

How a Self-Sovereign Identity prevents overcollateralisation in Decentralised Finance

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Abstract

1 Introduction

The field of Self-Sovereign Identity (SSI) is an increasingly important topic considering the increased demand of digital identification. Previous research has been done on multiple aspects which form the basis of establishing a digital identity; Security, Controllability and Portability [1].

Furthermore, a verifiable digital identity is a required feature for financial services that are operating in blockchain-based cryptocurrencies [2]. As decentralised finance is being developed further and with its popularity rising, the liquidity of digital markets have reached 25 billion USD [4] and monthly trading volumes have passed the trillion dollar mark in January 2021 [3].

The increase of adoption enlarges the demand for financial services that require more than is possible through the pseudonymous on-chain asset exchange. Financial capabilities of the cryptocurrency ecosystem are continuously extended through stacking of protocols and use of smart contracts to establish a decentralised autonomous organisation (DAO).

The basis of finance is founded by lending and borrowing, which has also been applied to the decentralized finance through Loanable Fund Markets [5, 6, 7]. These markets offer either flash loans or longer term collateralised loans. Flash loans are secured as a

single transaction which can be reverted in case the loan defaults, whereas longer term loans are secured by fully collateralising the loan. This means that the value of a loan plus interest is needed to insure counterparty risk, in the form of defaulting or fluctuations of asset value. The insurance that a borrower repays a loan is paramount to a healthy lending market. DeFi is anonymous or pseudonymous in nature and therefore lacks the background checking systems that are used by traditional lending companies.

A Self-Sovereign Identity with trusted attestations opens the door to a multitude of digital financial services while servicing as a big stick in order to transparently manage counterparty risk [2]. Such an SSI can safely and securely store a financial reputation score, much like a traditional credit score. Research on collateral reduction mechanisms have been done by [8] and [9], but is largely unexplored.

2 Problem Description

The main research question this paper tries to answer is as follows:

How can a Self-Sovereign Identity based credit score dissuade overcollateralisation in decentralised lending protocols?

In order to answer this question the following topics will be discussed in this paper. Firstly, the established peer to peer lend-

ing protocols and their reputation mechanisms are reviewed. Secondly, the most common credit score system (FICO[10]) and proposed adaptations for decentralized finance are discussed. Thirdly, an implementation is proposed based on these findings using a blockchain based SSI solution and both a credit score claim and a credit history evaluation. Finally, an experiment based on the proposed implementation is conducted and reviewed.

3 Your contribution

Experimental work

Improvement of an idea

4 Experimental Setup and Results

5 Responsible Research

6 Discussion

7 Conclusions and Future Work

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