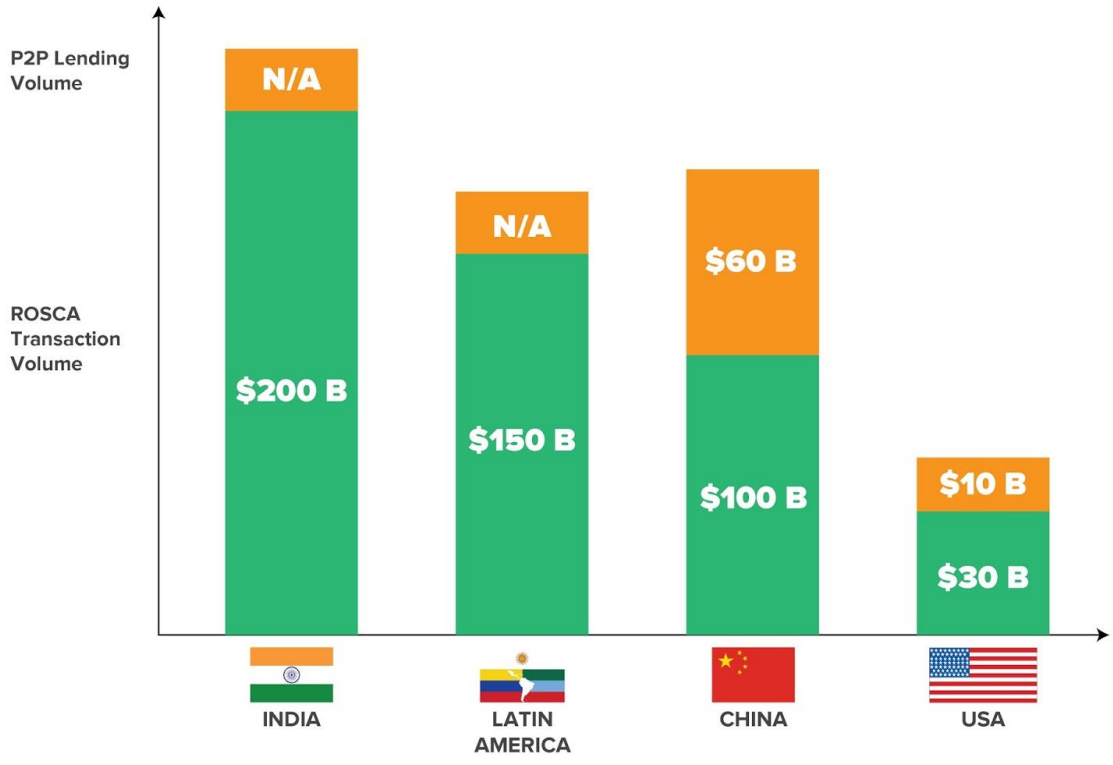
[9]Subramanian, S., Hari, S., Sanil, S., Subramanian, S., Pillai, S., & Nair, S. (2015, February 2). THE KERALA STATE FINANCIAL ENTERPRISES LIMITED. *Annual Report,* 1-60. Retrieved October 12, 2016, from http://www.ksfe.com/ANNUAL REPORT 2011-12.pdf

Why start with ROSCA as WeTrust's first Dapp?

Marketplaces can succeed if there is a balance between supply and demand, and critical mass is required from day one if users are to find usefulness in the WeTrust platform. This begs the inevitable "chicken and egg problem" in which a strong network is essential before users join and vice versa. To overcome this problem, we believe a ROSCA product is the ideal vanguard Dapp as it facilitates network effects and leverages existing networks/ behavior norms.

Market Size

The global ROSCA and informal banking industry is responsible for money flows over 10% of GDP in many countries, despite significant handling/ transaction costs. An estimated >$500 B flow through ROSCA type groups each year. In addition, with WeTrust enabled automation, ROSCAs serve as an attractive competitive alternative asset class not only to the rapidly growing p2p lending sector (over $70B/ yr), but also savings accounts, mutual funds, etc...



India: Formal banking institutions reach only ~15% of the population, and over $200 B is distributed via regulated and unregulated Chit Funds (term for ROSCA) where over 15,000 are registered entities, with a significantly larger unregulated Chit Fund sector[10] ; fees range from 5-10% of distribution, with thousands

[10] Acharya, N. (2015, July 18). Chit funds eye Rs 5K crore a year from NRIs. *Business Standard*. Retrieved October 13, 2016, from http://www.business-standard.com/article/companies/chit-funds-eye-rs-5k-crore-a-year-from-nris-115071800734_1.html

employed in the industry, and scams costing over $10B in recent years[11]. P2P lending is still in it's infancy with over 30 companies currently offering competing services.

China: A vast amount of lending is conducted via informal networks, with tech enabled p2p lending exceeding $60B/ yr[12] and conservative estimates of overall unregulated lending at over $2T/ year[13] and at least 5% going through ROSCAs.

