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Decentralized Lending Within the Concept of a Consortium Blockchain Network

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ABSTRACT

The decentralized finance (DeFi) ecosystem is a complex and ever-evolving system composed of various protocols. One of these protocols is lending, which has seen significant growth in recent times. However, the motivations behind investors' interest in this area remain largely unknown. Lending protocols operate on predefined algorithms that automatically provide loans to users, allowing them to actively participate in DeFi lending platforms on public blockchain networks. The adaptation of these algorithms to a blockchain network within the framework of state legislation has not been explored in depth. This determines the importance of the study. **The object** of the study is to compare lending in a blockchain network with traditional forms; **the subject** is to identify the factors that influence decentralized lending and its relationship with traditional finance. **The aim** of this study is to develop a model architecture that can be used to create decentralized credit applications within a consortium blockchain network that uses a native currency, such as a central bank digital currency (CBDC). **The main objectives** of this study are: 1) using data on transactions from the Aave lending protocol, one of the leading decentralized finance (DeFi) ecosystems in terms of market capitalization, to identify the motivations that drive participants to engage in DeFi lending activities; 2) based on research into the DeFi token ecosystem and its market, as well as analogues of traditional financial lending models, to develop a mathematical model and an architectural diagram for a decentralized lending system built on a consortium blockchain with a Central Bank Digital Currency (CBDC) as the native currency. **The results** of the study are presented in the form of a mathematical model and a diagram of the architecture for a decentralized lending system based on a consortium blockchain network using a consortium with a native cryptocurrency, known as CBDC.

Keywords: lending; collateralized borrowing; liquidations; decentralized finance; automated algorithm; retail CBDC; consortium blockchain network

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INTRODUCTION

DeFi lending allows users to borrow and lend money through special protocols, bypassing traditional banks and other centralized financial institutions. With these services, users can access digital assets without the need for intermediaries. The protocols are often open source, ensuring transparency and reliability [1].

The business process of DeFi lending, implemented through smart contracts, allows for rates to be set based on supply and demand. By November 2025, lending had become the leading protocol in terms of total value locked (TVL)[2], with a value exceeding $68 billion.

DeFi's lending protocols offer users new opportunities that differ from traditional bank loans. One of these is anonymity, making it impossible for traditional banks to use methods of assessing creditworthiness that they rely on. However, DeFi lending protocols also create a lending reputation, which is built through consistent participation in lending activities over time.

The rapid development of blockchain technology and regulations for mutual lending (such as mutual insurance and tokenization), as well as central bank digital currencies, opens the door to a new economic ecosystem based on consortium blockchain networks. This will be explored in more detail in this paper.

G. Cornelli and other researchers [3] argue that traditional lending practices, which rely on a borrower's reputation and financial stability, are becoming obsolete in the lending market due to the rise of anonymous participants. They suggest that credit pools, which use reputation

assessment algorithms embodied in smart contracts and based on user interactions, will be able to fulfill traditional intermediary roles between borrowers with projects and lenders with funds.

This reputation assessment algorithm promotes healthy competition among users, motivating them to participate more actively and contribute to the creation of a dynamic and sustainable financial system. DeFi lending services allow users to deposit crypto assets into a lending pool, which functions similarly to a savings account. Users can then borrow crypto assets based on the amount they have deposited. The interest earned on these assets is paid out to creditors, with a small fee collected by the lending platform and blockchain network for each transaction. Lenders are investors who earn interest on their deposits in the DeFi lending service. The anonymity and volatility of cryptocurrencies significantly influence risk management strategies in crypto lending. This makes the use of excess collateral a crucial risk management tool, compared to traditional banking practices.

In traditional finance, loans are often secured by insufficient collateral, with the main risk management strategy being an assessment of the borrower's creditworthiness. However, in the cryptocurrency world, the situation is different due to the unique characteristics of digital assets.

Volatility is a common feature of cryptocurrencies, and it can cause the value of a deposit to fluctuate. Additionally, there are instances where a deposit may no longer meet the required standards. In such cases, a liquidation process is initiated. A third party, known as the liquidator, is responsible for carrying out the liquidation. They partially repay the loan by seizing part of the collateral, often receiving a small bonus in return for their efforts. This process helps maintain the stability of the lending pool and encourages participation in the system [4].

DeFi protocols are completely governed by smart contracts executed on the blockchain network. This leads to complete automation of the lending and borrowing processes. The blockchain network enables instant loan issuance and lower transaction fees compared to traditional banks, which involve more manual processing and relationship management for loans.

From the abstract description of DeFi lending in public blockchain networks, it is clear that there is not enough trust to fully integrate into the state's economic ecosystem. Consortium blockchain networks have the trust inherent in traditional banking, as they operate within the framework of state legislation. Considering the advantages of DeFi lending compared to traditional mediation methods, studying and creating a hybrid model based on DeFi is a strategic goal for economic growth. This makes this research highly relevant.

