Regulated
Decentralised
Finance

The path to fair and responsible banking.

ReDeFi Blockchain Whitepaper

Published: *March 2023*
Last Updated: *December 2025*
Author: *Kenneth Kinsella*

Regulated Decentralised Finance

“ReDeFi restores financial freedom and inclusion in a decentralised and compliant manner.”

- Rushd Averroes,
ReDeFi’s Founder

Table of Contents

Legal Disclaimer: This document is intended solely for informational purposes and reflects the current strategic intentions and developmental trajectory of the ReDeFi project as envisaged by its creators. The visions, strategies, and analytical forecasts contained within are dynamic, predicated on present circumstances, and are not fixed predictions of future events. The contemplations articulated here represent a snapshot of aspirations and are inherently speculative. They are constructed upon present-day assumptions that may or may not hold true as ReDeFi's project landscape evolves. Therefore, they should not be interpreted as irrevocable guarantees or as a basis for irrefutable expectations. The ReDeFi project's path, as envisioned, may deviate due to numerous factors, including but not limited to market variability, technological advancements, regulatory shifts, and the broader economic climate. As such, these forward-looking statements should be treated with the understanding that they are subject to change, without obligation on ReDeFi's part to update or amend them in light of new information or future developments. The perspectives presented herein have not been endorsed by any regulatory authority and should not be perceived as a reflection of regulatory approval or guidance. They are independent of regulatory scrutiny and aim to maintain transparency with prospective participants about the ReDeFi project's objectives. Potential contributors and community members are advised to engage with this document's contents with a measured understanding, acknowledging the inherent risks and the absence of assurance regarding projected growth or performance. The ReDeFi project encourages a proactive approach to due diligence and a tempered interpretation of forward-looking statements. By engaging with this document, readers acknowledge their comprehension of its speculative nature and affirm their responsibility for personal due diligence.

Abstract

ReDeFi is a Financial Market Infrastructure (FMI) platform that integrates blockchain technology with the functional requisites of modern financial systems. It prioritises empowering financial entities through a decentralised framework conducive to various financial operations, from cross-border B2B transactions to e-commerce and boosts government fiscal procedures. With the Onchain Money model, ReDeFi maintains the singleness of money principle, while expanding financial inclusivity. This whitepaper elaborates on ReDeFi's infrastructural potential to reshape the banking and financial industries, advocating for secure and advanced services on a global scale.

Overview

Traditional financial conduits, while foundational to the international economic order, are increasingly beset with challenges that curb the fluidity and expansion of global commerce. ReDeFi is proposing a decentralised solution that not only addresses the exigencies of contemporary financial transactions but also anticipates the needs of an interconnected future. The following outlines four sectors where ReDeFi can introduce significant improvements:

1. Cross-border Payments

As of today, cross-border payments face systemic inefficiencies—high transaction costs, slow processing speeds, lack of transparency, and high-security risks. These inefficiencies do not just impede the flow of capital and commerce but also hamper the strides towards achieving universal financial inclusion.

ReDeFi alleviates the frictions inherent in traditional cross-border payments. The layer-1 blockchain architecture is designed to mitigate the costs associated with cross-border transactions. DLT technology eliminates the need for middlemen, thus substantially reducing the associated fees.

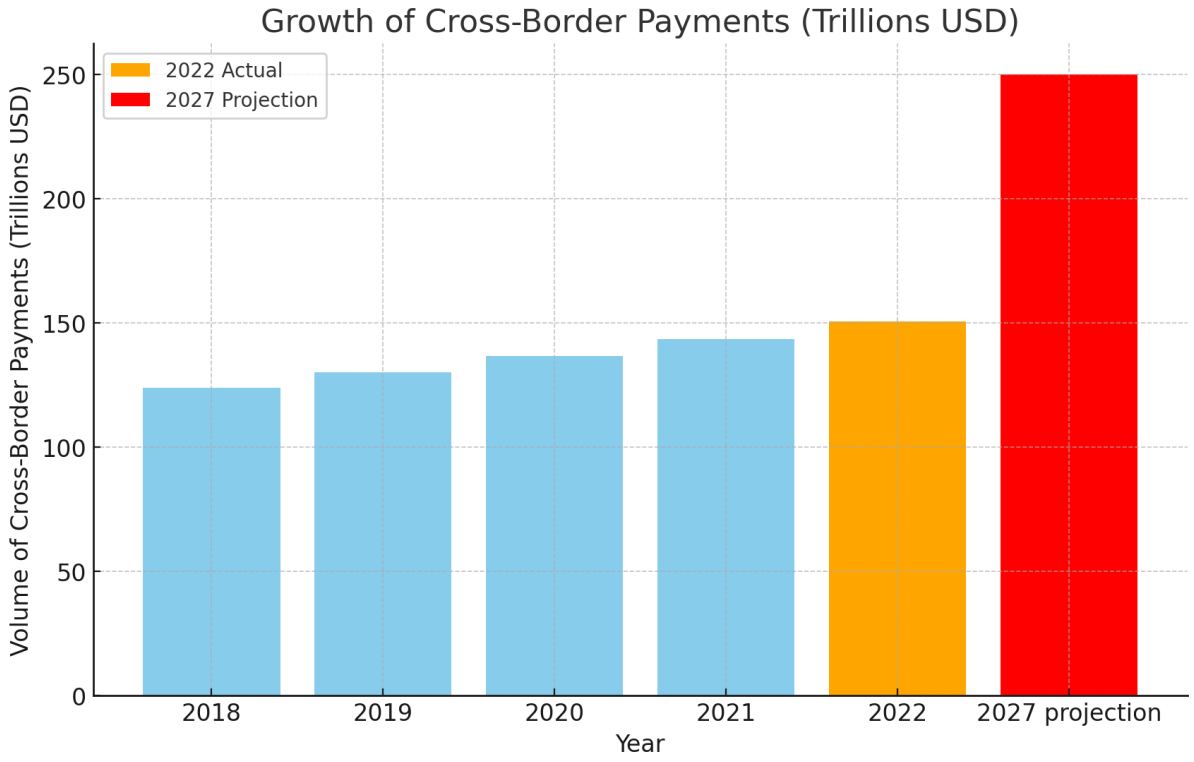
The network facilitates near-instantaneous settlements when compared to the traditional timeline of current international payments. This enhancement is extremely important for businesses and financial institutions that frequently encounter cash flow complications owing to protracted transaction periods.

Moreover, the blockchain's inherent nature ensures that each transaction is indelibly recorded, providing an unequivocal and accessible trail. Such transparency reassures users, granting them access to consistent, verifiable information on transaction costs, speeds, and data.

The deployment of advanced cryptographic methods, along with our NPoS consensus mechanism, reinforces the integrity of cross-border transactions. ReDeFi's inherent DLT

diversifies the locus of security reliance away from singular institutional defences, thus mitigating the risk of concentrated system breaches.

In addition, our Onchain Money model preserves the *singleness of money** principle which underpins a stable and uniform currency value, fostering confidence and stability.



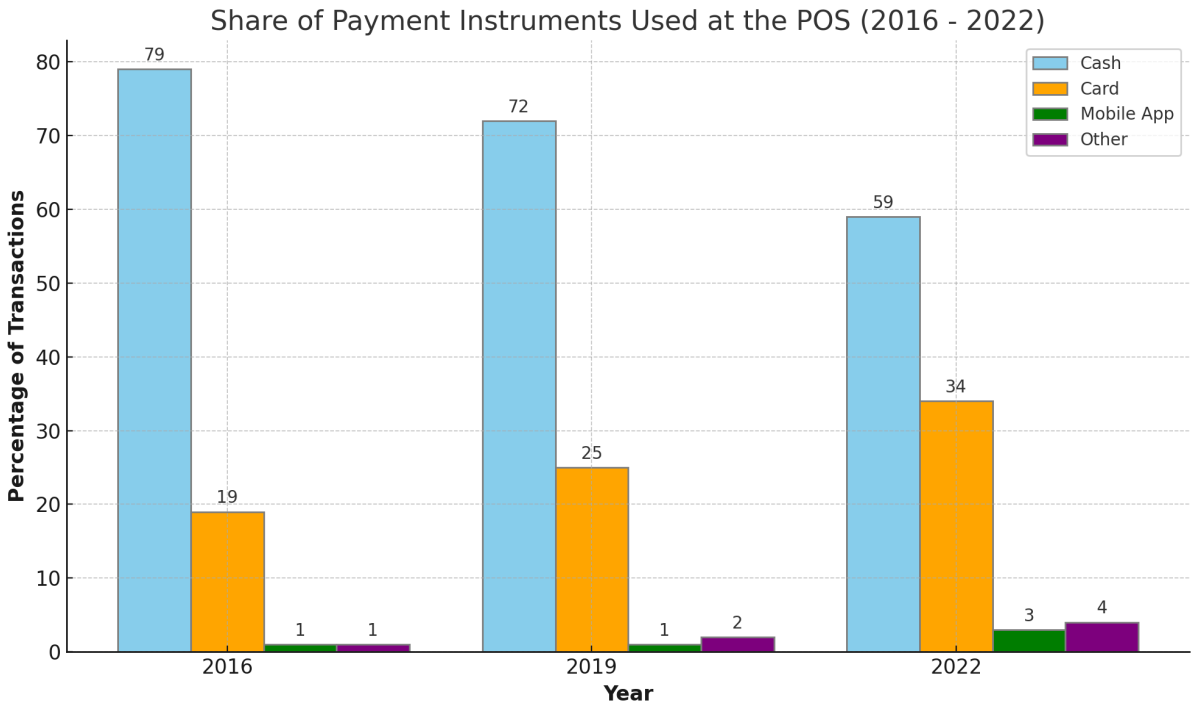
The graph showcases the growth of cross-border payments.

The volume of cross-border payments has surged to over $150 trillion in 2022, emphasising the sector's exponential growth and its pivotal role in global economic interactions. This trajectory is largely sustained by B2B transactions that form 97% of this volume. Projections for the coming years indicate a 60% increase, potentially elevating annual cross-border financial activity beyond $250 trillion. With the digitalisation of commerce and trade expansions, the need to redefine financial transactions across borders is clear.

---

*The principle of the **singleness of money** refers to the uniformity of value for any unit of currency within a monetary system. It postulates that irrespective of the form it takes—whether it's cash, digital, or balances in a bank account—each unit of currency must maintain parity in terms of purchasing power and function interchangeably in economic transactions.

2. Local Payments



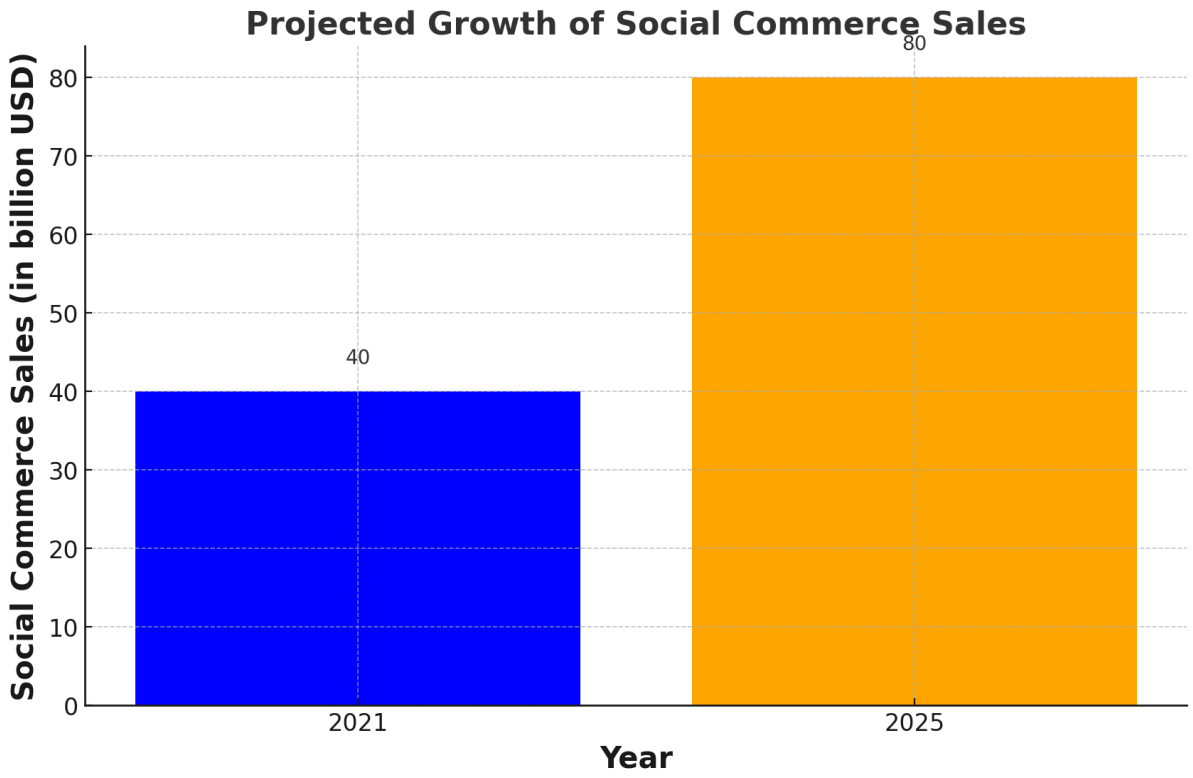
There is a notable decline in cash usage and a corresponding rise in card and mobile payments from 2016 to 2022. In 2022, cash transactions plummeted to 59% of all transactions from 79% in 2016, while card payments ascended to 34% from 19%. Mobile payments saw an increase from near non-existence to 3% of transactions. When the value of transactions is considered, the shift becomes more pronounced with card payments (46%) eclipsing cash payments (42%) in 2022 — a reversal from 2016 where cash led at 54% against cards at 39%.

This move towards digital payments signifies a consumer trend towards more traceable and potentially secure transaction methods, aligning with ReDeFi's vision of a more efficient and secure financial system.

Local payment systems currently grapple with significant transactional costs and inefficiencies, particularly for intra-country transfers. ReDeFi's platform can further boost day-to-day transactions by enabling instantaneous settlements and eliminating intermediary fees, offering a more economical, ethical and efficient financial experience for everyone.

3. E-Commerce

The graph below illustrates the projected growth of e-commerce sales, indicating an upward trend from $40 billion in 2021 to an expected $80 billion by 2025. This significant increase underscores the expanding role of more secure market platforms in the retail industry. As consumers continue to engage and shop, e-commerce is evolving to include a variety of new formats.



In the context of ReDeFi, the projected expansion of e-commerce aligns with our FMI platform's capabilities to enhance transactions. ReDeFi is inherently providing a more secure and efficient infrastructure for e-commerce businesses and will support the rapid growth of online retail sales. ReDeFi can boost B2B transactions with reliable, low cost and fast payment solutions.

E-commerce having a market value exceeding $6.3 trillion in late 2023, is adopting borderless transactions, with online retail sales poised to constitute 21.2% of global retail by 2024. ReDeFi addresses the need for secure, swift, and cost-effective payment solutions in this sector, offering a blockchain-based ecosystem for frictionless online transactions, irrespective of geographical boundaries.

4. Government Adoption

We can use *Project Ubin*** as an example, which aims to address inefficiencies in inter-bank payments within Singapore and cross-border financial transactions. The project found that existing processes were slow and unoptimised.

To tackle this, the Monetary Authority of Singapore (MAS) collaborated with a consortium of banks and regulators to develop a blockchain-based prototype for the Singaporean dollar to facilitate more efficient digital transactions. This solution was designed to ensure the incorruptibility of records through a decentralised trust system and enable 24-hour processing without the need for centralised, human-based checks. The partnership has yielded software prototypes for three different models of decentralised inter-bank payment systems, which are now being explored further.