Latin America: ROSCAs are used across Mexico (*cundinas*), Brazil (*pandeiros*), Peru, Argentina. Estimates of informal bank lending volumes exceed $150 B/ yr

USA: while accurate estimates are not available, anecdotal evidence shows 50-80% of recent immigrants from Latin America, Asian, and West Indies communities participate in some form of informal lending and ROSCA type arrangements.[14] ROSCA have transaction volume exceeding $30 B/ yr and online p2p lending exceeds ~$10 B / yr[15].

App Token

There are three essential parties in the WeTrust ecosystem: ***Sponsors****,* ***Forepersons, and Referral Partners****. We want to ensure Trust Coin is used properly to incentivise these actors to behave in a way that fosters growth and integrity on the system. These roles are not mutually exclusive, and one can wear any or all of these hats.*

Tldr;

1. **Sponsors** own tokens and are rewarded for playing a neutral 'arbiter' role in the network which requires them to accomplish tasks such as account validation, dispute resolution, handling insurance claims, serving as tellers for on/ off ramp between fiat/ cryptocurrency. One must own Trust Coins in order to participate in these tasks, and receive a reward for managing the network.
2. **Forepersons**: The organizer, evangelist, advocate, and product expert on the ground working with users of the WeTrust Platform. We depend on the Foreperson to educate, recruit, enforce and coordinate groups. Forepersons are rewarded with 20% of the total fees generated from the ROSCAs they organize.
3. **Referral Partners** aren't required to own tokens, and they receive a percentage of fees generated from the users that they introduce to our platform.

Details:

- **Sponsors**: These token holders preserve the integrity of the platform, are able to earn fees for

[11] Chit fund scams: Rs 80,000 crore and counting. (2016, April 24). *Times of India.* Retrieved October 13, 2016, from http://timesofindia.indiatimes.com/india/Chit-fund-scams-Rs-80000-crore-and-counting/articleshow/51967231.cms

[12] Chorzempa, M. (2016, July 15). P2P Series Part 2: Regulating China's Plethora of P2P Players. Retrieved October 15, 2016, from https://piie.com/blogs/china-economic-watch/p2p-series-part-2-regulating-chinas-plethora-p2p-players

[13] Elliot, D., Kroeber, A., & Qiao, Y. (2015, March). Shadow banking in China: A primer. *Economic Studies at Brookings*. Retrieved October 13, 2016, from https://www.brookings.edu/wp-content/uploads/2016/06/shadow_banking_china_elliott_kroeber_yu.pdf

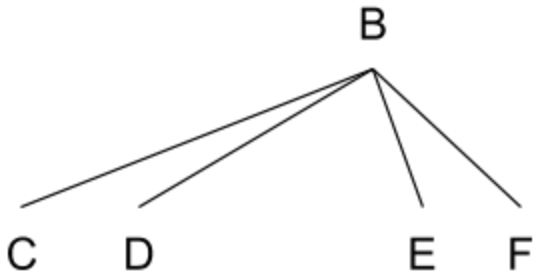
[14] Hevener, C. C. (2006, November). Alternative Financial Vehicles: Rotating Savings and Credit Associations (ROSCAs). *Discussion Papers, Federal Reserve Bank of Philadelphia,* 22-23. Retrieved October 13, 2016, from https://www.philadelphiafed.org/community-development/publications/discussion-papers/discussionpaper-ROSCAs.pdf

[15] LendingClub to Cut 12% of Its Workforce, as Loan Volumes Fall. (2016, June 28). Retrieved October 15, 2016, from http://www.wsj.com/articles/lendingclub-to-cut-179-positions-as-loan-volumes-fall-1467111409

tasks that ensure integrity of the platform and up to 40% of the total fees generated on the platform proportional to the number of Trust Coins they own. Non-participants are penalized 1% of their Trust Coin if they don't participate when called upon. 1% penalty is redistributed back to active participants. Sponsors perform the following tasks:

- **Account Validation**: New accounts are created with emails and can be associated with a purpose. (e.g. I'm joining WeTrust to save up in a community SuSu for my Christmas presents!) Additional validation tethering can also be attached, but users will be given an anonymous option. Sponsors (randomly chosen based on Trust Coin ownership) are required to approve or disapprove within one day. If the majority quorum approves, the member is allowed to create an account.
- **Dispute Resolution**: Problematic ROSCA participants can be reported to the Sponsors for conflict resolution. A jury (size tbd) is formed (again randomly) and the Sponsors will review the reason for missed payment and can either: 1) grant the participant additional time to repay or 2) penalize their credit with a negative mark
- **Staking (phase 2)** (need a minimum # tokens, tbd): A sponsor can earn additional fees by choosing an existing ROSCA or individual and underwrite the default risk.
  - Underwriting a ROSCA: Increase base fee from x% -> x+1% (sliding bar) per distribution and collateral will be put up to guarantee any missed payments. Sponsor receives the increased fee; however, the ROSCA members can vote to deny underwriting services.
  - Underwriting an Individual: The individual pays an increased fee x% -> x+1% (sliding bar) for a sponsor to put up collateral on his/ her behalf. Sponsor bears additional risk and receives increased fee, Individual gain more credibility.
- **Recruitment**: Sponsors can also act as a Foreperson or Referring member and accrue benefits accordingly (see below)
- **Mutual Insurance Claims Agent (phase 3):** As ROSCA pools increase in size, participants will have the option to create custom mutual insurance products using open source actuarial tables. When there is a claim on the insurance at least 2 opted-in TrustCoin token owners within the geographic region will be selected randomly to verify the insurance claim and will be paid a fee for their services. Remaining funds from excess premiums for a given period are returned to policyholders. Token holders that opt-in as claims agents participate in the Sponsor fee pool. Agents will also rated for the transaction and have a reputation score.
- **Teller (phase 3):** As participants need on-ramp and off-ramps between fiat and crypto, opted-in TrustCoin token holders have the opportunity to serve as tellers to facilitate transactions in their geography. Individual pays a fee (sliding bar, set by tellers) for handling fees. Tellers will be rated for the transaction and have a reputation score.
- **Debt Issuer (phase 2):** As users build credit profiles on the WeTrust platforms, token holders have the opportunity to issue loans to ROSCA groups or individuals seeking funds.
- **Sponsors who opt-in to Account Validation, Dispute Resolution, Teller, and Mutual Insurance Auditing services** will receive a portion of the fees generated due to the on-call nature of these responsibilities.

- **Forepersons**: The organizer, evangelist, advocate, and product expert on the ground working with users of the WeTrust Platform. We depend on the Foreperson to educate, recruit, enforce and coordinate groups. Forepersons are rewarded with 20% of the total fees generated from the ROSCAs they organize.
- **Referral Partners:** Participants of ROSCAs can earn rewards through several different channels.
    - **Direct Recruitment**
        - If you recruit someone to join you will receive 15% of all fees generated on disbursements from the ROSCA members he/she recruited directly. The Referring Partner is paid only at the successful completion of each epoch where there is 100% adherence among participants. If the ROSCA does not achieve 100% adherence for a given epoch, the fees enter the Sponsor pool.
        - If you recruit someone to join, who becomes an Foreperson, you will also receive 5% of the total fees generated by that Foreperson's ROSCAs
    - **Indirect Recruitment**: if you recruit someone, and they also recruit someone to join, you will receive 20% of the total fees generated in the ROSCA they receive. Again, fees are only collected if the ROSCA terms are adhered to.
    - **Fee Structure example: The 4 methods of earning fees are covered in this example ROSCA group, where B is the Foreperson with participants B, C, D, E, and F:**



Scenario:
Assumptions:

A) Total fee rate is a sliding scale (0.1% to 1.5%), is set by Foreperson, and agreed upon by the group, in this example they agreed upon a 0.5% fee
B) B, C, D, E, and F all contribute $800 per month and the total of $4000 is distributed to the auction winner and members according to the bid and residuals. 0.5% fee is placed on the $4000, which represents a total of $20 per round. Since there are 5 rounds in the Epoch, $100 fees are generated at conclusion of the Epoch.
C) Individual B is the ROSCA Foreperson in this group
D) Individual B was referred by A (non-participant in this ROSCA)
E) Individuals C, D were referred to the App by B
F) Individuals E, F were referred to the App by G (non-participant in this ROSCA)

Payout:

A) 20% of fees go to B because they are the Foreperson ($20)
B) C, D paid in aggregate $40 in fees, and 15% of that goes to the person who referred them

(B receives $6)

C) E, F paid in aggregate $40 in fees, and 15% of that goes to the person who referred them (G receives $6)
    a) If H referred G, H will receive 20% of the payout G receives ($1.2) for their **Indirect Recruitment** efforts, while G retains 80% ($4.80)
D) B paid $20 in fees, and 15% of that goes to the person who referred them (A receives $3)
E) 5% of fees go to the person who referred the Foreperson for the given ROSCA due to evangelist and critical operational role of the Foreperson (A receives $5)
F) $40 fees paid out in aggregate to A ($8), B ($26) and G ($6)
G) Of the remaining $60 in fees, $40 is placed into the Sponsor pool, to be distributed on a monthly basis according to the work contributed by Sponsors in the form of account validation, dispute resolution, and teller services. The remaining $20 is distributed to WeTrust Foundation, and used to pay developers for additional product development, research, marketing expenses, research grants, etc...