LITERATURE REVIEW

Due to the growing popularity of DeFi-lending protocols, a lot of research has recently appeared on its various aspects. Many of them are aimed at characterizing user behavior in lending and DeFi protocols. A. Green et al. [5] have created a process for converting transaction data into a form suitable for use in econometric modeling.

L. Heimbach and W. Huang [1], conducting an in-depth analysis of DeFi leverage, found that the largest and most active users tend to have higher leverage compared to other users. R. Kozhan and G. Viswanath-Natraj [6] provided early empirical data on loans secured by stablecoins, showing the relationship between credit risk and the volatility of the DAI stablecoin price. Also L. Gudgeon et al. [7] In the early stages of DeFi-lending, data on interest rates, the use of credit pools (liquidity pools in DeFi-lending protocols) are empirically examined and market liquidity is studied. A. Lehar and C. Parlour [8] have substantiated the stability of liquidity pools, which are automatic market makers (AMM, allow traders to automatically exchange one crypto asset on the other in the blockchain [9]) and indicate the conditions under which AMM dominates the limit order markets. A. Capponi et al. [10] emphasized the differences between behavior in the traditional

market, where informed traders hide their trading intentions, and on decentralized exchanges, where informed traders signal their privileged position by offering higher commissions. M. Bartoletti et al. [11] showed the use of a statistical analyzer in credit pools to find threshold and reward parameters that reduce the risk of non-performing loans. T. Rivera et al. [12] proved that the structures of fixed interest rates in DeFi-lending play a lesser role compared to the structures of traditional lending platforms. Work has been done to calculate the coefficient of financial health at the account level [13].

Most articles on DeFi-lending protocols explore their inherent vulnerability. The systemic vulnerability of DeFi lending markets is described, when liquidators sell collateral and thereby further affect prices, causing cascading liquidation of other loans [14]. A systemic risk is identified with a certain use of the DeFi-crediting protocol [15].

The work [16] was used for comparative analysis with the repo markets secured by private securities.

Regarding the consortium blockchain network (the term will be disclosed later), one of the co-authors in the work "Decentralized Finance: a Fair Economy" [17] justified the strategic importance of introducing a consortium blockchain network into the Russian economy. This innovation, based on the legislation of the Russian Federation, can significantly contribute to economic growth (*Fig. 1*).

The purpose of this study is to propose a model architecture for decentralized credit applications based on a consortium blockchain network with a central bank-backed currency. The main objectives of the study are:

1. To identify the motivations that drive economic agents to engage in DeFi lending activities by analyzing transaction data from Aave[1] lending protocol, which is currently one of the leading DeFi ecosystems by token[2] market capitalization deployed on the Ethereum blockchain, and shows rapid growth from a macroeconomic point of view.

2. To develop a mathematical model and architecture for a decentralized lending system within the framework of a consortium blockchain network, with a native cryptocurrency based on a central bank. This will be based on research into the ecosystem of DeFi lending tokens, as well as close analogies to DeFi lending business models from the traditional financial sector, in relation to the market.

MATERIALS AND RESEARCH METHODS

This study uses primary data generated from the addresses of the Ethereum blockchain network. These addresses are equivalent to accounts in traditional finance and are analyzed visually. Each DeFi transaction is associated with an address, which can be an external account (EOA) or a smart contract.

The data is collected from the transactional level of the Ethereum network using The Graph[3] platform. It covers the activities of the Aave V3 lending protocol and includes six types of transactions: deposits, collateral, withdrawals, borrowings, repayments, and liquidations. These transactions occurred between January 1, 2022 and November 31, 2025.

To distinguish between EOAs and smart contracts, we used blockchain address data from Amberdata[4] for each address in the submitted data.. The Aave V3 protocol, deployed on the Ethereum blockchain, does not cover all decentralized finance (DeFi) lending activities. However, since the Aave V3 protocol accounts for more than 60% of total value locked (TVL) in DeFi loans as of November 2025, its data can be considered a representative sample for analysis purposes.

The development of the architecture for the decentralized lending model within the framework of a consortium blockchain network was based on the methodology proposed by I. Giannakouros (2018), which examines in detail

[1] Aave Token ecosystem. URL: https://aave.com/ (accessed on 10.03.2026).

[2] Top Lending &Borrowing Tokens by Market Capitalization. CoinMarketCap. URL: https://coinmarketcap.com/view/lending-borowing/ (accessed on 10.03.2026).

[3] URL: https://thegraph.com/ (accessed on 10.03.2026).

[4] URL: https://www.amberdata.io/ (accessed on 10.03.2026).