The identified problem is a widespread challenge not unique to Singapore; it resonates globally where traditional financial systems often grapple with delays, high transaction costs, and a lack of transparency due to centralised and human-dependent processes.

ReDeFi offers a blockchain-based Financial Market Infrastructure (FMI) platform designed to mitigate these issues. By decentralising the core of financial transactions, ReDeFi removes the necessity for intermediaries that traditionally slow down the process, enabling faster and more cost-effective payments. It leverages the strength of distributed ledger technology to offer a streamlined, round-the-clock operational framework, fundamentally reforming inter-bank payment systems.

The Onchain Money model proposed in this paper is distinct from cryptocurrencies and stablecoins and reflects a tokenised representation of fiat currencies on the blockchain. This model presents a symbiosis of traditional banking security and the efficiency of modern blockchain technology. The potential for governments to adopt this system lies in its ability to facilitate transactions that are verifiable, irreversible, and settled instantly, enhancing both the speed and security of public financial management.

In the Onchain Money model, transactions are settled in the currency of the country in the bank, ensuring that the *singleness of the money* principle is upheld, and the trusted value of fiat currencies is maintained. This aligns with government and regulatory bodies' interests, as it does not challenge the existing monetary systems but rather augments them with the advantages of blockchain technology.

ReDeFi's framework enhances transparency and accountability in government transactions, which is crucial for public trust. The incorporation of ReDeFi by governments could lead to a substantial reduction in operational costs and an increase in efficiency, enabling more funds to be directed towards public services.

**Project Ubin -> https://www.mas.gov.sg/schemes-and-initiatives/project-ubin

ReDeFi Network

ReDeFi network is an FMI platform, that supports diverse scaling solutions and achieves interoperability across multiple blockchain networks. The main features of our ecosystem are the Onchain Money model, the Self-Custody wallet, a Multi-layered KYC solution, a Naming Service, and an FX Swap Protocol (DEX).

ReDeFi has a permissionless layer-1 blockchain and a layer-2 sidechain built on top, and is capable of replicating traditional banking account functions on-chain. While efficiently mitigating issues such as high gas fees and slow transaction times, our primary innovation is in integrating every-day bank accounts with blockchain technology.

ReDeFi operates on a Nominated-Proof-of-Stake (NPoS) consensus mechanism, along with a Peer-to-Peer (P2P) identity verification method. This ensures fast and secure transactions with low costs, while the system's integrity is further enhanced by requiring validators to undergo a strict KYC process. This amplifies ReDeFi's security and promotes responsible nodes by rewarding the validators for maintaining the security of the network.

For ReDeFi L1 blockchain, $BAX is the main utility token of the network covering transaction fees. In addition:

- **Validators:** Individual validators or entities will be able to run nodes to secure the network This will be done by staking a specific amount of $BAX tokens (TBD close to mainnet launch).
- **Nominators (Delegators):** Anyone that wishes to contribute and participate in the consensus of the ReDeFi L1 chain will be able to nominate their $BAX to their preferred validator set, further decentralising and securing the network.

For ReDeFi L2 blockchain, $RED is the main utility token cover transaction fees. The only difference here is that validators have to pass KYC/AML measures *(read further below)* in order to be in the active set of validators, but anyone that holds $RED will be able to nominate to their preferred validator if they wish so.

ReDeFi's interoperability is achieved by our cross-bridge solution, which fosters seamless integration between blockchains – Ethereum, Binance Smart Chain, Avalanche, and Polygon. The bridge acts as a conduit for the seamless transfer of assets between these blockchains, expanding opportunities with developers and innovative protocols, introducing cross-chain applications that allow to achieve true interoperability.

NPoS Consensus & Security Control

ReDefi uses the Nominated Proof of Stake (NPoS) consensus mechanism, designed to address the limitations of traditional PoW or PoS systems. It is characterised by a sophisticated staking model that upholds network security and promotes a democratic validation process.

In an NPoS blockchain there are:

- **Validators:** These are the node operators, validating transactions, creating new blocks, and securing our network. They must perform per our network parameters to avoid penalties, including the potential loss of their stake for any actions that threaten network integrity.
- **Nominators:** These are stakeholders who nominate the validators, effectively delegating their staking power to validators they trust. This process not only democratises the selection of validators but also allows nominators to contribute to network security and earn incentives without running a node themselves.

The staking process is integral to an NPoS consensus and involves participants committing a portion of their holdings as a stake. This stake represents their involvement and commitment to the network's well-being. Validators are chosen based on the total stake backing them, which includes their own stake as well as the stake of nominators supporting them. Rewards are distributed proportionally to the amount of stake each participant contributes, incentivising both validators and nominators to act in the best interest of the network.

Another key feature of NPoS is the slashing mechanism, designed to penalise dishonest or disruptive behaviour. It ensures that any validator, and by extension their nominators, who violates network parameters or attempts to undermine the system, can have a portion of their stake confiscated.

The advantages of NPoS over other consensus mechanisms include:

- **Energy Efficiency:** NPoS eschews the energy-intensive mining process of PoW, leveraging staking to secure the network, which is considerably less energy-consuming.
- **Enhanced Security:** The combined stake of validators and nominators in NPoS makes attacks on the network expensive and unattractive to potential bad actors.
- **More Decentralised:** By allowing a larger portion of the community to participate in the consensus process, NPoS fosters a more decentralised network environment.

NPoS also differentiates itself from traditional PoS by introducing the role of nominators, which adds a layer of strategic delegation to the staking process. This additional layer enhances network security by pooling stakes and aligning incentives across a broader set of participants.

Compliance

ReDeFi integrates an Identity Verification, or KYC natively. At its core, it hinges on a distributed verification approach through various industry partners to fortify the NPoS mechanism, ensuring a safer network environment with contributor verifiability.

Multi-layered KYC process begins by offering users to create Digital Wallets including their full names, date of birth and residency. For further service depth, users can undertake a

more comprehensive KYC process through industry partners, sharing requisite identification documents to verify their identity and residency. However, the most innovative facet of this model is its blockchain component. Recognised and fully KYC'ed users within the network can authenticate basic account details followed up by KYC verifications provided by industry partners to enable higher transaction volumes.

This strategy ensures that ReDeFi not only reduces potential vulnerabilities by intertwining identity verification with network trust but also fosters expansive growth. By amalgamating traditional PoS with Multi-layered KYC, ReDeFi emphasises that consensus security is not solely reliant on mathematical deterrence but also harnesses the power of contributor trust and accountability.

ReDeFi Naming Service

The ReDeFi Naming Service (RDFNS) provides a decentralised naming system for the assignment of human-readable aliases to the intricate hexadecimal addresses of blockchain entities, including but not limited to smart contracts and dApps. This service is designed to significantly improve user interaction within the ecosystem, streamlining the transaction process by mitigating the inherent complexity of direct address utilisation.

The RDFNS adopts a hierarchical nomenclature system, analogous to the established Domain Name System (DNS) employed within the broader internet infrastructure. This design choice facilitates an intuitive mapping from the user-friendly domain names to the corresponding blockchain addresses. The management of the primary domain host is maintained by the ReDeFi team, whilst allowing the delegation of subdomains to the broader user community, thereby promoting a distributed administration model.

The integration of the naming service is deeply intertwined with the blockchain's underlying smart contract framework. This ensures that the operations of assigning and resolving domain names are embedded within the blockchain's immutable ledger, affording a level of transparency and security characteristic of decentralised technologies. The execution of these operations through smart contracts enforces an autonomous and trustless environment for the naming service.

Accessibility has an interface designed to facilitate user engagement with the domain registration process. This interface enables individuals and entities to seamlessly associate their unique blockchain addresses or deployed smart contracts with a chosen domain name.

Efficiency is a byproduct of the naming service, as registered domain names can be utilised as references within the context of dApp interaction and as facilitators for transactional activities. This utility eliminates the conventional reliance on protracted addresses and improves accessibility.

Moreover, the RDFNS system is engineered with flexibility in mind, allowing domain owners the freedom to transfer ownership rights. This capability extends to the creation of subdomains, providing users with additional customisation and hierarchical management. Such features are intrinsic to the RDFNS system, ensuring that it remains an adaptable and user-centric component of the ReDeFi blockchain and more specifically to the privacy-focused layer-2 chain..

Onchain Money

Key takeaways:

- *Onchain Money is a tokenised deposit that is settled in central bank money and does not break the "singleness of money" principle.*
- *Onchain Money provides enhanced functionality by utilising smart contracts' ability to introduce fast execution, traceability, near-zero cost of operations, and transaction composability.*
- *Onchain Money has certain characteristics of stablecoins, but there is no mechanism for issuing a token IN EXCHANGE for a fiat deposit. Instead, Onchain Money mirrors GBP settled in traditional bank accounts. This enables deposits and withdrawals from and to any bank account using standard bank account details such as sort code, account number, SWIFT, IBAN, and so on. These accounts can be FSCS protected as direct Central Bank deposits with BOE.*

Introduction

The "singleness of money" is a fundamental part of the modern monetary system.[1] Singleness of money assures that monetary trade is not susceptible to variable exchange rates between different forms of money, whether privately issued (for example, deposits) or publicly issued (for example, cash). With monetary singleness, there is a clear unit of account that underpins all economic transactions in society.

To be clear, the singleness of money does not exclude variable credit risk among intermediaries. The value of private liabilities as repositories of value could range among intermediaries in the same way that bank bonds or negotiable certificates of deposit (CDs) can trade at differing spreads in the current two-tier monetary system. Rather than private liabilities as a store of value, singleness is a property of the payment. The perspective

[1] Padoa-Schioppa, T (2004): “Shaping the payment system: a central bank’s role”, speech at the Bank of Korea’s Conference on Payment Systems, Seoul, 13 May.

provided by the singleness of money is useful in talks on the tokenisation[2] of privately issued money and digitally representing claims using smart contracts[3].

Problem statement 1: Can the Onchain Money model be viewed as a tokenised deposit conducive to “singleness of money”?

Problem statement 2: Can the Onchain Money model expand the functionality by enabling programmable ledgers and introducing contingent execution and composability of transactions?

Problem statement 3: Can the Onchain Money model break the "singleness of money" principle?

The Onchain Money model

The Onchain Money model represents the issuer's liabilities, and the holder has a claim on the issuer for redemption at par value in the sovereign unit of account.

The transfer process does not involve a direct transfer of claims and liabilities and Onchain Money cannot be transferred to individuals outside the KYC border. The model envisages participants to be customers of regulated financial institutions such as banks, and transfers are logged at the individual bank level and settled automatically and balance sheets are updated at the time of a transaction. An individual or business knows that when they receive an Onchain Money payment from their customers, the money will be credited to their account at face value under this model of non-transferable liabilities.

The use of central bank money for settlement is the main aspect that supports singleness. The payment process is similar to the present two-tier monetary system's practice of debiting the sender's account and crediting the receiver's account, with settlement on the central bank's balance sheet. The payment is carried out by lowering the sender's Onchain Money and conventional GBP balances at their issuing institution and creating a new debt for the receiver that is issued by their institution. Meanwhile, central bank funds are being transferred utilising conventional money. This design does not require but does facilitate, the availability of both Onchain Money and conventional GBP on the same platform.

The issuance (mint) process does not involve an exchange of Onchain Money for a fiat deposit. Instead, Onchain Money mirrors a conventional GBP settled in the user's (owner's) name in a traditional bank account. This model allows money to be sent to and received from any bank, even if it is not connected to the ReDeFi blockchain platform, using traditional standard bank account details such as sort code, account number, SWIFT, IBAN, and so on.

[2] Tokenisation is the process of digitally representing claims in order for them to be transacted on programmable blockchain platforms utilising smart contracts.

[3] Smart contract is a combination of data and code that can behave automatically.

In general, any asset that can be exchanged will have an exchange rate, which can move away from par for a variety of reasons. Divergence from par may be due to variances in settlement frictions associated with the cashing out procedure. Discounting and value fluctuation could also arise as a result of variances in issuers' perceived credit risk, differences in holders' risk-bearing capacity, and higher order uncertainty associated with doubts about whether others have concerns about the token's worth. Even a modest seed of uncertainty (whether warranted or unjustified) has the potential to weaken money's role as a medium of exchange. Finally, major issuers' market power could be used to devalue tokens issued by smaller issuers.

Because the Onchain Money does not circulate as transferable issuer liabilities, it is excluded from financial assets with a market price. Money transfers under the Onchain Money model are immediately settled in central bank money and follow the two-tier monetary system's practice. The singleness of Onchain Money and all users' shared confidence in the value of money is assured in the same manner that conventional fiat money is.

It is also important to note that the Onchain Money model has no AML[4] or KYC[5] compliance flaws because liabilities are indirectly transferred to individuals with verified identities.

The table below depicts the distinctions between the Onchain Money model and stablecoins, using USDT as an example.

	Onchain Money	Stablecoins
Name	Onchain Money	USDT
Issuer	Bank with a node on the ReDeFi blockchain	Tether
Organisation behind	Bank-issuer, BABB, ReDeFi	Tether
Are they on-chain tokens?	Yes	Yes
Are they backed by conventional money?	They are not backed but mirrored in both traditional bank accounts and the ReDeFi blockchain	Supposedly yes, but it is not possible to verify.
Who is in control of the money?	Money is stored on the bank's account under the user's (owner's,) so the account holder's is the owner	The issuer controls the token and money.
Is there a mint and burn mechanism for them?	When it comes to the movement, no. Tokens are mirrored.	Yes
Is there an exchange of crypto assets for money?	No, since they are mirrored in a bank	Yes
Is there a need to redeem for cash or conventional deposits?	No, since they are mirrored in a bank	Yes

[4] Anti-money laundering (AML)
[5] Know-your-customer (KYC)

Does the pricing fluctuate?	No, it is an equivalent to conventional GBP	Yes
Does the payment process mimic the two-tier monetary system model of debiting and crediting accounts?	Yes, since they are mirrored in a bank	No
Does the payment process mimic the two-tier monetary system model of settlement on the central bank's balance sheet?	Yes, since they are mirrored in a bank	No
Does the payment process work with 3rd party banks (e.g., that do not enter the ReDeFi environment)?	Yes, since they are mirrored in a bank	No
Is the payment or a transfer a direct transfer of claims and liabilities?	No	Yes
Are they regulated?	They are mirrored in a segregated bank account.	Can be regulated to a certain degree
Are they FSCS protected?	They are mirrored in a segregated bank account.	No
Can they be approved by regulators?	They are mirrored in a segregated bank account.	Can be registered and controlled to a certain degree
Do they weaken the AML/KYC compliance?	No, since all ReDeFi environment users have gone through KYC	Yes
Is there commonly shared confidence in the value among all users?	Yes	No
Can costs or delays be imposed by the issuer?	No	Yes
Can they be credited to an account at face value automatically?	Yes	No
Can they be settled using Central Bank money with any bank?	Yes	No

Table 1. Difference between the Onchain Money model and stablecoins.

Use cases

Bank 1 and Bank 2 are participants in the ReDeFi environment.

Use cases and graphs below depict a specific technique of executing the Onchain Money model utilising blockchain technology procedures and terminology. The dotted lines reflect the four partitions of the model maintained by the two private tokenised money issuers

(Banks 1 and Bank 2) the central bank and the ReDeFi blockchain. The arrows indicate the issuers of the liabilities.

To be explicit, "Current acct" means a current bank account in conventional or modern banking with account details such as IBAN, BIC, sort code and account number. "Current mirroring acct" means a current bank account with account details such as IBAN, BIC, sort code and account number as well as a wallet address in the ReDeFi blockchain.