ROSCA Product Design

High Level Summary

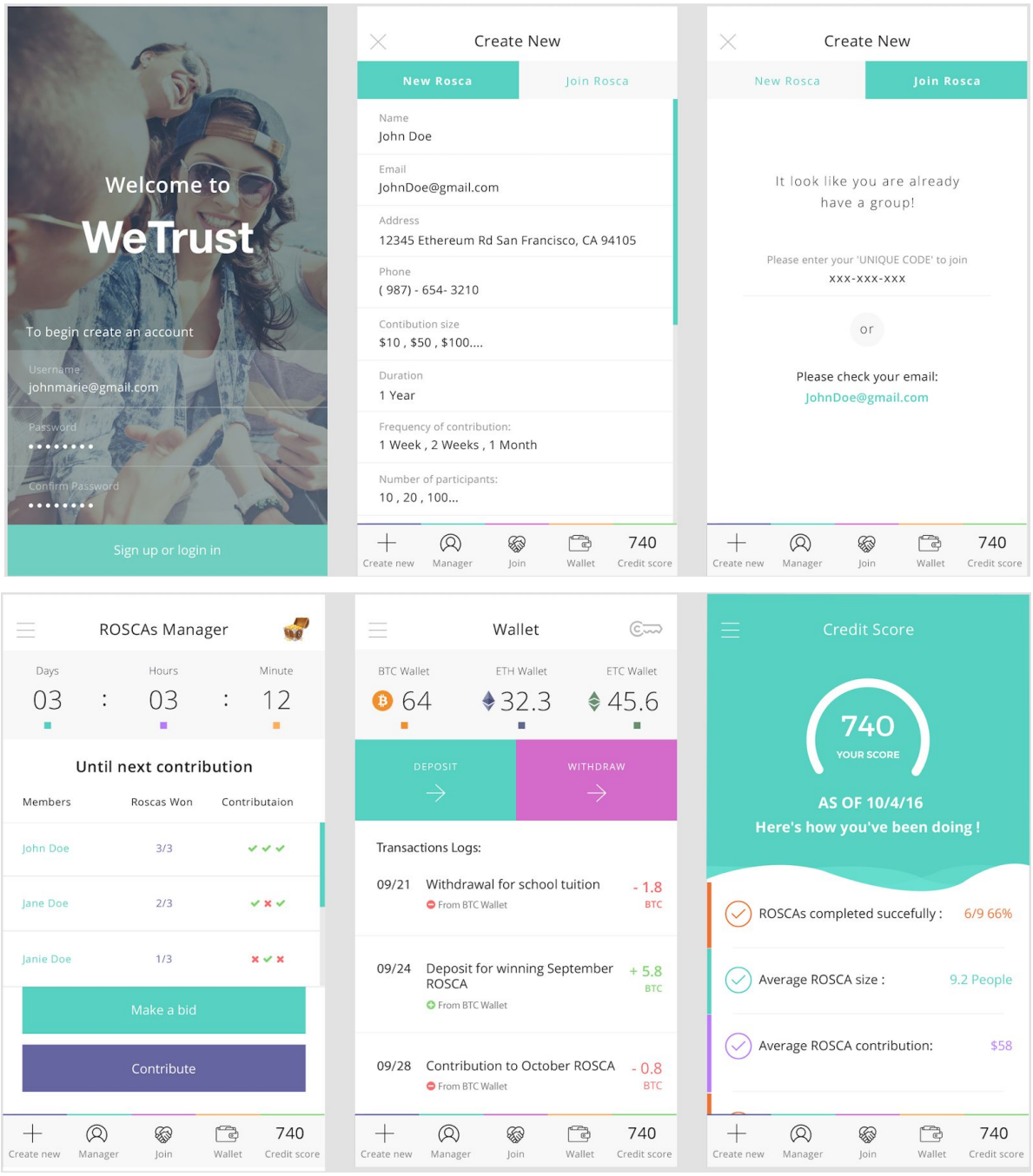
When users first download the ROSCA application, they would be prompted to create their account, after which a unique deposit address will be generated for each user. Periodic installments can be made directly into our platform and will signal the group if an individual misses payment. The platform will also handle bidding which distributes the monthly pot automatically to the winning bid. The ROSCA fund participants will be able to: view fund movements, bid information, and audit funds in escrow.

Deposits and Withdrawals

Users will deposit from their own wallet to the unique address during each round, and receive disbursements to the address of their choice. The foreperson determines the token to use, and WeTrust will provide recommendations on where/ how users can obtain the token of choice.

User Interface

The ROSCA product will have two main interface points: web portal and iOS/Android native application. The website will be basic and barebone, so it will not require intensive hardware, and thus will be accessible to anybody with a working PC or mobile phone. Upon visiting the web portal or downloading the application, users will be prompted with three options: ‘Create a New ROSCA’, ‘Join a ROSCA’ or ‘Manage ROSCAs’. The application is used for convenience, and only one person of the ROSCA group is required to have a mobile device or internet access.