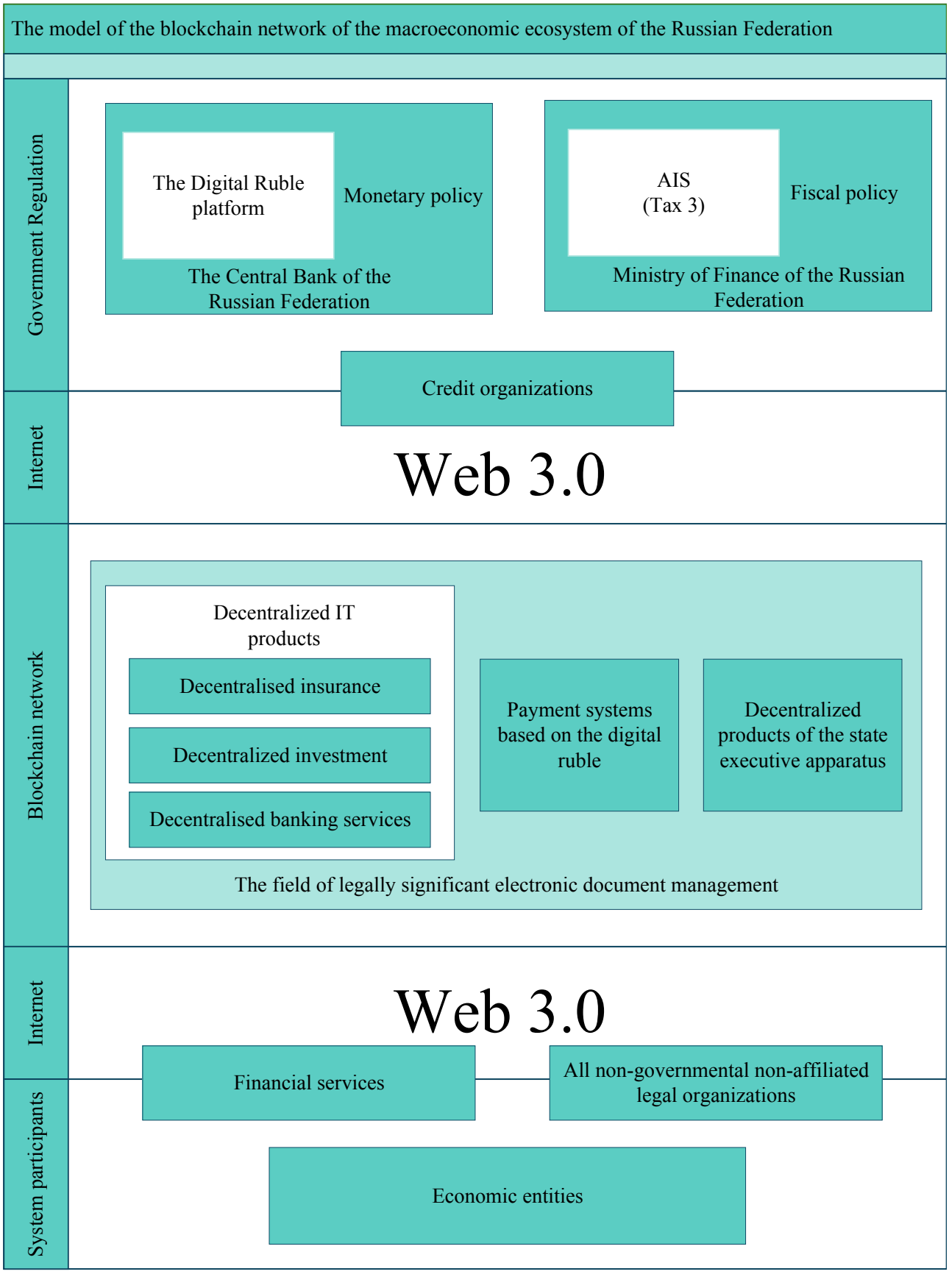

Fig. 1. **The Model of a Consortium Blockchain Network for the Macroeconomic Ecosystem of the Russian Federation**

Source: Authoring.

the mechanism of communication between the development of a token-based market and the creation of a new economic ecosystem at the national level.

The structural aspect of this approach is a market design object, consisting mainly of a typology of economic agents in the ecosystem, external dependencies, and transaction paths, as well as a typology of tokens involved in these transactions. The main factors that determine market design, such as density, congestion, security, usability, and social norms, were explained in the context of a token ecosystem.

Scientific methods were used to analyze and synthesize the Aave V3 DeFi crediting protocol.

RESULTS AND DISCUSSION

In this study, we analyze the structure of the DeFi lending protocol based on the Aave V3 protocol, which is deployed on the Ethereum blockchain. Before designing a lending protocol for a consortium blockchain with a native currency, it is necessary to evaluate the DeFi lending process on public blockchain networks. We need to understand why investors are attracted to these platforms, and why they choose to borrow rather than just sell their assets.

To begin our analysis, we visualize the summary statistics of our data sample.

The graph clearly demonstrates the rapid and steady growth of the DeFi lending market from a macroeconomic perspective, which underscores its significant role in the overall economic ecosystem.