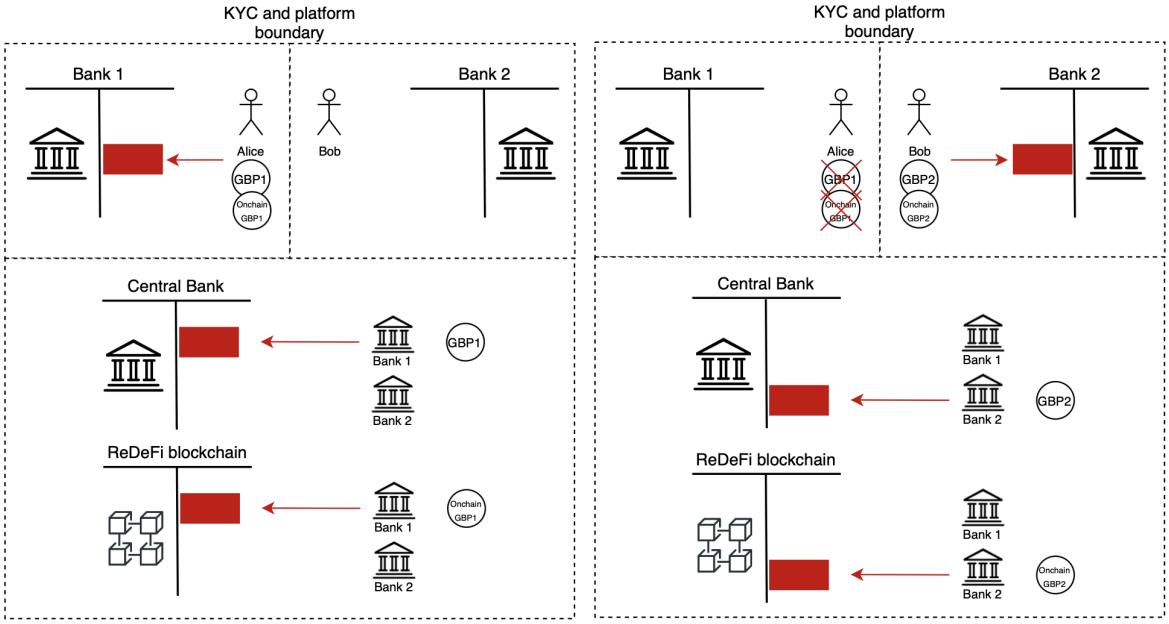
Both accounts provided by Bank 1 or Bank 2 are “everyday banking” accounts that give access to money for daily spending can be linked to debit cards and can be protected by the FSCS.

Use case 1. Alice sends money from her Current mirroring account to Bob’s Current mirroring acct.

The left-hand panel portrays the circumstances preceding Alice's payment to Bob. Alice has 1 Pound sterling in her Current mirroring acct with Bank 1, which is mirrored and represented by 1 Onchain GBP in the ReDeFi blockchain. Alice sends money from her Current mirroring acct to Bob’s Current mirroring acct.

The right-hand panel depicts what happens when Alice sends money to Bob:

a) Onchain GBP tokens are transferred (rather than burned and issued) from Alice to Bob since both banks are within the ReDeFi environment. If required, one Onchain GBP token held by Alice can be deleted ("burned") by Bank 1, and one Onchain GBP token can be assigned ("minted" or “issued”) to Bob by Bank 2.
b) The movement of onchain money tokens is accompanied by conventional GBP movement from the Current mirroring acct at Bank 1 to the Current mirroring acct at Bank 2 and the central bank's partition. One Pound sterling is moved from Bank 1 to Bank 2 and settled on the central bank's balance sheet. This is demonstrated by the fact that both Onchain GBP tokens and conventional GBP in the right-hand panel belong to Bank 2 after the transaction.



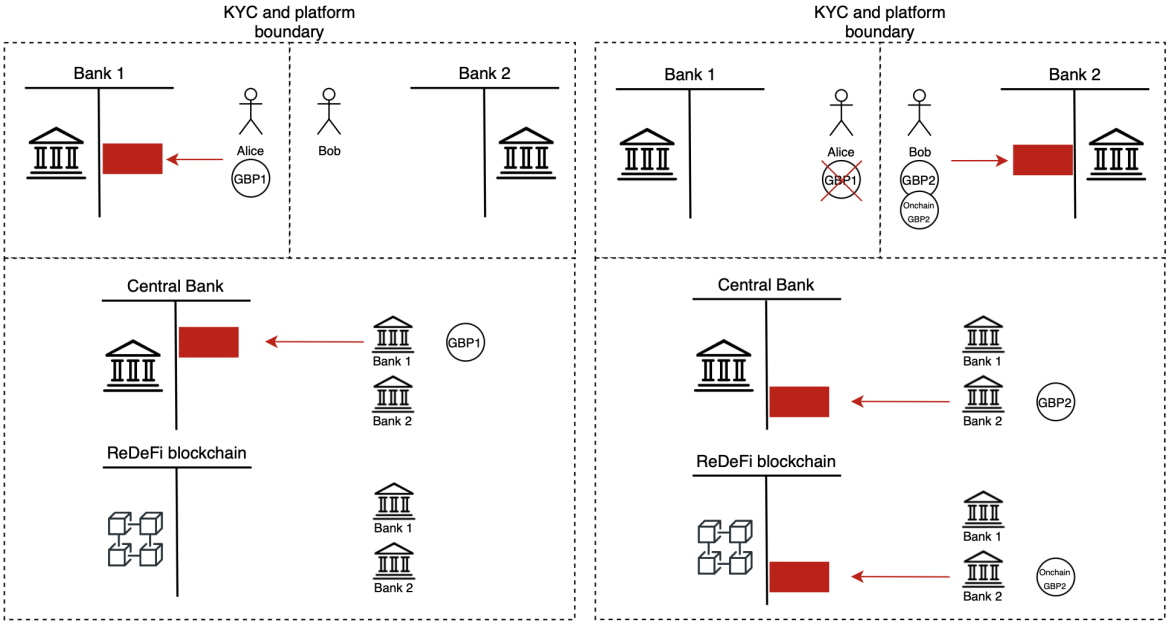
Graph 1. Alice sends money from her Current mirroring acct to Bob's Current mirroring acct. Both banks are participants.

Use case 2. Alice sends money from her Current acct to Bob's Current mirroring acct.

The left-hand panel portrays the circumstances preceding Alice's payment to Bob. Alice has 1 Pound sterling in her Current acct with Bank 1. Alice sends money from her Current acct to Bob's Current mirroring acct.

The right-hand panel depicts what happens when Alice sends money to Bob:

a) Because Alice utilised her Current acct with Bank 1, no Onchain GBP was mirroring conventional Pound sterling from her end. But, once the Pound sterling landed at Bank 2 at Bob's Current account, Bank 2 also assigned ("minted" or "issued") one Onchain GBP to Bob's Current mirroring account.
b) The creation of onchain money tokens is accompanied by conventional GBP movement from the Current acct at Bank 1 to the Current mirroring acct at Bank 2 and the central bank's partition. One Pound sterling is moved from Bank 1 to Bank 2 and settled on the central bank's balance sheet. This is demonstrated by the fact that conventional GBP in the right-hand panel belongs to Bank 2 after the transaction.



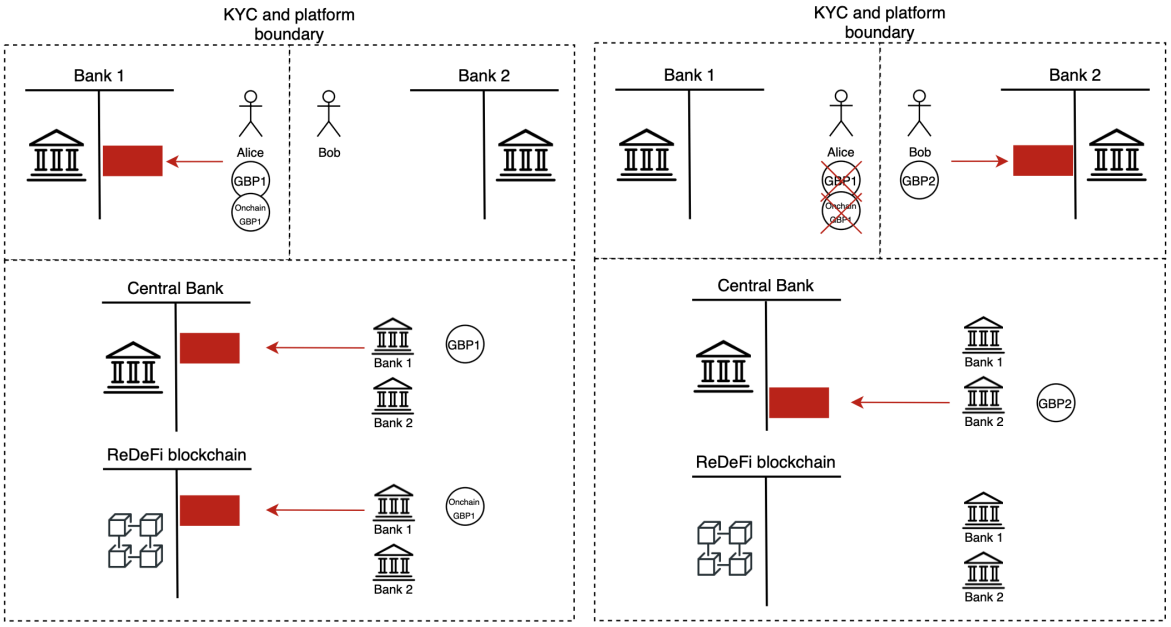
Graph 2. Alice sends money from her Current acct to Bob's Current mirroring acct. Both banks are participants.

Use case 3. Alice sends money from her Current mirroring acct to Bob's Current acct.

The left-hand panel portrays the circumstances preceding Alice's payment to Bob. Alice has 1 Pound sterling in her Current mirroring acct with Bank 1, which is mirrored and represented by 1 Onchain GBP in the ReDeFi blockchain. Alice sends money from her Current mirroring acct to Bob's Current acct.

The right-hand panel depicts what happens when Alice sends money to Bob:

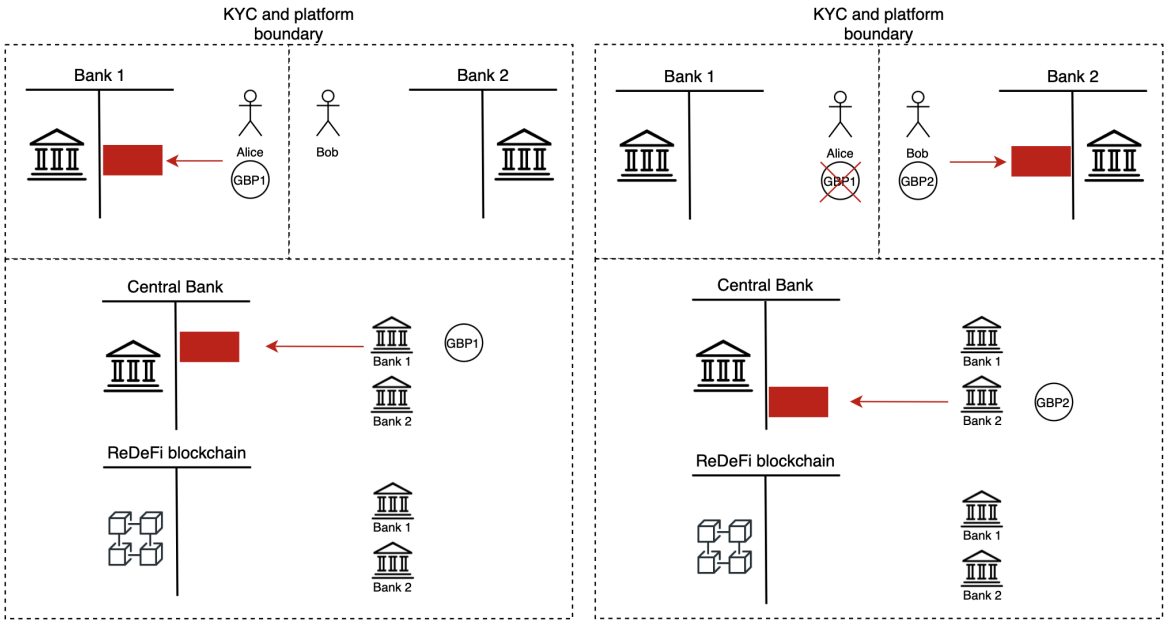
a) One Onchain GBP1 token held by Alice is deleted ("burned") by Bank 1. Because Alice sent to a Current acct at Bank 2, no Onchain GBP tokens were assigned ("minted" or "issued") to Bob by Bank 2.
b) The deletion of onchain money tokens is accompanied by conventional GBP movement from Current mirroring acct at Bank 1 to Current acct at Bank 2 and the central bank's partition. One Pound sterling is moved from Bank 1 to Bank 2 and settled on the central bank's balance sheet. This is demonstrated by the fact that conventional GBP in the right-hand panel belongs to Bank 2 after the transaction.



Graph 3. Alice sends money from her Current mirroring bank acct to Bob's Current acct. Both banks are participants.

Use case 4. Alice sends money from her Current acct to Bob's Current acct.

The left-hand panel portrays the circumstances preceding Alice's payment to Bob. Alice has 1 Pound sterling in her Current acct with Bank 1. Alice sends money from her Current acct to Bob's Current acct.



Graph 4. Alice sends money from her bank acct to Bob's bank acct. Both banks are participants.

The right-hand panel depicts what happens when Alice sends money to Bob:

a) Because both accts are conventional, there are no on-chain money tokens involved.
b) Conventional GBP moves from Current acct at Bank 1 to the Current acct at Bank 2 and the central bank's partition. One Pound sterling is moved from Bank 1 to Bank 2 and settled on the central bank's balance sheet. This is demonstrated by the fact that conventional GBP in the right-hand panel belongs to Bank 2 after the transaction.

Bank 1 is a participant in the ReDeFi environment, while Bank 2 is not.

Use cases and graphs below depict a specific technique of executing the Onchain GBP model utilising blockchain technology procedures and terminology. The dotted lines on the platform reflect the four partitions of the model maintained by one private tokenised money issuer (Banks 1) and Bank 2, which is not a ReDeFi network participant, and the central bank and the ReDeFi blockchain. The arrows indicate the issuers of the liabilities.

To be explicit, "Current acct" means a current bank account in conventional or modern banking with account details such as IBAN, BIC, sort code and account number. "Current mirroring acct" means a current bank account with account details such as IBAN, BIC, sort code and account number as well as a wallet address in the ReDeFi blockchain.

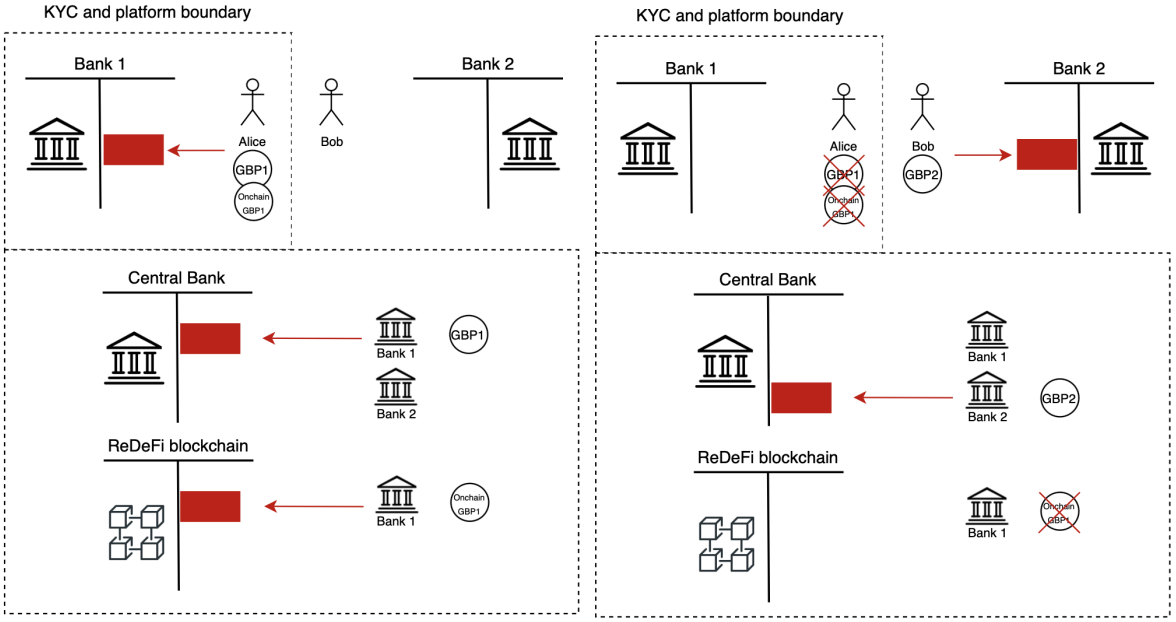
Both accounts are “everyday banking” accounts that give access to money for daily spending and can be linked to debit cards and can be protected by the FSCS.