1. ***'Create a New ROSCA'***: If you want to initiate a ROSCA for you and your friends, start here. Henceforth, the initiator is called the 'Foreperson'. Creating a New ROSCA will allow you to input the number of members in your ROSCA with their contact information, duration, contribution interval, contribution size, start date, and type (auction/lottery). If members do not have an email address or internet, the Foreperson can provide them with a unique code that will allow them to join the ROSCA and input/ confirm their personal details.

a. ***Foreperson***: The Foreperson is the individual who initiates the 'ROSCA Fund'. It is this person who will input the fund's specifications and input contact information.
b. ***Foreperson fee***: This is the agreed upon rate that the group wants to pay the Foreperson for organizing the group, and can be 0.
c. ***Contact Info***: This will include the all of the ROSCA members' contact such as: home address, email, phone, work address. This information will be viewable by members of the ROSCA, and cannot be viewed by outside parties unless granted by the individual.
d. ***Duration of ROSCA:*** The duration of the ROSCA will be equal to a multiple of the number of members in the ROSCA. The minimum duration of a ROSCA is equal to 1*# *members*contribution interval*, called an **Epoch**. If the ROSCA runs with duration that is greater than *1*# members*contribution interval*, it will operate thusly:

Suppose we have 10 members in our ROSCA. All will contribute in 10 equal intervals and will be able to claim the pot once. However, we can choose to extend the 'Duration of ROSCA' in multiples of 10 equal intervals (10, 20, 30…) and its members can claim the pot (1, 2, 3…times) respectively, but only win once per Epoch.

e. ***Contribution Size:*** amount each member commits to contribute at each interval.
f. ***ROSCA Interval:*** time period between each contribution/ distribution event.
g. ***Lottery ROSCA:*** the winner is drawn each period solely by random.
h. ***Auction ROSCA:*** individuals submit bids for the pot via reverse auction. The lowest bid (greatest discount) wins the pot for that interval. There shall be an effective minimum bid to prevent excessive equivalent interest rates. The discount is then redistributed to the other members. If no one submits bids, a winner is drawn by random for that period, and receives the full pot with no discount.
i. ***Unique Code:*** this is needed to join a particular ROSCA

2. '**Join a ROSCA**': choose this selection if your ROSCA has a **'Foreperson'** and they have invited you to their ROSCA. You will be prompted to enter the '**Unique Code**' and upon entering the code, the ROSCA's details will populate. Take a careful look at these details and accept. Once either all of the ROSCA's invitees have accepted the terms, or the start date has arrived, the ROSCA will initiate. There will also be an email option in which a unique link will enable users to join and will direct them to the ROSCA's detail page for approval.

3. '**My ROSCAs**': After you have joined the ROSCA, view the progress of your ROSCA here. **'Contribute'**, **'Make a Bid'**, and **'Collect/Withdraw'** options will all be available here.

a. **'Contribute'**: At the beginning of every interval, as agreed to by ROSCA participants, each member contributes the designated amount to the generated address. The smart contract will record the transaction as received and will notify the Foreperson if any member has not contributed by the required date. ROSCA members are responsible to remind each other to contribute in a timely manner; however, the platform will send reminders and alerts to those who have not contributed.
    i. In the event an individual stops contributing to the ROSCA, the pool will be reduced by their contribution(s) for that particular period(s). If ROSCA members successfully influence the individual to keep their promise, he will be allowed to 'Make Late Payment' and these funds would be sent to the relevant fund winners who did not receive the relevant funds, starting with the first missed payment.
b. '**Make a Bid'**: At the beginning of the interval, all individuals will submit a bid for the pot. If no bid is submitted, a bid with no discount will be submitted automatically. In the event of a tie, members with the same bid will be randomly drawn.
c. **'Collect/Withdraw'**: Once the bidding period has closed, a winner is determined and funds are distributed to the winner's wallet. The winner may withdraw the funds immediately.

Fee Structure

ROSCA fees will be inversely proportional to the amount of users on the platform. As the platform matures and more users onboard, fees can increase because each additional user benefits from the ones prior (network effects). As a result, a **tiered referral bonus** system will be designed and employed to reward early adopters and evangelists.

To make the onboarding process of new users as smooth as possible, WeTrust will cover the cost of creating any smart contracts on the underlying blockchain, (e.g., there is no cost to create new accounts and ROSCA funds.) A fee ranging from 0.1-1.5% will be put in place post Public launch on ROSCA fund distributions.

Technical Description

WeTrust is characterized by the three key operational pillars: ***autonomous, frictionless and decentralized.***

Autonomous: Smart contracts run the business logic autonomously, and we will utilize these features for fast, secure and reliable processing of the detailed ROSCA processes. This will reduce the friction

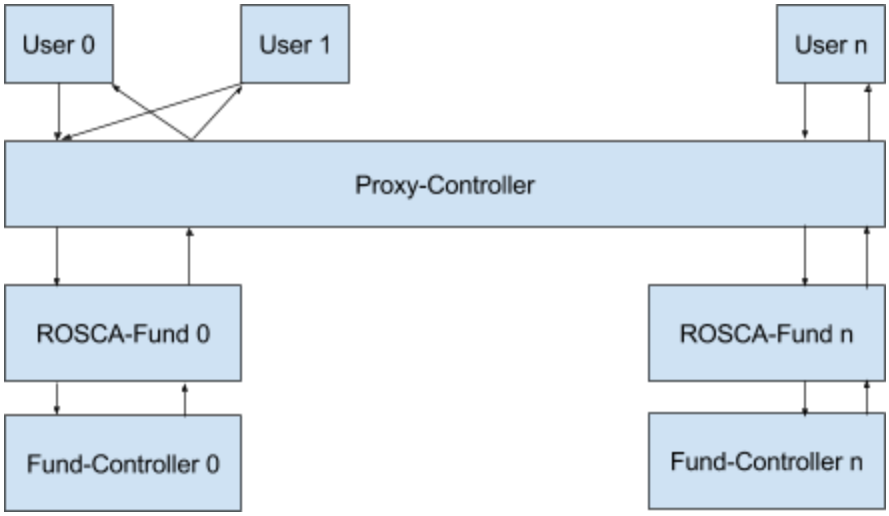
currently observed due to the numerous fees and operation costs imposed by middlemen, such as financial institutions.