To understand how users of decentralized finance (DeFi) loans behave, it's important to understand the specific characteristics of this market and to hypothesize about the reasons why people participate in DeFi platforms. This knowledge is based on an analysis of Aave, a well-established ecosystem that has undergone three generations and supports smart contract-based token management.

Aave operates as a decentralized money market that doesn't require depository custody, and from a financial perspective, it functions as a capital market for both short-term liquidity and long-term financing. The assets involved in these transactions are tokens, and because we're considering blockchain networks based on Ethereum, it's essential to consider the compatibility and convertibility of these tokens through a shared mechanism for executing smart contracts, implemented as a virtual machine. This leads to the creation of a diverse range of cross-border business processes.

We return to constructing hypotheses about users' motivation to participate in DeFi lending based on the data we have obtained and the work of leading researchers in this field. We will not cite these hypotheses in this paper, as we only need a general understanding of user motives for our purposes.

Two types of tokens dominate the DeFi lending market: "wrappers" for cryptocurrencies and stablecoins (*Fig. 2* and *3*). The former are volatile and the latter are stable. This forms the basis of one of the most popular loan schemes, often with full collateral. Given the diversity of DeFi products, there are several reasons why participants may choose to take out a loan on the platform. There are many different types of participants, varying in skill level and investment amount. However, let's focus on some basic hypotheses about the reasons for participating in DeFi lending:

- To earn passive income by depositing tokens in a DeFi lending platform, similar to earning interest on demand deposits in traditional banks.
- Borrow tokens to increase volatility profits. For example, if the owner of a volatile token believes that their tokens will increase in value, they can leave them as collateral by borrowing stablecoins. Then, by exchanging these stablecoins for the tokens, they will make a significant profit if their forecast is correct.
- Stablecoins can be used as a pool of mutual insurance or the capital of an organization. In order to not miss the opportunity to participate in centralized or decentralized exchanges or finance other areas, they are often mortgaged.
- DeFi lending protocols have their own markets where participants can earn profits.

In [17], the tokenization process implemented in the consortium blockchain network and its

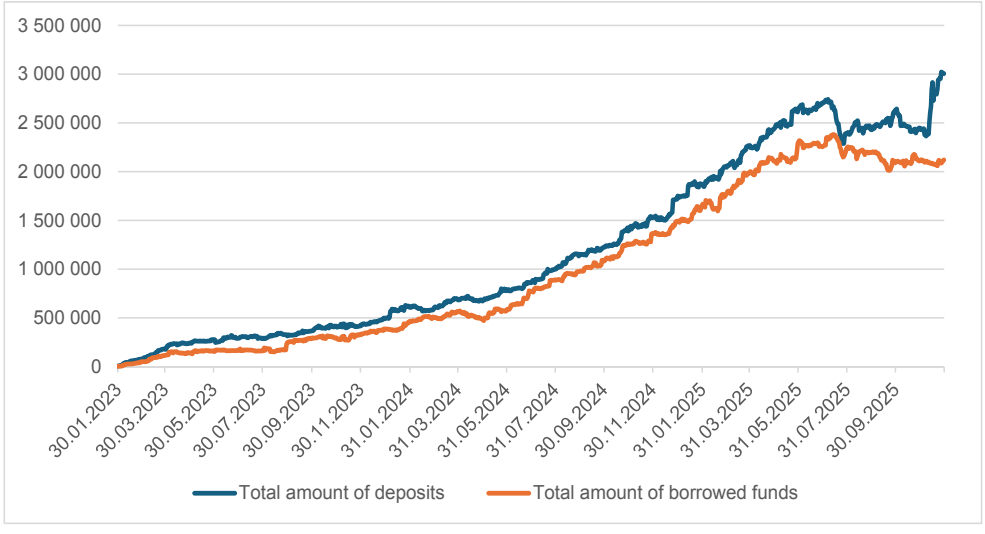

Fig. 2. **AAVE Protocol (DeFi lending) Ethereum V3 Development Chart Expressed in TVL of WETH Token (ETH Wrapper)**

Source: The authors' calculations based on data from public blockchain networks.