Use case 5. Alice sends money from her Current mirroring acct to Bob’s 3rd-party bank Current acct.

The left-hand panel portrays the circumstances preceding Alice's payment to Bob. Alice has 1 Pound sterling in her Current mirroring acct with Bank 1, which is mirrored and represented by 1 Onchain GBP in the ReDeFi blockchain. Alice sends money from her Current mirroring acct to Bob’s Current acct.

The right-hand panel depicts what happens when Alice sends money to Bob:

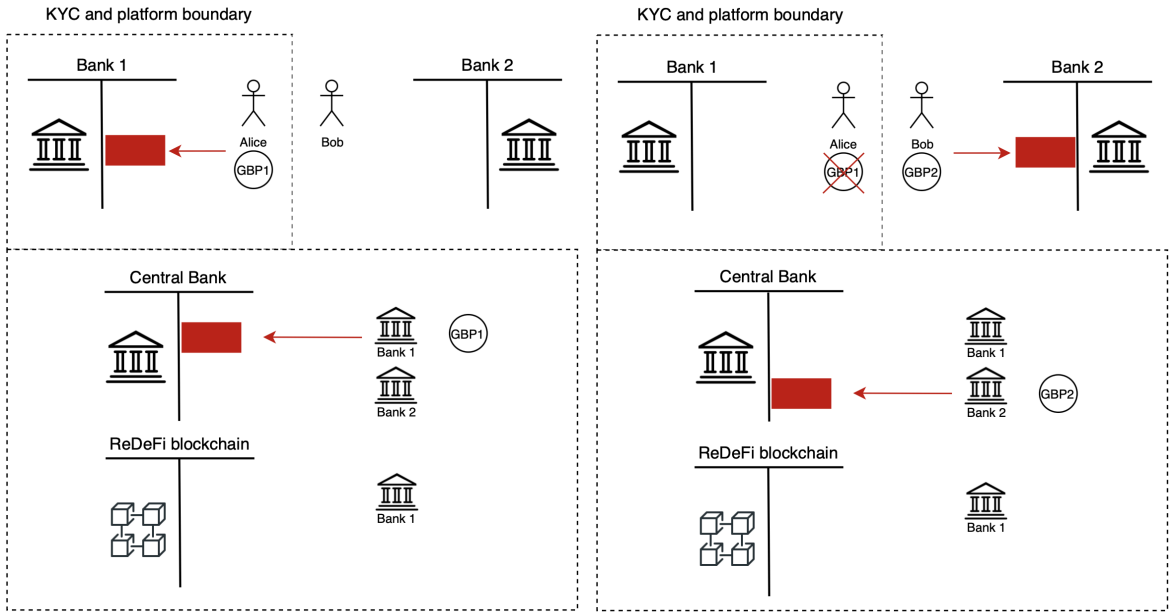
a) One Onchain GBP token held by Alice is deleted ("burned") by Bank 1. Because Bank 2 is not a participant in the ReDeFi network, it cannot deal with the on-chain money tokens so no tokens are assigned ("minted" or “issued”) to Bob by Bank 2.
b) The deletion of onchain money tokens is accompanied by conventional GBP movement from the Current mirroring acct at Bank 1 to the Current acct at Bank 2 and the central bank's partition. One Pound sterling is moved from Bank 1 to Bank 2 and settled on the central bank's balance sheet. This is demonstrated by the fact that conventional GBP in the right-hand panel belongs to Bank 2 after the transaction.



Graph 5. Alice sends money from her Current mirroring acct to Bob's 3rd-party bank Current acct. Bank 1 is a participant.

Use case 6. Alice sends money from her Current acct to Bob's 3rd-party bank Current acct.

The left-hand panel portrays the circumstances preceding Alice's payment to Bob. Alice has 1 Pound sterling in her Current acct with Bank 1. Alice sends money from her Current acct to Bob's Current acct.



Graph 6. Alice sends money from her Current acct to Bob's 3rd-party bank Current acct. Bank 1 is a participant.

The right-hand panel depicts what happens when Alice sends money to Bob:

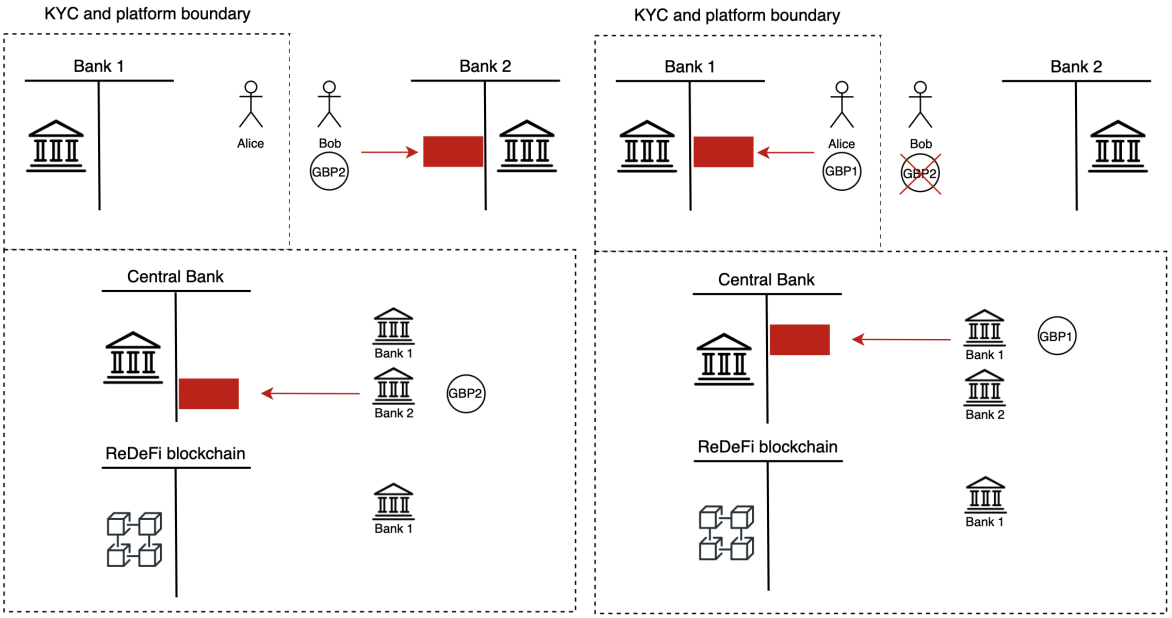
a) Because both accts are conventional, there are no on-chain money tokens involved.
b) Conventional GBP moves from the Current acct at Bank 1 to the Current acct at Bank 2 and the central bank's partition. One Pound sterling is moved from Bank 1 to Bank 2 and settled on the central bank's balance sheet. This is demonstrated by the fact that conventional GBP in the right-hand panel belongs to Bank 2 after the transaction.

Use case 7. Bob sends money from his 3rd-party bank Current acct to Alice's Current acct.

The left-hand panel portrays the circumstances preceding Bob's payment to Alice. Bob has 1 Pound sterling in his Current acct with Bank 2. Bob sends money from his 3rd-party bank Current acct to Alice's Current acct.

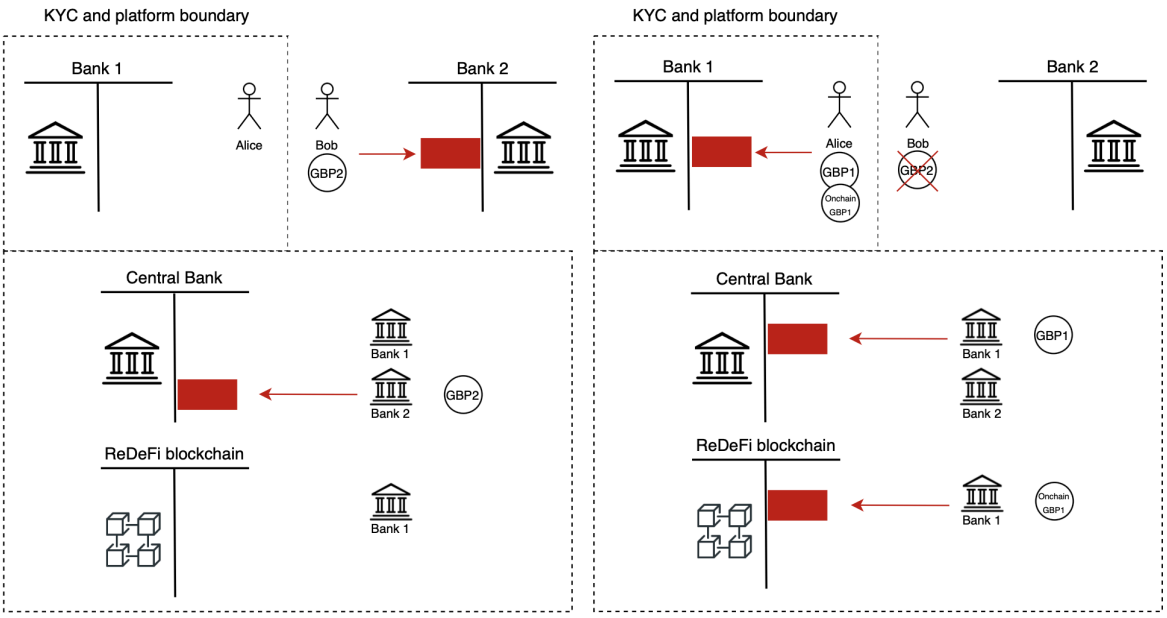
The right-hand panel depicts what happens when Bob sends money to Alice:

a) Because both accts are conventional, there are no on-chain money tokens involved.
b) Conventional GBP moves from a 3rd-party bank Current acct at Bank 2 to Current acct at Bank 1 and the central bank's partition. One Pound sterling is moved from Bank 2 to Bank 1 and settled on the central bank's balance sheet. This is demonstrated by the fact that conventional GBP in the right-hand panel belongs to Bank 1 after the transaction.



Graph 7. Bob sends money from his 3rd-party bank Current acct to Alice's Current acct. Bank 1 is a participant.

Use case 8. Bob sends money from his 3rd-party bank Current acct to Alice's Current mirroring acct.



Graph 8. Bob sends money from his 3rd-party bank Current acct to Alice's Current mirroring acct. Bank 1 is a participant.

The left-hand panel portrays the circumstances preceding Bob's payment to Alice. Bob has 1 Pound sterling in his Current acct with Bank 2. Bob sends money from his 3rd-party bank Current acct to Alice's Current mirroring acct.

The right-hand panel depicts what happens when Bob sends money to Alice:

a) Because Alice provided Bob with her Current mirroring acct at Bank 1, once the Pound sterling landed at Bank 1 at Alice's Current mirroring acct, Bank 1 assigned ("minted" or "issued") one Onchain GBP to Alice's Current mirroring acct.
b) The creation of onchain money tokens is accompanied by conventional GBP movement from Bob's 3rd-party bank Current acct at Bank 2 to Current mirroring acct at Bank 1 and the central bank's partition. One Pound sterling is moved from Bank 2 to Bank 1 and settled on the central bank's balance sheet. This is demonstrated by the fact that both Onchain GBP tokens and conventional GBP in the right-hand panel belong to Bank 1 after transaction.

User interfaces

The user interfaces depicted below are simplified versions of an end user's mobile interface. For greater clarity, the mobile app has two distinctive tabs for Onchain money and Conventional money.

To be explicit, "Conventional money" means a Current acct in conventional or modern banking with account details such as IBAN, BIC, sort code and account number. "Onchain

money" means a Current mirroring acct with account details such as IBAN, BIC, sort code account number as well as a wallet address in the ReDeFi blockchain.

Both accounts are “everyday banking” accounts that give access to money for daily spending and can be linked to debit cards and can be protected by the FSCS.

Interface 1. Sending money tabs.

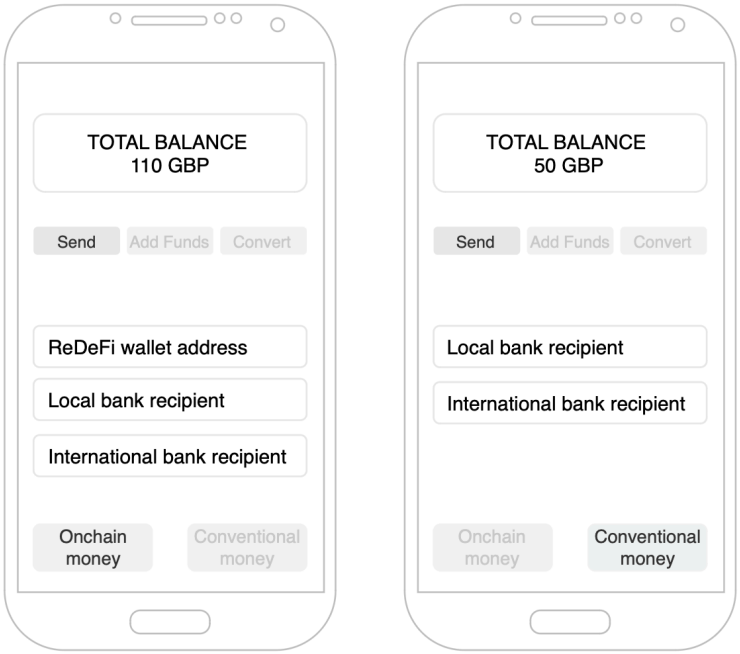
The Onchain money account is depicted on the left interface, with the following options:

1) To send money to a ReDeFi wallet address;
2) To send money to a local bank acct recipient using CHAPS, SEPA (e.g., the Sort code and Account number) or similar;
3) To send money to an overseas bank acct recipient using SWIFT (e.g., the IBAN and BIC) or similar.

All outbound onchain transactions from the Onchain money account to an external blockchain wallet address will be visible in the ReDeFi blockchain, but will not include the sender's or recipient’s name or other account details.

The Conventional money account is depicted on the right interface, with the following options:

1) To send money to a local bank acct recipient using CHAPS, SEPA (e.g., the Sort code and Account number) or similar;
2) To send money to an overseas bank acct recipient using SWIFT (e.g., the IBAN and BIC) or similar.



Interface 1. Sending money tabs.

Interface 2. Receiving money tabs.