Unlike existing centralized platforms and services, WeTrust's transactions are publicly verifiable, viewable, self-operated, and not subject to the risk of mishandling by organizers. Our system is a finite-state machine. Each transaction (i.e. create a fund, contribute, bid, and disburse...) will transform the system to a defined and predictable state. Also our functions on smart contracts do not produce non-deterministic behaviors.

Frictionless: Traditional ROSCA processes have been cumbersome and manual, resulting in high fees, fraud to create and manage a ROSCA fund. WeTrust platform focuses on delivering good and friendly experiences to our end-users and developers. We design and build an abstraction layer on top of underlying blockchain so that developers and customers do not even know they are running on decentralized servers and blockchain technology. Furthermore, we introduce SDK's in different programming languages to help users integrate with our platform, create and manage ROSCA funds easily. Here is an example of how one could create a ROSCA fund in JavaScript:

```
var ROSCA = require('ROSCA');
var options = {
    name: 'example1',
    startDate: 2016-10-10,
    endDate: 2016-11-10
};
var fund = ROSCA.initFund(options);
fund.addUser(ROSCA.findUser('#abc')); // User #abc is a member of ROSCA platform
fund.addForeperson(ROSCA.findUser('#xyz')); // User #xyz is a member of ROSCA platform
fund.start();
```

Decentralized: Traditional online businesses with centralized structures are subject to hacking and onerous overhead costs. Decentralized ROSCA fund management, auction arbitration, contribution tracking, and distribution of funds -- enables elimination of reliance on payment processors, reduces costs associated with fees and bureaucracy, and protects against fraud. Building on top of a platform (potentially Ethereum), our entities are based on 'Smart Contract' as a first class citizen. Detailed architecture of the platform will be further described in the diagram below.



User: A smart contract that store the user's information, balances and history. These records will help determine the Credit score of the user and/or match him/her with available public ROSCA funds.

Proxy-Controller: A smart contract to manage users of the ROSCA platform and their interactions with Funds. This contract mostly contains authentication and authorization logic as well as permissions management.

ROSCA-Fund: A smart contract that store all the states of a ROSCA fund (e.g., Foreperson, members, term, conditions, status, contributions)

Fund-Controller: A smart contract that contains business logic to operate the fund (e.g., manage the contribution, bidding and disbursement process for each ROSCA-Fund)

Security

Security is treated with the highest priority at WeTrust. In order to ensure that underlying smart contracts that move ROSCA funds are secure and working as intended, the WeTrust team commits to subjecting its platform to a comprehensive security audit and bounty programs prior to launching the platform to the public. We will hire the most reputable security experts to conduct security audits prior to our public launch, and release all results of the audit and fix flaws that are identified.

In addition, WeTrust will build a dedicated server to monitor all transactions on our platform anonymously. This server will detect and prevent suspect behaviors and fraudulent activities. Alert notifications will be automatically set up and will alert developers around the world to fix any known incidents.

Sybil Attack Prevention

Because WeTrust is a community-based platform which relies on its users' performance in ROSCAs to generate Credit Scores, it is important for us to preserve the integrity of the Scores by thwarting Sybil Attacks from automatically created fraudulent accounts. It would detrimental to our platform if one person created fake profiles and ROSCAs to generate a legitimate Credit Score. WeTrust has some potential solutions:

1. Require users to provide identity information from off-blockchain sources such as: Facebook, Twitter, or Cell (activated through two-factor authentication).
2. For each account, we will allow a limited number of “free” ROSCA funds. Any additional ROSCAs will require a small fee. Further, ROSCAs will be required to be of a minimum size. This would require individuals with malicious intent to actually contribute into a fund and pay the service fees.

Roadmap

WeTrust ROSCA Dapp is the first of many

In order to bootstrap the WeTrust Lending Platform, the initial product release will be ‘ROSCAs on the Blockchain’ bringing traditional, community based lending practices onto the Blockchain. By leveraging the ROSCA group nature, the initial user base can be bootstrapped and find value immediately, and use this product to spread awareness and usage of the platform.

The ROSCA product in turn serves as a stepping stone to incent creation of blockchain based identities, which then enables access to future products on our roadmap such as: credit scores, P2P mutual insurance, P2P lending, larger ROSCA pools/ investment vehicles, CDs, additional asset investment opportunities such as gold, fixed income, equities, etc…

Identity and Credit Reputation

Lending in general has been a difficult problem to solve online, but has thrived in US markets where there are credit scores. In countries without formal credit scoring institutions, it becomes much more difficult to accurately gauge credit default risk.