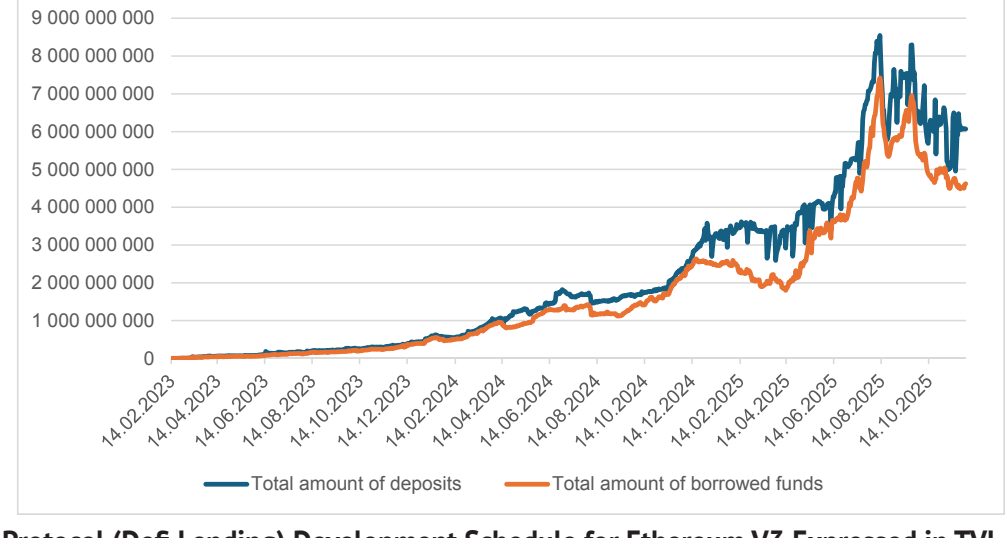

Fig. 3. **AAVE Protocol (Defi Lending) Development Schedule for Ethereum V3 Expressed in TVL of USDT Token (Stablecoin)**

Source: The authors' calculations based on data from public blockchain networks.

role in the Russian economy, as well as the process of its regulation by the state, were analyzed. Based on this analysis, it can be concluded that today's decentralized finance (DeFi) lending, working with tokens of "wrappers" of cryptocurrencies (WETH, WBTC, etc.) and stablecoins (USDT, etc.), will continue to evolve by incorporating assets from the real world. This development will be facilitated by the expansion of the aforementioned consortium blockchain network, which adopts the capital markets model at the level of national legislation. Tokenization allows investors to operate on real-world assets by registering them as digital assets in the form of tokens. This evolution emphasizes the strategic significance of DeFi lending research in the context of a consortium blockchain network with a native currency based on central securities, which this study aims to explore.

MODEL

A DeFi loan (from the point of view of implementation as a class) is a smart contract in which the terms of the agreement between the borrower and the lender are concluded. The basis of the agreement is the number of B_0,

units of borrowed tokens at time $t=0$ secured by C_0 units of tokens. In DeFi-lending, risk management, as in traditional finance, is a critical task if, without going into details and comparing the business models of traditional credit institutions with DeFi-lending, they will correspond to repo and pawn loans. But our conclusion on this issue, which coincided with the result of L. Heimbach and W. Huang [1] have shown that repo and securities borrowing have major differences from DeFi-lending. It follows that only the pawnshop loan model remains, comparable to the DeFi-lending model. In DeFi-lending protocols, certain participants perform the role of debt liquidators, securitization functions for a certain bonus received from the liquidated collateral. As mentioned earlier, our research is based on the DeFi-lending protocol — AAVE, which is an ecosystem for managing tokens of the ERC-20[5] standard within the framework of the financial theory of credit. ERC-20 introduces a standard for interchangeable tokens. We can express the spot price of collateral in loan units equal to p_t, where the total value of collateral for the loan at time t is defined as $C_t p_t$. To simplify the readability of expressions, we denote the initial market value of the collateral at time t as $Cl_0 = C_0 \cdot p_0$ и $Cl_t = C_t \cdot p_t$. On DeFi-lending platforms, loans are secured based on the loan-to-value LTV ratio. Let's call it Ltv. For example, in Aave v3, the Ltv coefficient of the WETH token is 0.8. This means that with a collateral value of Cl_0 of 1000 USDC, you can get a loan of up to 800 USDC. Therefore, the collateral discount (eng. haircut), denoted Hc, equal to $1-Ltv$, will be 0.2, then $Ltv = 1-Hc$ and B_0 will not exceed $Cl_0 \cdot Ltv$. According to the theory of credit: the borrower's current debt position (Dp) at time t, which increases due to constantly accrued interest on the loan (i_b), is determined by the expression (in simplified form i_b is a constant):

$$Dp_t = B_0 \cdot e^{i_b t} = Cl_0 \cdot Ltv \cdot e^{i_b t}. \quad (1)$$

[5] URL: https://ethereum.org/ru/developers/docs/standards/tokens/erc-20/ (accessed on 10.03.2026).

The risk factor (Ef) is the ratio of the current debt to the current value of the collateral:

$$Ef_t = \frac{Dp_t}{Cl_t} = \frac{Cl_0 \cdot Ltv \cdot e^{i_b t}}{Cl_t}. \quad (2)$$

The critical value at which the DeFi-lending platform considers a debt position to be significantly unsecured is the liquidation threshold (LTh) and is determined by the equality $LTh = Ef_{critical}$, $LTh \in (0,1)$. Consequently, the further away the liquidation threshold is from the risk factor, the more reliable the loan is, which makes it possible to predict the loan security situation by monitoring and changing the risk factor.