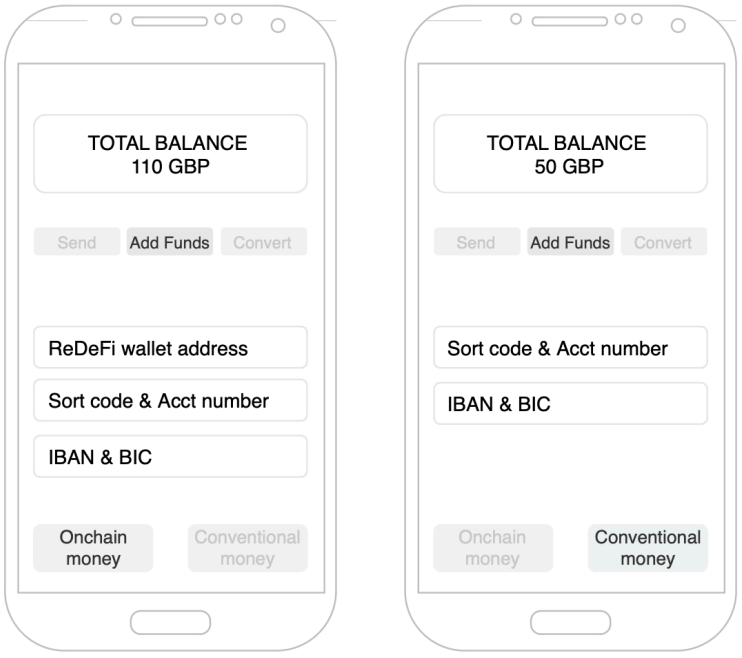
The Onchain money account is depicted on the left interface, with the following options:

1) To receive money from a ReDeFi wallet address;
2) To receive money from a local bank acct using CHAPS, SEPA (e.g., the Sort code and Account number) or similar;
3) To receive money from an overseas bank acct using SWIFT (e.g., the IBAN and BIC) or similar.

All inbound onchain transactions from an external blockchain wallet address to the Onchain money account will be viewable in the ReDeFi blockchain, but will not include the sender's or recipient's name or other account details.

The Conventional money account is depicted on the right interface, with the following options:

1) To receive money from a local bank using CHAPS, SEPA (e.g., the Sort code and Account number) or similar;
2) To receive money from an overseas bank using SWIFT (e.g., the IBAN and BIC) or similar.



Interface 2. Receiving money tabs.

Interface 3. Converting money.

The Onchain money account is depicted on the left interface, with the following option:

1) To convert money to Conventional GBP.

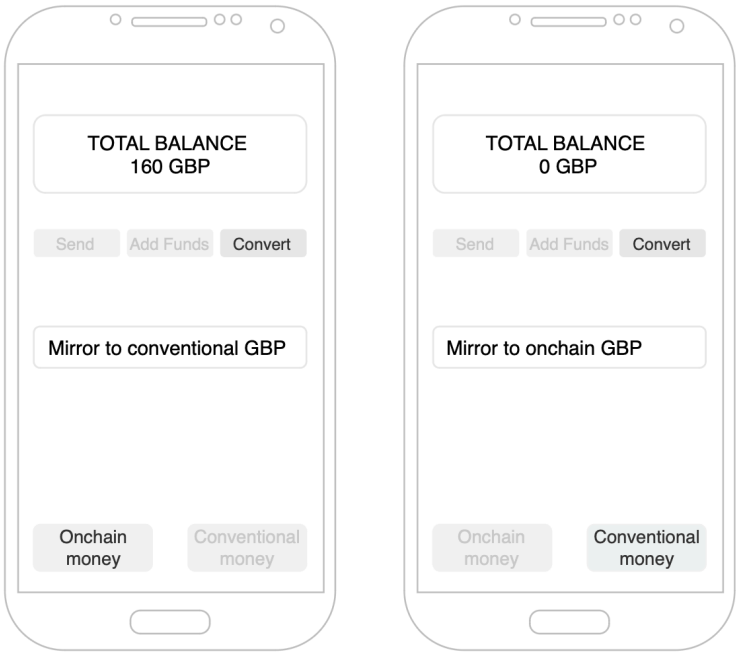
The Conventional money account is depicted on the right interface, with the following option:

1) To convert money to Onchain GBP.

In the interfaces below, its user transferred 50 GBP from their Conventional money tab (Current acct) to their Onchain money (Current mirroring acct), resulting in 160 Onchain GBP.

(The user had 110 Onchain GBP and 50 Conventional GBP on the interfaces 1 and 2).

Because both accounts are "everyday banking" accounts that provide access to funds for daily expenditure, can be connected to debit cards, and are FSCS-protected, this user can spend 160 Onchain GBP from their Current mirroring acct.



Interface 3. Converting money.

Conclusion

The Onchain GBP model represents tokenised deposits that do not break the “singleness of money” principle and expands the functionality by enabling programmable ledgers and introducing contingent execution and composability of transactions.

Thus, the Onchain GBP model is appropriate for use by banks and other financial institutions, as well as individuals and businesses, who want to benefit from the enhanced functionality and smart contracts' ability to introduce instant execution, traceability, near-zero cost of operations, and transaction composability while remaining on the regulated side of the financial system.

ReDeFi Self-Custody Wallet

Key takeaways:

- *ReDeFi Self-Custody Wallet is a decentralised wallet that allows users to retain complete control over their digital assets, including Onchain money, and access their funds online from different devices.*
- *ReDeFi Self-Custody Wallet allows its users to take advantage of mirroring safeguarding[6] accounts that hold the same amount of traditional fiat currency that users have Onchain money in their wallets..*
- *ReDeFi Self-Custody Wallet provides users with bank acct information such as sort code and account number, IBAN and BIC, and others, allowing them to send traditional fiat currencies from regulated institutions like banks and receive them as Onchain money in their ReDeFi Wallets.*

The ability to keep total control over owned assets is a fundamental human right. Existing non-custodial, or decentralised, hot and cold wallets allow users to own the wallet's private keys (a secret seed phrase that functions similarly to a very strong password) and retain ownership of their cryptocurrencies and tokens. As well as participate in smart contracts or blockchain protocols. The problem with the existing non-custodial wallets is that they do not fit the regulations such as FATF[7], and so cannot be completely incorporated into the financial sector.

The ReDeFi Blockchain is a decentralised network that is regulated. Thus it allows its active users to create decentralised apps and services that can be active participants in the regulated financial sector. The ReDeFi Self-Custody Wallet is a hot wallet that allows users to keep control of their cash in the network by controlling private keys and seed phrases.

Problem statement 1: Can the ReDeFi Self-Custody Wallet fit the existing regulation while also providing its users with the ability to retain complete control over their assets?

Problem statement 2: Can the ReDeFi Self-Custody Wallet work with the existing financial system and provide users with an enhanced utility via smart-contract interactions?

[6] https://www.fca.org.uk/firms/emi-payment-institutions-safeguarding-requirements
[7] https://www.fatf-gafi.org/en/publications/Fatfrecommendations/Targeted-update-virtual-assets-vasps.html

Overview

The ReDeFi Self-Custody Wallets represent the issuer's liabilities, and the holder has a claim on the issuer for redemption. Depending on the asset, the claim could be at par value in the sovereign unit of account (for example, Onchain money) or not (for example, stablecoins or other tokens).

When using Onchain money, the ReDeFi Self-Custody Wallet represents tokenised deposits that do not violate the "singleness of money" principle. Moreover, the wallets are linked to individual safeguarding accounts in a bank. As a result, the ReDeFi Self-Custody Wallet can be used within the traditional banking system: individuals and businesses, for example, could send traditional money from or to traditional bank accounts while benefiting from enhanced functionality such as instant execution, traceability, near-zero cost of operations, and the ability to interact with smart contracts while remaining on the regulated side of the financial system.

It is also important to note that the ReDeFi Self-Custody Wallets have no AML[8] or KYC[9] compliance flaws because liabilities are indirectly transferred to individuals with verified identities.

The table below depicts the distinctions between the ReDeFi Self-Custody Wallets and other wallets.

	ReDeFi Wallet	Other decentralised wallets
Organisation behind	Regulated Decentralised Finance LTD	Anyone
Who is in full control of the assets?	User, they keep the private/public keys and the seed phrase	User, they keep the private/public keys and the seed phrase
Can wallets hold tokens?	Yes	Yes
Can wallets work with Onchain money such as Onchain GBP, Onchain EUR and so on?	Yes	No
Do tokens represent the issuer's liabilities?	For Onchain money, the claim is at par value in the sovereign unit of account. For other tokens, it works in the same way as other wallets.	Supposedly yes, but it is not possible to verify.
Is Onchain money in the wallet backed by conventional money?	Onchain money is not backed, but mirrored in a safeguarding account in a traditional bank by ReDeFi LTD	No
Is Onchain money in the wallet protected?	Yes, since Onchain money is mirrored in a safeguarding account	No

[8] Anti-money laundering (AML)
[9] Know-your-customer (KYC)

	in a traditional bank by ReDeFi LTD	
Can conventional money be sent to the wallet?	Yes, they will arrive as the Onchain money	No
Can Onchain money be sent from the wallet to a bank acct?	Yes, users can send Onchain money to their bank accounts	No

Table 2. Difference between the ReDeFi Self-Custody Wallets and other wallets.

Use cases

The use cases and graphs below depict the work of ReDeFi Wallets utilising blockchain technology procedures and terminology. The dotted lines reflect the five partitions of the model maintained by the one private tokenised money issuer (ReDeFi Ltd), and the central bank and the ReDeFi blockchain. The arrows indicate the issuers of the liabilities.

To be explicit,
"Current acct" means a current bank account in conventional or modern banking with account details such as IBAN, BIC, sort code and account number.
"Current mirroring acct" means a current bank account with account details such as IBAN, BIC, sort code and account number as well as a wallet address in the ReDeFi blockchain.

Both accounts are “everyday banking” accounts that give access to money for daily spending, and can be linked to debit cards and can be protected by the FSCS.

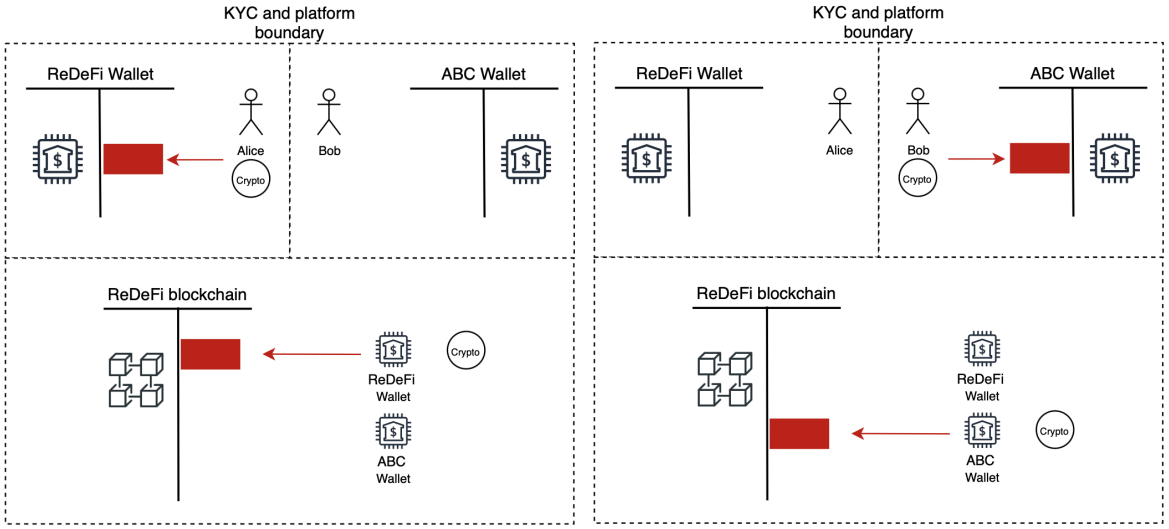
"Mirroring ReDeFi sub-account" refers to a bank sub-account under the ReDeFi LTD account. The funds in these sub-accounts do not belong to users, but rather to ReDeFi, and are kept in segregated safeguarded sub-accounts. This design allows for avoiding double spending issues while also unlocking Mirroring current accounts for Onchain money. Every ReDeFi Wallet is linked to a Mirroring ReDeFi sub-account that contains bank acct details such as IBAN, BIC, sort code, and account number, allowing users to send money from traditional banks and receive it as Onchain money in a decentralised wallet or send money to traditional banks directly from their decentralised ReDeFi Wallets.

Use case 1. Alice sends cryptocurrency from her ReDeFi Wallet to Bob’s ABC wallet.

The left-hand panel portrays the circumstances preceding Bob's transaction. Bob has 1 cryptocurrency token in his ABC Wallet in the ReDeFi network.

The right-hand panel depicts what happens when Bob sends funds:

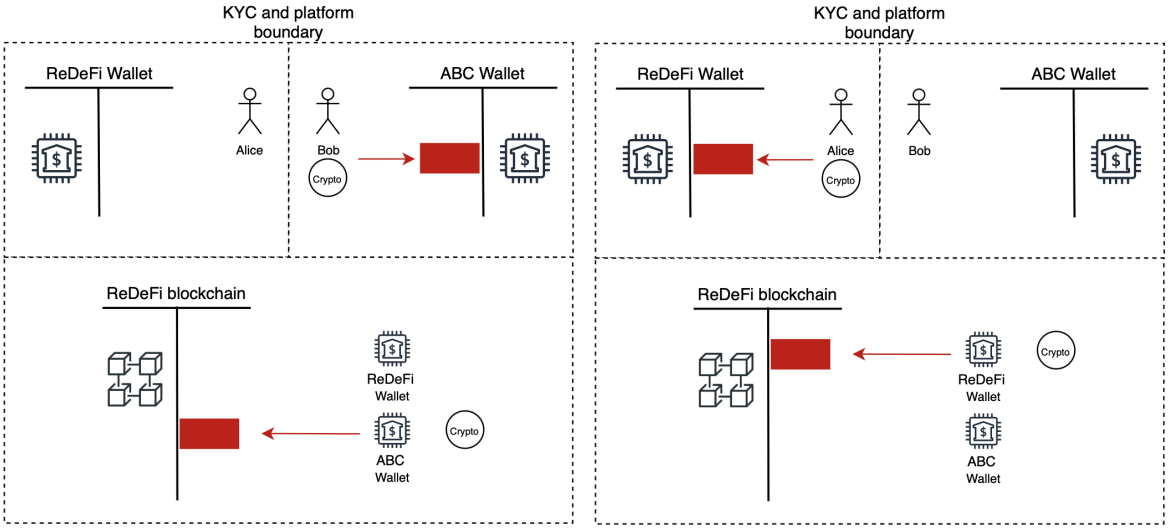
a) The Cryptocurrency token held by Bob is transferred to Alice after network confirmations.



Graph 9. Alice sends cryptocurrency from her ReDeFi Wallet to Bob's ABC wallet.

Use case 2. Alice receives cryptocurrency to her ReDeFi Wallet from Bob's wallet.

The left-hand panel portrays the circumstances preceding Alice's transaction. Alice has 1 cryptocurrency token in her ReDeFi Wallet in the ReDeFi network.