Through usage of our platform, individual and group credit reputations are built based on participation in ROSCAs and by tethering profiles to their account. In this way, we enable the creation of a self-sovereign [16] credit identity and reputation. Credit Reputation will incorporate elements of both individual credit worthiness and the reliability of the ROSCA groups said 'individual' has associated with. We expect that Gamification, Social Pressure, and access to useful financial products will encourage adherence to commitments made by individuals and groups of individuals.

Further, a blockchain based identity with user-controlled levels of privacy can then enable owners of this identity to participate in more sophisticated financial products built on WeTrust Platform such as insurance, P2P lending (instead of group ROSCAs), etc… and enable other users to evaluate the risk involved when interacting with other users.

[16] Lilic, J. (2015, November 27). UPort; A Glimpse into a Next Generation Self Sovereign Identity System. Retrieved October 12, 2016, from https://www.linkedin.com/pulse/uport-glimpse-next-generation-self-sovereign-identity-john-lilic

Technical aspects of identity creation and management TBD

Bootstrapping Credit Identities

As users participate in WeTrust facilitated ROSCAs, their data will be hosted on a neutral/ decentralized network and allow them to track each ROSCA they participated in. The data will be encrypted with user's unique private keys, and may be released to third parties at the user's proactive discretion. The features of immutability and historical record keeping allow users to build a blockchain credit history and ***thrive on a borderless blockchain driven financial system***.

P2P Insurance

This section is TBD

Alternative investment class

ROSCAs also serve as an alternative asset class. With historically low interest rates and perceived uncertainty in stock markets around the globe, ROSCAs can serve as an attractive alternative. ROSCAs use group dynamics of accountability and psychology to help individuals achieve personal saving goals, and ROSCA participants tend to have lower default rates compared to p2p lending[17] due to the social dynamic and the *confianza* ideal.

The Team

Core members have deep expertise in entrepreneurship, engineering, business development, finance, compliance, and marketing.

Core Members

George Li

George is an ex-Googler who previously co-founded CottonBrew, a Stanford StartX computer vision company. Prior, he held roles in Corporate Strategy and Infrastructure at Google, and was a consultant at McKinsey. He holds a M.S in Management Science Engineering from Stanford and B.S. in Electrical and Computer Engineering from Rutgers University.

Patrick Long, CPA

Patrick previously worked in Finance at RMS, and Ernst and Young in Assurance Services where he earned his CPA. In his spare time, he manages a crypto-currency fund raised from friends and family and is always scouting for new opportunities. He holds a B.A. in Economics from UC Berkeley.

Ron Merom

Ron previously worked at Google as a Software Engineer, where he specialized in voice recognition, emerging markets and social interactions. Ron is passionate about blockchain technology and wants to use his technical

[17] Reyes, B., Lopex, E., Phillips, S., & Schroeder, K. (2013). *Building Credit for the Unbanked: Social Lending as a Tool for Credit Improvement*[Pamphlet]. San Francisco, CA: San Francisco State University.

expertise to make a social impact on the lives of those less fortunate. He holds a M.Sc. in Computer Science from the Weizmann Institute of Science and a B.Sc. in Computer Science and Environmental Science from The Hebrew University.

An Zheng
Principal Engineer An previously worked at Sandora as a Senior Software Engineer. An holds a M.S. and B.S. in Systems Engineering from a highly ranked, world renowned university.

Tom Nash
Tom previously worked at Hydrant as a Web Developer, but recently has taken a sabbatical to travel the world and work on freelancing. He is a quick learner, an ambitious individual who is passionate about blockchain, capable of taking on any task thrown at him, and wants to create social impact through technology. He holds a B.S. in Computer Science from Lancaster University.

Shine Lee
Shine is a entrepreneur at heart. After graduating from UC Davis about a year ago, he created his own Ethereum mining farm which generates enough passive income for him to be self-employed. He joins WeTrust as a developer working on Solidity smart contracts and brings his cryptocurrency domain experience. He holds a B.S. in Computer Science from UC Davis.

Advisors

Benedict Chan | Blockchain Advisor
Benedict is the Platform Lead at BitGo and has vast experience in creating blockchain and wallet platforms. He created Ether.Li - first multi-signature web wallet. Ben advises the team on smart contracts, wallets, and security matters. He holds a B.S. in Computer Science from University of South Wales Australia.

Fennie Wang | Legal Advisor
Fennie works at MONI Limited as General Counsel and was previously an associate at Wilmer Hale. She is passionate about microfinance and tools that address financial inclusion. She holds a B.S. in Business Administration and Legal Studies from UC Berkeley and a J.D. from Columbia University.