As long as the borrower has $B_t < Cl_t$ there is an incentive to release the loan (repay the debt). Asset-backed securitization is subject to the market risk associated with collateral, this problem is solved by providing excess collateral. The algorithms of DeFi-lending protocols introduce the concept of "borrower's borrowing capacity", which is determined by the formula $Bc_t = Cl_t \cdot LTh$. Under the condition $Bc_t \geq B_t$ the DeFi-lending platform considers the debt position to be healthy, therefore, the ratio of the borrower's borrowing capacity to the initial borrowing base is called the "health factor" and is expressed by the formula:

$$Hf_t = \frac{Bc_t}{B_t} = \frac{Cl_t \cdot LTh}{B_t} = \frac{Cl_t \cdot LTh}{Cl_0 \cdot Ltv} = \frac{Cl_t \cdot LTh}{Cl_0 \cdot (1-Hc)}. \quad (3)$$

Thus, a loan is considered healthy if

$$\frac{Cl_t \cdot LTh}{Cl_0 \cdot (1-Hc)} \geq 1. \quad (4)$$

In traditional financial practices, when providing loans, the "additional collateral requirements" mechanism is often used. This involves calculating the percentage of margin erosion as a reference indicator for risk. This percentage is determined by taking the difference between the initial market value of collateral and the current market value at time t, and dividing it by the initial margin.

In the context of decentralized finance (DeFi) lending, this indicator can be calculated

in a similar way. However, instead of using traditional collateral such as property or assets, DeFi protocols use cryptocurrencies or other digital assets as collateral. The calculation of the percentage of margin erosion would still be based on the same principles, but with different values for the initial market value and current market value of these digital assets.

$$Me_t = \frac{Cl_0 - Cl_t}{Cl_0 \cdot Hc} \Rightarrow$$
$$Me_t \cdot Cl_0 \cdot Hc = Cl_0 - Cl_t \Rightarrow$$
$$Cl_t = Cl_0 \left(1 - Me_t \cdot Hc\right). \quad (5)$$

Substituting expression (5) into the definition of the health factor (3) and considering expression (4), we obtain the following:

$$Me_{critical} = \frac{LTh - 1 + Hc}{LTh \cdot Hc}. \quad (6)$$

In a consortium blockchain network based on government legislation, the DeFi-lending model takes on a hybrid form (combining DeFi-lending and traditional bank lending) by adding financial mechanisms of traditional banking activities that allow you to earn on risk ($B_t > Cl_t$). At the same time, the roles of participants in DeFi-lending are expanding (they will be presented in detail later).

By analogy with traditional banking, it is necessary to determine the risk of a liquidity shortage resulting from a structural mismatch between total liabilities and assets, which is self-insured by having unused capital at its permanent disposal in an amount sufficient to cover possible adverse changes in its activities. The method of calculating this insurance capital depends on the jurisdiction and policy of the specific DeFi-lending platform. In general, it consists of multiplying each credit exposure (eng. credit exposure) $CE_i = B_t - Cl_t$ to the "risk weighting factor" W_i, specific to the given credit position.[6]

$$RWA_i = CE_i \cdot W_i, \quad (7)$$

where RWA_i — risk-weighted-asset.

Summing up all the RWA_i gives the regulatory requirements for the capital of the DeFi-lending platform (for credit risk).

$$Capital_{Credit\ Risk} = k \cdot \sum_i RWA_i, \quad (8)$$

where k — A coefficient that determines the severity of capital for credit risk specific to a particular DeFi-lending platform.

Credit risk capital is used by analysts to assess return on risk-weighted-assets[7]:

$$RoRWA = \frac{Profit}{\sum_i RWA_i}. \quad (9)$$

Expression (9) is an indicator of profitability, which can be used as a parameter of the function $sh = f\left(RoRWA\right)$, $sh \in (0,1)$, which determines the offset of the value of the function (6). Therefore, we obtain:

$$Me_{critical} = sh \cdot \frac{LTh - 1 + Hc}{LTh \cdot Hc}. \quad (10)$$

Once this value is reached by analogy with loans in traditional financing, DeFi-lending platforms can conclude that the borrower is in default and establish the status of the asset (smart contract addresses in the blockchain network), which has a debt position as "free for liquidation", and notify all active liquidators about it. This, in turn, will allow them to buy back a certain share, expressed by $f(0,F)$, $F \in (0,1)$ at a certain discount. The percentage of % is called the "liquidation coefficient". The remaining part of the debt starts a process similar to the process of collecting bank debt, which should be automated as much as possible using smart contracts. After studying the behavior of participants in DeFi lending on public blockchain networks and describing a mathematical model of DeFi lending, the architecture of a DeFi lending model in the context of a consortium blockchain network has been designed in accordance with a methodology (*Fig. 4*).