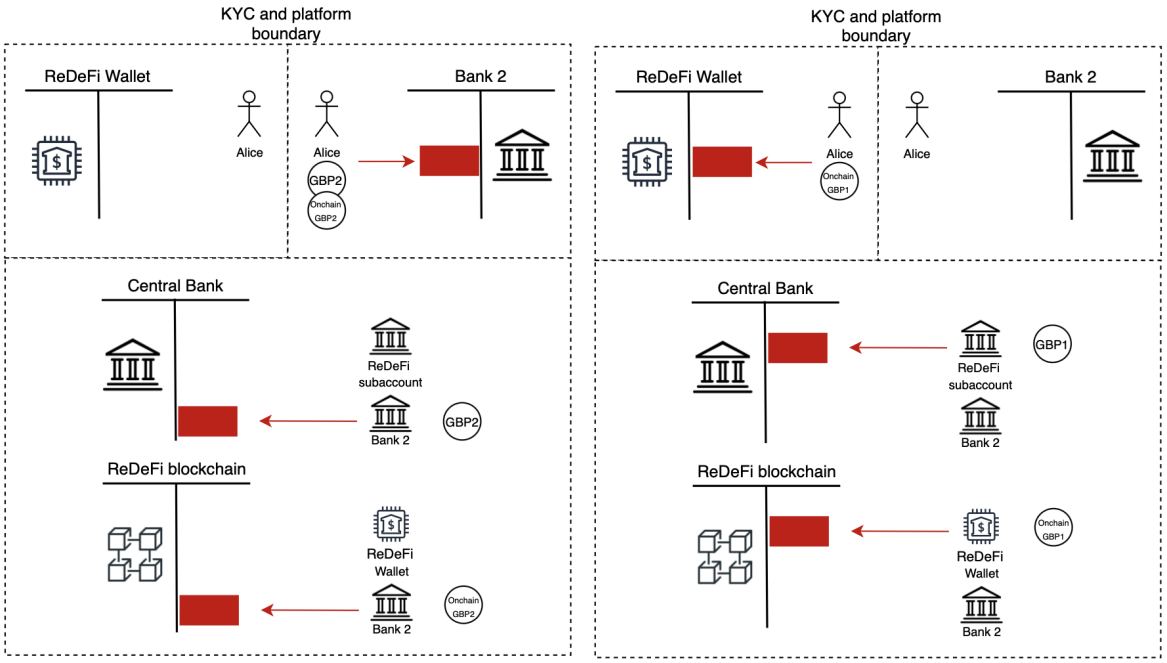
Graph 10. Alice receives cryptocurrency to her ReDeFi Wallet from Bob's ABC wallet.

The right-hand panel depicts what happens when Alice sends funds:

a) Cryptocurrency token held by Alice is transferred to Bob after network confirmations.

Use case 3. Alice sends Onchain money from her Current mirroring acct in a ReDeFi network bank to her ReDeFi Wallet.

The left-hand panel portrays the circumstances preceding Alice's transaction. Alice has 1 Pound sterling in her Current mirroring acct with Bank 2, which is mirrored and represented by 1 Onchain GBP in the ReDeFi blockchain. Alice sends money from her Current mirroring acct in a ReDeFi network bank (Bank 2) to her ReDeFi Wallet.



Graph 11. Alice sends Onchain money from her Current mirroring acct in a ReDeFi network bank (Bank 2) to her ReDeFi self-custody Wallet.

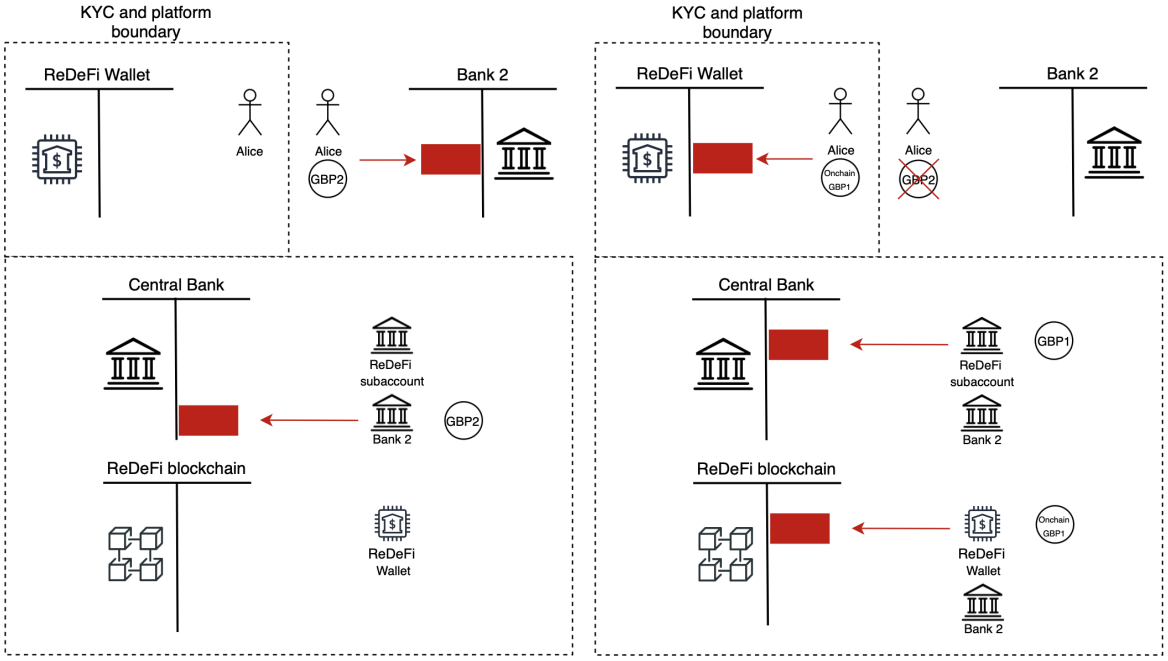
The right-hand panel depicts what happens when Alice sends money:

a) One Onchain GBP token held by Alice is deleted ("burned") by Bank 2, and one Onchain GBP token is assigned ("minted" or “issued”) to Alice by ReDeFi. Onchain GBP tokens can be transferred (rather than burned and issued) since both Bank 2 and ReDeFi are within the ReDeFi network.
b) The deletion and creation of onchain money tokens are accompanied by conventional GBP movement from the Current mirroring acct at Bank 2 to the Mirroring ReDeFi sub-account and the central bank's partition. One Pound sterling is moved from Bank 2 to the ReDeFi sub-account and settled on the central bank's balance sheet. This is demonstrated by the fact that Onchain GBP tokens in the right-hand panel belong to Alice’s ReDeFi Wallet and conventional GBP belongs to the Mirroring ReDeFi sub-account after the transaction.

Use case 4. Alice sends money from her Current acct in a 3rd party bank to her ReDeFi Wallet.

The left-hand panel portrays the circumstances preceding Alice's transaction. Alice has 1 Pound sterling in her Current acct with Bank 2, because it is not a ReDeFi network

participant, there is no Onchain GBP. Alice sends money from her Current acct in a 3rd party bank to her ReDeFi Wallet using Mirroring ReDeFi sub-account details.



Graph 12. Alice sends money from her Current acct in a 3rd party bank (Bank 2) to her ReDeFi Wallet.

The right-hand panel depicts what happens when Alice sends money:

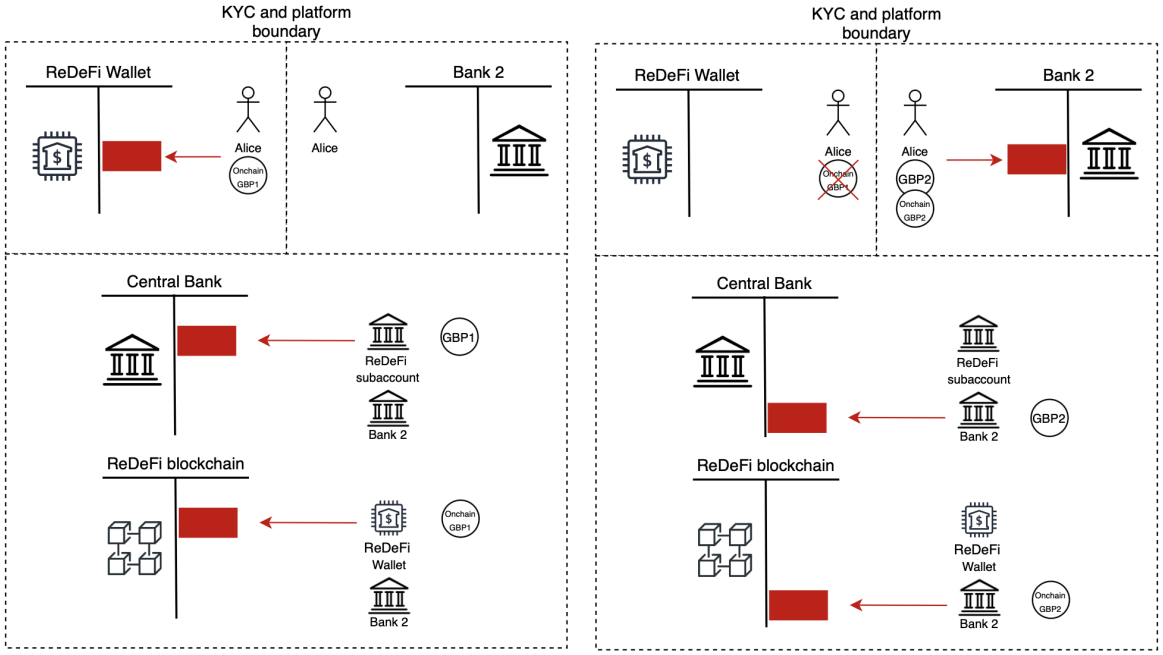
a) Because Alice uses account details of a Mirroring ReDeFi sub-account linked to her ReDeFi Wallet, once 1 Pound sterling landed at the Mirroring ReDeFi sub-account, ReDeFi assigned ("minted" or "issued") one onchain GBP to Alice's ReDeFi Wallet.
b) The deletion and creation of onchain money tokens is caused by conventional GBP movement from the Current acct at Bank 2 to the Mirroring ReDeFi sub-account and the central bank's partition. One Pound sterling is moved from Bank 2 to the ReDeFi su- account and settled on the central bank's balance sheet. This is demonstrated by the fact that Onchain GBP tokens in the right-hand panel belong to Alice's ReDeFi Wallet and conventional GBP belongs to the Mirroring ReDeFi Sub account after the transaction.

Use case 5. Alice sends Onchain money from her ReDeFi Wallet to her Current mirroring acct in a ReDeFi network bank.

The left-hand panel portrays the circumstances preceding Alice's transaction from her ReDeFi Wallet to her Current mirroring acct in a ReDeFi network bank. Alice has 1 Onchain GBP in her ReDeFi Wallet. ReDeFi LTD stores 1 Pound sterling under the sub-account linked to Alice's wallet. These funds do not belong to Alice but they are required to keep the "singleness of money" principle. Alice sends tokens from her ReDeFi Wallet to her Current mirroring acct in a ReDeFi network bank (Bank 2).

The right-hand panel depicts what happens when Alice sends money:

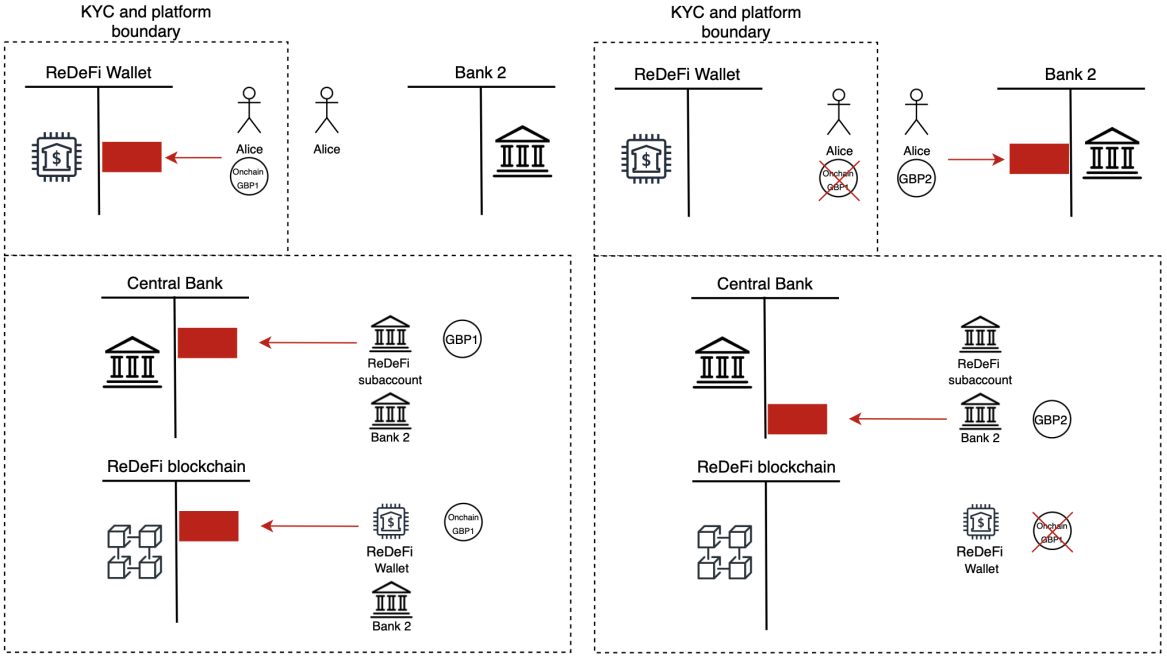
a) One Onchain GBP token held by Alice is deleted ("burned") by the ReDeFi blockchain, and one onchain GBP token is assigned ("minted" or “issued”) to Alice by Bank 2. Onchain GBP tokens can be transferred (rather than burned and issued) since Bank 2 is a ReDeFi network participant.
b) The deletion and creation of Onchain Money tokens is accompanied by conventional GBP movement from the Mirroring sub-account at ReDeFi LTD to the Current mirroring acct at Bank 2 and the central bank's partition. One Pound sterling is moved from ReDeFi LTD to Bank 2 and settled on the central bank's balance sheet. This is demonstrated by the fact that both Onchain GBP tokens and conventional GBP in the right-hand panel belong to Bank 2 after the transaction.



Graph 13. Alice sends Onchain money from her ReDeFi Wallet to her Current mirroring acct in a ReDeFi network bank (Bank 2).

Use case 6. Alice sends Onchain money from her ReDeFi Wallet to her Current acct in a 3rd party bank.

The left-hand panel portrays the circumstances preceding Alice's transaction. Alice has 1 Onchain GBP in her ReDeFi Wallet, and the ReDeFi keeps one Pound sterling in the corresponding Mirroring ReDeFi sub-account. Alice sends her Onchain GBP from her ReDeFi Wallet to a 3rd party bank account (Bank 2).



Graph 14. Alice sends Onchain money from her ReDeFi Wallet to her Current acct in a 3rd party bank (Bank 2).

The right-hand panel depicts what happens when Alice sends money:

a) One Onchain GBP token held by Alice is deleted ("burned") by ReDeFi blockchain, and because Bank 2 is not a ReDeFi network participant, no Onchain GBP is assigned ("minted" or “issued”) to Alice by Bank 2.
b) The deletion of Onchain money tokens is caused by conventional GBP movement from Mirroring ReDeFi sub-account to Current acct at Bank 2 and the central bank's partition. One Pound sterling is moved from the ReDeFi to Bank 2 and settled on the central bank's balance sheet. This is demonstrated by the fact that conventional GBP belongs to Bank 2 after this transaction.

User Interface

Simplified versions of mobile user interfaces are shown below. The actual interfaces themselves could differ. ReDeFi Wallet may also offer web interfaces.

Interface 1. ReDeFi Wallet main tabs.

On the left, the main tab displays the available Onchain money, cryptocurrency and tokens. The two buttons above the balances allow users to Send and Add funds to their wallets.