Glossary

- **Rotating Credit and Savings Association (ROSCA):** A group of individuals who act as an alternative financing institution through regular contributions and withdrawals from a common fund. The name, Rotating Credit and Savings Association or ROSCA, comes from the type of transactions that occur in these associations in which members contribute on a regular basis (e.g., once a month) and are allowed a chance at the pot each contribution period.
- **Epoch:** A full cycle of contributions, where the Epoch timeframe is equal to the # of participants * regular contribution interval. For example, if there are 6 members, and the contribution is weekly, than one Epoch is equal to 6 weeks. Typically a member can only win the pot once in one Epoch.

- **Foreperson**: The Foreperson is the individual who initiates the 'ROSCA Fund'. It is this person who will input the fund's specifications, input contact information, and responsible educating participants about the process.
- **Foreperson Fee**: This is the agreed upon rate that the group wants to pay the Foreperson for organizing the group.
- **Platform Fee:** This is the fee that will be collected by the platform to cover operational costs, development costs, with excess fees going to grants, scholarships, and other non-profit pursuits.

Appendix

History of Rotating Savings and Credit Associations

ROSCAs are currently popular in regions where there are a lack of sophisticated investment options and where there is difficulty to access loans through formal institutions -- typically because credit scores either do not exist or do not play a meaningful role in individual's financial health. In India and China for example, it is common for alumni from a common university, colleagues from the same company, or simply friends from the same city, to create informal ROSCAs as a way to save and invest. Research indicates that informal ROSCAs have similar or lower default rates for loans when compared to formal institutions, and offer competitive returns on investment for savers. ROSCAs are increasingly also being used to address the continuing phenomenon of low interest rates and uncertain strength of centralized institutions.

ROSCAs exist in various incarnations around the world. Here are some examples:

- As "*Chit Funds*": In **India**, each State has a regulatory agency for "*Chit Funds*" that are responsible for setting rules such as: maximum fees, capital reserve requirements, fund registration, insurance/ bonded requirements, etc. Kerala State Financial Enterprise is a government-owned ROSCA fund of the Kerala State and is one of the largest funds in India. They employ over 6,000 employees and in fiscal 2015, have substantial operational costs. Currently, financial enterprises in India are large and sophisticated; however, WeTrust believes our technology can reduce costs, yet still preserve transparency, compliance with regulators, and safety. [18][19]
- As "*Tanda*": In Latin America and **United States**, particularly amongst the migrant worker community from Latin America, workers are employing this group saving concept to help save for their retirement. According to Jeffrey Cheung, President and CEO of OneCalifornia Bank, "[*Tandas*] really does hit on the fundamental of lending. Is the person you are lending money to someone you can trust? Someone who is honorable, someone who you think will pay you back?"

[18] C-DIT. (Ed.). (2016, October 12). The Kerala State Financial Enterprises Ltd. Retrieved October 12, 2016, from http://www.ksfe.com/mainnew.htm, Subramanian, S., Hari, S., Sanil, S., Subramanian, S., Pillai, S., & Nair, S. (2015, February 2). THE KERALA STATE FINANCIAL ENTERPRISES LIMITED. *Annual Report,* 1-60. Retrieved October 12, 2016, from http://www.ksfe.com/ANNUAL REPORT 2011-12.pdf

[19] T. (2014, February 11). The joys of pretending to help the poor: The Kiva Story. Retrieved October 12, 2016, from http://www.dailykos.com/story/2014/02/11/1276681/-The-joys-of-pretending-to-help-the-poor-The-Kiva-Story

[20] "[*Tandas*] are a worldwide phenomenon for poor people whose access to capital is limited. [*It*] easiest way to do it is to pool your resources," said Carlos G. Velez-Ibanez, Anthropologist at Arizona State University.[21]

- As "*Hui*" or "*Shadow Banks*": Since the Tang Dynasty in **China** during the spread of Buddhism, the Chit fund tradition also spread from India and has been around for more than 1,000 years. Currently, there is a booming "shadow banking" sector (think banking, but based off trust) in which over $14.5 trillion yuan ($2.2 trillion dollars) are managed informally. This equates to roughly a quarter of total all total loans originated in China and is worrying regulators because these loans are often highly leveraged and borrowers are typically less credit-worthy. Again, similar to the India, China is another huge market that will benefit from the transparency, auditability and safety the Blockchain can provide.[22] [23]

Disclaimer

[20] Gaynor, T. (2016, October 12). U.S. migrant money pools thrive in the recession. Retrieved October 12, 2016, from http://www.reuters.com/article/us-usa-savingsclubs-idUSTRE5613J420090702

[21] Vélez-Ibáñez, Carlos (2010). *An Impossible Living in a Transborder World: Culture, Confianza, and Economy of Mexican-Origin Populations*.University of Arizona Press. ISBN 0816526354.

[22] Boesler, M. (2012, July 19). Should we be worried about China's $2.2-trillion shadow banking system? Retrieved October 12, 2016, from http://business.financialpost.com/business-insider/should-we-be-worried-about-chinas-2-2-trillion-shadow-banking-system

[23] Forney, M. (2004, November 22). China's Shadow Banks. Retrieved October 12, 2016, from http://www.freechina.net/2004/comment/00260.htm