[6] Risk-based capital requirements. URL: https://www.bis.org/basel_framework/chapter/RBC/20.htm (accessed on 10.03.2026).

[7] Return on Risk Adjusted Capital. URL: https://www.investopedia.com/terms/r/rorac.asp (accessed on 10.03.2026).

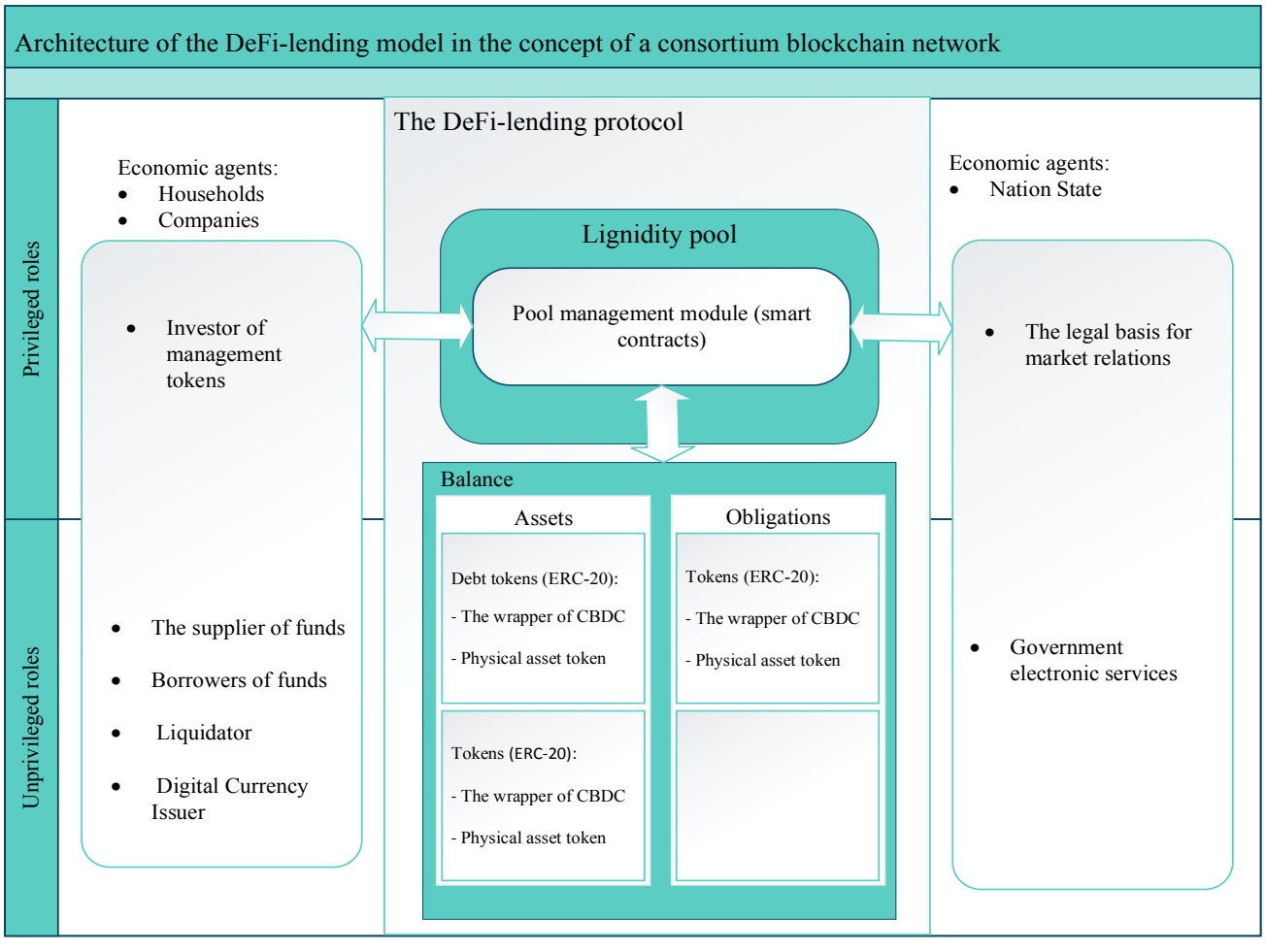

Fig. 4. **Architecture of a Decentralized Lending Model in the Concept of a Consortium Blockchain Network with a Native Currency in the Form of CBDC**

Source: Authoring.

Consortium blockchain networks are partially decentralized, as they are controlled by a group of organizations. They are used in industries where multi-party cooperation is necessary. Consortium networks can be public or private, although they are often private [19, p. 6–11].

This architecture of the blockchain network greatly enhances the capabilities of DeFi products by combining the best features of traditional finance with modern blockchain technology. This integration is largely due to the incorporation of the functionality of traditional financial intermediaries into automated modules composed of smart contracts, leading to the development of new models for providing financial services.