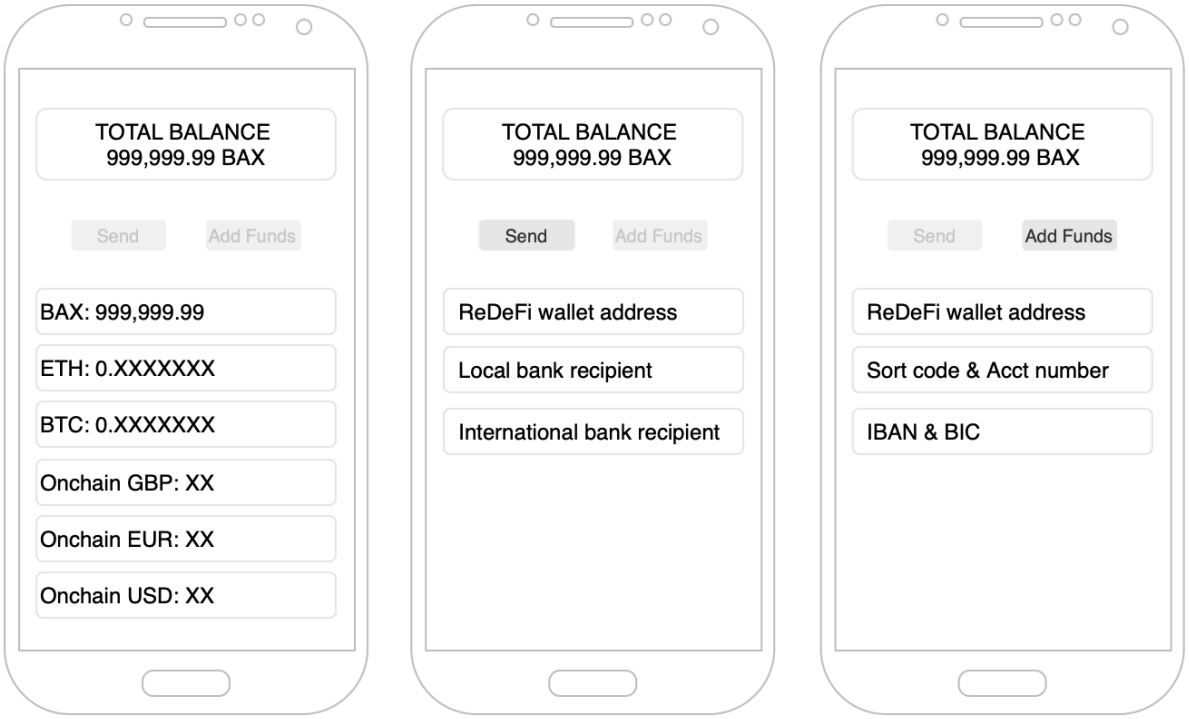
The Send tab is shown in the centre. Depending on the asset, a user can:

1) Send funds to a ReDeFi Wallet address;

2) Send funds to a local bank acct recipient using CHAPS, SEPA (e.g., the Sort code and Account number) or similar;
3) Send funds to an overseas bank acct recipient using SWIFT (e.g., the IBAN and BIC) or similar.

Cryptocurrencies like BAX, ETH, and BTC will only have wallet address options, however, Onchain money like GBP, EUR, and USD will have two more options for sending straight to a bank. This action will be carried out from the Mirroring ReDeFi sub-account associated with this wallet.

The Add Funds tab is shown on the right.



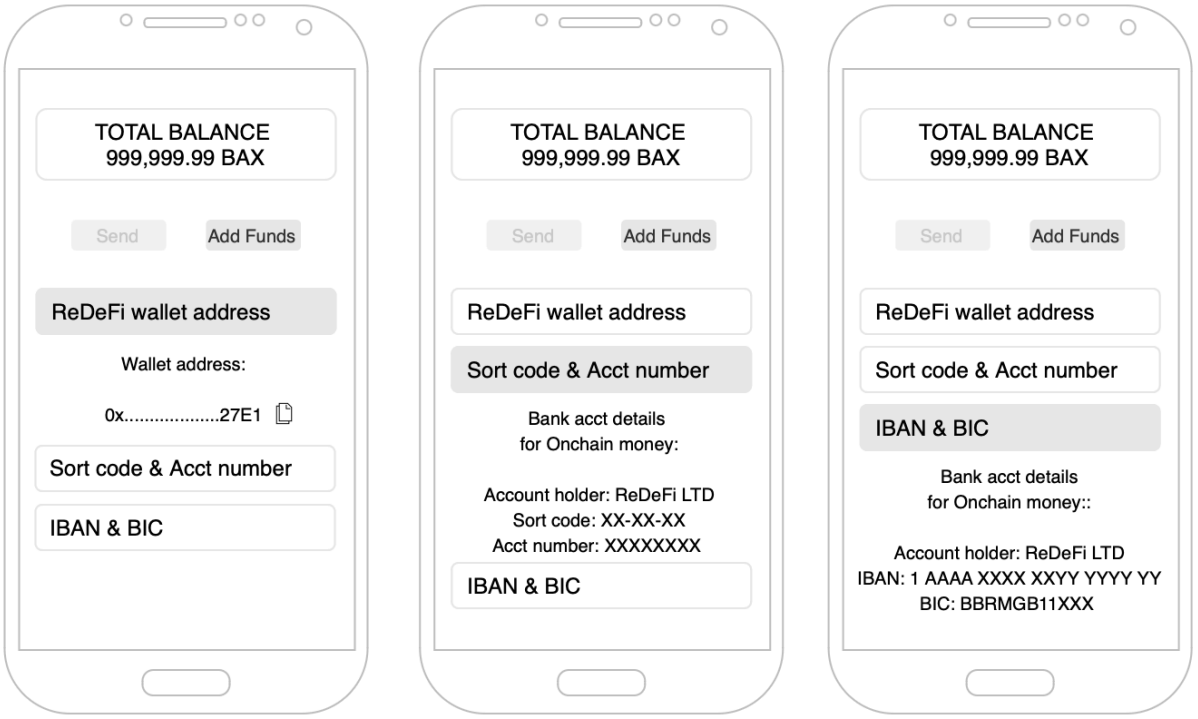
Interface 4. ReDeFi Wallet main tabs.

Interface 2. Add funds options.

The main tabs for Add Funds are shown below. Depending on the asset selected, a user can:

1) Receive funds from a ReDeFi Wallet address;
2) Receive funds from a local bank acct using CHAPS, SEPA (e.g., the Sort code and Account number) or similar;
3) Receive funds from an overseas bank acct using SWIFT (e.g., the IBAN and BIC) or similar.

Which is seen below, from left to right.



Interface 5. Add funds options.

Cryptocurrencies like BAX, ETH, and BTC will only have wallet address options, however, Onchain money like GBP, EUR, and USD will have two more options for receiving funds. This action will be carried out using bank acct details from the Mirroring ReDeFi sub-account associated with this wallet.

Conclusion

ReDeFi Self-Custody Wallet complies with current regulations and can use the Onchain GBP model, which represents tokenised deposits that do not violate the "singleness of money" principle. Furthermore, users have complete control over their assets in the wallet.

The ReDeFi Self-Custody Wallet extends the capabilities of existing decentralised wallets by enabling programmable ledgers and smart contracts while remaining on the regulated side of the financial system.

FX Swap Protocol

The FX Swap Protocol introduces a DEX tailored specifically for the exchange of Onchain Money. It facilitates the conversion and settlement of Onchain Money among participants within the prescribed KYC border.

The Onchain Money Paradigm

Onchain Money, representing liabilities of the issuing entity, assures holders redemption at par value in the sovereign unit of account. It exists within a controlled environment, wherein participants are clients of regulated financial institutions. This design precludes the direct transfer of liabilities outside the KYC boundaries, ensuring compliance and integrity within the financial ecosystem. Settlements occur in real-time, with the bank's ledger balance sheet as the fulcrum, maintaining the singularity and confidence akin to conventional fiat money.

Functionalities

This protocol operates on the premise of facilitating foreign exchange transactions within the ReDeFi blockchain, mirroring traditional banking systems. It leverages the stability of Onchain Money, as it is pegged and settled against central bank reserves. The swaps do not engage with transferable liabilities, thereby preserving the integrity of the monetary system and maintaining the value parity anchored to the sovereign currency.

Operational Integration

The DEX offers an interface for banks to conduct foreign exchange transactions in a decentralised manner. It recognises the dual presence of Onchain Money - as reflected in the traditional banking accounts and simultaneously on the ReDeFi blockchain. The exchange operates under strict adherence to the regulatory framework, thereby negating concerns related to Anti-Money Laundering (AML) and Know Your Customer (KYC) compliance.

Distinction from Conventional DEX Models

The core differential of the FX Swap Protocol lies in its exclusion from market price-driven financial assets, remaining impervious to volatility typically associated with other cryptocurrencies or tokens. It functions under the protection of regulated financial entities, with each transaction underpinned by conventional GBP settlements.

The FX Swap Protocol provides a regulated, stable, and efficient DEX for foreign exchange within our network. It underscores the innovative potential of blockchain technology to operate within the boundaries of existing financial regulations while offering enhanced efficiency and security to everyday transactions between participants.

The 9 Applications of AI and Big Data

ReDeFi is multi-layered blockchain network that presents numerous opportunities for the application of AI and Big Data. These technologies can significantly improve the functionality, security, user experience, and overall attractiveness of the ecosystem to both retail users and institutional clients. ReDeFi positions as a forward-thinking, technologically advanced and user-centric platform in the blockchain and financial services arena.

1. Fraud Detection and Security

Functioning: Leveraging advanced analytics, ReDeFi integrates AI to continuously monitor and scrutinise transactional activities across its blockchain layers and within the BABB App. By applying machine learning techniques, the system discerns patterns indicative of legitimate transactions and those that suggest fraudulent intent. This proactive monitoring is capable of identifying intricate schemes by comparing current activities against a vast repository of historical blockchain data.

Benefit: The deployment of AI for fraud detection substantially elevates the security infrastructure of the ReDeFi network. By automating the recognition of fraudulent activities, it not only consolidates trust amongst participants but also significantly diminishes the incidence of financial malpractice. This automation relieves the system of extensive manual monitoring, thereby streamlining operational efficiency and resource allocation.

Implementation Plan:

- **Data Collection:** Amass a comprehensive database of transactional history to serve as a learning base for AI algorithms.
- **Model Development:** Develop sophisticated machine learning models that refine their detection capabilities with ongoing exposure to transactional data.
- **Real-time Monitoring:** Establish an omnipresent monitoring system that utilises the trained models to detect and alert on anomalies instantly.
- **Continuous Learning:** Implement a feedback loop that consistently updates the AI models with new transactional data, ensuring adaptability to emerging fraudulent patterns.

2. Personalised Financial Services

Functioning: Our user-centric approach lies in AI's capacity to personalise financial services. By meticulously analysing user behaviour, transaction history, and stated preferences, AI creates individual user profiles. These profiles inform customised financial advice, investment suggestions, and service offerings within the BABB App and ReDeFi wallet. Big Data supports this by enabling the predictive analytics component, which extrapolates market trends to furnish users with forward-looking financial planning and investment insights.

Benefit: This personalisation translates into a highly individualised user experience, deepening user engagement and platform fidelity. It empowers users with knowledge and tools that are tailored to their unique financial journey, potentially optimising their financial outcomes and fostering a sense of partnership in their financial growth.

Implementation Plan:

- **Data Analysis:** Systematically gather and analyse user data to discern distinct patterns, preferences, and financial behaviours.
- **Algorithm Development:** Construct and refine AI algorithms dedicated to personalisation, ensuring they are attuned to the nuances of user data.
- **Predictive Insights:** Deploy predictive analytics to provide users with actionable financial insights, enabling informed decision-making for investments and savings.
- **Feedback Mechanisms:** Integrate a robust feedback loop that continuously enhances personalisation algorithms based on user interaction data and changing market conditions.

3. Improved User Experience

Functioning: AI chatbots can be equipped with natural language processing (NLP) technology, and transform user interaction. These chatbots provide instantaneous support for financial transactions and technical inquiries, understanding and responding to user commands in their natural language. The AI's ability to learn from each interaction ensures a progressively smoother user experience.

Benefit: The principal advantage in this, is a more intuitive and accessible platform, diminishing user frustration and making complex financial operations more user-friendly. The immediate support significantly improves customer satisfaction and alleviates the workload of customer service teams, optimising operational costs in the process.

Implementation Plan:

- **Chatbots:** Initiate the integration of AI-powered chatbots within the BABB App and ReDeFi wallet to provide immediate customer support.
- **NLP:** Implement natural language processing capabilities, enabling users to engage in fluid, natural-language dialogue with the platform.
- **Interface:** Leverage AI to analyse user interactions, systematically refining the user interface and experience based on data-driven insights.

4. Enhanced Trading on ReDeFi DEX

Functioning: Utilising AI for market analysis, our DEX will equip our users with predictive insights into market trends, enabling them to make well-informed trading decisions. Furthermore, the DEX will offer algorithmic trading functionalities that allow users to execute

trades automatically, based on user-defined parameters and strategic models developed by AI algorithms.

Benefit: Traders are provided with a suite of tools that sharpen their understanding of market dynamics and enable the optimisation of their trading strategies. The automated trading capabilities ensure trades are executed efficiently and improve trading performance.

Implementation Plan:

- **Market Analytics:** Construct AI-based tools that provide real-time market analysis and predictive trend insights to users on the DEX's interface.
- **Algorithmic Trading:** Develop and make available customisable algorithmic trading options, empowering users to execute trades autonomously according to established strategies.
- **Educational Resources:** Comprehensive educational materials to aid users in effectively leveraging AI for trading, enhancing their ability to utilise these advanced tools directly in their strategies.

5. Compliance and Regulatory Adherence

Functioning: ReDeFi harnesses the analytical power of AI to oversee and ensure adherence to the shifting landscape of global regulations. The system will be equipped with AI-driven mechanisms tailored to monitor transactions, flagging any activity that could potentially breach Anti-Money Laundering (AML) directives.

Benefit: The implementation of this AI framework secures our compliance with legal standards, thereby mitigating the risk of punitive measures. It establishes a bedrock of trust and reliability with both users and regulatory entities, a cornerstone for sustainable operation and growth within the financial industry.

Implementation Plan:

- **Regulatory Database:** Collate and curate a comprehensive database detailing current and forthcoming regulations across diverse jurisdictions, as they release.
- **Compliance Assurance System:** Deploy an AI-based system to perform continuous surveillance and assurance of adherence to the documented regulations.
- **Specialised AML Monitoring:** Design and integrate a dedicated AI algorithm capable of meticulous AML transaction analysis, bolstering the ecosystem's defence against financial malpractices.

6. Data-Driven Decision Making for Management

Functioning: These insights are garnered through the diligent analysis of vast datasets, driving key business decisions and preempting operational inefficiencies.

Benefit: The strategic leverage of such data-driven decision-making processes kindles the discovery of growth avenues and the refinement of user engagement strategies. Furthermore, AI's predictive capabilities in system maintenance forestall potential disruptions, cementing a robust operational framework and ensuring a seamless user experience.

Implementation Plan:

- **Comprehensive Data Analysis:** Establish a platform for the aggregation and rigorous analysis of ecosystem-wide data.
- **Business Intelligence:** Integrate sophisticated business intelligence tools to distil and translate data into strategic insights.
- **Proactive Maintenance:** AI can anticipate and schedule maintenance, thereby preempting system outages and ensuring uninterrupted service delivery.

7. Cross-Platform Integration and Interoperability

Functioning: Through automation and data processing, AI simplifies and accelerates the synergy between disparate platforms. Concurrently, Big Data analytics provides a deep dive into usage patterns, which is important in fine-tuning the interoperability functions.

Benefit: The result is a seamless, frictionless interaction between ReDeFi and traditional financial environments, significantly boosting user convenience. This broadens our ecosystem's appeal, drawing in a diverse user base and paving the way for a more interconnected financial industry.

Implementation Plan:

- **AI-Driven Integration Framework:** Construct an AI-infused framework designed to streamline the integration process with external banking and financial entities.
- **Ongoing Data-Driven Analysis:** Deploy analytics tools to dissect and understand cross-platform engagement, with a focus on iterative enhancements to interoperability features.

8. Marketing and Enhancing User Base

Functioning: The AI analytical process enables the crafting of precise marketing strategies, specifically designed to engage diverse segments of the user population effectively. In parallel, extensive big data analytics provide deep insights into prevailing and emerging trends within the market, affording ReDeFi the capability to swiftly adapt to the changing needs and expectations of its target audience.