When designing the architecture for the DeFi lending model, all possible types of economic actors were identified who connect their transaction paths. It is important to note that one of these economic actors is the state, as opposed to the public DeFi lending model. The use of a federal state information system enhances the risk management model, resulting in maximum efficiency and reliability for financial business processes. Additionally, the architecture of the proposed consortium blockchain network is based on the idea of central bank digital currencies, which offers new possibilities for the development of decentralized applications.

In their work, V.V. Kalukhova and M.V. Dugaev [20] proved the significant role of central securities in the context of global digitalization, allowing states to control transactions and maintain economic stability. The concept of integrating the mechanism of the CCB module into the blockchain network using the example of the digital ruble was described and justified

from the point of view of reliability, security and optimality by the authors in the work "Decentralized Finance: a payment system based on the digital ruble" [21]. Tokenization of real-world assets (real estate, etc.) at the legislative level will expand the possibilities of DeFi-lending.

It is clear that this departure from anonymity can be seen as a positive development in some situations. However, on the other hand, the blockchain network model proposed by the consortium will provide access to the state's digital ecosystem, which could lead to increased economic growth through DeFi lending. Additionally, financial inclusion, a key principle of DeFi as outlined in the concept paper [22], would contribute to economic development.

The presented architecture of the model is basic, as it is a template for decentralized applications deployed in a consortium blockchain network under the control of a decentralized autonomous organization. It also lies within the framework of such traditional financial paradigms as pawn loans and asset-backed securitization and private debt markets.

From a technical point of view, the implementation of the business logic of this model consists of application-level protocols (a logical chain of smart contracts) deployed in a virtual machine of a blockchain network derived from the Ethereum blockchain. Therefore, all its artifacts (tokens, smart contracts, etc.) can interact with any other protocols (insurance, investment, etc.). This will allow you to build a secure and reliable financial ecosystem, eliminating all intermediaries that bring instability and vulnerability, which significantly reduces the cost of the transaction and increases its speed and reliability.

From a business perspective, the model is designed to provide a capital market for both short-term liquidity and long-term financing. This is achieved through lending pools, which are the core component of DeFi lending. These pools define the business logic through smart contracts, which not only perform the functions of liquidity pools, such as AMM (automated market maker) and connecting internal and external markets, but also provide the platform with up-to-date information. In addition, these contracts include a functional module that offers the lending platform all the necessary features of a credit service, such as supplying and withdrawing funds, receiving interest, borrowing funds against collateral, and more. Each pool also has a storage facility called a reserve.

The basic roles of economic agents in this model are divided into two categories, which are not mutually exclusive:

Unprivileged roles assigned to participants on the Defi lending platform implementing this model:

- The fund provider, a participant in this role, deposits eligible tokens into the platform's liquidity pool, and their deposits continuously increase depending on the accrued interest rate.
- The loan borrower, a participant in this role, receives a loan denominated in one of the tokens available in the platform's liquidity pool and pays a certain percentage of the loan.
- Liquidators, participants with this role, have the opportunity to pay off an outstanding loan by purchasing a security deposit at a predetermined discount.
- Organizations capable of tokenizing physical assets according to national legislation are assigned the role of digital asset issuers.
- Decentralized autonomous organization members use privileged roles.
- An investor in management tokens who makes decisions (votes, etc.) on strategy, operational issues, and investments. The acquisition of management tokens is dependent on the successful implementation of the DeFi lending platform, and this role could be greatly expanded.

CONCLUSIONS

The study aims to analyze the behavior of investors in DeFi lending protocols and identify the main factors that determine the intermediary activity in DeFi. To achieve this, we analyzed detailed transaction-level data from Aave, a prominent player in the DeFi lending space.

Our findings show that the main motivation for borrowing, for both retail and institutional investors, is driven by speculative goals, such as the desire for high returns through leverage,

market movement, and price speculation. Additionally, the risk of liquidation and potential losses encourages borrowers to maintain a significant amount of collateral as a safety margin.

The industry practices and factors[8] that affect each element of the decentralized lending structure are analyzed and demonstrated in detail. Based on this analysis, along with scientific literature, a mathematical model for decentralized lending is presented. This model is based on the financial paradigms of pawnbroking and asset-backed securitization.

[8] Industry practice factors are a set of conditions and characteristics that shape the business environment in a particular industry and determine the behavior of market participants.

Using the analysis of the architecture of the DeFi lending protocol and the mathematical model, we have designed the architecture for the DeFi lending model in the context of a consortium blockchain network with a central bank-backed currency. The combination of blockchain technology and traditional finance creates an evolutionary financial product that has the potential to significantly improve lending quality in terms of economic growth.

The results of this work could be useful for financial engineers when designing decentralized finance (DeFi) products within a consortium blockchain network. They could also be valuable for a variety of researchers and software developers working in the field of financial technology.

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