Benefit: This approach to marketing not only maximises the ROI in promotional activities but also ensures that ReDeFi's offerings are consistently aligned with the expectations and preferences of the market. As a result, it fosters the growth of a loyal and expanding user base, whilst solidifying ReDeFi's position as a dynamic and user-focused platform.

Implementation Plan:

- **Customised Marketing Initiatives:** Deploy AI to conduct an in-depth analysis of user interaction and consumption patterns, facilitating the development of customised marketing campaigns that resonate with distinct user groups.
- **Forecasting Market Evolution:** Implement an advanced suite of analytical instruments to scrutinise and interpret the trajectory of market trends, ensuring that ReDeFi's strategic direction is both proactive and responsive to emerging opportunities and user demands.

9. Liquidity Management

Functioning: ReDeFi can sift through vast amounts of historical transaction data to accurately predict instances of heightened liquidity demand. This predictive functionality enables the proactive adjustment of liquidity pools, ensuring that resources are allocated efficiently and effectively. The system dynamically manages these pools, adapting to fluctuating market conditions and user activities to maintain optimal liquidity levels.

Benefit: The primary advantage of such a liquidity management approach is the assurance of our platform’s resilience during periods of volatility. By minimising slippage and offering more favourable exchange rates, the platform not only retains its existing user base but also becomes more attractive to potential traders and liquidity providers.

Implementation Plan:

- **Historical Data Aggregation:** Compile a comprehensive database of past transaction and liquidity data across all trading pairs within ReDeFi’s network.
- **Predictive Analytics:** Leverage machine learning technologies to build models capable of predicting liquidity demands. These models will analyse patterns in market conditions, user transactions, and historical liquidity data.
- **Automated Liquidity Adjustment:** Design and deploy algorithms that can automatically adjust liquidity pools in anticipation of or in response to predicted liquidity demands. This system will ensure that liquidity is always aligned with current and forecasted needs.
- **Ongoing Analysis and Optimisation:** Establish a regimen for continuous data collection and model updating. This will involve regularly refining the predictive models with new transaction data to maintain their accuracy and effectiveness in forecasting liquidity requirements.

Sustainability and UN's SDG

Social impact

Reducing inequality, particularly financial inequality, and spurring economic growth has been at the heart of ReDeFi since the beginning. As a result, ReDeFi, as a responsible player seeking to pave the way towards fair and responsible banking, has joined the 2030 Agenda for Sustainable Development[10] which was adopted by all United Nations Member States in 2015. The agenda lays out a shared vision for people and the planet's peace and prosperity today and in the future. The 17 Sustainable Development Goals (SDGs)[11] are at the heart of everything, and they represent an urgent call to action by all governments AND businesses in a global partnership.

We at ReDeFi think that focusing on less and achieving more is preferable to focusing on more and missing out. As a result, ReDeFi has chosen four targets from three objectives, by priority:

Goal 10, Target 10.c: "By 2030, reduce to less than 3 per cent the transaction costs of migrant remittances <...>".

Goal 10, Target 10.2: "By 2030, empower and promote the social, economic and political inclusion of all, irrespective of age, sex, disability, race, ethnicity, origin, religion or economic or other status".

Goal 1, Target 4: "By 2030, ensure that all men and women, in particular the poor and the vulnerable, have equal rights to economic resources, as well as access to basic services, ownership and control over <...> appropriate new technology and financial services <...>."

Goal 8, Target 10: "Strengthen the capacity of domestic financial institutions to encourage and expand access to banking, insurance and financial services for all".

ReDeFi is committed to ending financial exclusion in all of its forms and dimensions so that all people can reach their full potential in dignity and equality, live wealthy and meaningful lives, and economic and technical progress can occur in harmony.

[10] https://sdgs.un.org/2030agenda
[11] https://sdgs.un.org/goals

As a result, ReDeFi is dedicated to achieving sustainable development in a balanced and integrated manner. We will combat financial inequities within and among countries, as well as create conditions for inclusive, sustainable and long-term economic growth.

Environmental impact

ReDeFi is an environmentally friendly layer-1 blockchain. To secure the network, ReDeFi's PoS-A consensus mechanism uses BAX rather than energy. It is too early to say how much energy ReDeFi consumes across the entire global network though. The bottom-up estimates of the ReDeFi network's electricity consumption and carbon footprint will depend on the electricity consumption of different nodes as well as differences in hardware and client software configurations. As nodes join and exit the network, the annual electricity usage and carbon emissions values will change. ReDeFi will make every effort to make emissions data and energy use reports available as soon as practicable for individuals who want to inspect its findings or utilise it for their analyses.

It is worthwhile to compare estimates for different industries in order to contextualise ReDeFi's predicted energy consumption. This will help us determine whether the PoS-A estimate is high or low.

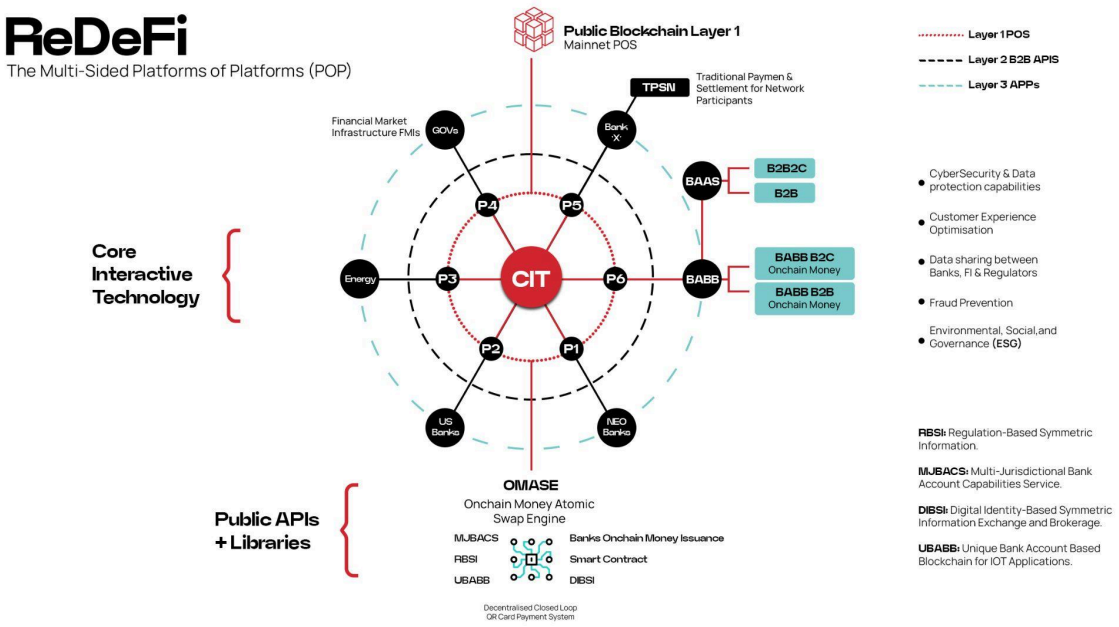
	Annualised energy consumption (TWh)
Data centres[12]	200
Bitcoin’s Proof-of-Work [13]	131
YouTube[14]	12
Netflix[15]	0.451
ReDeFi’s PoS-A estimated	0.002 - 0.004

Table 3. Predicted annual energy consumption for the ReDeFi comparison table.

ReDeFi's PoS-A consensus is both energy-efficient and environmentally friendly. A staking mechanism that uses validators chosen from the staking pool to validate transactions, thereby gaining incentives and contributing to the network's growth, aids in the maintenance of a clean and energy-efficient blockchain and lowers its carbon footprint.

[12] https://www.iea.org/commentaries/data-centres-and-energy-from-global-headlines-to-local-headaches
[13] https://ccaf.io/cbnsi/cbeci/comparisons
[14] https://www.gstatic.com/gumdrop/sustainability/google-2020-environmental-report.pdf
[15] https://ir.netflix.net/governance/ESG/default.aspx

Core Interactive Technology



The Core Interactive Technology (CIT) facilitates a range of services from traditional banking systems to innovative financial market infrastructures. Within the ReDeFi ecosystem, distinct points from P1 to P6 *(image above)* represent interfaces for multifaceted interactions among banks, regulatory bodies, and energy sectors, each connecting to ReDeFi. This integration can support the seamless execution of complex financial operations such as on-chain settlements, regulatory compliance checks, and cross-institution data sharing.

The Onchain Money Atomic Swap Engine (OMASE) can execute real-time conversions. By enabling atomic swaps, OMASE reduces dependency on intermediaries, thereby minimising settlement time and associated risks. Similarly, the Regulation-Based Symmetric Information (RBSI) and Digital Identity-Based Symmetric Information (DISBI) systems embed compliance into the transaction pipeline, ensuring adherence to financial regulations and secure information exchange.

The Multi-Jurisdictional Bank Account Capabilities Service (MJBACS) streamlines cross-border banking operations, fit for the complex regulatory landscapes and diverse customer needs. It simplifies the creation and management of bank accounts across different jurisdictions, enhancing the global reach of financial services.

For Internet of Things (IoT) applications, the Unique Bank Account Based Blockchain (UBABBI) provides a secure and traceable platform, blending financial transactions with the IoT infrastructure. This integration paves the way for financial applications that align with the evolution of smart devices and their role in transaction facilitation.

ReDeFi's Public APIs and Libraries extend its utility beyond the core blockchain functionality, empowering developers to create custom solutions that tap into the platform's robust capabilities. This opens avenues for innovation in cybersecurity, data protection, and the broader scope of Environmental, Social, and Governance (ESG) considerations within the financial sector.

In essence, ReDeFi's blockchain serves as a versatile and scalable platform, enabling a multitude of applications that transcend traditional financial models, fostering the growth of decentralised financial services that are more accessible, secure, and compliant with global standards.

About ReDeFi

ReDeFi Blockchain is a product owned by Regulated Decentralised Finance Ltd.

Regulated Decentralised Finance Ltd is a company registered and incorporated in England and Wales with company number 10803612 and registered office at Level 39, One Canada Square, Canary Wharf, E14 5AB, London, United Kingdom.

Regulated Decentralised Finance Ltd is a registered crypto asset firm with the United Kingdom Financial Conduct Authority (RRN 849446) under the Money Laundering, Terrorist Financing and Transfer of Funds (Information on the Payer) Regulations 2017 (as amended) in respect of its activities in crypto assets.

Contacts

Please, send any correspondence to BABB, Level 39, One Canada Square, Canary Wharf, E14 5AB, London, United Kingdom.

FAQs

Onchain Money

Q: *Why and how is the Onchain Money model better than stablecoins?*

A: The *Onchain Money model does not imply departures in their exchange values away from par, which would violate the "singleness of money". Under this model, a person or firm knows that when they accept and receive a payment from a customer of any bank, the payment will be credited to their account at face value. The use of central bank money for settlement is the main aspect that supports singleness. Furthermore, Onchain Money is not issued in exchange for a fiat deposit but rather mirrors GBP settled in the user's (owner's) name in a traditional bank account.*

Q: *Why and how is the Onchain Money model better than CBDCs[16]?*

A: *Onchain Money model enables any bank to join the ReDeFi blockchain by running a node in the network and benefit from the enhanced functionality of smart contracts, while also allowing money to be sent to and received from any bank that is not connected to the network using traditional standard bank account details such as sort code, account number, SWIFT, IBAN, and so on. The Onchain Money model provides for the preservation of existing financial market infrastructure and monetary policy while growing the use of blockchain and smart contracts.*

Furthermore, CBDC requires all banks to join the network at the same time and it's difficult to attain widespread adoption, but the Onchain money model allows institutions to join whenever they wish. The model will continue to function.

Moreover, the current CBDC design is intended to be managed by central banks, which are not designed to deal with customers directly.

Q: *How does a bank join the ReDeFi blockchain and participate in the Onchain Money model?*

A: *A bank should set up a node in the ReDeFi blockchain network, link to the Onchain Money smart contract, and set up mirroring bank accounts for its customers. Following that, a bank can freely use and benefit from the Onchain Money model.*

Q: *When two banks join the ReDeFi network, do they have to "mint" and "burn" Onchain Money, or can it be sent to treasury accounts?*

[16] Central bank digital currencies (CBDCs)

A: When two banks are the ReDeFi network participants, Onchain Money tokens can be transferred (rather than burned and issued). They also can keep their accounts and use treasury accounts instead.

Q: *Can Onchain Money be sent to non-KYCed users onchain?*

A: *The Onchain Money model follows a targeted update on the implementation of its Standards on virtual assets (VAs) and virtual asset service providers (VASPs), with a focus on FATF's Travel Rule*[17].

Q: *How does a bank receive Onchain Money without being a participant?*

A: *Because the payment method is comparable to the current two-tier monetary system's practice of using central bank money for settlement. The payment is made by debiting the sender's Onchain Money and conventional GBP balances at their issuing institution and crediting the receiver's conventional GBP balance at their institution. The Onchain Money is deleted ("burned") by the sender's bank because the receiver's bank is not a participant.*

Q: If a non-bank financial institution has a safeguarding*[18] *arrangement with a bank, can it join the ReDeFi network?

A: Yes, if a non-bank FI has a safeguarding arrangement with a bank, it can also join and benefit from the ReDeFi network. In this situation, its customers will use virtual IBANs (vIBANs), but the rest is the same.

Q: Why do users need to have double fiat accounts?

A: To illustrate, the mobile app in the preceding examples (User interfaces section) contains two unique tabs for Onchain money and Conventional money. However, this is simply for demonstration reasons, and the actual user interface may differ from this example. For example, the user interface can only have a Current mirrored fiat acct and not a Current acct - a "traditional" one.

Q: *Is it possible to create Onchain EUR, Onchain USD, Onchain GBP or something else?*

A: *Yes, everything that has been said about Onchain Money is applicable and possible for any existing 180*[19] *sovereign fiat currency.*

ReDeFi Self-Custody Wallet

[17] https://www.fatf-gafi.org/en/publications/Fatfrecommendations/Targeted-update-virtual-assets-vasps.html
[18] https://www.fca.org.uk/firms/emi-payment-institutions-safeguarding-requirements
[19] https://en.wikipedia.org/wiki/List_of_circulating_currencies

Q: ***To clarify, there will be two distinct decentralised ReDeFi Wallets, one containing bank account details issued by regulated banks and FI and the other without.***

A: *No, there will only be one ReDeFi Wallet with bank account information. ReDeFi LTD will open a standard bank account and create sub-accounts for each ReDeFi Wallet it creates.*

Others can develop their versions of decentralised wallets on the ReDeFi blockchain. It can look like MetaMask wallets (no bank account, just a wallet) or like ReDeFi Wallets, in which case, they would need to establish their agreements with banks to generate sub-accounts and provide users with acct details such as sort code, account number, BIN, IBAN and so on.

Q: ***Why do you need Mirroring ReDeFi sub-accounts for each wallet?***

A: *This is what makes ReDeFi Wallet innovative and unique compared to any other decentralised self-custody wallet. Having dedicated sub-accounts for every wallet, users will be able to send conventional money to and from any 3rd-party traditional bank regardless of whether this bank participates in the ReDeFi network or not. Next, having dedicated sub-accounts allows for better accounting and audit.*

Furthermore, the Onchain Money model offers tokenised deposits that do not violate the "singleness of money" principle, making it suitable for usage by banks and other financial institutions, as well as individuals and businesses. As a result, even with a ReDeFi Wallet, it is critical to keep this model active.

Q: ***What will happen if a user loses their private keys?***

A: *This is an unfortunate event. Self-custody, by definition, means that only the owner of the private keys has access to the funds in the wallet. Fortunately, ReDeFi Wallet will have a feature that will allow users to designate a secondary wallet address to withdraw funds after a specified period of inactivity. The ReDeFi Blockchain provides expanded functionality through smart contracts while remaining on the regulated side of the financial system.*